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ON ARCHITECTURE AND URBANISM
CONFERENCE PROCEEDINGS

Editors: Dr. Hourakhsh Ahmad Nia and Dr. Rokhsaneh Rahbariaryazd

CONFERENCE PROCEEDINGS

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Introduction

The *1st International Conference on Contemporary Affairs in Architecture and Urbanism* is organized by Anglo-American Publications LLC with the collaboration of International Journal of Contemporary Urban Affairs. ICCAUA 2018's mission is to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of the contemporary concerns, methods and approaches to architecture and urbanism. It also provides the premier interdisciplinary forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, concerns, practical challenges encountered and the solutions adopted in the field of Architecture and Urbanism.

Accordingly, the conference brings together all the theories, manifestos and methodologies on contemporary architecture and urban spaces to raise the understanding for the future of architectural and urban planning. Overall, the Conference aimed to establish a bridge between theory and practice in the built environment. Thus, it reports on the latest research findings and innovative approaches, methodologies for creating, assessing, and understanding of contemporary built environments.

A broad outline of the conference's scope includes: peer-reviewed original research articles, case and technical reports, reviews and analyzed, papers, short communications. This conference proceeding is the combination of scholars, practitioners, professionals, researchers and policymakers with a common interest in the field of architecture and urban design from different disciplines, such as Art, Architecture, Landscape, Urban Plane and Urban Design. The Scopes of this conference proceeding includes:

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Innovative Planned Unit Redevelopment: A Legal Review

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Abstract

Examined is the regulation and execution of urban/ suburban redevelopment in the planned unit form, a PUR ordinance template, the varied means to formulate and implement the PUR through innovative forms of cooperation among land owners as well as regulated compensation for windfalls and wipeouts, and a review of case studies.

There is a compelling need for new regulatory instruments to address the demands of urban and now suburban renewal, and the emerging market demand for mixed-use, infill redevelopment. Here redevelopment preserves existing uses and repurposes others in a planned manner that adds value to the redeveloper[s] and mitigates existing zoning hindrances.

This new form is with challenges, addressed through various techniques of land value capture and compensation, including tax/ subsidies, consumer/ investor-based cooperatives, and the incorporation of a neighborhood site/ re-platted plan into zoning. Indeed, this incorporation into zoning accommodates redevelopment flexibility while making obsolete the redeveloper and promoting individual builders and investors.

Regarding PUD's/ PUR's legal review the issue of the constitutionality of regulatory form-based manuals and parcel-specific distinctions as to land use. Such challenges can be withstood if they adhere to the jurisprudential standard of the rightful use of legislative power or its delegation to an administrative agency/ official and if not constitutionally vague and, thus, a condition for substantive due process.

The PUR overcomes legal challenges of spot zoning and nonconforming, pre-existing uses, as well as the contentious politics of neighborhood renewal, and presents a positive economics for all. While the performance of case studies is evaluated, the form presented here is novel and has yet to be tried.

Keywords Planned Unit Redevelopment, Planned Unit Development, urban redevelopment, suburban redevelopment, land use controls, mixed-use development, infill development, windfalls for/ and wipeouts, consortium agreements, transfer development rights, consumer/ investor-based cooperatives, spot zoning, form-based regulation, substantive due process.

1. Introduction

1.1 Land Development Controls

Land development controls make a fundamental choice between [a] planned and [b] unplanned developments, and between a [a] comprehensive and coherent design and review and [b] piecemeal and uniform zoning and subdivision standards of height, bulk, set-back, open space and parking metrics as well as Euclidean¹ separated land uses. The history of developments, particularly residential and ensuing the Second World War in the 1950's and 1960's has embraced the latter [b]².

This land use control and real estate development traditions are largely anti-urban in that they reject mixed uses and lead to the sameness in “cookie-cutter” residential and commercial subdivisions. Simply and up to the innovation of PUD's, “urban” is what preceded land development controls by local government. At best, these regulations were suited to a time when the nuclear family³ dominated the demographic profile of growing suburban communities.

¹ *Ambler Realty v. Village of Euclid*,

² Daniel Mandelker, Unit Developments, APA Planning Advisory Service Report # 545, 2007

³ 3.37 children per household with both parents, [Mandelker 2007]

The Standard Zoning Enabling Act⁴ as adopted by most states ignores any statutory authority to regulate a planned unit development. In a sense, traditional land development controls, spearheaded by the legal, not planning, community, preferred highly regulated while unplanned developments over planned ones. If the premise accepted is that a planned development adds value, there is opportunity value lost in traditional zoning and subdivision controls.

In recognition, the Urban Land Institute [ULI] in 1965 published⁵ a model statute for a planned unit development, but proved too rigid and was not adopted. So, the American Society of Planning Officials [ASPO and later known American Planning Association, APA] commissioned Daniel Mandelker over the period 1966-1984 to prepare a PUD model ordinance and assess its performance in practice, and which it published⁶. Mainly, these provided for residential cluster developments, with attendant open space, either through subdivision controls or as conditional uses in zoning. Essentially, these introduced discretionary and comprehensive site/ subdivision plan review by the plan commission and BZA.

Thus, the early PUD was limited to the suburban form of residential, single-family land use and jeopardized by the exercise of discretion by both the regulator and regulated. Developers at times obtained in negotiation excessive concessions and reneged of developer commitments, such as

⁴ Standard State Zoning Enabling Act, 1921 and with 2nd printing 1926, U.S. Department of Commerce. The American Planning Association wrote that the SZEa with the Standard City Planning Enabling Act of 1927 "laid the basic foundation for land development controls in the U.S." Sources: *Advisory Committee on Zoning (1926), A Standard State Zoning Enabling Act: Under which municipalities may adopt zoning regulations (PDF) (Revised (1926) ed.)*, Washington: U.S. Government Printing Office; Meck, Stuart, ed. (January 2002). *Growing Smart Legislative Guidebook: Model Statutes for Planning and the Management of Change* (2002 ed.). Chicago, Illinois: American Planning Association. [OCLC 275187048](#)

⁵ Richard Babcock and David McBride, "The Model State Statute," *University of Pennsylvania Law Review* 114, No.1: 140-170. See also, Babcock, Legal Aspects of Planned Unit Residential Development, Washington, DC, Urban Land Institute, 1965

⁶ Daniel Mandelker, Controlling Planned Unit Development, Chicago, IL, American Society of Planning Officials, 1966; also Mandelker, "Reflections on the American System of Planning Controls: A response to Professor Krasnowiecki," *University of Pennsylvania Law Review* 114, No.1: 98-105. See also, Collen Moore and Cheryl Siskin, PUD'S in Practice, Washington, DC, Urban Land Institute, 1984

amenities, and the plan commission exacted design features that rendered the development insufficiently profitable. Discretion clears the way for abuse, comparing unfavorably with the simplistic fairness of standard zoning.

1.2 Advent of the PUD

Commencing in the 1940's is model of urban renewal, following the pattern of land acquisition by a redevelopment authority, demolition, and offering to private redevelopers. Urban renewal is a planned unit development typically at war with the neighborhood. It entails displacement and dispels stakeholder involvement, and has resulted in both failures and successes. Further, much of this resulted in suburban-style developments [single use blocks with periphery surface parking] or vacant blocks that endured. The assumption is that redevelopment required this strategy, and the PUR challenges this as the only method.

Commencing in the 1980's there has emerged a plethora of modern PUD's and spurred by the neo-traditional design, or traditional neighborhood development [TND] movement and, with notable exceptions, an acceptance of sprawl⁷. In 1981 Robert Davis developed the 80-acre Gulf coast town of Seaside, Florida. Almost a decade later in 1989 Joseph Alfandre and the Chevy Chase Bank developed Kentlands on 352 acres in Gaithersburg, Maryland. These early projects had their design and financial challenges, including Alfandre's deed in lieu of foreclosure to his lender, but today there are more than 350 built TND's nationwide.

⁷ This despite the claim of the Sustainable Cities Institute of the National League of Cities: "Traditional Neighborhood Developments seek to remedy the most pressing problems associated with sprawl - low-density, auto-oriented development, single-use developments lacking context and distinctiveness." The Congress of New Urbanism used to tally TND's nationwide, resulting in 2006 in 350 such developments, but apparently has ceased this practice. The CNU notes "TNDs can be built anywhere — in cities, first ring suburbs, old towns, on the suburban fringe or in the countryside." To wit, there are several infill, inner city redevelopments patterned on the TND, such as Fall Creek Place in Indianapolis, but the vast majority of TND's are have acquired farms or vacant lands far removed from urban centers, and the essential compact development rations land consumption but practices sprawl nevertheless.

A benchmark publication in 1998 was sponsored by APA and the International City/ County Management Association [ICCMA], Best Practices Development. The best practices of mixed land uses, mixed-income housing, transit, and open space conservation were adopted in PUD ordinances.

More relevant, are urban, infill applications of this concept. Hope VI of HUD, the replacement of failing or defunct public housing, is premised on the lower-density design motif of TND's. Fall Creek Place, the award-winning, 26-block redevelopment of perhaps the most disinvested neighborhood in Indianapolis, during its development of 2000-2004 has proven a meteoric success of a public-private partnership of Federal HOZ, area lenders and Mansur Properties.

Predominantly residential, there are mixed uses present with retail, small office, recreation and institutional in these more recent infill developments. But, in each there is substantial land clearing, modest rehabilitation and major new construction.

The trend is to provide a semblance of the traditional neighborhood and small town effects. It is a nostalgic movement, but largely through new construction to mimic pre-modernist styles.

2. Research Questions

That brings us to the central challenge of our research. How do you plan and then execute the redevelopment of an urban neighborhood in a comprehensive, coordinated and coherent manner? How do you do so when, typically, such neighborhoods are those of disinvestment, and where a systematic approach to redevelopment is requisite to creating a market? The PUD concedes to the PUR that much structures will remain intact, although holding open their adaptive reuse, and that specific parcels will gain new structures and uses or be dedicated to agrarian, recreation and open space purposes.

Unlike the PUD with a single developer purchasing the land from a single seller, such as a farm, the PUR presents a mosaic of property owners. How to gain site control becomes the subsidiary challenge. In response, the PUR assembles the land not necessarily through purchase but by a variety of collective actions, including developer/ consumer cooperatives, and public tax/ subsidies for “windfalls and wipeouts.”

The regulatory challenges focus on the aforementioned question of discretion and the fairness of the negotiation between developer and local plan commission or BZA. Is this an overlay district? Does such a district float with the prescribed conditions of its location? Are land uses and forms generalized or rather precise? Or, should the underlying zoning district yield to a PUR?

More precisely, should the PUR district strive for sameness in architectural style, building materials, height and bulk, etc. with existing uses, or does revitalization require a higher density and diversity in uses and building types to attract a middle class, or a “creative class?”

Significantly, and if successful in its implementation, the PUR would tend to gentrify a neighborhood, absent price controls and affordable set-asides. Redevelopment and more intensive land uses would add to traffic and parking and introduce NIMBY critiques, a challenge to the politics of change. How to correct for these self-inflicted wounds?

These research challenges pale with the practical challenges of adopting a different regulatory path than in place since the early 20th Century. There are no true case studies, only creative measures that address both economic and political imperatives of this subject.

What we do know is of highest order: One, the PUR’s intention is economic, to generate positive impact on reinvestment through a coherent redevelopment strategy. This in contrast to the more modest, politically-motivated, conflict-aversion goal of conventional zoning’s compatibility of land uses and forms, and intention to preserve, rather than generate, property values. Indeed,

development of cities and towns predates zoning, which adopted the tactic of continuing with infill and extension the existing land use pattern. Two, that such a goal all starts with different comprehensive, and neighborhood community/ economic development plans.

3. Central Role of Innovative Planning in Land Development Controls

Virtually all zoning enabling state statutes require either *consideration* or *consistency* with the comprehensive plan.⁸ New Jersey, a state with an organized planning presence, mandates that zoning that is inconsistent with the comprehensive plan be so announced in the introduction of that local ordinance, an important public notice that may compromise the goals and strategies of the comprehensive plan.

Either *consideration* or *consistency* are enforceable, and should be more seriously practiced. This presents an imperative if planned unit redevelopment is to pursue a plan of the target neighborhood and its relation to the entire jurisdiction, its needs and its impact on public facilities.

Second, planning is responding to the market demands of the important millennial demographic segment for places to live, work, shop, play, and learn, with serious ramifications for mixed-uses and housing preferences⁹. In the rush to attract the creative class, identified by Richard Florida¹⁰, and a sustainable younger generation, cities and towns seek new regulatory, marketing and financing instruments to compete.

Third, to be effective, planning is evolving toward the actionable plan, where a feasible path to implementation is delineated in responsible parties, resource requisites and procurement, phasing,

⁸ Stuart Meck, Growing Smart Legislative Guidebook, APA, 2002

⁹ Niche housing markets dominate over a mass market geared toward the nuclear family [married parents with at least one child under 18 years old], which has declined in importance [37% of households, nationally in 1960 to 16% in 2013; source: *PEW Research*], and household size has diminished [3.33 in 1960 to 2.54 in 2015; source: *Statistica*]. Multifamily rental options have soared recently, and with a convenience retail ground floor. Live/work options have emerged.

¹⁰ The Rise of the Creative Class, 2002, and in a series of related books and articles

etc. Accordingly, new development and redevelopment is planned with partnerships of public and private sector players, as well as extensive stakeholder involvement and community organization. Where the market has abandoned a neighborhood, a downtown, cooperative initiatives among stakeholders has taken hold. The PUR advances as the matched regulatory instrument.

Lastly, sustainability and its smart growth component promote redevelopment over new development. A PUD from a cornfield is still sprawl, just planned and less monotonous. A PUR is the adaptive reuse of existing development, carried by a previous investment in infrastructure, both public and private, or the adaptive reuse of private structures. The positive impacts are on energy consumption, carbon emissions, public budgeting, both capital and operating, and private development costs. A sustainability strategy, local and state, cannot avoid the PUR.¹¹

3.1 Features of the PUR Ordinance

Daniel Mandelker¹² has formulated a checklist of ordinance options for the PUD that, in part, constitute a template for the PUR. I have added to his list of options in Figure 1.

¹¹ I asked a local PUD developer in West Clay Township, a suburb of Indianapolis, why not redevelop any one of the 51 dying Indiana towns instead of a cornfield. The response was she had not thought of it that way, but that land assemblage would prove too complex.

¹² Planned Unit Developments, APA, PAS #545, 2007

Figure 1. Options in Formulating PUR Ordinance

	Ordinance Options	Rationale
A	By-Right <i>or</i>	Locality has established a set of redevelopment formats with confidence and more than a cursory review of conformance is unnecessary
	By-Review	Discretionary review by Plan Commission, BZA and local governing body, with prescribed roles, is required
B	Short-Form <i>or</i>	In absence of expected problems, maximize discretion of Plan Commission and BZA in development plan review; the property owners in some legal standing form pursue redevelopment plan review and entitlement
	Long-Form	A site/ re-subdivision plan is presented in the zoning ordinance particular to a geographic area
C	Concept Plan <i>and/ or</i>	Local governing body approves goals and general features of the PUR prior to formal redevelopment plan review
	GDP <i>and/ or</i>	A general redevelopment plan is presented in zoning depicting the general location and intensity of land uses
	Site/ Re-Subdivision Development Plan	A detailed plan is incorporated into zoning, akin to a development plan but formulated by the public
D	Local Governing Body <i>or</i>	Local governing body's approval is required on any changes to the redevelopment plan
	Plan Commission <i>and/ or</i>	Plan Commission handles all approvals pursuant to the ordinance
	BZA	PUR is a conditional use or requires variances or special exceptions, requiring Board of Zoning Adjustment approval
E	Overlay Zone <i>or</i>	Underlying zone prevails and controls redevelopment plan, subject to modifications in that plan
	Base Zone <i>and/ or</i>	PRD replaces underlying zoning
	Conditional Zoning	Local governing body prescribes detailed conditions regulating redevelopment
F	Method of Owner Compensation Prescribed <i>or</i>	Ordinance prescribes one or more methods of compensating land owners for the rezoning that results in winners and losers in property valuations, and especially in cases of windfalls and wipeouts
	Method of Owner Compensation Deferred	Ordinance defers to future legislation on differential valuation consequences of rezoning or prescribes conditions and options to be followed in future legislation

Of note is that enabling zoning state statutes do not limit the detail of zoning districts, which could embrace detailed site and subdivision plans, and pass the judicial test of spot zoning.

4. Legal Review of the PUR/ PUD

There are two categories of legal challenges to PUR's. One is the constitutionality of form-based regulations as falling under the police power's welfare [property values] condition. Such a challenge can be withstood if it adheres to the jurisprudential standard of the rightful use of legislative power, or its delegation to an administrative agency/ official, and if not constitutionally vague and, thus, a condition for due process.

The second challenge arises, as PUR must overcome spot zoning and nonconforming, pre-existing uses. Spot zoning is illegal if the individual parcel, small in scale, is designated a land use distinct from proximate uses and principally for the benefit of the parcel owner. The dual juris standard is established with [a] a clear public purpose, such as found in the comprehensive plan upon which the zoning is based¹³, and [b] documented with either a mixture of uses in the area or a trend toward the land use attributed to the subject parcel¹⁴. The second challenge is exclusively the province of the PUR, not the PUD and where owned by a single developer.

4.1 Form-Based Challenges

In his 2010 publication¹⁵ on designing PUD's, Daniel Mandelker presents the court challenge of design standards in land development ordinances. He bases this largely on a 2006 law review article¹⁶ that comprehensive reviewed state-by-state court cases, and categorized:

- a. Allow aesthetics to be used alone as basis for regulation¹⁷

¹³ See, e.g., *Hanna v. City of Chicago* ⁵ (spot zoning occurs when a relatively small parcel or area is rezoned to a classification out of harmony with the comprehensive plan).

¹⁴ See e.g., *1350 Lakeshore Associates v. Casalino*, 352 Ill.App.3d 1027, 816 N.E.2d 675 (1st Dist. 2004).

¹⁵ Daniel Mandelker, *Designing Planned Communities*, iUniverse, 2010

¹⁶ Perlman, et. Al., "*Beyond the Eye of the Beholder Once Again: A New Review of Aesthetic Regulation*," 38 Urb. Law, 1119, 1120 (2006)

¹⁷ AS, AK, CA, CO, DE, FL, GA, HA, ID, MA, MI, MS, NH, NJ, NM, NY, NC, OR, SC,TN, UT, VM, WI, DC, and Federal jurisdictions

- b. Allow aesthetics when also justified by some other basis, but ARE moving toward “aesthetics alone”¹⁸
- c. # [b], but NOT moving toward “aesthetics alone”¹⁹
- d. “aesthetics alone” is not a valid governmental purpose, but will uphold such regulation if also based on another public purpose²⁰

The kernel of the Mandelker argument in judicial review for upholding aesthetics [form-based codes] in zoning is the standards be adopted legislatively before delegated to an administrative or quasi-judicial body, such as a Plan Commission, and that the standards be explicit and not vague. Mindful that there is no prohibition in the Federal or any state constitution that forbids the delegation of legislative powers, but state courts have actively applied the delegation of power in a range of highly limited or liberal decisions. Of course, the reasoning for explicit design standards is in the due process clauses of the 5th and 14th Amendments of the U.S. Constitution.

4.2 Spot-Zoning Challenges

The courts review factors such as the size of the parcel, the anticipated public benefit, the consistency with the comprehensive plan, and the consistency with surrounding zoning, and uses, to make a determination in denying a spot-zoning claim. The public benefit standard originated with in *Griswold v. Homer*,²¹ the Alaska Supreme Court found spot zoning to exist by considering a cost benefit analysis, as well as the size of the parcel in question and the rezoning in relationship to the comprehensive plan. Critically, it found that the spot zoning was absent because, among

¹⁸ AL, AR, CN, KS, LA, ME, MN, MO, MN, ND, SD, WV

¹⁹ IA, KY, NV, OK, WY

²⁰ IL, IN, MD, NE, OH, PA, RI, TX, VA, WA

²¹ *Griswold v. Homer*, 926 P.2d 1015 (Alaska 1996)

other things, the underlying ordinance resulted in genuine benefits to the City of Homer as a whole, and not just to the particular landowner.

Commonly, if the zoning is enacted in accordance with a comprehensive plan, it is typically not “spot zoning.”²² As far back as 1995, researchers concluded that the judicial tests widely known and a litany of cases denying its validity, that spot zoning had become an anachronism.²³

Nevertheless, the practice of the PUR to results in parcels gaining windfalls and others denigrating to wipeouts based on the land-use designation may see a resurgence of spot zoning legal claims. Accordingly, financial mechanisms to have windfalls compensate wipeouts, such as special tax assessments or the distribution of dividends in a mutual benefit corporation of neighborhood property owners emerges as essential.

4.3 Accommodation to Pre-Existing Land Uses

Zoning enabling statutes commonly set-aside “pre-existing” land uses, which may also prove to be “non-conforming” to the newly enacted local code. In all cases, the PUR must deal with these land uses, and property owner agreements facilitates this. These were discussed above, and may entail consortia agreements amongst all or several property owners, the membership in a mutual benefit neighborhood corporation, the provision for compensation among properties developed with different financial outcomes, etc. Benefit from this mode of zoning continues despite the lack of unanimity among all property owners to abide by the redevelopment plan, and indeed the redevelopment plan may be selective of properties.

²² See, e.g., *Jones v. Zoning Board of Adjustment of Township of Long Beach*, 32 N.J. Super. 397, 108 A.2d 498, 502 (1954).

²³ Osborne M. Reynolds Jr., “Spot Zoning”—A Spot That Could Be Removed from the Law, 48 Wash. U. J. Urb. & Contemp. L. 117 (1995)

4.4 Challenge to Vague & Inflexible Standards

For planned developments to be valid the case law makes clear that vague and inflexible standards must be avoided. These go beyond the challenge just to design standards and spot zoning. Prominent among this case law is the Colorado Supreme Court²⁴ promulgated twelve [12] standards for a valid planned development:

1. **Compatibility** with surrounding area
2. **Harmony** with the character of the neighborhood
3. **Need** for proposed development
4. **Effect** of the proposed PUD upon the **immediate area**
5. **Effect** of the proposed PUD upon the **future development of the area**
6. Whether or not an **exception from the zoning** ordinance requirements and limitations **is warranted** by virtue of the design and amenities incorporated in the PUD plan
7. Land surrounding the proposed PUD can be planned in **coordination** with the proposed PUD
8. Proposed change to the PUD District is in **conformance** with the general intent of the **comprehensive master plan and the general zoning ordinance** of the jurisdiction
9. Existing and proposed **streets** are suitable and **adequate** to carry anticipated traffic within the proposed district and in the vicinity of the proposed district
10. Existing and proposed **utility** services are **adequate** for the proposed development
11. PUD creates a **desirable and stable environment**
12. PUD makes it possible for the creation of a **creative innovation and efficient use of the property**

Given these explicit standards, the Court noted that PUD ordinances were a “modern concept in progressive municipal planning.” Applying standards was the necessity of meeting substantive

²⁴ *Tri-State Generation & Transmission Co. v. Thornton*, 647 P2d 670 (Colo. 1982)

due process. In a companion ruling of the Vermont Supreme Court, the principle of flexibility [e.g., granting waivers of specific standards] must be compliant with the general standards of the ordinance.²⁵

It appears conclusive that judicial review honors for planned developments the contextual matters of legislative land development general standards and the process of planning as a precursor for legislation. The ordinance for PUD's [and PUR's] benefits from comprehensive planning, and as a child of both necessity and general benefit.

The courts have yet to rule on PUR's use of the mutual benefit corporate or contractual form of cooperation among property owners and the compensatory measures of dealing with windfalls and wipeouts.

Further, in a PUR the needs and effects of the development plan may override the compatibility of the surrounding area and harmony of the neighborhood, providing new land uses and contemporary forms essential for redevelopment purposes. The question is whether the redevelopment objectives and strategies of the neighborhood are harmonious with the needs of that neighborhood; it is challenging to consider that it is not.

4.5 Legally Requisite Standards for PUR's

There are a series of issues in establishing a PUR ordinance, in its administration and in the conduct of redevelopment of the subject neighborhood. The resolution of these issues is discretionary to the jurisdiction, and that we highlight only.

²⁵ A similar approach taken in *Pierce Subdivision Application*, 965 A.2d 468 (Vt. 2008) regarding a PRD ordinance authorizing cluster housing

4.5.1 Plan Presentation in the Ordinance

The zoning ordinance may declare the PUR as its own base district or as an overlay for the underlying base district or a portion thereof. The advantage of an overlay is that the PUR district requires a certain degree of cooperation among properties owners within and when achieved could qualify for the overlay. The requirements for either involve the presentation of a site/ subdivision plan of one of the following orders, or in their combination:

A. A **General Development Plan [GDP]**, demonstrating the general locations and intensities of land uses, and their conditions, if any. For example, on arterial roads the plan may show mixed uses in retail, office and multifamily with the highest density in dwelling units and F.A.R. per acre. It may also designate 24/7 mixed retail/ professional office with residential at corner lots. It may demonstrate conditions for shared spaces, such as decked parking or community centers or shared retail services [e.g., food coops, grocery stores, sales of maker district products]. These conditions could include that attendant to the access road, density of adjoining uses, and even a distribution of land uses by range to serve a balance of neighborhood needs [e.g., 5-20% of total land uses in food services].

B. A series of **Redevelopment Plans** [site and subdivision plans] from preliminary to final. This results in approved lots for development as authorized by zoning, and inflation of property values as approved land parcels. “Developer commitments” would be for form-based matters, “urban amenities,” anti-displacement, affordable set-asides, compensation for wipeouts or the sharing of gains, etc. As this may eliminate the need for land developers, except for common area improvements²⁶, builders can readily receive building permits, upon meeting those requirements

²⁶ On-site improvements, such as shared parking, recreational spaces, land or building dedications for public purposes; off-site improvements, such as street improvements, complete streets.

and bypassing the Plan Commission/ BZA. The local building or zoning administrator may administer these commitments, or as preliminarily delegated to a recognized neighborhood organization.

C. **Rules for granting variances** in the development plan or the GDP. These must prescribe the procedure, prescribe criteria, and not violate the general objectives of the plan as delineated for each type of plan above. For this reason among others, the plans for development must emerge from a neighborhood or comprehensive planning process, and adopted by the local governing body.

D. In a modification of [B], the **Selective Redevelopment Plan** would single-out existing land parcels as the subject of significant improvements, including adaptive reuse. For illustration, the neighborhood's redevelopment objective is to remedy the problem of vacant and abandoned housing at 15% of its stock, and those parcels become the subject of the plan. Alternately, the neighborhood may recognize itself as a food desert or entailing food insecurity, and designate parcels for attendant land uses of crop farming, grocery outlets, etc. The redevelopment plan may leave unattended all other parcels, including those that may require less than gut rehabilitation or that would prove more suitable in a reuse. It may preserve certain parcels until they are vacant for enough time to be the subject to the new ordinance. The degree of selection is discretionary and the subject of a planning study.

4.5.2 Failure to Redevelop or Maintain

Although common to PUD under the control of a single land developer, the need for penalties [e.g., performance bonding] or reversion to the underlying zone appears incongruous with the redevelopment model outline above. Failure would simply mean that existing land uses would continue until the time another redeveloper would procure site control.

Of course, success to redevelop may bring issues of maintenance of private and common area properties. Utilized is the convention of property maintenance codes as enforced, special tax assessment authority implemented, and HOA or Merchant Association/ BID organizations with ability to establish fees for remedy.

5. Feasibility of the PUR

Traditionally, development plans presented for local approval entail a single property and developer. In PUR, land is not assembled in the conventional sense of purchase, and the redeveloper may be a consortium of existing property owners, managed by themselves or contracting with a master developer or construction management company. The property owners may be the developer or the consumer, they may experience windfalls or wipeouts in the process of redevelopment as some parcels will change uses and intensities, up or down in valuation, and others remain but would experience improvements.

5.1 Valuation Differentials

Pursuant to the 1992 *Lucas*²⁷ decision, short of a total taking [i.e., rendering the land parcel without economic value], or present a compelling state mandate, localities may increase or decrease the value of property through land development ordinances. These are depicted in Figure 2.

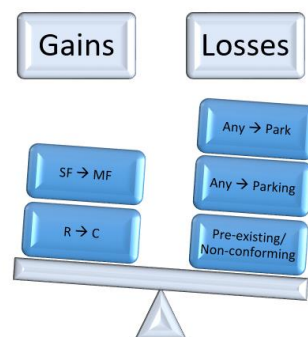


Figure 2. PUR Owners Gains/ Losses.

²⁷ 1992, U.S. Supreme Court, [Lucas v. South Carolina Coastal Council](#) (112 U.S. Supr. Ct. 2886)

There may be wipeouts in a PUR, with some parcels re-identified as open space, say as a neighborhood park owned by the HOA or similar collective, or maintained by the city. There may be near wipeouts for less intensive uses, such as parking. On the other hand, the net effect may well be windfalls with many uses becoming more intensive, such as multifamily or mixed-use. The options in compensating for value differentials as a consequence of the PUR rezoning are depicted in Figure 3.

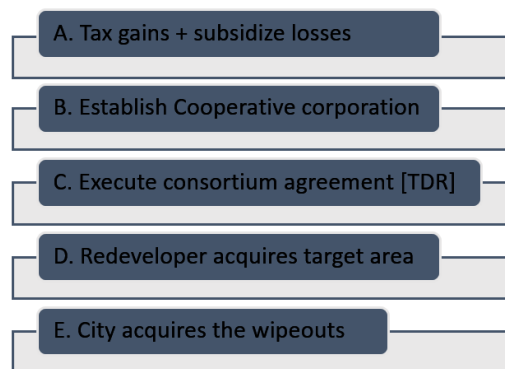


Figure 3. Methods of Compensation in a PUR

5.1.1 Tax Gains & Loses

The convention is a *special assessment* by the locality of positive and “negative” taxes. Those experiencing a gain in real estate valuation are taxed, and those with a loss are compensated. Controlled are any improvements on the property, of course. As the PUR is designed as a net positive economics, those taxed should compensate for those losing value, with funds remaining for public services and capital improvements.

5.2 Establish Cooperative Corporation

The owners in the target area establish a cooperative corporation [for-profit, but with a social mission]²⁸, and either as a *producer coop* [serving as the redeveloper] or a *consumer coop*, serving as consumers of the PUR improvements. The shareholder agreement sets the method of compensation. This is my preference and achieves the required community organization.

5.3 Execute Consortium Agreement

This has the similar effect of a cooperative corporation or “B” corporation, but with less dynamics, although the consortium or property owners’ agreement is subject to amendment. Thus, the legal form is a contract to be civilly enforced. The common Transfer of Development Rights [TDR] is a longstanding instrument for windfalls compensating wipeouts, and holds the promise of property gains compensating property losses short of a wipeout.

5.4 Redeveloper Acquires Target Area

We return to urban renewal, where the private redeveloper or the Redevelopment Commission acting as the redeveloper, and attracting builders, acquires the target area. If blighted, a declaration of the same is pre-required for condemnation. This is fraught with either the politics of contention or cooperation, however.

5.5 City Acquires the Wipeouts

A facile solution is to avoid the wipeouts in meeting the judicial test, and so the city acquires those parcels dedicated as city parks or other forms of open space. This is not comprehensive compensation, only that required pursuant to Lucas.

²⁸ In Indiana and other states there is also the “B” corporate form, with a social purpose above and beyond the “C” corporation.

6. The Form of the PUR

In studio, a team of graduate urban planning students performed a PUR plan for a targeted neighborhood in the City of Muncie, IN, the Gilbert neighborhood. Below is a site/ re-subdivision plan that was produced in Figures 4 and 5. Their plan presented four [4] phases.



Figure 4. Gilbert PUR Plan Aerial View with Legend of Land Uses



Figure 5. Gilbert Plan Birds Eye View



Figure 6: Aspirations of a PUR.

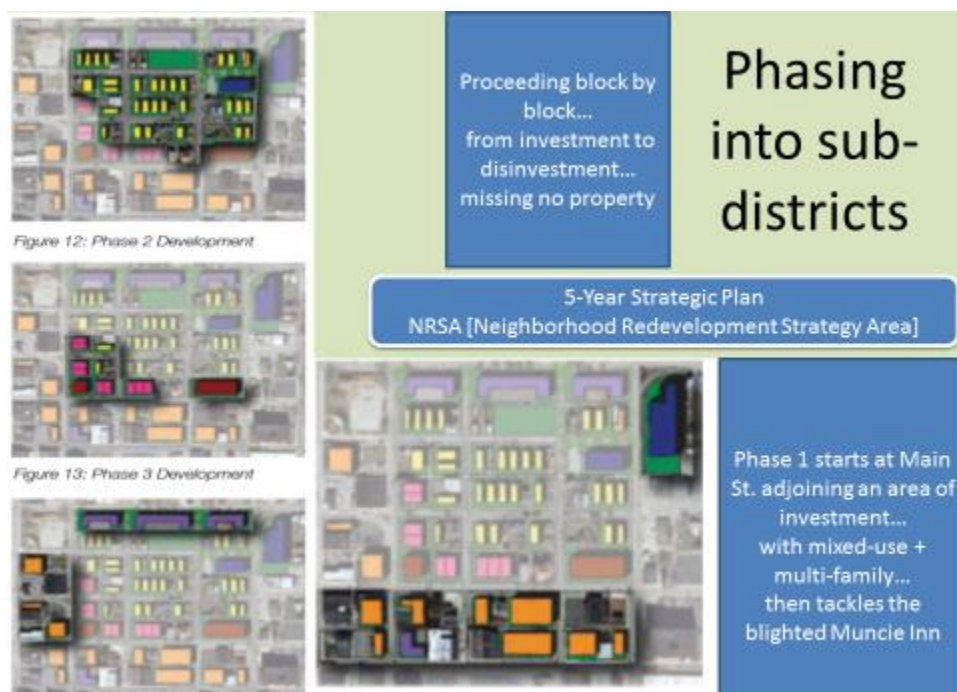


Figure 7: Example Phasing into Sub-districts.

7. PUR Light Alternative

Absent a well-organized mutual benefit corporation to manage windfalls and wipeouts, a viable alternative is to formulate and put in place a more specified General Development Plan [GDP] as the new zoning district.²⁹ All economically non-productive land uses, such as free parking, parks, community centers, and public facilities are either bought by the city or the neighborhood association as incorporated, and akin to common areas of a subdivision owned and managed by a homeowners association. However, this would prove a spot zoning denial of economic use and, thus, illegal unless there was a mandate to purchase for the existing fair market value prior to the new zoning. Such mandate would not pose a significant barrier.

Conditional uses direct the redeveloper, constituted as individual property owners or a consortium thereof contracting a professional firm, toward specific locations that meet certain conditions for various special land uses. These uses may be live-work-sell, professional offices, retail, etc. and with conditions such as on arterial or connector streets only, at the corners of neighborhood streets, proximity to public parking, etc. Terms of the use may consider a form-based code component. For example, the district may allow for a big box retail that sells only the works and services of local residents in “production, distribution, repair” [PDR] in the manner of a “maker district,” or the more familiar farmers market with only local growers.

²⁹ West Lafayette, Indiana, has adopted a similar code [2017]

8. Conclusions

To put planning into land development controls, communities must meet the challenges. Zoning accommodates multiple uses, but needs to make way for coherent, coordinated, and strategic mixed uses. Residential districts should urbanize with 24/7 retail, consumer-serving professional office and live/ work/ sell arrangements. Downtown districts need to add residents to their day workers, realizing retail as a child of this marriage. Bedroom suburbs are considering tract subdivisions and reaching for a center with mixed uses. Planning and zoning should further its response to significant demographic demand for urban living, the millennial market, and addressed well, perhaps only, through the PUR. Proposed here is to accelerate the repopulation of metro cities and small towns.

At the center of these challenges is the role of community organization. The collaboration of neighborhood property owners for the common cause of redevelopment and the creation of an investment market may take many forms, but most promising is the producer/ consumer cooperate. Further, that same organization also markets the investment, finds end users, and otherwise promotes the plan. That same organization eliminates the necessity, but accommodates the role, for the redeveloper and its profits, relying instead on builders or even on their trades as contractors. The PUR is recorded in zoning, in an agreeable detail of a site/ re-platting plan of particular land uses per parcel, which may be changed through consolidation or further subdivision. Winners compensate losers in land value differentials based on changes in current valuation through shareholder agreements, special assessments/ subsidies, or the city's role in acquiring the "wipeouts."

Planners are called to claim the regulatory environment they commonly administer. A planner's formulation of such land development control ordinances would encourage a reclamation of

downtowns and neighborhoods of disinvestment, instead of merely shooting for conflict mitigation, the province of our legal community. Cooperation with a strategy emerges as the promising agent of change for our distressed communities.

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Learning from Resilience: Cities towards a Self-Organizing System

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Abstract

The study exploits development of a new field of research with the aim of reading uncertainty and transformation at cities by revealing resilience systems thinking theory for urban studies. The paper first generates understanding the resilience framework and its critical identities. Secondly the city is introduced as a complex living organicism. Here the complexity of cities is conducted in the context of a self-organizing organism while conserve their spatial structure, function and identity. At this juncture; cities and their built environment are proposed in the framework of 'being able to absorb uncertain perturbation and adapt itself through an adaptive cycle; of which key attributes of resilience is figured out a novel method for urban studies to be used to detain the taxonomies of uncertainty at identity of built environment. The study is concluded by impelling resilience as novel frontier thinking for postulating the ways of assessing a self-organizing city thinking towards uncertainty of change.

Keywords: resilience, adaptive cycle, city, living organism, self-organizing system

1. Introduction

"We know that we can't design for every unpredictable event, but we can make sure our buildings and cities are better able to weather these disruptions."

(Mehafyy and Salingaros, undated)

Today, one of the reason why a range of scientific approaches of urban studies fail in pragmatism is because they endorse a rigid conceal for understanding city and its built environment in a stabilized equilibrium, and also a steadiness of relationships. Since, change occurs perpetually in life. The problem of adjusting built environment and cities in equilibrium disregards the monarchy of change, which continuously exists. Therefore, the complexity of relationships could not be understood, or may be difficult to be rationalized in a model. Therefore, the growing challenges of shocks, depletion and destruction of change must endorse a novel vision for understanding cities as a system in a resilient form, rather than in a stabilized equilibrium. However, the intense here should not admire designing each unpredictable and uncertain event; but allocating built environment and cities in a better capability of adaptation or a self –containing towards uncertainties of change. The question is to understand how the cities could detain the uncertainty of change as a self-organizing organism and how coherent contributions from other fields revealing resilience thinking could be embedded in mean of resilient self-organizing cities. Therefore, in the next sections, the study presents the resilience thinking framework and its critical identities regarding the relevance of those magnitudes to the cities. First, the study examines several definitions of resilience term for asserting a grounded understanding of its meaning. Then, a theoretical review is accomplished for defining its critical identities. In the third section, the city is examined as a living organism that asserts a self-organism system where a complex interaction between parts accomplishes multi-equilibrium to conserve whole of the system in a stabilized equilibrium. In the last session; the study introduces the city and architecture in mean of adaptive capability or the ability to bounce back to equilibrium, of which is the domain dimension of resilience in a self-organizing system dealing with multi-equilibrium.

2. Understanding Resilience Framework and Critical Attributes

2.1 A Definition

Over time, the term resilience refers to the ‘jump back, or ‘flexibility quality of a substance (Klein, et.al., 2003; Ledesma , 2014; Greene, (ed.), 2002). As opposed to its original use, resilience term is also utilized as a conceptual framework to evaluate the ability or capacity of a person, object, entity, or system to persist in the face of disruptions or difficulty (Michelle and Fannon, 2016). In core, resilience is primarily utilized to describe ‘a thing’s ability to deal with change by remaining or preserving the same state or condition, or adapting itself to the novel the state or condition.’ (Url -1).

In literature multiple approaches describe, discuss and explain the resilience notion through different meanings and methods. As examples from ecology, Holling (1973) provides a persistence system quadrant of the term resilience in multi-stability core drawing an ability to absorb change; Alexander (2013) from geography provides a detailed historical etymology of the term ‘resilience’; Bruneau et al. (2003) identifies robustness, redundancy, resourcefulness and rapidity as properties of resilience term; Gallopín (2006) thoroughly analyses the conceptual relations of resilience to interrelated key terms such as vulnerability and adaptive capacity; Klein et al. (2003) explore the usefulness of the resilience concept to natural hazard reduction. Some of the scholars accumulate defining resilience through in ***thinking of system attribute towards the disturbance***; as ‘before’ and ‘after disturbance’. On one hand; Lebel (2001); Walker et.al. (2004); Allenby and Fink (2005); Fiksel (2006); Norris et al. (2008); Longstaff *et al.* 2010; provide a perspective to defining resilience regarding a system’s attribute in response to after disturbance. Lebel (2001) ensures the resilience as a system that demonstrates the ability to maintain its structure, function or identity in the face of disturbance and re-organize the system stability based on the disturbance-driven change (Lebel, 2001). Walker et.al. (2004) defines resilience as “the capacity of a system to absorb

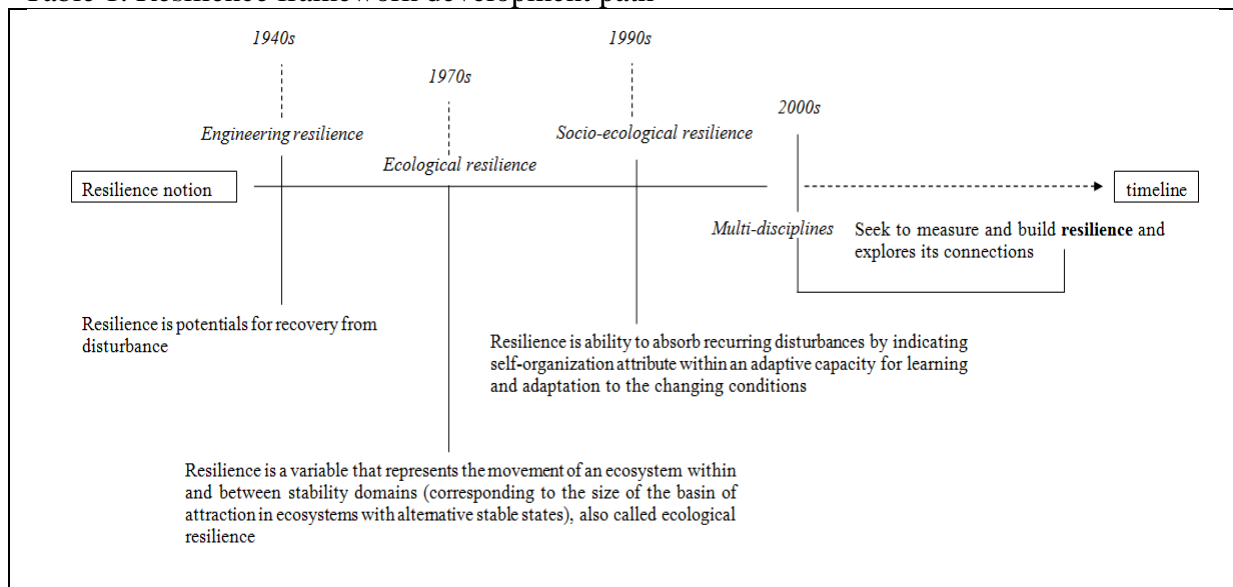
disturbance and re-organize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks” (Walker et.al. , 2004). Allenby and Fink (2005) define resilience as the capability of a system to maintain its functions and structure in the face of internal and external change and to degrade gracefully when it must. Fiksel (2006) operates the term resilience “the capacity of a system to survive, adapt and grow in the face of change and uncertainty”. Norris *et al.* (2008) define it as “a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation *after* [emphasis added] a disturbance.... resilience emerges from a set of adaptive capacities”. Longstaff *et al.* (2010) illuminate resilience “the capacity of a system to absorb disturbance, undergo change, and retain essentially the same function, structure, identity, and feedbacks. According to Carl Folke et al, “*resilience for social-ecological systems is often referred to as related to three different characteristics: (a) the magnitude of shock that the system can absorb and remain in within a given state; (b) the degree to which the system is capable of self-organization, and (c) the degree to which the system can build capacity for learning and adaptation.* “ On the other hand; Tierney (2003); Kahan et. al. (2009); Gilbert (2010); describe a perspective resilience regarding a system’s attribute before and after disturbance. Tierney (2003) describes “the term ‘resilience implies both the ability to adjust to ‘normal’ or anticipated stresses and strains and to adapt to sudden shocks and extraordinary demands. In the context of hazards, the concept spans both pre-event measures that seek to prevent disaster-related damage and post-event strategies designed to cope with and minimize disaster impacts” (Tierney 2003, p. 3). ” (Kahan *et al.* 2009 “We see resilience as the aggregate result of achieving specific objectives in regard to critical systems and their key functions, following a set of principles that can guide the application of practical ways and means across the full spectrum of homeland security missions... The objectives (or end states) of resilience that underpin our approach are *resistance, absorption, and restoration*” (Kahan *et al.* 2009).

Gilbert (2010) “*resilience* is defined as the ability to minimize the costs of a disaster, to return to a state as good as or better than the *status quo ante*, and to do so in the shortest feasible time... *Resistance* is used to mean the ability to withstand a hazard without suffering much harm. *Resilience* in this paper will include resistance but will also include the ability to recover after suffering harm from a hazard” (Gilbert, 2010).

As the review of the literature presented here clearly demonstrates, there is considerable variation in how different authors from different fields have defined resilience (Carlson et.al., 2012). In consequence, diversity in definitions accumulates a danger for resilience becoming another buzzy concept in rhetoric theory and application (Davoudi, 2012). Perhaps the most fundamental divide lies in identifying which definitions of resilience indicate a system thinking in “ability of adaptation towards dwelling with change”, and which are not. Three overarching frameworks of resilience are provoked; *engineering, ecological and socio-ecological resilience*; in which resilience is conceptualized as a quality, as a state or as a process (Weichselgartner and Kelman, 2015). Within engineering resilience, the resilience is modestly evolved in mean of bounce- back, which refers to the time it takes to return to a state of dynamic equilibrium after a disturbance hits a system. The resilience term is significantly envisioned as a condition that demonstrates the ability to return a particular situation of something to its original state after a disturbance/ crisis/shock (Kirmayer, Sehdev, Whitley, Dandeneau and Isaac Community, 2009.). A stable state ideology is asserted as a resultant of dynamic interactions between system components that guide the system to return in time to a controlled equilibrium after an attractor-disturbance-shock. Therefore, a stable equilibrium in a system adjusts stability, robustness, rapidity and constancy, of which a system is efficient to return a stable equilibrium state after a perturbation. Different than engineering resilience perspective in ecology; the resilience is considered more as a capacity measure for absorbing disturbance. In this mean, ecological resilience regards to ability of anything to accord a

disturbance (Folke, 2006). Therefore, ecological resilience fundamentally admits the amount of change and a system's absorbing ability which is preventing system's initial state to enter in other state. As a main attempt in this direction, resilience is suggested as an ability of absorbing change and remaining the system in persistence, in which same relationships between system's components are preserved (Holling, 1973). In contrast to single state equilibrium of engineering resilience, ecological resilience indicates multiple equilibrium states an understanding. Ever last, multiple equilibrium states promote characteristics of persistence, redundancy and resourcefulness in function, structure and identity of a system. In social sciences, the term is re-viewed in form of a novel revelation where resilience is approached within notion of adaptation- adaptability. Though in socio-ecological systems, the mean of resilience is critically distinguished from '*absorbing disturbance/stressor/threshold*' to '*moving disturbance/stressor/threshold away*' by promoting transformability with an adaptive self-organizing attribute (Walker et. al., 2004) (Table 1).

Table 1. Resilience framework development path



2.2 Critical Attributes

The resilience and change relation in a system is tended to be discovered within stability framework ignoring single equilibrium (Levin, 1998). In other words, a system's resilience is relied in having more than one stability state (Gunderson, C. Allen, & Holling, 2009; Holling, 1973). Bunse suggests understanding ecosystem dynamics by defining their attributes in a valley of stability framework (Bunse, undated). Yet, the character of change is dynamic, and it is not linear. Levin (1998) challenges implement of a single stability state thinking in a complex system. According to him, a complex system is coherently the amalgamation of other dynamic subsystems, of which forms an entire complex adaptability from non-linearity and uncertainty (Levin, 1998). And, into such a context; "*single stable framework*" could not be valid especially when inherent uncertainty and complex dynamism is the domain praxis (Scheffer et al. (2001). Therefore, nature of complex systems discard to impel a single stable state, other than modestly move or fluctuate in between a set of interacting variables (Genkai-Kato, 2007). As Folke addresses, these systems impose multiple interrelationships in multiple-states to absorb or adapt the change at different scales (Folke et al., 2004). The system is more heterogenous by multiple states across scales create heterogeneity in system character, which remains the system stable. In other words; heterogeneity draws stability of resilience at a system. And this restrains the system state to shift in to a different stability state among the interrelation act of multiple states across scales. Such a condition poses regime shift/s in system structure/identity/function. Therefore, the stability is not a state appears as a contribution of linear interaction, but dynamic equilibrium formed by interaction among multiple states. In significant, resilience approach significantly distinguishes essentiality of multiple states as a significant path for system to absorb or adapt the change.

However a system may not always ascertain adaptation and stability state may shift from one to another state. A regime shift is dependent on the characteristics of change, as continues or discontinues or degree of change as small or large (Scheffer et al. 2001). Specifically, it is possible to resemble crudity of non-linear relationships endorsing a dynamic regime or state shift transformation or shift appears from one state to another. In fact, regime shifts are the conceptual approach breaking the linearity and providing analytical explorations on casual spirit of change and systems dynamics. Thus, basically they are defined as the possibilities of change with small or large disturbance posing big effects, where characterizes a system state. Regime shifts are primarily characterized as large, abrupt, persistence changes in the function and structure of any particular system (Rocha, et. al. 2014). As if; regime shifts are the drastic large-scale changes that are interconnected with thresholds, step trends, critical thresholds, rapid transitions or tipping points (Simon et. al. 2009). Different set of processes reside a particular regimes at specific scales of space and time (Garmestani, et. al., 2009). As Scheffer and Carpenter (2003) have noted, it would seem that regime shifts should be largely driven by external perturbations to a system where uncommunicative set of processes reside across scales of system whole. In reality, both external and internal conditions can influence a system and pose system state to reach a critical threshold (Holling 1973). Regime shifts are result of the high level of thresholds in system where control the system behavior between system components (Scheffer and Carpenter 2003). More simply, they emphasize regime shifts as where feedbacks of system are changed. Walker and Meyers (2004) notify the regime shifts as the change in the nature of feedbacks that the controlled level of system components are cracked by the maximal zone of thresholds (Walker and Meyers, 2004). On the other hand Cumming and Collier (2005) define regime shifts as the phase of change, when systems experience new versions of current former function-structure-identity as a result of loss of resilience (Cumming and Collier, 2005). On this basis, it is notable to define the

regime shifts as large, abrupt and persistence changes pushing the system to enter into a new state, when a system experiences the change in its internal feedback interactions operating self-organization. Since the amalgamation of various feedback loops aims for a common goal; they basically cooperates to keep the system character self organizing. Which means, a set of particular feedback loops over in time tend to come together to form a dominant feedback loop to provide self-organization in system structure. On this basis, the regime shifts appear while dominant feedback loops loss “*resilience*”. Those with reduced resilience; a disturbance may pose to the system entering from one stability state into another.

To preserve resilience after a disturbance/catastrophe, resilience indicates a system of progressive organization into the model of adaptive cycle. Adaptive cycle is the accumulation of a series of phases that fortify a metaphor of continues change (Scheffer, et. al. 2002). These series of phases regards adaptation in structure/function/identity of a system under uncertainty (Gunderson, 2009). The cycle describes a metaphorical sequence how an organizational order is experienced under change (Li, 2013). The adaptive cycle is a model of natural patterns of change in ecological and socio-ecological (Gunderson and Holling, 2002). It consists of four distinct phases; growth or exploitation (r), conservation (K), collapse or release (Ω) and reorganization (α) - (Figure X). Growth or Exploitation (r): is the process of rapidly initiating the exploitation of the resources through expanding new opportunities on the collapsed old systems. The (r) phase is transitory phase of the systems after collapse. Thus the system does not emphasize high stability. But system structure becomes more diverse due to accumulation and more new connections between networks are accomplished. Thus, the system has high resilience. Conservation (K): is the phase where the systems get mature. Therefore, the systems demonstrates slower growing, entities are entered the system. Thus, the system goes into maintaining process of existing matured structure. The networks in system are progressively connected. Thus, the system is in the locked-on condition and does not build a

novel structure. It demonstrates less flexibility, more vulnerability and more stability.

Collapse or Release (Ω): is the phase where external environment pose stress on system and enforces the systems to perturb. In this the connectivity between networks decreases due to release of accumulated-stored resources. The system enters to the level of creative destruction with the potential in short period of time. Thus, revolution can occur in system.

Reorganization (α): is the phase after systems collapse due to perturbation. The system state enters to a new stability state through reorganization (beginning) process. The system in reorganization phase leads the system towards growing phase upon novel cycle.

The process in adaptive cycle is asserted on the three disguised types of change; incremental change in r and K phases, abrupt change in the transitional phase from K through $\square\square$ and \square and meaning change through interaction between different scales (Holling, and Gunderson. 2002). Therefore, it is probable to determine the first two phases are the phases of system maturation and they are called forward loop of cycle. They are in need of accumulation of capital, slow incremental growth predictability and stability (Garcia, 2013). Furthermore, the other two phases are called back loop of cycle that involves the rapid phases of reorganization leading the renewal. As a consequence, adaptive cycle mainstreams the empirical visualization of metaphoric change at a rich framework to understand the persistence and renewal of the complex dynamic systems.

3. City as a Complex Living Organicism

An organism is *an autonomous individual form of life* considered as an *complex and organized system analogous* to a living being, where a composed of mutually interdependent parts functioning together (Random House Kernerman Webster's College Dictionary, 2010). Any organism has distinct physical and behavioral characteristics, a specific size and boundary of which contains differentiated parts, but form and function are always linked (Collins English Dictionary –2014). The physical morphologies of living organisms define the

specific traits of organisms and they are generated by processes in which a given species evolves as the product of many small changes at the most elemental level (Darwin, 1859). These changes are embodied in an inherent code that dictates the way the organism mimics itself (Batty and Marshall, 2009). However, cities are the form of life. Likewise, as an organism they demonstrate a distinct physical and behavioral characteristic within a specific size and boundaries. Since the cities involve dynamics of social, economical and environmental impacts; they contain different, but interdependent parts processing together. The process between parts is complex and dynamic, but organizational. Therefore, it is possible to realize common analogies of living organisms into cities (Geddes, 1913; Geddes, 1915; Miller, 1989; Mumford, 1961; 1966; 1982; Miller, 1989; Le Corbusier, 1933; 1964) and many other scientists, scholars, professions etc. envision the city in analogy to ecological term- living organism and uses tools from the biology (Decker *et al.* 2007). In a broader sense; the “living organism” term is widely been used in diverse means (as a method or a methodology) to describe the cities and architecture in the context of dynamic changes (Reichow, 1948; Mumford, 1961, 1966, 1982; Miller & Mumford, 1989; Samaniego & Moses, 2008; Carroll, 2009).

Ever since, the views related organicism conception in relation to cities and architecture have attempted to form an analogous to nature and its laws and processes. In history; the conceptual enterprise of organicism in relation to cities and architecture arose from the growth of science in the eighteenth and nineteenth centuries. In the book of architectural historian Caroline van Eck, the organicism idea is defined as an intangible phenomenon that appeared from classical antiquity era. In classicistic tradition, the nature is functioned as a role model for perfect imitation to create the illusion of life. Into this, the architecture is seen as a part of living nature where the natural processes are convinced as a tool of imitating for divine uniformity in architecture. In classical organicism era, the architecture entitles a more

philosophical character of the organicist interpretation of nature. For example, this intangible phenomenon more clearly emphasized in the gothic era and is suited to the religious connotations. However, with the impact of growing science between the period of in 18th-19th centuries, the philosophical characterization of organism concept is resided more propelled and evolved with more radical shifts in approach. Also, with the impact of rapid industrialization in 19th century, a very fast interval increase in human population in cities affected the urban areas to growth. Moreover, the new implications of industrialization figured out a new role in the fast urbanizing civilizations. In sudden, the cities resided in space of growth in the context of dynamic changes. In significant, the urban planning in growing areas is facilitated by new mass production technologies (Bettencourt, 2013). Ever since, many theorists, researches professions, scholars, etc. have searched for understanding and defining the city and architecture in the context of dynamic changes of growth (Batty& Marshall, 2009). According to Bettencourt (2013), the industrial revolution- 19th century as a benchmark posed two splits in urban planning conceptions (Bettencourt, 2013). On one hand, the city is viewed as systems subject to optimization (Batty& Marshall, 2009). On the other hand, the city within growth parameter is seen subject to gradual evolution as an open-ended process. Those viewing the city as a gradual evolution embedded a note on organic features of the cities (Geddes, 1915) with/out implying a fixed relationship between the parts and the wholes (Batty& Marshall, 2009). In this era, the organisms phenomenon is more evolved with radical characterizations. We see that it is evolved with a profound synthesis of nature and technology (Gandy, 2004). Into this synthesis, the philosophical classicist notion of organicism- “as a source of uniformity” is redefined in terms of a metaphoric functionality. Biologist urban theorist Patrick Geddes initiated cities as evolutionary as an ecosystem in urban and town planning of - in mean of cities born, growth, and die (Geddes, 1913). That needed to subject the cities in mean of organisms interacting with their environments, in a

similar way of a living being (Geddes, 1915). Here the city is a large of body as an organism that is accommodated through parts and architecture is the product of this functionalist organic entity, where it acts for structuring processes in the functional phases (born, growth, die) of a city. in the era of functionalist organicism, we also see a profound coherence of other pragmatic conjunctions as well. For example ; Le Corbusier exploited the biological functionalism of a living organism to settlements with the purpose of improvement of living conditions Behne asserted a position in between nature and society with suggesting organic design; Alderman Adri Duivesteijn implemented the ideal of organic urban development. Especially at the early beginning of 20th century the tradition of functionalism the body of an ‘organic entity’ had been transformed into a fragmented body under the discourse of metabolic organicism (De Solà-Morales, 1995). The city is entitled in an organic form of high-tech self-retained machine, where the fragmented body (architectural units) accommodates a flexible adaptation as organs of living organism (Kurokawa, 1998).

In late nineteenth-early twentieth-century, the organicism traditions (biological and physiological connotations of organicism) also largely employed a living phenomenon to urban development. In order to eliminate the chaos between city and the loss of natural landscapes due to rapid urban development, the organic metaphor of the city is resembled through concerning the nature as the major fact revealing urban uniformity, not only for visual uniformity (organic city), also a new integrity of human life based on spiritual, psychological and material needs (social organicism) (Schilders, et.al 2001). Urban planning theorist Howard motivated the modern planning era by conceptualizing garden city; a living cluster/system of settlements optimizing a healthy living environment by decentralizing the settlements from city center (Howard, 1898). Following the Howard, in 1904, Raymond Unwin and Richard Barry Parker (1904) progressed the Howard’s organism notion into planning method with assuming suburbs a practical for greenbelt surrounding the town as living organisms (Unwin

and Parker, 1904). However, with the publication of Zevi, *Towards Organic Architecture*; the organicism conception is removed from its traditional provokes that nature and its processes/laws are perfect tool for imitation. Zevi induced the notion of organic into a social conception, where city embody an organic spatial organization for social contentment (Zevi, 1950). The humanized urbanity of organicism is also recognized by Mumford. Mumford a difference from Zevi utilizes the functional, physical and social molds of organicism notion in organic form. According to him, the city in an organic form is a symbolic image of an organism, which can stand in natural environment as an interconnected and of itself as a symbol of organic form and function (Mumford 1982).

However, with the alert of 21st century crises of rapid population and urban development and unsustainable nature of modern cities; organicism notion in planning is reintroduced with ecological footprints (Owiti A. K'Akumu, 2007). The contemporary organicism following this 'sustainable concept' is developed for assessing balance with nature. To model the fast changing environmental, social and economical conditions; the new era of planning embodied the discourse of thinking city as a living organism; that also appealed in the context of many movements such as new urbanism, intelligent urbanism, smart growth, biomimicry etc. The living organ is paradigm to indicate potential relationships of city with entire metabolism of the development with ecosystem based, that concerns the long-term social, economical and ecological wellbeing of cities, town, villages etc. (Wheeler, 2004). Thus, sustainable development phenomena intended to put the dogma of ecosystem based relations between living organism-living environment- nature in cities etc.. However, the eco-centric planning approaches of sustainable development has resided into a chaotic transition, and attained an ordinary meaning - from a popular form to darkness of failure/fuzziness. Thus, ecological organicist metaphors of sustainable era remained rhetoric and partial. The organic analogies to city and architecture have been unspoken and unexploited. Many suggestions also left

fragile. Their consequences have not been fully worked through. They are blurred in many impacts, and bounded to uncertainty (Batty & Marshall, 2009), where dynamic interactions in structuring processes at different spatio-temporal scales are pulsed in. In this case, many scholars argued the lack of understanding the dynamic interactions in actual development within a zoned area posed a shift in thinking organicism not a source to balance nature, but a self-sufficient process evolved organism (Bogunovich, 2014) (Table 2).

Table.2 Organicism Conceptions in relation to architecture and urbanism

Century	Connotation	Vision
Classicist Era 17th century	Classical Organicism	Architecture Imitating Nature
Modernism Era 18-19th century	Functional Organicism	Form Follows Function
	Metabolic Organicism	Architecture as an Extension of the Body
	Formalistic	Organic Architecture'
	The Organic City	Unification of City and Nature
	Social Organicism	Planning for Human Happiness
Contemporary Era 20-21st century	Process Organicism	Flexible Planning for Gradually Growing Cities

4. Revealing two Scale in Adaptive Cycle: city and architecture

Cities are complex and heterogonous living systems. Cities impel a stream of inter-reliant duality between its subsystems. However, many invalid paths have been projected on how cities grow and develop as a system in linkage of dynamic processes and interlinked variables. Such misinterpretations challenged admiring social, built environment, economical flows and the other inputs making a city as a system that progresses inter-reliant duality for resilience. Several questions arise from here to understand in theory and practice cities as self-organizing resilient systems at the stipulation of possible (Chelleri, 2012). In thinking of 'city as a system

of organism'; all social, economical and environmental variables append the process of operating the transition of cities toward more resilient and self-organizing paths (Holling and Goldberg 1971). Yet, uncertainty and discontinuities are inherent characterization of cities. With the potentiality of diverse and inter-reliant variables at subsystems; a city easily could process an internal resilience by assorting multiple stabilities, which are organized at different scales and time (Batty, 2005). As Zhao et.al (2013) defines 'city as a whole is far from equilibrium and is more than the sum of its subsystems.' (Zhao et.al , 2013). A complex system mode of interconnected networks is coherent and patent. Into this, a certain development is interconnected to historical experiences of the system and nonlinear events of ongoing change. A system when begins to get mature; it becomes over connected fixed and rigid through ordered patterns of interactions increases, where a system could be more sensitive to a breakpoint to a disturbance (Wahl, 2017). Indeed, the matured old patterns in case of a disturbance get affected more and impose the system to the chaos. In fact, the cities as complex and living systems becomes more creative while a chaos hits inter-reliant stability of the city. It should be notified that cities are drastically in episodic correlation between persistence and growth; order and chaos; between stability and transformation as the fundamental stream of self-organizing character (Wahl, 2017).

To think, cities as a self-organizing living organism conferring resilience at urban systems, understanding how a city starts to grow and acts more creative during a chaos could be a causal obstacle. This aspect endorses a scale tenet in thinking. Yet, cities fundamentally grow from the bottom to up through an organizational order between interconnected parts (Batty, 2008). They accomplish a large-scale complex artifact. The integrity of bottom-up is not controlling, or stopping the growth towards uncertainty of change; but predicting the behavior of development or transformation by focusing smaller scales. In fact; the bottom- up thinking infers the processes of cities that are organized at the bottom scales and reached to the whole.

However, ‘organicism conceptions up till now would seem to suggest a comprehensive urban development is crucial of top-down planning. The top-down planning vision stayed limited in its unified form and did not allow meeting with processes at smaller scales. As Batty (2008) mentions “the city is not conceived of as a unified whole following a developmental programme, but is more usefully seen as a collection of interdependent, co-evolving parts (Batty, 2008). The parts of city must be seen in the role of which operate organizational structuring processes for a self-sufficient whole. A self-sufficient city reveals ability of persistency in its function/identity/ structure through fast changes of urban growth. In order to attain persistency; the processes infer the interdependent scale-relations. That means, in a city as a self-sufficient organism is not scale-free. It is in the high level of multilevel hierarchical interactions, where high-degree of connectivity interplay between scales of parts. In fact, that implies the holistic systems thinking utilized the two-way interactional connectivity between different spatio-temporal scales- from bottom-up and top-down: cross scale interaction (Levin 1999.). Into this, small scale observations provide an important route to explore dynamics interactions across-scales. The observation in smaller scales is critical to understand the patterns and processes operated at larger scale. Likewise, it is important to understand how the processes at large-scales communicate with smaller scales (Nash et. al, 2014). In the sequence of this two-way interactions, the smaller scales of parts are in the role of determining the data about the generated processes for self-sufficiency/ or the shift from a persistent to non-persistent structure. Hence, the abrupt changes at smaller scales ensue frequently in a short time period, due to fast variables are dominant then the slow variables in the system structure. That means at smaller scale the change is faster than larger scales. At large scales the slow variables are dominant towards fast variables. Therefore, change appears more slow in a long time period. In the structure of a city top-down planning control emerges when several bottom-up fragile occurs- smaller variables appear to control the system for

periods of time (Lance Gunderson Comparing Ecological and Human Community Resilience, 2009, CARRI Research Report 5). Thus at large scale disturbance is the result of cascading phenomenon of the fast changes (non-persistence structuring processes) in smaller scales (Holling, 1996). Therefore, small-scale observations provide an important route to explore urban growth and development dynamics.

Yet, cities are artificial environments composed of smaller scale artifacts as a result of human interactions with their environment. However, considering the city as an organizational progress does not only questions space and time together with the human spirit and metaphor of change into new tools, terms and images; it also raised varied questions such as re-thinking the landscape and city expansion relations, unplanned urban sprawl though the essence and power of architecture which is endorsing essential flexibility to cope with interference/disturbance. Here, the self-organizing thinking infuses to conduct with the architecture as the smaller scale artifact of the biggest artifact which is the city. And the urban space is seen at the larger scale domain. The organizational order is polarized through declaring urban spaces as larger-macro scale and architecture as smaller-micro scale elements of a city. In fact; the first trial of the idealization of urban and its architectural extension in an adaptive cycle is adjusted in architectural studio of Kenzo Tange, in 1960. In the studio project of Tange (1960) at MIT, the growth and change aspects are amalgamated to external growth- internal regeneration affiliation. Here, the main goal of Tange is to formulate a new relationship between the part (architecture) and whole (city). Two particular quadrants are maintained for parts- *transient elements* and for whole -*permanent* element (Lin, 2010). The shorter cycles are the fast changes appearing at the smaller scales of urban clusters. They are the parts forming the whole. And, the long cycles are the slow changes structured at larger scales (urban clusters) to be inherent in long-life duration (Tange, 1960). In ‘*Emerging Complexities*’ essay of Asada (1997); complexity of a city as a living organism has been

demarcated as a simple system of hierarchical cycle between transient and permanent elements. In the detail, the hierarchical inclusion between parts and whole have been demarcated as a narration between the function and structure into a cycling model (Asada, 1997). This thinking provides potential to estimate cities as a creative self-organizing organisms responding to disruptions and change whereas resilience theory reveals upon same core. At this point, the architecture could be linked as the domain part of the urban design. Only when architecture is diagnosed to as part of the urban space, the city as a system of multi-layers could be defined within the metaphoric sequence of self-organization. Such a correlation does not only combine the architecture and urban towards to understand the city with architectural concerns, also makes a critical criticism towards relationships contextual essences and physical aspects of architecture in the traces of urban space. While this relationship is transmitted to the view of adaptive cycle; architecture endorses internal regeneration in the system and leads urban spaces to exploit external growth within a certain domain of stability. During graining internal regeneration; transiently acting an architectural system is crucial in thinking. In fact, architecture could be thought as a regenerative magnet to convey an internal resilience. Transient characterization accomplishes a nested set of hierarchal interaction and a higher level of adaptation by defeating flexibility. This allies a bond for city to adaptively polarize a permanent urban clustering. Into this, urban spaces demonstrate a slower growing. The urban space is mature and all other networks are connected, conserved and locked-on mode. The system stability is significantly infused by permanent urban clustering.

4. Conclusion

Approaching to a city should be intensive for identifying change- transformation- adaptability through varied interfaces of urban space. This devises an integrative design understanding between architecture and urban design critically essential. Here, the fundamental

contradiction is to re-think the nature of growth-transformation-city relation adaptive, rather than a new episode of destruction. Since, current cities came into a parallel catastrophic trunk; the study infuses to adjust (re)thinking the urbanism and architecture as an integrated whole, a restrained coordination resiliently coping with collision of urban growth. Thus, the study opens a new argument that consolidate cities as a self-organizing system; in which change is dependent on, and human-environment relation is operated towards change in an adaptive cycling path. However, the main point is to understand the city and architecture more specifically in terms of a resilience framework. Moreover, the study reveals cultivating cities in the context of adaptive cycle of resilience thinking. By this way; the study accumulates a novel way of thinking on how a city acts as a complex but self-organizing system that indicates a stable stability at macro-scale by integrated multiple-stability configuration at micro-scale. In general, the argument admires bringing the domain notions of resilience thinking as an integrative elucidation for analyzing the cities as a self-organizing and adaptive organism towards urban transformation, growth and change.

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The Impact Of Globalization On Cities

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ABSTRACT

A lot of cities nowadays are changing a lot due to the influence of globalisation. The most significant impact of globalization is in cities, because of the cities are becoming the rulers of the countries. The real impact of globalization urban identities, quality of urban services, environmental values and urban infrastructure appear on. Urban developments pending in this process are with different dimensions. However, here is the globalization process and to the understanding of the continuing city administration, to the effects of urban space and urban life. In sum, the effects of globalization on cities and the concept of world city are forming. In the context of the problem of globalization, the globalization of economic, cultural, social, spatial and environmental values and effects on management understanding. It was established that globalisation also includes the increased movement of people, products, ideas, images, lifestyles, policies and capital and that it affects cities through local and global dynamics which in turn causes macro-urban and micro-urban changes. Conclusions were made that globalisation tends to effects a lot of spatial, economic and social patterns which in turn affect cities but does not result in the same spatial patterns.

Keywords: *Cities, Globalization, Global City.*

Introduction

Globalisation is one of the most dominating topics around the world and covers a lot of aspects which range from economics, politics, religion to social elements. The extent to which globalisation has been influencing economic and social elements has been so significant that

researchers like (Brenner, 1999; Healey, 1997), now consider it a global phenomenon just like its name implies.

Globalisation, on the other hand, consists of a lot of aspects and elements and some of them tend to interfere and contrast with each other and hence its meaning is always subject to a lot of different definitions. Globalisation will be defined as the continued increase in the movement of commodities, capital, images, identities and people through a global space (Jessop, 1998). A study by Amin and Thrift (1994), consider that globalisation is not limited to the movement of physical things such as products and people but can also extend to include intangible things such as ideas. Hence, we can redefine globalisation as the increased movement of lifestyles, policies, principles, ideologies, commodities and people through a global space. From this definition, we can thus note that globalisation has to a greater extent being influencing a lot of aspects and most of them being social aspects such as lifestyles, culture, and images.

It is also important to note that the increase in globalisation has been caused by two important things and these are technological and media developments. A lot of new and innovative technology is now being introduced almost on an annual basis and this affects the way people communicate or shares ideas (Tasan & Van Weesep, 2007). In addition, the growth and developments of social media channels now play an important role in people's lives as it now causing huge changes in people's tastes and preferences.

Irrespective of the causes of globalisation, there are a lot of ideas which consider globalisation to pose huge effects on the society. For instance, an idea was given by Ritzer (2004), also showed that globalisation has huge effects on social aspects, values, norms and beliefs as well as activities and processes that characterise of help to identify people. With regards to this aspect, it can thus be noted that globalisation tends to affect the way people stay. This can be supported by ideas obtained from a study by Jessop and Sum (2000), which highlighted that there is now a huge shift in the way people are staying especially those in the cities as a result

of globalisation. This idea shows that there is a strong connection between globalisation patterns and cities whether in terms of structure, style, designs or development. This is because changes in lifestyles, culture, tastes and preferences as a result of globalisation tend to affect the way cities are designed and developed. This can simply be expressed the way and extent to which cities are being urbanised.

Meanwhile, efforts to study the impact of globalisation will not be complete unless effort is devoted to studying how it affects cities. This is also because of ideas which have been given which showed that globalisation does not only affect economic elements but also causes a change in culture, lifestyle, opinions, beliefs, ideas, tastes and preferences (Johnston et al., 2003). Hence, we can expect that people's perception towards modern western architectural building designs to change as well as their desire to stay in the cities. More so, it was noted that there is a change in the way cities are being managed as a result of an influx of new ideas through globalisation. With all these ideas in mind, it, therefore, shows that there is a greater need to examine the effects of globalisation on cities. This paper, therefore, seeks to examine the effects of globalisation on cities.

The Concept of Globalisation and Urban Geography

As noted from the above explanations, globalisation has a strong influence on urban geography and effort was once placed by the Urban Regional Research Centre Utrecht to examine the effects and scope of globalisation (Jessop & Sum, 2000). The findings showed that ideas about globalisation have been limited in terms of scope and that both its effects and scope are diverse and affect a lot of things such as urban development. This was further supported by ideas established in a study by of Tuna Taçan-Kok which highlighted that the effects of globalisation are not homogenised and have a lot of effects on spatial patterns on the periphery of both developed and developing economies (Healey, 1997). This, however, led to two important questions being raised, that is,

- What is globalisation?
- How does globalisation affect local specialities such as cities?

From these two questions, additional information and ideas were obtained which showed that globalisation itself is always changing and that it poses effects on economic activities in cities. Hence, it can be questioned from these ideas;

- Whether globalisation affects spatial, economic and social patterns?
- If all the places that are experiencing globalisation have the same spatial, economic and social patterns?
- To what extent can we regard spatial changes in cities as globalisation?
- Whether certain urban changes can be linked to globalisation or not and if so how?

Observations were made that all globalising cities are increasingly becoming similar (Hubbard & Hall, 1998). Whether the new city features are more important than the old age city features or not, it all depends on how people are viewing the newly globalised cities. Some of these aspects were narrowly covered and outlined in the Journal of Housing and the Built Environment in which it is highlighted that there is a relationship that exists between urban systems, local development and globalisation (Bryson, et al., Eds.). As a result, globalisation was presumed as causing positive changes in urban systems and local development. However, the extent to which globalisation affects local urban systems and local development tend to differ with the way and manner to which global and local aspects of globalisation are being handled or approached. This implies that globalisation has its own different global effects and the way in which the local environment or people respond to globalisation also influences urban systems and local development is going to change. Which implies that the greater the level and extent to which the global economy is globalising will also have a significant influence on how other cities will be affected or will globalise. On the other hand, the more responsive the local people are to globalisation, the greater the level of changes that will be seen in terms of urban

systems and local development. As a result, this paper can, therefore, raise the following questions;

- What is really globalisation and how does it affect cities?
- How do local and global forces contribute to urban change?
- To what extent do global processes affect neighbourhood development?
- Why do cities that are part of regional systems still dependent on other cities when globalisation can make them less dependent?
- How changes in global capital movements affect the real estate and property sector and in turn cause changes in cities?
- How can urban management be modelled to account or cater for the globalisation of cities?

The above questions can somehow be grouped into four elements and the obtained elements are illustrated in a diagrammatical form as shown in figure 1. It can be noted that the effects of globalisation will initially commence on a global scale then extend to the lower level. They also see changes starting from the urban systems rising to affect the urban systems which in turn affect cities at the neighbourhood level. It is at the neighbourhood level that we find property market dynamics.

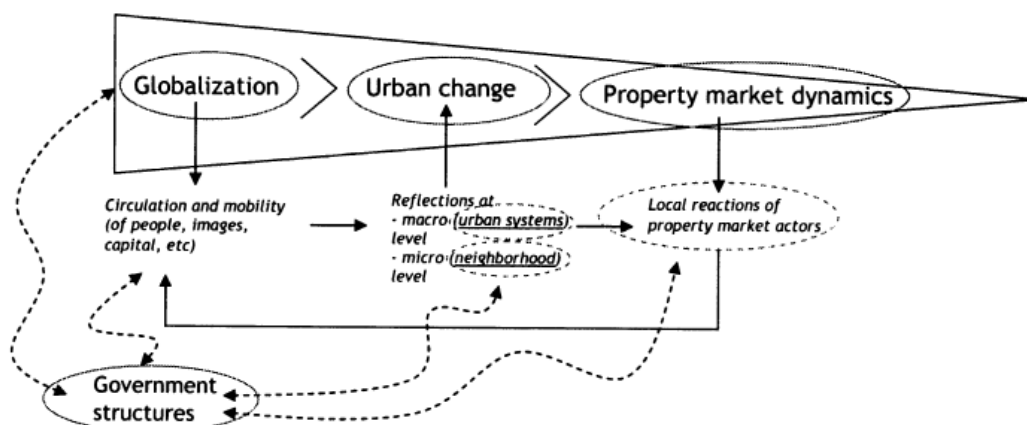


Figure 1: Conceptual aspects of globalisation, urban change and property market dynamics
Source: Taşan-Kok and Van weep (2007, pp. 4). Global-local interaction and its impact on cities.

The figure above reflects globalisation is a multi-faceted element which affects a lot of aspects. As noted, it affects the mobility and circulation of capital, images, products and people and this, in turn, causes urban change as it begins to reflect the micro-urban change and macro-urban change. There are also changes in governmental structures that occur as a result of globalisation. Once governmental structures begin to change, urban changes both macro and micro, as well as changes in property market dynamics, will be inevitable. Changes in property market dynamics usually cause a change in reaction by property market actors.

There are however ideas which go against some of the implications made by figure 1 and such ideas also agree that globalisation tends to affect a lot of spatial, economic and social patterns, but they tend to disagree on the idea that globalisation does not result in the same spatial patterns.

Efforts to examine how globalisation affects cities can also be analysed using the interaction of local and global dynamics as shown in figure 2.

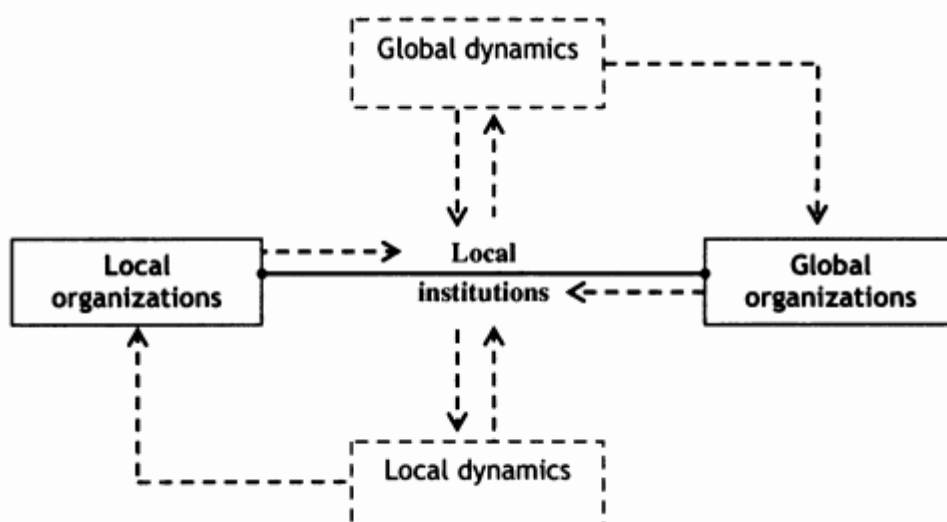


Figure 2: The influence of the interaction between local and global dynamics of globalisation on cities

Source: Taşan-Kok and Van weep (2007, pp. 5). Global-local interaction and its impact on cities.

Figure 2, denotes that both local and global dynamics interact to cause changes in local institutions. The same applies to local and global organisations, they all pose effects on local institutions and it is through changes in local institutions that changes in cities will begin to take place.

What is being globalised?

Different ideas can also be given on what is being globalised. There are studies which show that globalisation does not globalise anything (Jessop & Sum, 2000; Johnston et al., 2003). Yet, on the other hand, it can be noted that globalisation affects almost anything be it retailing or consumption (Jessop, 1998). This can be supported by ideas established by Ritzer (2004) which suggests that globalisation has initiated almost similar patterns of consumption with an increase in the creation of non-places. As a result, there is an increase in the number of entertainment centres, office parks, shopping centres that are being created as a result of globalisation. However, the ability of other people in other cities to follow the same patterns does not mean that a standard or measurement or an idea that the effects of globalisation are the same but rather serve as an inspiration for spatial development. Though cities may also take or assume the same architectural style, design, scale and function, it still remains the same that globalisation is not causing the same effects across the globe or on cities (Johnston et al., 2003).

Urban change: Global and Local Forces

Global forces tend to have an impact on urban areas and such impact are due to the following reasons;

- Economic globalisation causes cities to look more beautiful as capital funds are moved from one nation to the other especially from advanced cities to urban areas that may possibly be lacking in terms of development (Ritzer, 2004).

- Increases in global competitiveness which is causing cities to seek new regulatory frameworks so as to provide support to non-market, neo-liberal and entrepreneurial market regimes (Tasan & Van Weesep, 2007).
- Cities are a form or representation of a legal system and their administrators tend to adopt social, political, economic and local conditions. This is because urban development tends to assume of following certain patterns and hence making it difficult to have a model of a globalised city (Tasan & Van Weesep, 2007).
- Cities are always in competition for international funds and efforts to lure more funds than other cities will be reflected on how they react and position developmental activities so as to gain a competitive advantage over other cities (Jessop, 1998).

However, globalization is said to increase the subjugation of localities (cities or regions) to global forces (Amin & Thrift, 1994).

Urban Systems Within The Global Network of Cities

When it comes to the idea of globalisation, considerations can be made that cities can benefit positively from globalisation. This is because cities can attain better positions in the world by boosting the competitive edge. This is also as a result of the idea that economic, political and social strategies adopted and implemented by urban governance do not only cause a change in economic performance but also result in additional economic development (Ritzer, 2004), Ritzer (2004). Efforts to ensure that cities remain competitive require that cities possess sound and effective decision makers, organisations and actors. This is because the main emphasis is to get more global capital. As a result, municipal authorities will engage in activities that will see cities being developed especially to levels and standards where they can; lure more global funds (Tasan & Van Weesep, 2007). Such can also be a reflection of the effects of globalisation which, may also cause cities to become a global network of each other.

Globalization and property markets

It is also important to note that there exists a relationship between globalisation and property markets. This can be illustrated using ideas given by Ritzer (2004), which contend that globalisation results in globalised cities which have features of cities as being financial centres and huge bearing of an urban economy. Such is possible when barriers that limit capital movement have been removed hence creating a new urban space and place for consuming, servicing, producing, working and dwelling. More investors who are in need of potential investment vehicles often turn to the property market for investment (Tasan & Van Weesep, 2007). Such can have a huge impact on cities especially when investors from globalised nations begin to plough more funds into cities that are not globalised and developed.

Conclusions

Based on the established ideas conclusions can, therefore, be made that globalisation tends to affect cities and its effects on cities is in a number of different forms. This follows ideas which have also been given which showed that globalisation does not only affect economic elements but also causes a change in culture, lifestyle, opinions, beliefs, ideas, tastes and preferences. Conclusions can also be made that globalisation tends to affect a lot of spatial, economic and social patterns which in turn affect cities. Conclusions can also be made that though globalisation affects cities, it, however, does not result in the same spatial patterns. Conclusions can be made in respect of the established questions that;

- Globalisation is the continued increased in the movement of people, products, ideas, images, lifestyles, policies and capital and that it affects cities through local and global dynamics which in turn causes macro-urban and micro-urban changes.
- Changes in local and global forces contribute to urban change through the effects they pose on local institutions which in turn causes macro and micro urban changes.

- Cities that are part of regional systems can still be dependent on other cities when globalisation can make them less dependent because they are part of a network of cities which relies on other cities for products, services, ideas etc.
- Changes in global capital movements affect the real estate and property sector and in turn, cause changes in cities as investors will be looking for investment vehicles which they can use to make investments. The notable investment vehicle being the property market.

Policy implications

- There is greater need to take advantage of globalisation especially in terms of people, products, ideas, culture and capital to positively design and develop cities in a way that will enhance people's standard of living and quality of lifestyle.
- Domestic or local planning authorities and architects are strongly encouraged to adopt international standards in the day so as to come with developments and designs that are of international standard and quality.
- Cities or urban administrators must have good management of public resources so that they be entrusted with huge global capital funds.
- Better management of cities is needed so as to put an effective use of funds towards the development of cities.

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Concomitant Recital of a Prolonged Reign: Dilation of the Dutch Empire and Enticement of Ascendancy, Delineating Batavia, Victim and Valedictorian

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Abstract

The VOC (Verenigde Oost-Indische Compagnie) was both the absolutist and the pacifier as it sought to colonize *Sunda Kelapa* through the displacement of indigenous population, architecture, and regimen; the VOC was deployed catalyst to the marking of a golden era, roughly spanning the 17th century through which architecture, trade, science, and military boomed, marking Jakarta a resilient harbour to the world's finest trades. Batavia, modern day Jakarta, welded a myriad of names, endorsing its irrefutable paramount; one of which, "Queen of the East", paraphrased an allusion to its urban beauty. Until its last derogatory stages, before the Dutch surrendered to the Japanese, the name Batavia ricocheted across the globe, as reverberation to its resilience, urban beauty, varsity of cultures, and robust trade as the Dutch East India Company. The VOC has, unequivocally, paved the road of prominence for the glorious city of Jakarta, manifesting a discourse of exalt. Analysing the egress and relinquishment of the Dutch Empire and its appurtenant colony, delineating the urban tableau, a prevalent architectural resplendence. The unravelling of holistic fabric through which urban planning, architectonics, politics and sociology interweave, meandering the gradual transition of the Dutch East Indies, yearning subordinate to Jakarta; the unwavering proclaimed prerogative.

Keywords: Dutch East Indies, Colonialism, History, Urban planning, Architecture, Batavia, Jakarta

1. Forge of an Empire

1.1. Introduction

The VOC, *Vereenigde Oostindische Compagnie*, acknowledged as the epitome to multi-national companies, was an amass joint company constituted of six different major Dutch companies. The *Compagnie* was a culmination of Dutch efforts to surpass competing European trading companies thriving in the East Indies, the world's largest archipelago, encompassing 17.500 islands, one of which is Java, a relatively young island acknowledged for its remarkable fertility due to its geographical constitution. A trade port since the twelfth century, *Jayakarta*, origin of today's name Jakarta, lied in central Java and was, therefore, sought by traders from Asia and Europe due to its strategic location, breeding dispute and wage of wars as companies competed for sovereign foothold. The power-shift labyrinth is palpably manifested through each ruling power's attempt at alluding to its reign in the city's ever-changing urban morphology, architecture, culture, socioeconomics, and, subsequently, name. *Batavia*, an allusion to the Dutch republic's legendary ancestors, was assigned to the colonial city by the VOC Governor-General, Jan Pieterszoon Coen, and has quivered a ricochet in Jakarta's history as its ruling power, the VOC, laid the foundation to the city's thriving, prompting a golden age through which the East Indies' economy soared. This monograph is a historical, urban, architectural, and sociological record of Jakarta's colonial and post-colonial environs through which the Dutch *Compagnie's* influence is discernible, affecting both the Indonesian context and its dwellers. The methods employed in the study are therefore dependent on a thorough reconstruction of the historical events, surveying of the city's urban morphology, analysing of the sociological inbred hybridity, and conducting of a comparative

analysis thereafter which, in turn, denotes a tenacious integration between the colonial past and post-colonial present, rendering both elements inseparable.

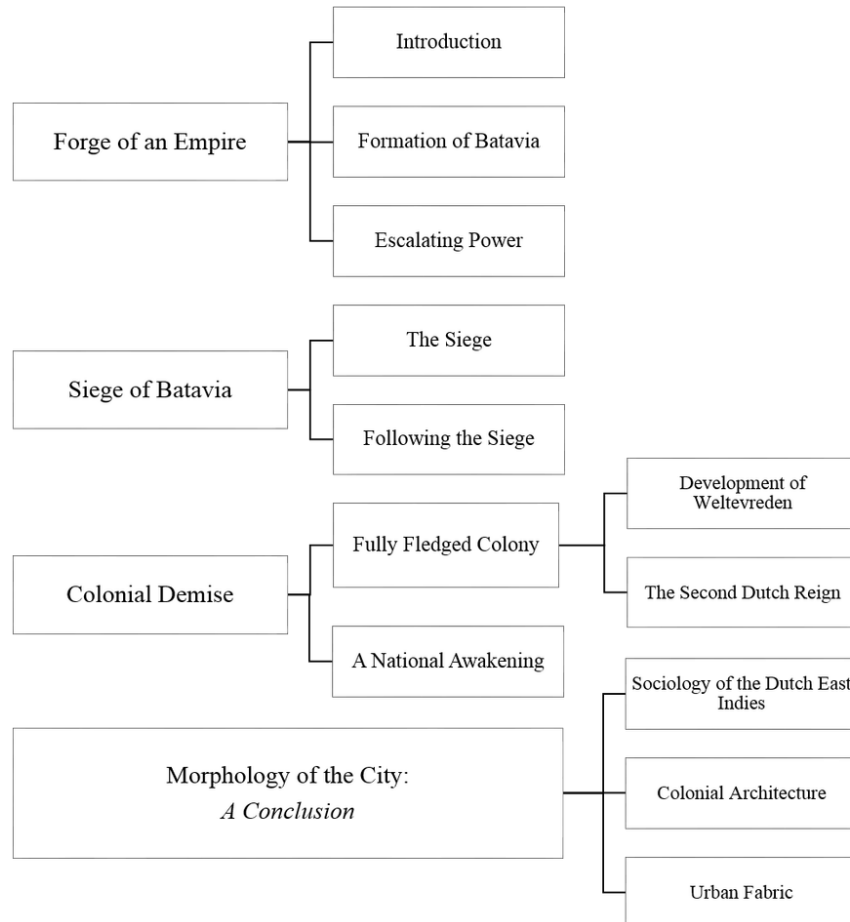


Figure 1. *Structure of the Study (Developed by Author).*

1.2. Formation of Batavia

Early Jakarta was part of Tarumanagara kingdom in the fourth century; Hinduism and Buddhism domineered the region, granting central Java the name *Land of Thousand Temples*. Amongst the integral apparatus to Jakarta's political and social power was Sunda Kelapa's port which was part of the Srivijaya Empire in the seventh century, a power that consolidated its tenure until the thirteenth century. A univocal trade sovereign first attracted Europeans into the region in the

sixteenth century when the Portuguese merchants first ventured forays to the region and, eventually, established concord with the Sunda Kingdom, building their own port in 1522. It wasn't until 1527 that the city waned in the face of the powerful Banten Sultanate and was named *Jayakarta*.



Figure 2. *Borobudur, 9th century Mahayana Buddhist temple located in Central Java, offers a glimpse of ingenuous Indonesian architecture, Indonesia, a Country Study, William H. Frederick.*

The fifteenth century was marked by the Portuguese efforts to enlighten the Europeans of the world's broad oceans in hopes of emphasizing an annex to the European market through the cheaply provided spices of the East. It was the venturesome expeditions initiated by the Portuguese, followed by the Spanish, that sparked an interest in the Dutch Republic to explore the Indies. The first Dutch expedition to Indonesia, taking place from 1595 to 1597, was

instrumental to the viability of the soon to be founded VOC and its lucrative contribution to the Indonesian spice trade. *Compagnie van Verre*, the first Dutch expedition, raised 290,000 guilders, cobbling four ships: the *Mauritius*, *Amsterdam*, *Hollandia*, and *Duyfken*. The fleet faced plenty of obstacles, many of which were a direct result of bad leadership skills offered by Cornelis de Houtman, the *de facto* leader of the expedition. Suffering many losses and earning very few allocation of spices, *Compagnie van Verre* yielded many of its recruits due to illness or sporadic unfriendliness towards the natives which cost the Dutch wars the armada couldn't handle. The following expedition, taking place from 1598 to 1600, raised a tremendous amount of 800,000 guilders, an unprecedented amount of money ever to be reconciled in the Netherlands for a private venture. Corelius van Neck brought strategic and administrative measures to the expedition as he exploited predecessor shortcomings into employing a route that cut the journey's duration in half. Van Neck, moreover, exerted greater control over the *Bantamese* natives as he shrewdly offered protection against a mutual enemy, the Portuguese, granting the Dutch fleet a surplus of spices in exchange for their assistance. Putting a democratic apparatus to work earned the expedition a tremendous success, netting a 400% profit for its backers. In light of the successful expedition and following successes launched thereafter, an apprehension of subsequent dispute rising between Dutch merchants declared it mandatory that the Dutch unify their efforts into a singular entity: *Vereenigde Oostindische Compagnie*. The VOC had a very clear objective: securing a Dutch foothold in Asian trade, which meant eradicating any competitors to achieve domination. The *Staten-Generaal* played a substantial role into the fulfilment of the VOC's goal by granting them rights to build fortresses, declare defensive wars, and amend treaties that served their end. In 1611, the VOC existed merely as a trading post in Jayakarta, confined by the power of Prince Jayawikarta whose tenure abode by the Banten Sultanate. It was the escalating Dutch power that

ticked off Prince Jayawikarta, adhering to a discourse that sought the British Company's aid. The agitated prince initiated an attack with the help of the British on the Dutch *Fort Jacatra*. Shortly after the turbulent events, the Bantanese authorities addressed their exasperation of the unapproved alliance with the British forces to the prince. Jan Pieterszoon Coen, governor-general of the VOC, took advantage of the political plight in Jayakarta and razed it to the ground, marking the beginning of *Batavia*.

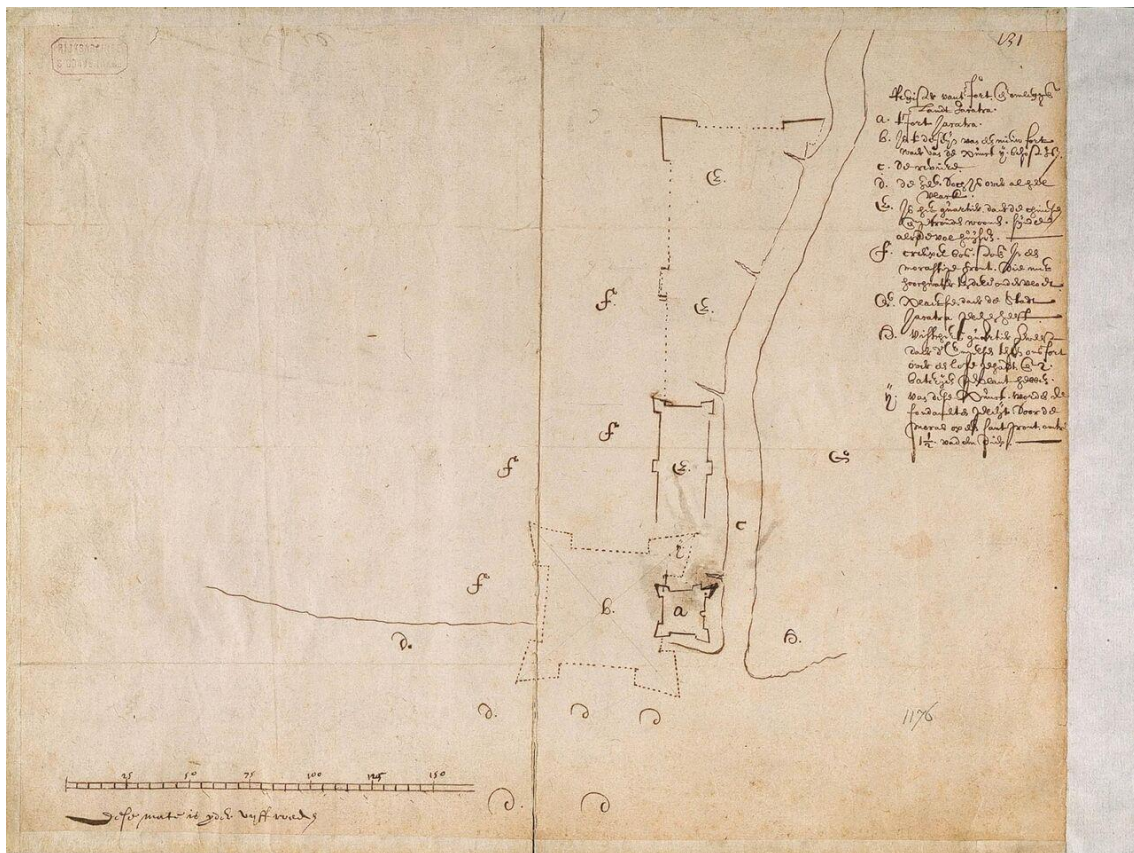


Figure 3. 1619 map portraying initial expansion plan by Coen

1.3. Escalating Power

"Now we have defeated those from Bantam out of Jacatra and have foot and domini in the land of Java. Her (these are the English) wickedness has been punished within reason. Certainly, this victory and the flight of the haughty English will create much terror throughout the Indies. The honour and reputation of the Dutch will improve enormously by it. Everyone will search to

be our friend. The foundation of the so long wished for rendez-vous has been laid. A large part of the most fertile land and seas of the Indies can be called yours"

Governor General Coen write to the Gentlemen XVII in the Netherlands (Coen I, pp 472)

The Dutch left a strong imprint on Jakarta's urban fabric as well as on local affairs that have morphed radically in the 17th century, marking Jakarta's golden age. The *Compagnie's* growing jurisdiction is reflected through the commission of various constructions that still stand today in Jakarta's old town and Batavia's headquarters, *Kota Tua*; amongst which are factories and warehouses that tended to the booming of the city's welfare. After having taken control of *Jayakarta*, Coen started a spatial reconfiguration of the city that included a new fort, nine times the size of the old *Fort Jacatra*, and walled settlements, later separated from the fort and castle by a canal named *Kasteelgracht*, located south of the archaic city's centre. Saving very little of the original context of *Jayakarta*, Coen intended for the city to reflect Dutch sovereignty and encompass only Dutch residents, expelling all of *Jayakarta's* ingenuous occupants. Planned settlements were shrewdly aligned parallel to the river and perpendicular to the sea, ergo, to the fort, ensuring the protection of the settlements. Land and water development in the orderly parcelling of the city establishes physical evidence to the Dutch persona sought to be deployed, which stood the test of time as the city continues to reflect that persona. A very intricate and elaborate urban scheme was unravelling from 1622 onward: the maps demonstrate a paraphrasing of the settlements, amassing a startling shift over the 1618-1627 interval.

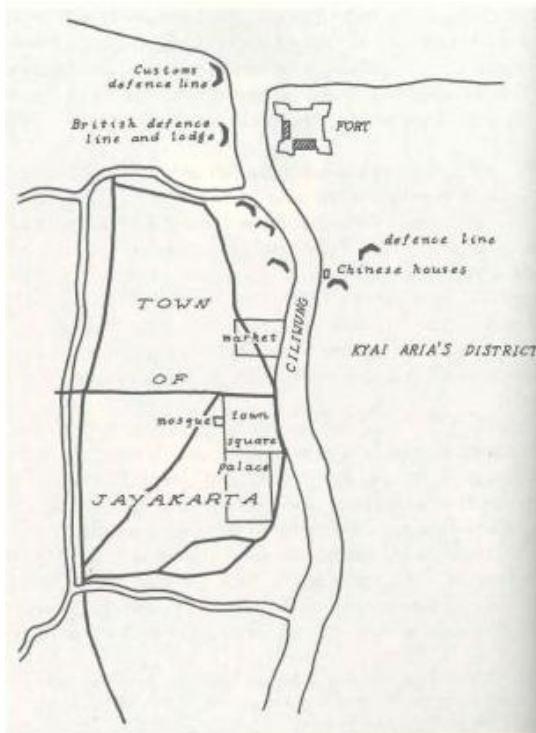


Figure 4. 1618 map shows the Dutch's limited jurisdiction in the city of then Jayakarta. F.de Haan, Oud Batavia

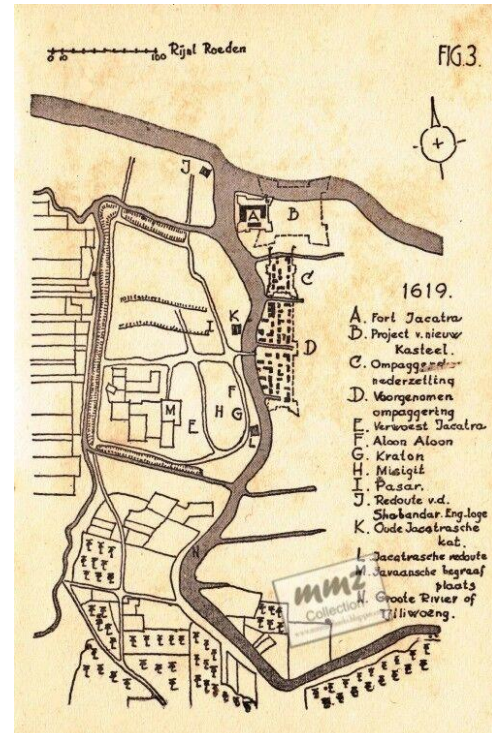


Figure 5. 1619 map shows Jayakarta after the Dutch annexed the city to the south. Het Voormalige Batavia

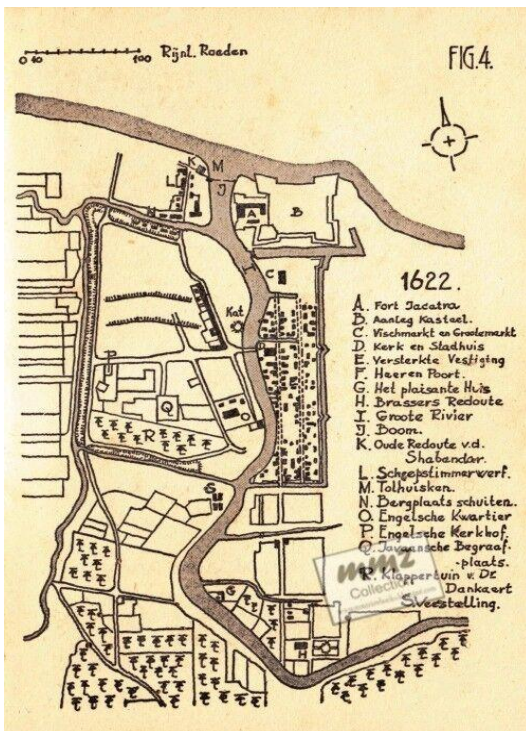


Figure 6. 1622 map shows stronger jurisdiction in the alignment of settlements and newly entrenched canals. Het Voormalige Batavia

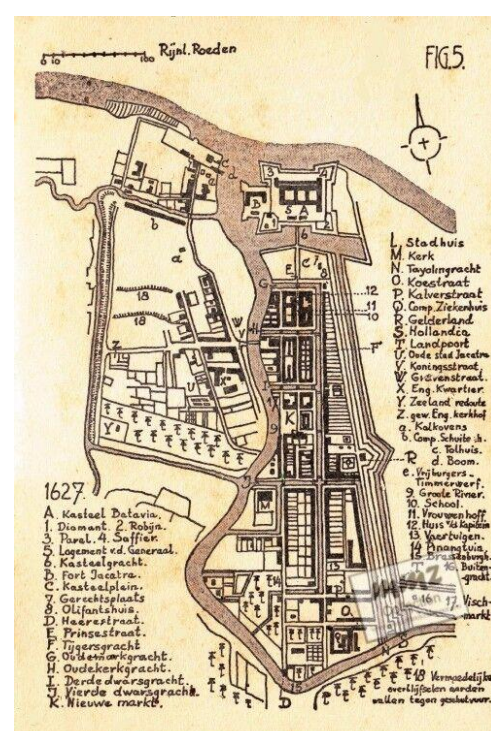


Figure 7. 1627 map emphasizes a well-defined layout of settlements as well as a new canal. Het Voormalige Batavia.

An evident pattern of influenced planning doctrine can be seen in maps of *Batavia*. An entrenching of three canals to the east of the Ciliwung river initiated in 1622, signifying signs of civilization through the orderly aligning of settlements and nuances of a walled city declared in the rudimentary map of *Batavia*. *Leeuwengracht*, *Groenegracht*, and *Steenhouwersgracht*, an exemplary manifestation of Dutch planning, extrapolated within their environs Batavia's first church and town-hall. Implements of connecting the three *grachts* through the *Tijgersgracht* started in 1627. A truly remarkable addition to Batavia's scape was the *Tijgersgracht* canal as its vista encompassed the rather cordial aligning of buildings and streets of Dutch design, welcoming its observer with "agreeable shadow", as one historian comments, and scenic outlook on Batavia.

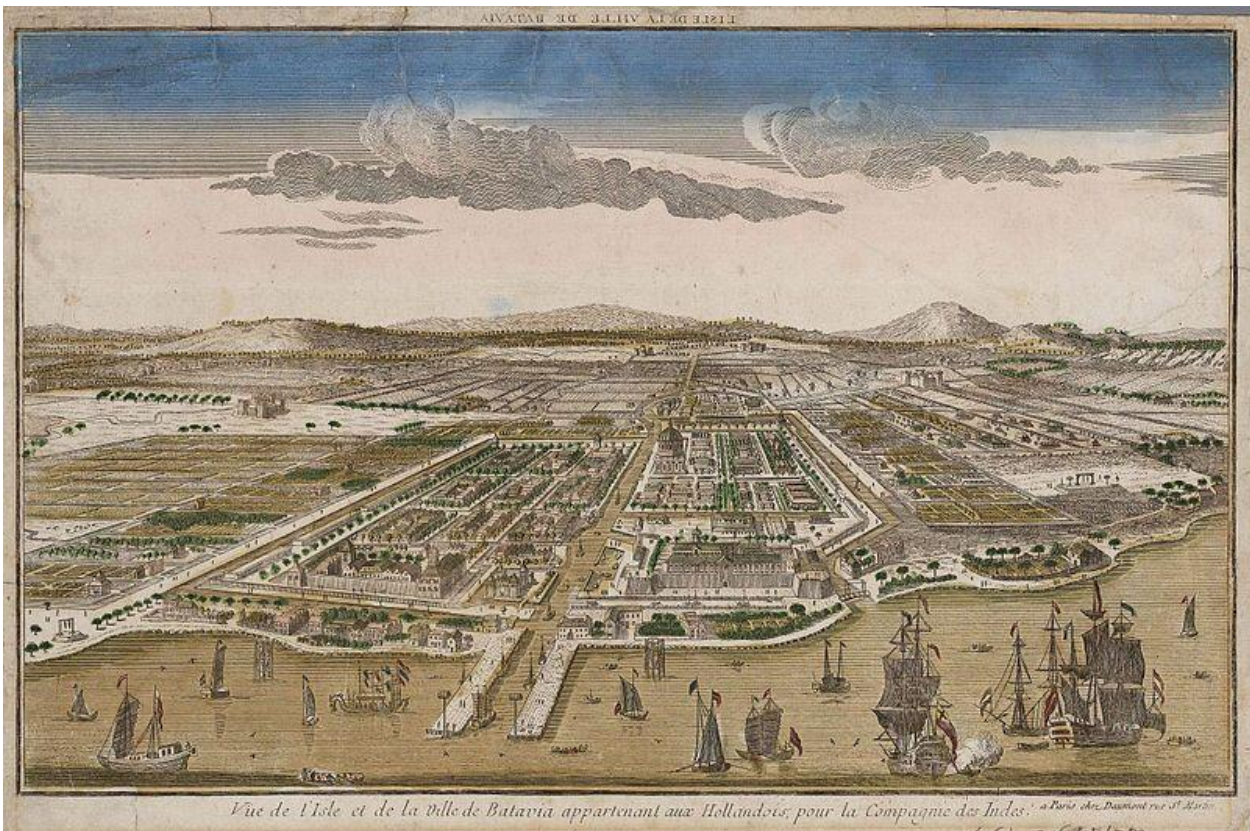


Figure 8. *View of the island and the city of Batavia, underscoring Dutch planning doctrine. Daumont, Paris c. 1780. NL. Universiteit Bibliotheek.*

2. Siege of Batavia

2.1. The Siege

Siege of Batavia occupies a cornerstone in Jakarta's historically bustling timeline. A military campaign was led by Sultan Agung of Mataram to capture the Dutch port settlement of Batavia. Batavia's future hung in the balance as it fell prey to Sultan Agung's desire to unite the whole of Java under his rule. The Mataram and the VOC's tense relationship dated back to the early years of Sultan Agung's reign. Sultan Agung Hanyakrakusuma, the third Sultan of Mataram in Central Java, was a skilled soldier and powerful ruler. Agung's reign denotes as the golden age of the Mataram as under his reign, almost the entirety of Java Island was reconciled. The European port and settlement, Batavia, became the single unattainable entity in Java Island. A treaty was forth between the two opposing forces, the Mataram and the Dutch East Indies, in the early 1600s; one that granted the establishment of the VOC's trading post in Jepara. The VOC, to return the kindness, had to aid the Mataram in the relinquishment of Surabaya. However, busy as the VOC was with setting foothold in Moluccas and eventually Jayakarta, the VOC refused to help the adamant Sultan with his endeavours, triggering a retaliation that burned the VOC's trade port in Jepara. Shortly after, the VOC counter-stroke the Mataram's capital, inflicting heavy damage. Since then, the relation between the Mataram and the VOC deteriorated gravely. With the surrender of Surabaya into the Sultan's forces in 1625, Agung was brought closer to fulfilling his longed-for dream of occupying Java and saw, henceforth, no reason to tolerate the Dutch's presence in what he considered his rightful domain. August 1628, a vanguard of Sultan Agung's navy had landed in Batavia as part of a scheme, *ruse de guerre*, that intended to deviate the Dutch's garrison into thinking the Mataram's landing was merely a trading urge. The size of the fleet,

however, forebode a sense of hostility in the Dutch, prompting the VOC into moving artillery to Batavia's northern bastions; en garde.

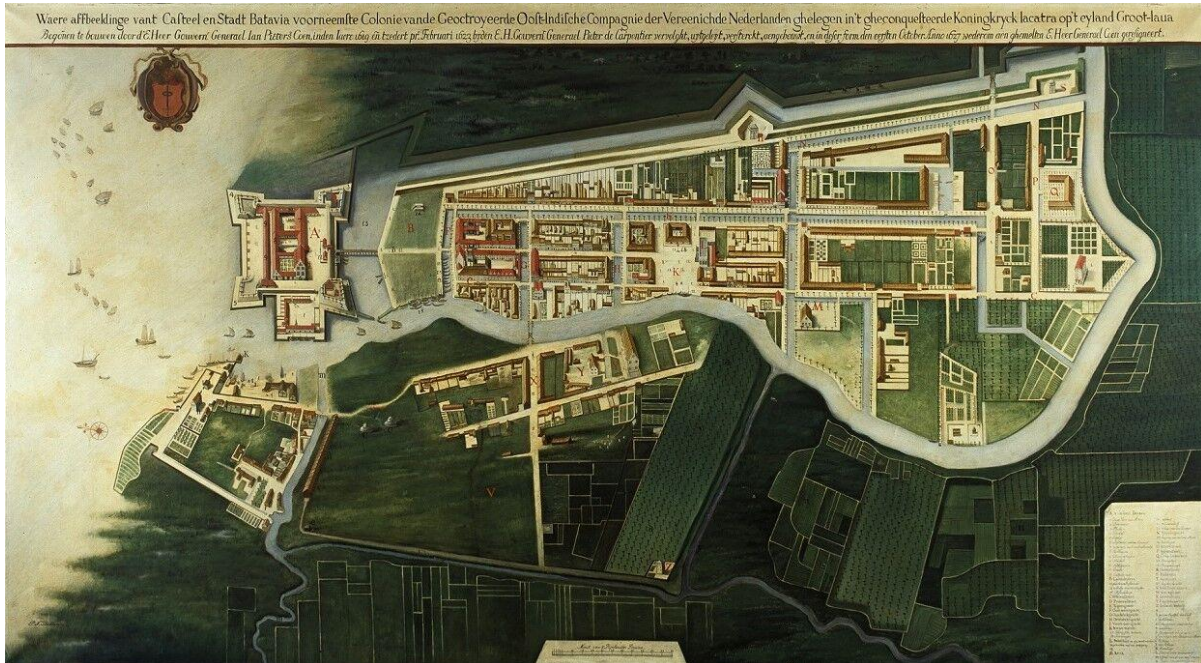


Figure 9. The old course of the Ciliwung River is still clearly visible here; the path of which will be straightened as a defence ditch; an event triggered mostly by the siege. Reproduction. Oil painting of the map of Batavia from around 1627 in the Westfries Museum, 1919-1921.

Confirming the Dutch's doubts, an escalating number of Mataram ships followed the vanguard several days later, prompting the Dutch to pull all personnel into the castle and open fire on incoming Javanese. Sultan Agung sent two forces: one by sea and another overland. Jan Pieterszoon Coen articulately handled the landing of Mataram on Batavia's soil by burning most of Batavia's bamboo shack suburbs, denying the Mataram of any shelter. As the number of Mataram ships arriving on Batavia's bay increased and eventually launched their first attacks on *Fort Hollandia*, 120 VOC troops fought back the attack, inflicting heavy damage to the Javanese. The Mataram retaliated by blockading all roads running south and west of the city and tried, henceforth, to dam the Ciliwung river to limit the Dutch's water supply. Consequently, the

Mataram's attempts were futile as they had not come prepared for a long siege so far from home, in an area devoid of local logistical support. The Mataram was running out of supplies and perseverance in the face of the Dutch's hefty military and fortifications. Shortly afterwards, the Dutch learned that their opponents had marched home. A second attempt arose as the Sultan was determined to conquer Batavia. The second strike was bigger and more prepared but was, however, of no success as the VOC burned down the Mataram's supplies, forcing the Sultan to retreat and surrender to the VOC's unassailable existence.

2.2. Following the Siege

The key element in Jayakarta's transition was the sequential morphing of its urban fabric and architecture that served as a testimony to the events the city has endured. Siege of Batavia foresaw a need to update the city's defence system. Batavia had only occupied the eastern sector of the Ciliwung River's vista. Governor-General, Jacques Specx, resorted to the planning stratagem of a renowned Dutch military engineer, Simon Stevin, designing a moat and extending the city walls to the west of Batavia. The defensive stratagem followed an application of arithmetic units, strict symmetry, and Dutch engineering and fortification works from the sixteenth and seventeenth centuries. Stevin's ideal city alludes to the typical Greek and Roman cities; the city followed a grid that yearned to the existence of a primary axis which, deployed by the river or a canal, allocated the city's functions. An *ideal city* had an encompassing water moat and a canal scheme that ran through the city's grid. According to Stevin's *De Stercktenbouwing*, military buildings were constructed like forts: with fortification walls, canals, locks, dikes, and bridges. *De Stercktenbouwing* also mentions the principles upon which the fortifications are built: a geometric basis which would be adapted to the projectile orbits of the new firearms, instead of the archaic cross-bow. Batavia's fortifications were constructed using earthen walls as they are, according to

Stevin, more resistant to the impact of bullets. The *ideal city* bore an exhaustive canal system that tended to both the city's connectivity and protection; the canal system, however, caused a tremendous amount of problems to the capital both by its restricted capacity and unhygienic circumstances; a predicament that forebode a city centre shift.

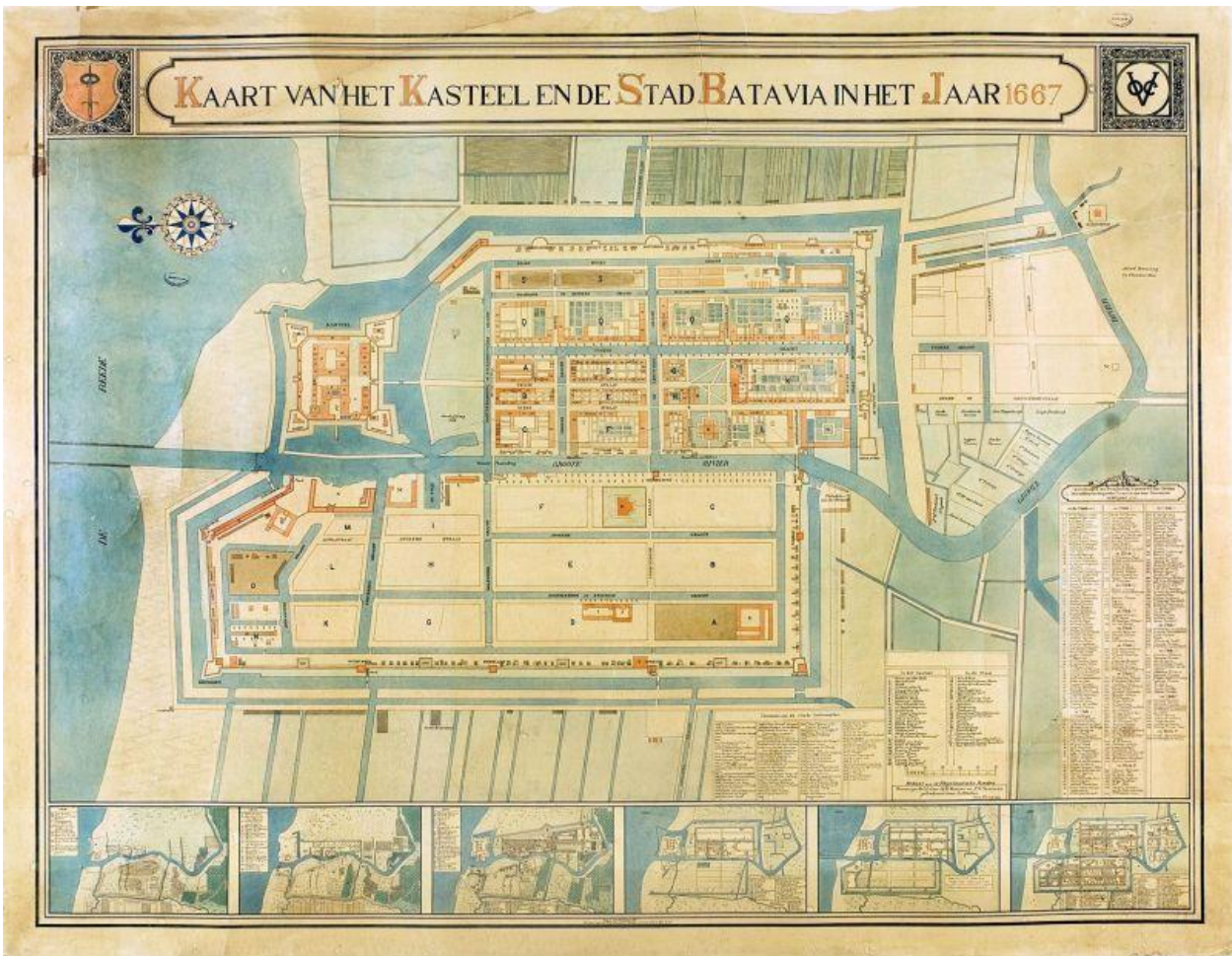


Figure 10. The development of Batavia based on the military defensive engineering stratagem by Simon Stevin. Tropenmuseum, part of the National Museum of World Cultures.

3. Colonial Demise

3.1. Fully Fledged Colony

Batavia continued to thrive affluently in the first half of the 17th century, drawing migrants from all around its environs. Since Batavia was built to reflect the centre of colonial administration, the

city's walls welcomed only peers of that administration. *Outside* the walls, henceforth, offered settlement for rural migrants. The colonial town constituted a societal system, distinguishing the residents of *Kota* from the local residents in indigenous *Kampungs*. In this system of societal separation between the *Europeans* ranked as first-class citizens and the Chinese and other *alien orientals* second, an architectural and spatial configuration deployed physical emphasis in terms of infrastructure sufficiency, security, and building material that resulted in a drastic shift in architectural character between *inside* and *outside* the city walls. The activity carried out outside the walls eventually disturbed Batavia's equilibrium as large-scale cultivation of the hinterland resulted in coastal erosion of northern Batavia. Moreover, maintenance of the canals was extensive as a result of frequent closures. In the 18th century, Batavia grew to be more unsafe, a predicament that propelled Malaria epidemics, killing many *Europeans*, earning the city the nickname *Het Kerkhof der Europeanen*, translating to The Cemetery of the Europeans. It didn't take long until the wealthier settlers of Batavia abandoned *Kota* and moved to southern regions of higher elevation. Somewhere in the middle of *Kota's* relinquishment, the VOC started to decline. The decline which eventually led to the dissolution of the *Compagnie* was caused by several internal and external factors. Lack of market for certain commodities and corruption amongst the VOC's personnel were among the reasons behind the *Compagnie's* downfall. After the VOC went bankrupt, eventually, and was dismantled in 1799, all of the *Compagnie's* assets and wealth were taken over and liquidated by the Dutch government, nationalizing the VOC's territorial claims into a fully-fledged colony, the Dutch East Indies.

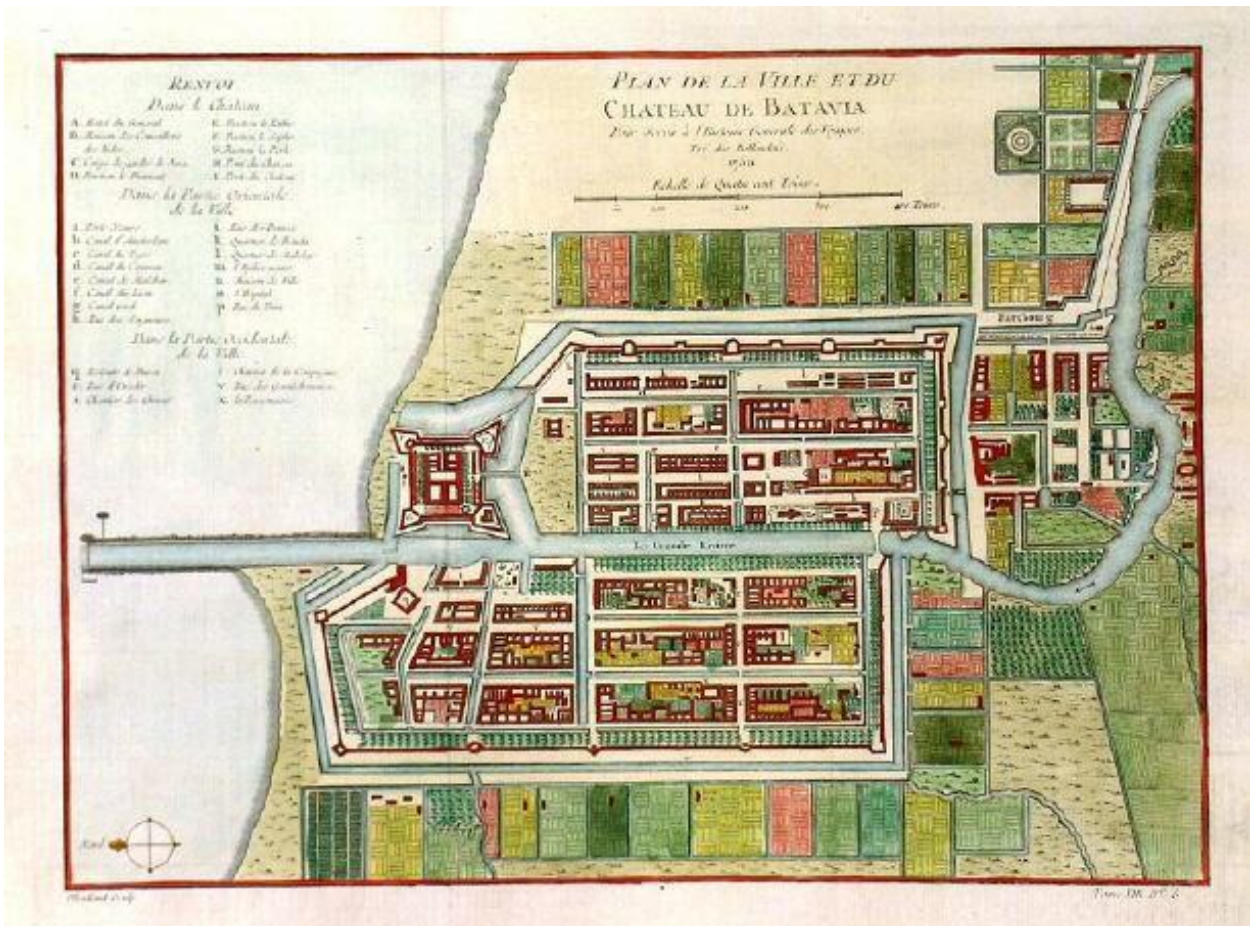


Figure 11. Batavia's spatial configuration map circa 1744 (*Plan de la Ville et du Château Batavia*, Jacques Nicolas).

3.1.1. Development of Weltevreden

Early nineteenth century marked the beginning of the French and British interregnum, taking place from 1806 to 1815; a relatively short period that had momentous influence in the history of the Dutch East Indies and Java's urban morphology. Java underwent vigorous infrastructure rehabilitation and reformation of administration in the colony. The French Empire and the British East India Company (EIC) contended for the control of Java. King Lodewijk Napoleon assigned one his generals, Herman Willem Daendels, to be acting Governor-General of the East Indies and strengthen Java's defence system to uphold the British-anticipated-invasion. A martial ruler,

Daendels built new roads, hospitals, military barracks, and new arms factories in Surabaya and Semarang. Daendels also gave rise to a new city centre, namely several kilometres to the south of the old city and named it Weltevreden. Kasteel Batavia was demolished and replaced, in light of military appropriations against the EIC, by a robust structure in Surabaya named after the king, *Fort Lodewijk*. The rise of the British EIC was among the causes after which the VOC collapsed and it's in the culmination of their conflicts that the Dutch rises again and recaptures the Dutch East Indies. The period of the British Interregnum, 1811-1815, yielded a great many changes to the archipelago. Thomas Raffles, appointed lieutenant governor of Java by Baron Minto, implemented liberal economic principles and liberalized the system of land tenure, putting a stop to compulsory cultivation in Java. It was under Raffles that a large number of ancient Javanese monuments were rediscovered and excavated, contributing majorly to the welfare of the city's identity. In 1816 the Dutch regained full control of their colony and resumed conquering other independent polities in the means of fulfilling full control of the archipelago. Batavia prospered in the second Dutch reign. The city now held two city centres: Batavia-stad and Weltevreden. Batavia-stad, formerly *Kota Tua*, acted as the business hub where offices, warehouses of shipping, and trading companies were located. Weltevreden, on the other hand, served as the new home for government, military, and commercial insets. The two centres were connected by a canal, *Molenvliet Canal*, and a road that ran parallel to the waterway. A new architectural style emerged, exemplar of the era's prospering, and was named *Indies Empire Style* after the colony. The style deploys sophistication and beauty, deployable in its white plastered villas and grand front porches. The efforts dedicated to the beautification of Batavia earned it the nickname *De Koningen van het Oosten* or Queen of the East.



Figure 12. *Javasche Bank, Batavia. Extract from Batavia-Weltevreden-Meester Cornelis, Centrale Bibliotheek, Amsterdam.*



Figure 13. *Stadhuis, Batavia. Extract from Batavia-Weltevreden-Meester Cornelis, Centrale Bibliotheek, Amsterdam.*

3.1.2. The Second Dutch Reign

Persevering a yet another influential reign, the Dutch effectuated a cultivation system in the mid-nineteenth century that imposed all agricultural productions of Batavia devote a portion to export crops; a cultivation tax, the *Cultuurstelsel*. The 1860s marked the start of a rather remarkable period, the *Liberal Period*, which highlighted an effort to right the injustices employed by the *Cultuurstelsel* and culminated at bringing an end to the system. Abolition of the system made way for the establishment of a great many advances to the city's trade and private enterprise. In light of the abolition, Kota or Batavia-stad replenished its deteriorating structures and replaced them with auxiliary structures that would serve as first hand recipient of goods brought through the Ciliwung River. Batavia continued to thrive as it established its first railway system in 1867, contributing to a more efficient transportation network throughout Java. Batavia's welfare drew a perpetual increase in the city's population which, in turn, gave rise to a general atmosphere of restlessness caused by the uprising demand for housing and dense living condition. In a time of change that few could adapt to, crop failures and outbreaks of disease concurred as a direct response to escalating absence of public amenities and subsequent poor sanitation. In 1901, the Dutch queen, Wilhelmina of the Netherlands, announced the government's willingness to bear "moral duty" towards their colonial polity and the subjects whom the Netherlands bore a "debt of honour" towards as a result to the remarkable *Cultuurstelsel* profits. This *Politiek* called for new and extensive government initiatives to expand public schooling, improve healthcare, modernize infrastructure, and reduce poverty. The goals set by the *Politiek*, however, delivered little real fruit as substantial funding was required to set-forth such drastic measures to the Indonesian population's welfare. The *Politiek*, however intangible some of its goals were, brought improvement to roads, communication, and flood control to Batavia which also cued

transmigration policies to relieve population pressure in Java. By the late 1920s, the colonial government's efforts have moved a long way from the idealistic goals the *Politiek* had set for the now growing Indonesian demands for independence; demands that had grown as ricochet to the rising Indonesian awareness brought forth by the *modernized* and politically broad education system.

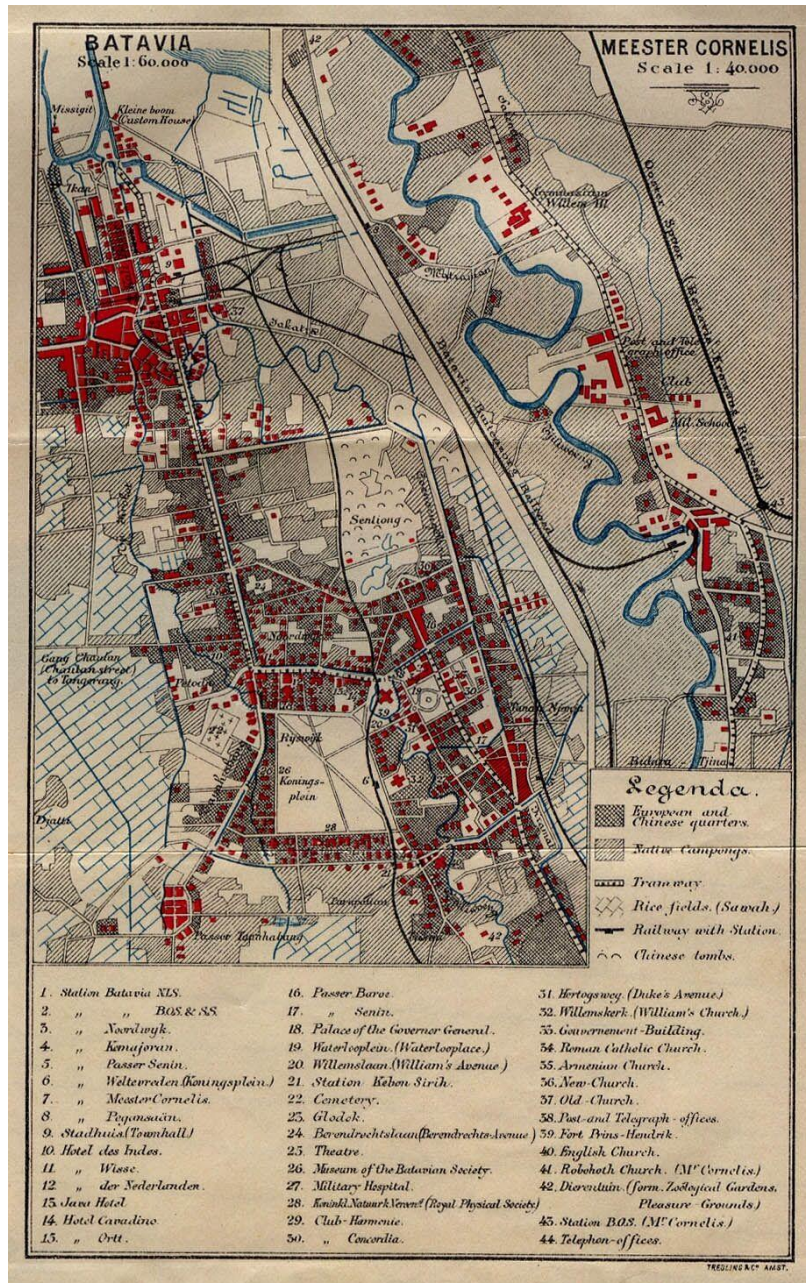


Figure 14. 1897 map of Batavia highlighting the city's center shift and the interweaving connection that lies between the two centers: Batavia-stad and Weltevreden; Meester Cornelis.

3.2. A National Awakening

A crucial sequential element to the upheaval of the Indonesian Nationalist conscience is the rise of *westernized* education; the notion that drew unbiased parallelism in the education of both indigenous and European students. In the process, Javanese students became quickly aware of what a tiny majority they shaped up in their very own society. Beginning to coalesce as a society very much aware of their diversity, the indigenous graduates imagined a modern society of their own; based on achievement rather than innate traits that made up the race; devotion to modernity rather than tradition. They believed they could dictate rules to the remainder of the century and change history's course. Soon enough a discourse in action was mandatory to Indonesians who began to speak of *Pergerakan*; a concept aimed mainly at obtaining freedom from the Dutch rule. Nationalist movements developed rapidly in the first decade of the twentieth century upon which associations such as PKI prompted sabotage and rebellion in Western Java and Sumatra. Chants that posed a challenge to Dutch supremacy spread throughout the archipelago. The Dutch government grew outrageous and frightened of the perpetual insurrections, leading to brutal amendments as arresting and exiling thousands of communists which effectively shut the associations down only until the Dutch were abolished by the Japanese.

"We have ruled here for 300 years with the whip and the club, and we shall still be doing it for another 300 years"

Dutch Governor-General Bonifacius C. de Jonge

March the 5th, 1942, the Dutch formally surrendered to the Japanese occupation forces, transferring the rule of the colony to Japan under which the city has morphed drastically. Under German occupation, the Dutch barely acted to maintain its acquisition of Indonesia. The Japanese, unlike the Dutch, facilitated education, trained, and armed young Indonesians, bringing their existence and political voice into eminence. It was under Japanese occupation that the notion of Indonesian Independence emanated, and the city was renamed Jakarta. The Netherlands, sought to reclaim the Indies but the Indonesians' striving to maintain what they've only recently acquired, their identity, ensued a social and military struggle which resulted in the Netherlands' recognition of Indonesian Sovereignty in December 1949.

4. Morphology of the City: A Conclusion

4.1. Sociology of the Dutch East Indies

“Whoever wishes to contemplate the Company in the possession of regal and princely power, must seek her in Asia, where she sits enthroned; is mistress of life and death; deposes and raises up kings; makes war and peace; has her own mint; and possesses all the attributes and signs pertaining to independent sovereigns”

Jan de Marre, *Batavia*

The Dutch ubiquity in the East was determined by men throughout the 19th century. The phenomenon of a societal concept in the Dutch East Indies reverberates the gradient collimate in colonial political ideologies. Availing the ascendancy of phallic dominance. Portraying a condescending European colonizer to the native populace, an echoic of domestic male dominance, conveyed by policies reassuring concubinage and the discriminating prohibition of female immigration to the colony. An alteration in ideological principles, an exigency, a quodlibet of degeneracy and the endeavour of women. A preeminent change to a more European

destined colony, where they were the superior race and in control of economic affairs, having a strong stable society based on families. As a reverberation, outmoded policies were abscised, acquainting novel regulations, allowing liberal immigration practices, the fiscal patronize of European families and the provision of inevitable amenities, endorsing a colonial society settled or dictated upon Dutch scruples. With the VOC becoming a contrivance templet for divergent metropolitan bourgeois and sovereigns, exalting, amongst others, the English East India Company and the umpteen French Compagnies des Indes Orientales. Persisting as one of the most prospering, hybrid colonial endeavours. Authorizing mercantile emulation, noesis, traversing the globe. A deviation, ranging from the mercantilism of spices and clothes in Indonesia and India, to the industrialization of sugar in Brazil and the slave trade in Africa. An ensue, indispensable in the sociological field. A primal component, apprehending the formation of the global colonial system, elucidating the causal factors of an attainment, a downfall and systemic transformation. A perfunctory coup d'oeil at the dire straits of Indonesia, accenting Jakarta, the cardinal plinth and demesne of the Dutch empire, bewrays a radical and volatile modus vivendi of colonial domination. A concomitant, the displacement of the ancien régime styles of accumulation and rule and the segue of Dutch colonialism from a company rule towards a more bureaucratic, socially interventionist system. The suburbanization of Jakarta, an efficacious pragmatic of sociology. With the emergency of accruing poverty, irrupting of slums and the lack of a safety net. The dependency of Jakarta's residents upon the dynamic inclement of the urban and built environment. As an emphasis, the Dutch East Indies, merely a class-conscious society.

4.2. Colonial Architecture

*“Cities and Thrones and Powers
Stand in Time’s eye,
Almost as long as flowers,
Which daily die;
But, as new buds put forth,
To glad new men,
Out of the spent and unconsidered Earth,
The Cities rise again”*

Rudyard Kipling, ‘‘Cities and Thrones and Powers’’, Puck of Pook’s Hill

An imperative and expedient location, Batavia has been scrutinized in original old maps, delineating the *chef-d'oeuvre* in progress or furtherance. Culminating a vignette of the fortifications, a work that has progressed over the decades, raising questions regarding the efficiency of the town's defence. The study reveals the construction progress and its development over the years, keeping up with modern types of bastion construction. Castle of Batavia, proverbial, *Kasteel Batavia*, a fortification used as the administrative centre of the Dutch East India Company, settled at the mouth of Ciliwung river in Jakarta. An amalgam of Dutch and Italian contriver, a geometrical basis, adapted to the novel armament. Castle of Batavia, at its expanse, a framework square-shaped, was armoured or accoutred with four protrusive bastions, entitled to the appellation of inestimable stones; the sturdy bastions protruded from every corner. Perusing 17th century itineraries, one can decipher that those who visited the castle, described it as being substantially spacious.

The accretion or alluvion of the coast of Batavia depicts a mid-18th century conundrum. A prosaic agnise, the castle of Batavia unreasonably outlined the seashore as defence for the mouth of the harbour. In need of a more pragmatic alternative, the construction of a new fortification initiated in 1741; entitled *Waterkasteel*. Located at the end of the foreland, the fort was perceived as a preliminary palisade of the city, bringing forth the *Trace Italienne*, reiterated; the *Italian outline*

was an exordium to a vogue, conglomerated with a gradualist plan of conquest. The fort was of profound influence to the settlers of the colony, rearticulating the colonial representations; the formation of a “culture of fear” where Colonial architecture and culture arrogated. Colonial culture has compelled the invention of a new post-colonial identity; nuances of Indonesian identity in architecture has sizeable imprint in the history of the nation, shaping the nation's political culture and its spatial configuration in urbanism. The role of racial and societal identity has direct impact on the nation’s cultural politics. Moreover, the significance of space is accountable for unravelling of collective subjectivities and the 'culture of fear' in the urban space of contemporary Indonesia. It is therefore, discernible through the study that architecture and urban space can be interpreted as both historical and theoretical representation of political and cultural tendencies that characterize an emerging and a declining social order, concurrently. The map displays the formerly known *Kasteelweg* and *Kasteelstraat*, at the present-day street *Jalan Tongkol*, traverses through the centre where Castle of Batavia once stood. The area is designated as part of *Kota Tua*, Jakarta's old town. Also discernible are the Dutch urban planning practices of the seventeenth century in the Indies, demonstrating Dutch hierarchy. Jakarta presents a vivid illustration of how a city's very form served to expose the Dutch aspect, inherent in cities that has yearned to its dominion.

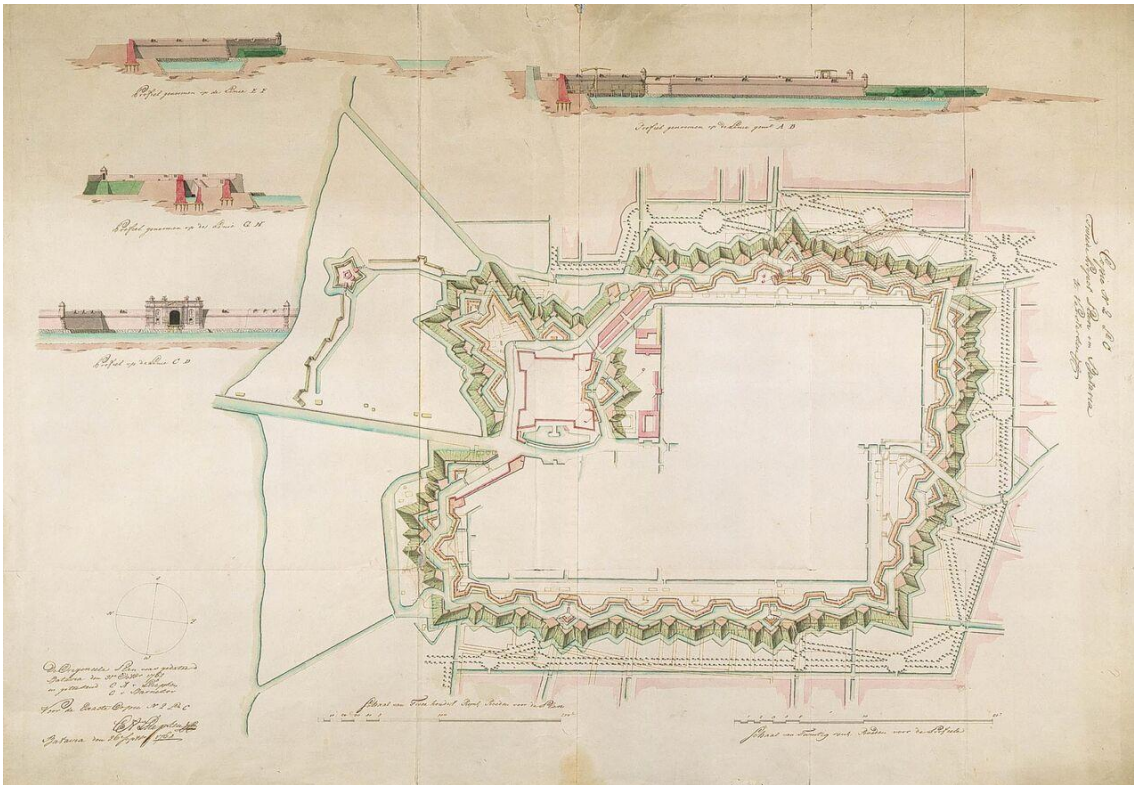


Figure 15. Plan, elevations and sections of the castle of Batavia, 1762. (Nationaal Archief, Verzameling Buitenlandse Kaarten Leupe, Inventaris nr. 1198)



Figure 16. The castle of Batavia, at the mouth of the Ciliwung River. The map shows the outline of the city of Batavia and its defensive walls and bastions in 1780. Visible in the bottom is the Waterkasteel. A. van Krevelt of Amsterdam

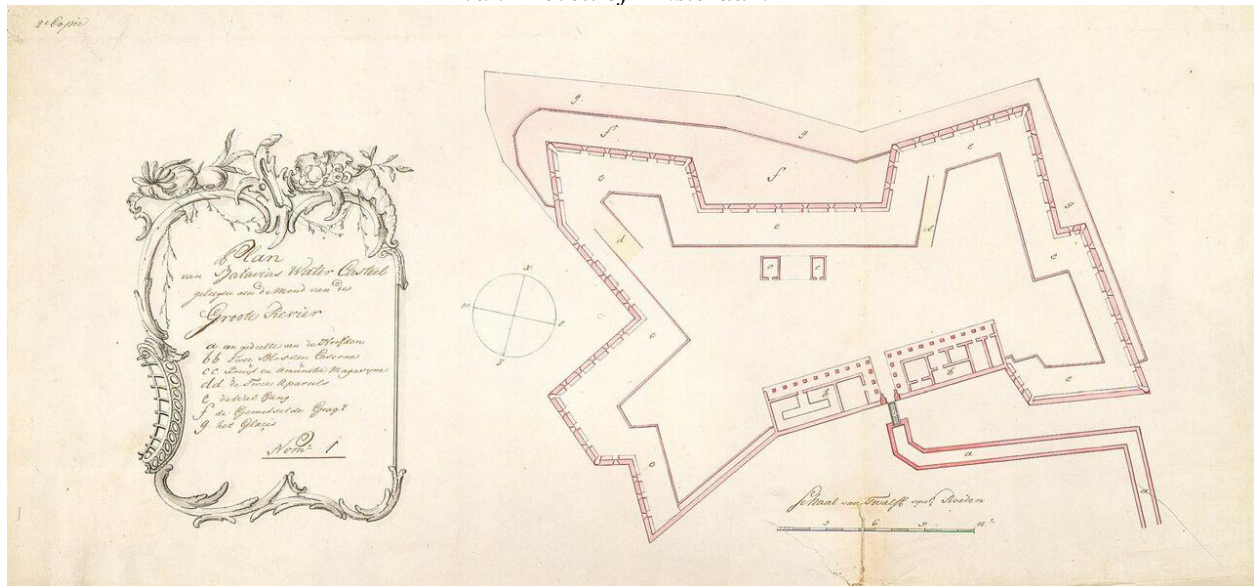


Figure 17. The design for the Waterkasteel, displaying the plan, circa 1762. (Nationaal Archief, Verzameling Buitenlandse Kaarten Leupe, Inventaris nr. 1212)

4.3. Urban Fabric

Jakarta's urban morphology remains an important testimony to the Dutch *Compagnie's* influence which gravely altered the archipelago's structure through its prolonged reign. Java constitutes a rather geographically prestigious site which justifies conflict over its acquisition. Moreover, one of the most remarkable features Jakarta's urban morphology deploys is the palpable shift in the city's planning, constituting a paradigm to the historical events the city has underwent and the culminating diverse identity. The city emanates at the northern port and diverges through canals and settlements that constituted the canals' vista. The city grew gradually to divulge evolution of elaborate military strength, sovereign, and economic welfare. The Dutch surrounded the city with sturdy walls and moats, a defensive stratagem typical Dutch planning manifests. It wasn't until wars like the *Siege of Batavia* that the city expanded grandly to outgrow the preliminary Jan

Pieterszoon Coen drafts of Batavia and *Fort Jacatra*. The French and British Interregnum contributed greatly to the city's southern parceling and eventual configuration of two centers: Batavia-stad or Kota Tua and Weltevreden. *Kota* and *Kampung* were two distinct demonstrations of architectural character and spatial structure. *Kampungs* resembled informal settlements that resided outside city walls and lacked proper building materials and sufficient infrastructure which *Kota* affluently conveys. The city then underwent beautification initiatives in its second Dutch Reign which glorified the new city centre, Weltevreden, appropriating it with squares, parks, and elitist architecture. Mediating Kota, now a business hub, and Weltevreden was a canal and road that ran alongside the waterway, proliferating a medium that connected both realms of the future and past. The city continued to grow about these two media notably after the declaration of Indonesian Sovereignty in 1949. Modern-day Jakarta still cherishes the two centres in its urban formation as they hold the main canals, roads, the city's main functions, and heritage of both colonial and post-colonial Jakarta.



Figure 18. Study map manifesting the two city centers: Batavia-stad and Weltevreden

(Developed by Author).



Figure 19. Study map manifesting the city's urban planning's core mediating the two city centres upon which the city relies greatly (Developed by Author)

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A Theoretical Evaluation in the Context of Actor-Network Theory (ANT) Approaches of Urban Regeneration Implementations: Case Study of Bağcılar District, Istanbul

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Abstract

Over the past decades, Istanbul has experienced the major changes in the macro form of the city and the social structure. Development of business activities and population growth in the center by influencing the surrounding housing districts, the rapid increase of the traffic density, and the adverse environmental conditions like noise, air pollution have been affecting the demographic, social and urban texture. As a result of the rate of urbanization; A series of ‘urban transformation projects’ has become a current issue to restructure the irregular formation and transportation problems in Istanbul.

The paper analyses the development of urban design projects since the 2012 Urban Regeneration Law through a research project conducted in the Bağcılar District of Istanbul. Housing design projects exist within the highly complex social and technical networks of the human-built environment. The analysis identifies the roles of both human and non-human actors in urban regeneration project and this paper proposes a means of mapping the actor-network of housing design. The network mapping focuses on the flow of design related information between actors and proposes the use of social network analysis tools to identify important network features and facilitate system intervention. In this study, a theoretical framework is formed in the context of Actor-Network Theory and this process illustrated by a case study of Barinkent Neighborhood located in Bağcılar District. The paper concludes that

the challenges of urban regeneration projects are rooted in the context of the key actors of network mapping process in Istanbul.

Keywords: Urban Transformation, Housing Production and Design, Actor Network Theory (ANT), Social Network Analysis (SNA), Key Actors, Bağcılar District.

1. Introduction

The changing economic and social structure in the post-1980 period in the whole world is also transforming the spatial structure of cities. As the changes in employment change the social composition of the urban people, the spatial demands and preferences change and the difference between the social and economic groups opens up as the fragmentation of space. The urban decadence areas and social problems that arise as a result of these transformations, if not taken precautions, will threaten the future of the cities. Urban transformation is seen as a concept that has emerged in order to bring solutions to the problems experienced in the economic, social and spatial transformations processes that cities are in by taking advantage of such concepts as renewal, revitalization, sanitation and protection. Projects that are realized in public sector and private sector partnerships especially in public areas and urban transformation areas should be seen as a part of planning and taking into account the dynamics of urban transformation.

In Today's Turkey; reproduction of the space is emerged out as the one of the most important issues of the city's multi-actors structure. Cities evolve; space is transformed by the influence of natural or artificial factors; in this process states are increasingly becoming centers of power and control over space. As a product by definition of Henri Lefebvre, space is social and socially produced, contains social, political and ideological elements and has many conflicts, tensions and negotiations within itself. (Lefebvre, 1976; Okyay, 2008) The lack of relationships and communication disruptions in the administration and conflicts of authority, network of political relations, decision-makers, residents and other civic actors in the city, the fact that the processes and stages of participation cannot be properly structured and sustainable and the mechanisms

of monitoring and control have not been developed shake the management integrity of cities. Today, the complexities of cities development and changes have put the local government into their search for solutions through their urban transformation projects. In this context; in order to use urban transformation as a tool, it is necessary to treat spaces as elements that have a meaning with social structure and to study together with socio-economic background.

The largest cities of Turkey, urban transformation projects increasingly within the 2000s, are reshaped through housing projects produced, which are commonly named as "gated communities". The fact that the capital accumulation in cities after the 1980s is over the real estate and construction sector has supported this process. In this period, Istanbul is the city where both the studies and discussions on urban transformation and the new housing production are seen as the most intense. Urban transformation projects mobilize national and local resources and various transformations are observed in cities. At the same time, this process is seen as an action plan and a model of joint participation that ensures the integration of all actors in the city.

In the scope of study; the concept of urban transformation will be emphasized in Bağcılar district of İstanbul and the different actors and sectors taking part in this process will be examined within the framework of the relational approach to Actor Network theories (ANT) by showing the interaction with new residential areas and real estate markets. Subsequently, the local participation model by reference to UK experience is tried to be applied, but the contractor/ developer model from the private sector stakeholders is preferred by dwellings. In this study, Barinkent Urban Transformation project whose construction is completed will be analyzed and actors involved in the reproduction of the project will be analyzed by using a qualitative research method. The analysis concludes that focal actors and policy makers in Bağcılar, Istanbul have begun to face up to the challenge of charting Istanbul's route to sustainable urban regeneration and that the impact of the Bağcılar experience should be

evaluated in this context. As an employee of Bağcılar municipality in the period of 2011–2018, enabled me to understand the perspectives of key official actors / decision makers in metropolitan and district municipalities, central government and other stake holders in private sector.

2. Conceptual Expressions of Urban and Neighborhood Renewal

2.1. Definition and purpose of urban transformation

“Towns and cities change over time, nothing is immune from either the external forces that dictate the need to adapt or internal pressures that are present within urban areas and which can precipitate growth or decline” Roberts (2000, p. 26)

Urban areas are always in a state of transformation. Urban areas mirror the numerous processes that drive physical, social, environmental and economic change and they themselves are key generators of many such transitions (Sykes and Roberts, 2000). Studying urban transformation is very important to deal with urban problems and respond to urban opportunities. Nowadays, urban regeneration has evolved as a tool of managing urban transformation.

Urban transformation can be defined as the economic, social and physical reproduction process of a settlement area. Urban transformation aims to make cities into better habitable areas. It also aims to create economic vitality in the city parallel to physical healing. In this sense, urban transformation causes both quality and structural change (Tekeli, 2003: 3-7). Urban transformation; many socio-economic city planning actions; laws, politics, economic decisions and preferences, it is the whole of the actions that various actors can take.

The main purpose of these actions is to improve the quality of urban life as for the need for transformation is due to spatial distortions. The basic essence of the urban transformation system is to restructure the city's urban life with the urban people and taking into account all the environmental factors by changing and / or renewing the urban space (Turok, 2004: 60).

2.2. Development of urban transformation in the context of historical analysis of Turkey

Sennett's cities are defined as "representatives of social change and memory, incubation of the future and monument of the past" (Schubert, 1996: 81). Problems of 19th century industrial tricks have been coming for the housing assets of 20th century. An understanding of the history of Turkish urbanization is a fundamental requirement for an explanation of the contested concepts and practices of contemporary neighborhood redevelopment. An historical analysis of Turkish urbanization identifies the specific characteristics of urban regeneration by earthquake mitigation and urban regeneration law.

Turkey, with the rapid industrialization, met with squatters in the 1940s, along with the growing squatter after 1950, the city has started to grow, and this growth has continued until today in an uncontrolled manner. The new habitat of workers employed in the industry, squatters, emerged as a mass of new voters, determining the fate of the places while populist politics was the prime of 1980s.

Years of 2000s with entry efforts to European Union is meant to struggle with the challenges of globalization, it began to feel distinctly urban space with the 1990s for the Republic of Turkey. This situation has put the country to the position which in search of a radical restructuring of urban governance. The phenomenon of urban transformation in Turkey in the last fifty years metropolitan different periods in different structural, contextual, socio-economic, administrative and vary depending on the physical dynamics (see Table 1). The implementations were realized parallel to these policies.

Table 1: Evaluation of urban transformation policies (Source: Colantonio and Dixon, 2011)

Period Type of politics	1940-1950	1960's	1970's	1980's	1990's	2000's
	Physical Transformation	Social Welfare	Economic Welfare	Real estate focused Transformation	Society partnerships	Sustainable Places

Transformational interventions and tools have been determined both by local contextual conditions and by global trends. These forms of intervention are increasingly diversified to include more socio-economic dimensions than physical intervention itself. Response to gain the variety of forms ranging from planning approaches in the world and it has been in the framework of reflections on Turkey. The need to deal with transformational interventions with a more participatory and processed new planning approach has arisen by the time. Experience of urban transformation in Turkey, plans and programs, rather than the direct result of political intervention methods, market conditions, society's "spontaneous / instant" solution to, is based on the interaction of the central and local governments. The purpose of doing a historical analysis is to determine the national and international role of external factors in the process and practice of urban transformation. Fifty years of urban transformation in Turkey willingly go at the end of this period, although the physical structure of the transformation is also a result of social and economic transformation. Meanwhile, major cities of Turkey is compared to developed western countries have grown much faster. (See Table 2). The institutional and legal regulations that control this transformation and the approaching planning approaches often fall behind transformation.

Table 2: Evaluation of urban regeneration (Source: Roberts 2000)

Period	1950s	1960s	1970s	1980s	1990
Policy type	Reconstruction	Revitalization	Renewal	Redevelopment	Regeneration
Major strategy and orientation	Reconstruction and extension of older areas of towns and cities often based on a 'master plan'; suburban growth.	Continuation of 1950s theme; suburban and peripheral growth; some early attempts at rehabilitation.	Focus on insitu renewal and neighbourhood schemes; still development at periphery.	Many major schemes of development and redevelopment; flagship projects; out of town projects.	Move towards a more comprehensive form of policy and practice; more emphasis on integrated treatments.
Key actors and stakeholders	National and local government; private sector developers and contractors.	Move towards a greater balance between public and private sectors.	Growing role of private sector and decentralization in local government.	Emphasis on private sector and special agencies; growth of partnership.	Partnership the dominant approach.

2.3. Implementations of urban transformation and community planning participation models

In the process of urban transformation, existing houses are demolished and all kinds of superstructures are built, where the lower structure and the ground are intact, and multi-story residential areas are constructed and existing residential owners are also provided from these residences.

- Social and spatial problems created by the transformation applications:

1. Displacement:

Being displaced brings new problems of housing design. Such practices, especially seen in areas where certain social subgroups coexist, dissociate the segments that can survive in the social life of the big cities but cling to each other and throw them into different regions of the cities. These sections are having difficulty in adapting to new lifestyles and cultures, establishing new social relations in the transformation areas. Local residents living in those areas also suffer from difficulty in adapting to this new social layer.

2. Social Exclusion:

Social exclusion has become one of the main problem areas of urban transformation applications as the most important concept of economic, social political debates and public interventions as well as covering and / or relating to basic social policy issues such as poverty,

unemployment, social protection, inequality and discrimination.

In the 2000s years, a society-based transformation approach in urban transformation projects is beginning to attract attention. The most important reason for this has been the lessons learned from the beginning of the collapse of the studies made by leaving the back of the past and the social background of the past which will give opportunity to observe the erroneous aspects of the applications made 40-50 years ago. Public and private sectors and universities have tried to reach the best practices with cooperation. It is aimed at ensuring accession and for all stakeholders to agree on the implementation of urban transformation.

One of the most experienced countries in transformational practice, the transformational agenda in the UK, is now known to be filled with the goal of social integration, strengthening, participation, space, goodwill, social and cultural diversity in low income groups. From the beginning of 2010, Turkey has focusing axis of the discussion of the problems of cities and urban interventions.

Urban design has gained its popularity by the end of 1990s with the emergence of what is called the 'Third Way Policy' (Giddens, 2013) and the urban renaissance agenda. A huge emphasis was placed on the matters of design excellence. UTF (1999) advocates for a stronger commitment in order to have quality and creativity in the way which we design buildings, public spaces, and transport networks. Urban transformation in England has been supported by the central government at varying levels since the late 1960s. (Atkinson and Moon, 1994, Jones and Evans, 2008, Tallon, 2010). In particular, since the 1970s, cities have shifted to thematic strategies in order to increase their economic competitiveness on the global stage and to think about social problems in response to urban regression processes. All these initiatives are often referred to as 'urban Renaissance' in England from the mid-1990s (Urban Task Force, 1999, DETR, 2000).

Neighborhood Renewal Strategy

- *A strong vision for the future of poor neighborhoods, and a long-term commitment to the realization of this vision,*
- *Net geographical priorities for a 20-25-year program*

In parallel our case study design alternative explicitly focused on identifying the principles of urban and neighborhood regeneration as practiced in the UK and other EU countries. The study drew on this experience to develop an outline sustainable neighborhood regeneration strategy for Bağcılar, which embodied the first attempt to develop a Turkish version of the dual approach. (see Figure 1) These studies marked the inception of the ongoing debate about the purpose, scope, and desirable outcomes of urban regeneration in Istanbul. Further commissioned research by universities developed researches and site surveys, especially the need to integrate planning and regeneration through strategic development frameworks and action plans.

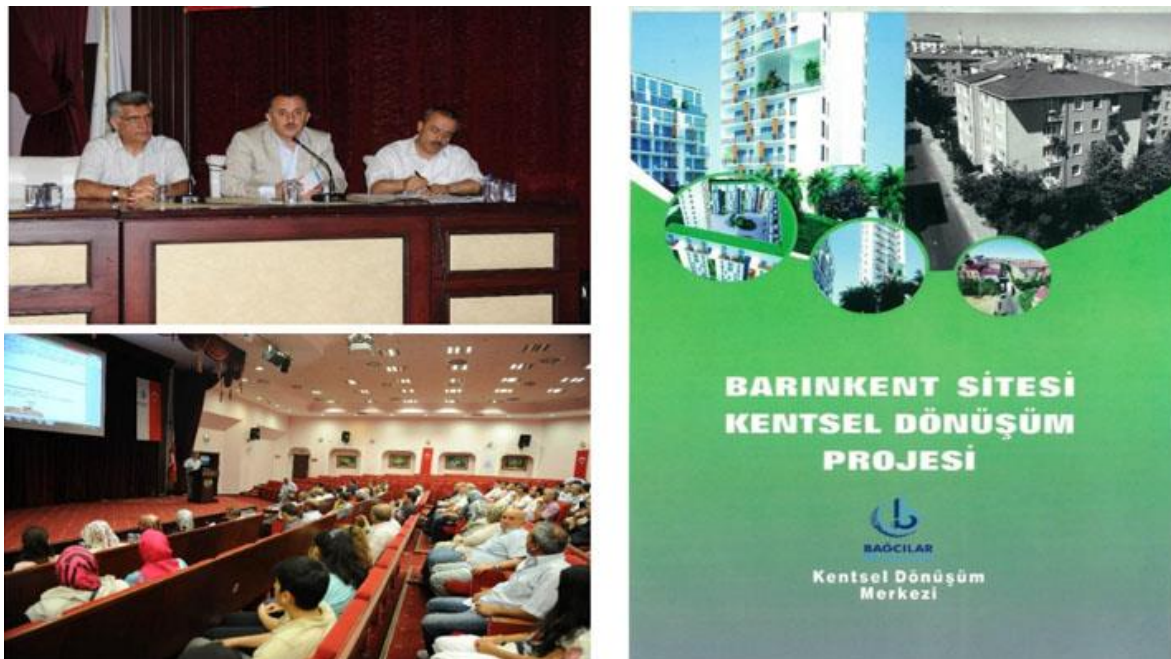


Figure 1: Neighborhood Regeneration Project in Bağcılar / Community Participation.

2.4. Legal process of urban transformation in Turkey

Especially in developing countries, the housing problem is one of the main problems in urban

areas. In the period of 1950-1980 which is defined as the migration of labor from the country to the city in our country and the neo-liberal urbanization politics, the housing policies adopted in the post-1980 period, when the capital is increasingly concentrated in the cities, are based on differentiated problem sources. However, in both periods, metropolitan areas are confronted as the areas most affected by the rapid change / transformation agenda, depending on the housing policies and practices implemented in urban areas. In recent years, large-scale housing projects, which are carried out under the scope of residential projects carried out by the General Directorate of Housing Administration and the Law Concerning the Transformation of Areas under Disaster Relief No. 6306, which are under the jurisdiction of urban transformation applications, are prominent in these areas. In relation to the same law, it is seen that the parcel-based transformation activities in urban areas are accelerated and the build-sell mechanism is revived.

While the new laws are shaped on the basic logic of the Draft Law on Public Administration, the notion of urban transformation, which has been on the agenda since the 2000s, has taken its place in these new legal structuring movements.

Legal Laws regarding the Urban Transformation:

- ‘Law of Transformation of Areas under the Disaster Risks no. 6306 (conventionally referred to as the Urban Regeneration Law) (16.05.2012 date and no: 28309)
- Implementation Regulations of no.6306 (02.07.2013 date)
- Decree related to interest Aid by the banks for proprietary rights within the law no. 6306 (13.09.2012 date and no:28410)
- Implementation Regulations in Planned Areas

Main Purpose of the Law:

- Creating safe and livable areas in transformation of areas under disaster risk and destruction of risky structures throughout the country. Any study determined according to the scientific evidence that it is risky building will be destroyed as the life safety.
- The essence of the law is the agreement procedure, and those who break down the risky structure through agreements will be given support such as credit, housing and workplace banking, housing certificate.
- If 2/3 of the owners are in agreement with the parcels on the building, the application will be made according to this agreement and the competent authority will not intervene.

3. A Theoretical Evaluation in the Context of Actor-Network Theory (ANT) Approaches

3.1. Actor Network Theory (ANT) - Social Network Analysis (SNA)

Actor-Network Theory (ANT) is rooted in science and technology studies. It has been developed from the 1980s by Bruno Latour, Michel Callon and John Law. Since the 1980s ANT has been used in multiple variations. Although ANT carries ‘theory’ in its name, it is better looked at as a method for doing research. ANT is an interdisciplinary methodology that handles the heterogeneous of human and non-human actors ‘relationships, their effects to each other within a non-technical network. ANT can be applied to all disciplines with collectible data regarding a study, given ANT’s ability to analyze the network and estimate the success of a project. Architecture and Urban design disciplines are suitable for applying ANT, since the network includes both human actors and non-human actants such as central & local government, developers, legal documents, materials, etc.

Network analysis reveals the forms of relationships among people in the social system and the analysis of the settlements of these relations in the social structure and their changes over time. The Actor Network Theory (ANT) resembles these quantitative approaches. The ANT is concerned with how objects are assembled, how relations are established, spatial rather than classical spatial network analysis rather than analyzing spatial network. It deals with issues

related to everything from society, nature, space to relational point of view. Social Network Analysis (SNA) aims to understand the changing nature of interactions, the formation of actors in one or more social networks in classical social terminology. At this point, SNA has a similar disagreement with ANT on the concept of network and relationship.

Thompson (2003) concludes in a comparison of network theories in relation to hierarchies, both ANT and SNA consider a network as a set of relations between actants and techniques; and both explain network outcomes as “*variations* of network structures.” SNA analysis provides a means of measuring and observing such variations of network structures irrespective of the properties of the actors and the intermediary in circulation.

3.2. The Actor Network Theory Stages

- Problematization
- Agreement
- Participation
- Action

The principle and the fact that the actors are brought together and the ideas they have agreed on are the economic implications. The involvement of new actors in the actor network is achieved by establishing personal or economic relations with existing actors in the network or by performing the action defined by the key actor.

- The actors agree on the economic income-earning projects of the actors who want to take part in the network, thus revealing the deal phase of the actor network; legislation, regulations, plans, etc. to legitimize the actions of actors in this process. mediators,
- Network participation phase is realized by two methods; the actors who want to join the network in the first of these are involved in the network by establishing contact with key actors or other actors in the network and the second is that the actors outside the network are invited to the network by key actors or other actors on the network,

- The actor is intended to reveal actors and intermediaries who contribute to the realization of network actions in the process of network formation. For the purpose of this study, the opinions of the interviewers and the laws, regulations, etc. It has been deemed appropriate to describe the intermediaries that contribute to the realization of the action by obtaining and resolving the data from the documents.
- On the basis of these views, it can be seen that the laws of human actors, which are derived from the law to carry out the actions of the human actors, constitute antagonism as intermediaries contributing to the actions of the human actors.
- It can be argued that the principle and the fact that the actors gathered together and agreed on these ideas are economic returns. Participation in the actor network is achieved by establishing personal relationships with the actors in the network; it is understood that the actors who are in the network but are obstructed in the action of the network are removed from the network and replaced with a new actor and the network is in a stable state.

The actor network approach provides the understanding of the relationships between the heterogeneous elements of human or non-human actors and the formation of nets by following the evolution of these relations (Latour, 2005: 5, Bosco, 2006: 137). At this point, a case study should be done to prove the thesis hypothesis. Qualitative research method should be used in order to be able to do this within the framework of actor network theory. In this context, data collection using the interview technique and related laws, plans, regulations and so on. The instruments that justify actions such as documents must be evaluated within the framework of qualitative research methods.

3.3. Actors/ Actants playing role during the process of projects

The examination of the cities is a continuous change is observed. The transformation that takes place in urban space as a result of change sometimes occurs with the spread of a long period of action in the process, with the intervention of a large number of actors, sometimes in a very

short period of time and with a certain- even often fewer- actors' desire to create a brand New and different space. Urban transformations carried out in a short period of time and under the leadership of specific actors, and the effects of these interventions made in the city on the physical and social environment, constitute the field of study for long-time urban researchers. The cities that have been shaped under the influence of different politics in each period have been structured or restructured mainly in the last thirty years under the influence of neoliberal policies.

After the 1980s, various actors began to take place in urban transformation projects. European and American cities that want to become centers of attraction have seen that urban transformation cannot be achieved by state support alone, as the time and space concept shrinks with the globalization process. Conversion projects were carried out by partnerships with the public sector, private sector, non-governmental organizations and local people.

It seems that the transformation has taken place in line with the decisions taken in the 1990s. In this sense, it seems that a sustainable urban transformation is not only a monopolistic public sector, but also cooperated with other actors, taking lessons from past failures.

By adopting a participatory approach in urban transformation projects, central and local governments have been involved in the private sector process. In addition, urban transformation projects in recent years can be realized with far wider actors with the participation of international organizations. These actors are a strong partner in terms of broader financial resources. (Sönmez, 2005: 18).

3.4. Implementations of Actor Network Theory

The theory have tried to explain the behavior of actors. Researchers can find out what they want to do, why and how they do it. The challenge for researchers is to find artificially created categories and behaviors about how actors are made.

The theory has been appreciated for its inclusion of non-human beings and the actives. However, it is criticized as being prejudiced against non-human beings (Habers and Koenis, 1996; Krarup and Blok, 2011, Newton, 1999, 2002). In addition, institutions, networks of actors which are often criticized for making black box treatments, which can be opened for futile descriptions (Hanseth, Aanestad and Berg, 2004, Krarup and Blok, 2011).

In ANT, it is investigated that how a network has emerged, what links it contains, how actors are involved in the network, and stable links and indecisiveness on the network. When the research question is identified, the first thing to do is to determine a starting point. The starting point may be the theme, the goal of the research and the central question. For example, if the implementation of a particular policy is being investigated, the policy document prepared for it may be a good starting point. It is important to be able to recognize the activists involved in the research and the new links established. For this reason, negotiating, analyzing the documents obtained, direct observation etc. must be done for analysis of theory.

- *ANT mapping inside the 'black box'*

To commence a mapping of the flow of design information in the existing housing design and its provision network the actors in the network were established employing the ANT definition of an actor as "(a)ny element which bends space around itself, makes other elements dependent upon itself and translates their will into the language of its own" (Callon and Latour 1981 p. 286). In order to represent the network as effectively as possible information has been gathered from a variety of sources including existing literature, texts, and semi-structured interviews with key industry stakeholders (as described in Diagram 1).

This complies with the two main methodological approaches advocated by ANT: 'following the actors' via interviews and ethnographic research and examining inscriptions.

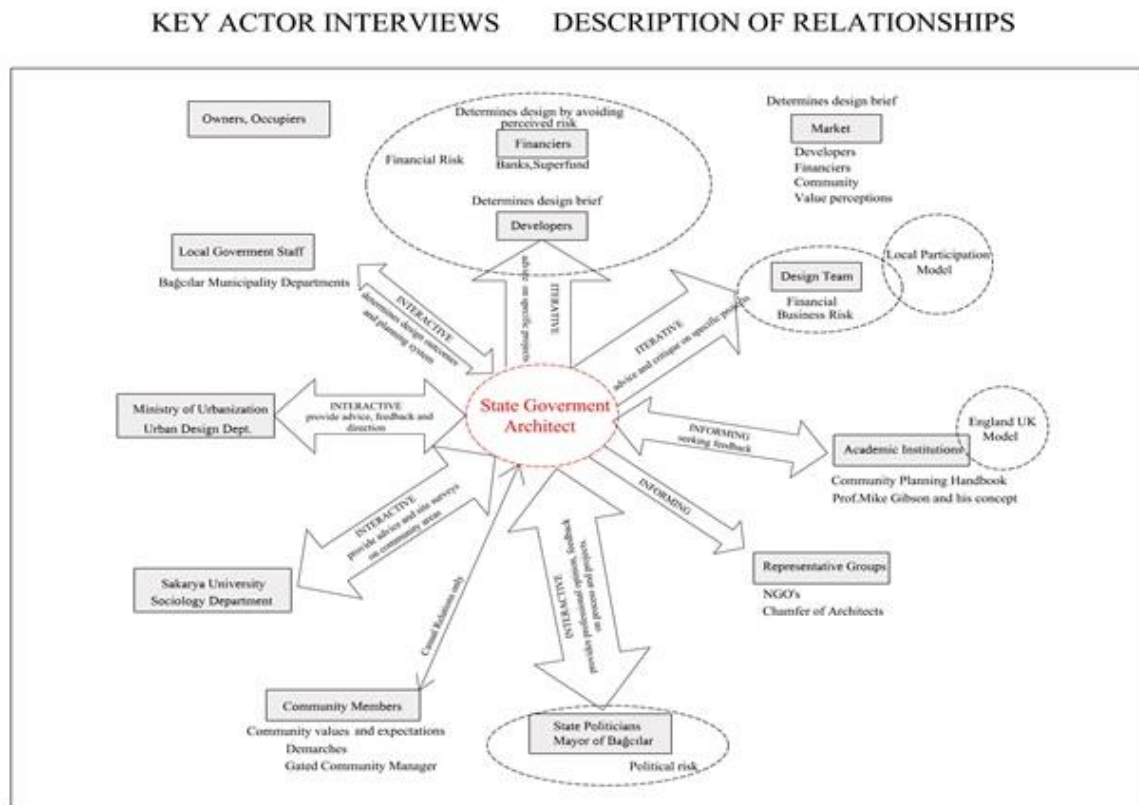


Diagram 1: Data gathering from stakeholder's interviews to uniform ANT Mapping.

In this research, interviews have been conducted with Actors/Actants in order to understand their approach to network mapping process. This information has been used to determine both the actors in the network and, importantly, the flow of design information between them. A complex range of human and non-human actors were identified with intermediary flows/connections. The actors and intermediary flows identified constitute a stabilized network which, having formed over time through a variety of translations and inscriptions (Callon 1986), has been offering Barinkent Housing Real Estate to the housing market in İstanbul for an extended period of time. That is, they represent the contents of the stable ‘black-box’ (as described in Diagram 2).

KEY ACTOR INTERVIEWS- STRENGTH OF RELATIONSHIPS WITH STAKEHOLDERS

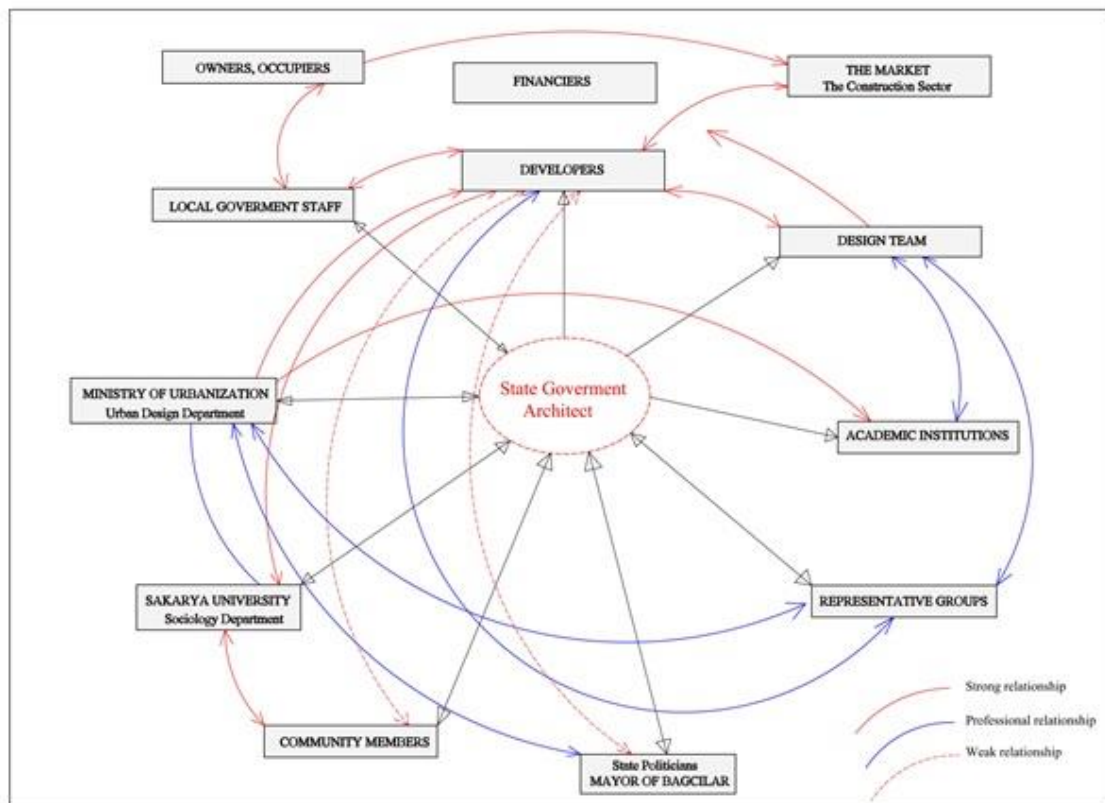


Diagram 2: Flow of design information between stakeholders through ANT Mapping.

In mapping this network, the interest to the project is to open the ‘black-box’ and observe its contents: to visualize the actors it contains and how design information flows between them to result in the urban transformation projects we have today. That is to say, the proposed mapping does not intend to map the preceding, or historic, translations and inscriptions which led to stabilization of the network and subsequent creation of the ‘black box.’ (see Table 3).

Table 3: Design relationship – unlocking the design “Black box”.

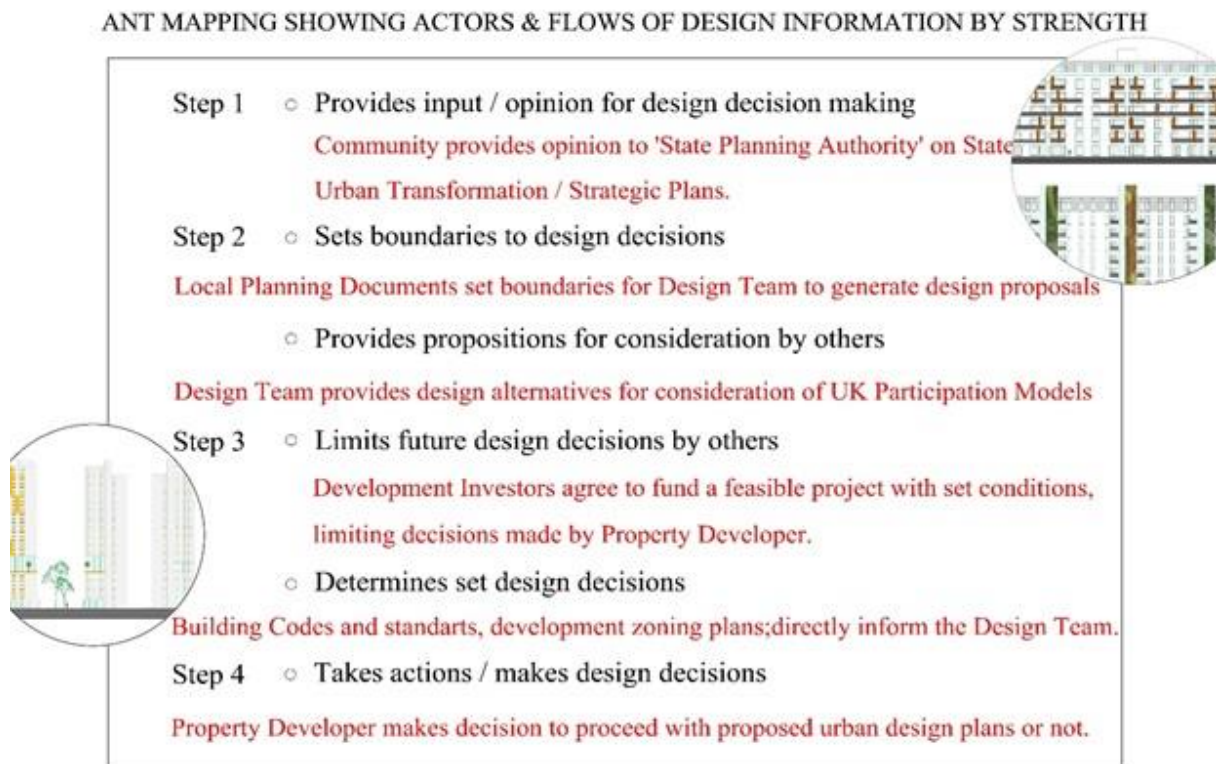


Table 4: Actor Network Theory Definitions.

ANT MAPPING SHOWING NETWORK ACTORS

Actor :	<ul style="list-style-type: none"> "Any elements which bends space around itself, makes other elements dependent upon itself and translates their will into the language of its own" (Callon and Latour 1981 p.286).
Focal Actor :	<ul style="list-style-type: none"> One who acts to align the interests of a diverse set of actors with their own interests (enacts translation) (Callon 1986).
Mediator :	<ul style="list-style-type: none"> Mediator : actors who ' transform, translate, distort and modify '.
Obligatory Passage Point :	<ul style="list-style-type: none"> A situation that has to occur for all of the actors to be able to achieve their interests, as defined by the focal actor (Callon 1986).
Intermediary :	<ul style="list-style-type: none"> the language of the network. Anything that "passes between actors in the course of relatively stable transactions." Product,service or money.

Table 5: Actor Network Theory Definitions (applied on the case study)**ACTOR NETWORK THEORY DEFINITIONS : IMPLEMENTING ON THE CASE STUDY**

ANT CONCEPTS			
ACTORS / ACTANTS			
HUMAN ACTORS		NON - HUMAN ACTORS	
Central-Local Government Developer-Design Team-Politics		Urban Transformation Area Bağcılar District-Design Tools	
Both Actants in the network system have equal capacity to do actions.			
INTERMEDIARES / MEDIATORS			
INTERMEDIARES (Non-effective on action)		MEDIATORS (effective on action)	
Public Institutions, Municipality Demarches , NGO's , Community Groups		Master and Development Plan, Plan notes, Legal documents, Site surveys and polls.	
TRANSLATIONS			
Problematisation	Agreement	Participation	Action
Human & Non-HumanActors Focal - key actor	Consensus between actors	Participating to the network	Action Plan for Urban Transformation Projects

The case of the Local municipality (Bağcılar) and sub-institutions of local governments (BAŞAK Company) as well as local governments' associations and home investors turned out to be human actors in the change of the physical space,

- The public power of the central and local governments and the investors and the community itself are the human actors in the change of the physical space,
- The key actor- the outcome of an individual, an entrepreneur, a local government and a central government, which can vary according to the project and the implementation.

As the human actors in the center of the physical space (the government, the political power and the state apparatus in the framework of their understanding) and local administrations (Istanbul Metropolitan Municipality and Bağcılar Municipality) and investors (housing and construction investors).It is understood that the central (government, political power) and local administrations (Istanbul Metropolitan Municipality and Bağcılar Municipality) and investors

(residential and construction investors) play a leading role in the investments leading to the change of the physical space. From these findings it can be stated that the Bağcılar Urban Transformation Areas are an important factor in the human change in today's physical change. (See Table 4 & 5).

3.5. The formation of Actor Network Theory and the phases

Cities are the result of the change in the economic organization as a reflection of social relations. During the reproduction of the physical space of the city, alliances are formed between the groups forming the society. It should be emphasized that the state apparatus is part of these alliances within the framework of the paradigm change that is happening today. These alliances, which are conceptualized as actor networks in the time frame we are in, are in the framework of unseen and unordered relations. In this context, the underlying cause of the loss of cultural heritage can be explained as the acts of the actor network, which is aimed to generate income from the urban land during the reproduction of the urban space in line with the needs of the changing social structure.

The actor network theory describes the concept of 'mediator' as the means / agents that take on and contribute to the realization of the actions of the actors. These tools include laws, regulations, development plans, etc. The documents are in conflict. The second topic on the occasion of the intermediary which does not play a role in the actors' actions, is not influenced by the actor's networking process, and facilitates the establishment of relations between the actors.

What are the principles and facts that bring the actors together and cooperate on them?

- How does the actor participate in the network?
- What are your thoughts about the impact of urban networking on actor networking?

From this perspective, the principle and the fact that the actors come together and agree on the idea are the economic implications. The involvement of new actors in the actor network is

achieved by establishing personal or economic relations with existing actors in the network or by performing the action defined by the key actor. Regarding the exchange of space, the related individuals, groups and so on. the key actor definition of the conditions created to attract attention, the network describes the problem-solving phase,

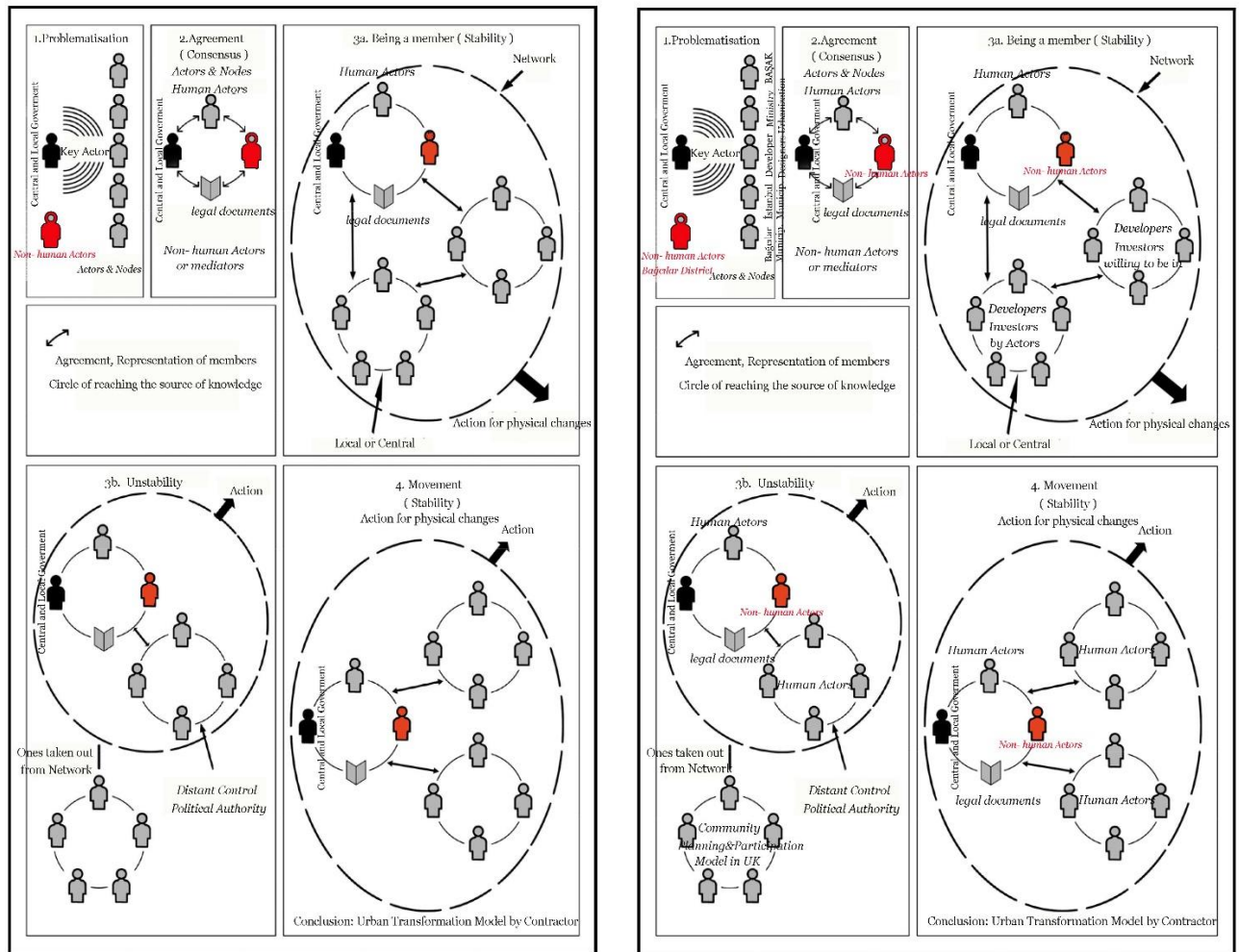
- The actors agree on projects that bring in economic income to actors the actor will reveal the deal phase of the network; in this process the actors' actions laws, regulations, plans, etc. to legitimize the mediators,

- Network participation phase is realized by two methods;

At the first method; actors who want to join are involved in the network by contacting the network's key actor or other actors; At the second method; actors outside the network are the key actors or other actors on the network invited by the network.

- The next stage from the network participation phase,(the first arrives at a fixed position in the network, the second takes effect in the network if the actors are not satisfied with the progress or action the deterioration of the stability of the network, the removal of the actors that disturb the stability, with the participation of the actors or with the rest of the actors who have been out of the network to come to a fixed position again with the reach of stability, (see Table 6), the results of the actor network have been reached that the Bağcılar Community have been involved in the transformation of the physical space in the urban transformation area.

Table 6: The formation of the Actor Network and the phases of its process (Source: Selman,2000) .



4. Urban Transformation and Neighborhood Planning Process: Case Study of Bağcılar District

This section establishes the context and rationale for the Barinkent Real Estate Project (Bağcılar case study) in terms of an analysis of the emergence of urban and neighborhood regeneration since the early 2000s. This process was driven by the acceptance of the need for regeneration as a component of earthquake mitigation action and the impact of the ongoing restructuring of the city's economy. Feasibility studies such as site survey, technical building risky reports, community meetings, conferences and market statistics have contributed to the re-shaping of the long-established processes of urban transformation and renewal projects.

4.1. An overview of urban regeneration in Istanbul Province

Istanbul has recently started to address the challenge of developing of sustainable urban regeneration, with previous experience to build on. However, Turkish analysts and decision makers have the opportunity to learn from both the successes and the failures of the historical and contemporary experience of major cities. Since the early 2000s, it has been increasingly acknowledged in Istanbul that the changing processes of urbanization are presenting problems and challenges which require government interventions through urban and neighborhood regeneration programs which would be the equivalent of those in many EU cities.

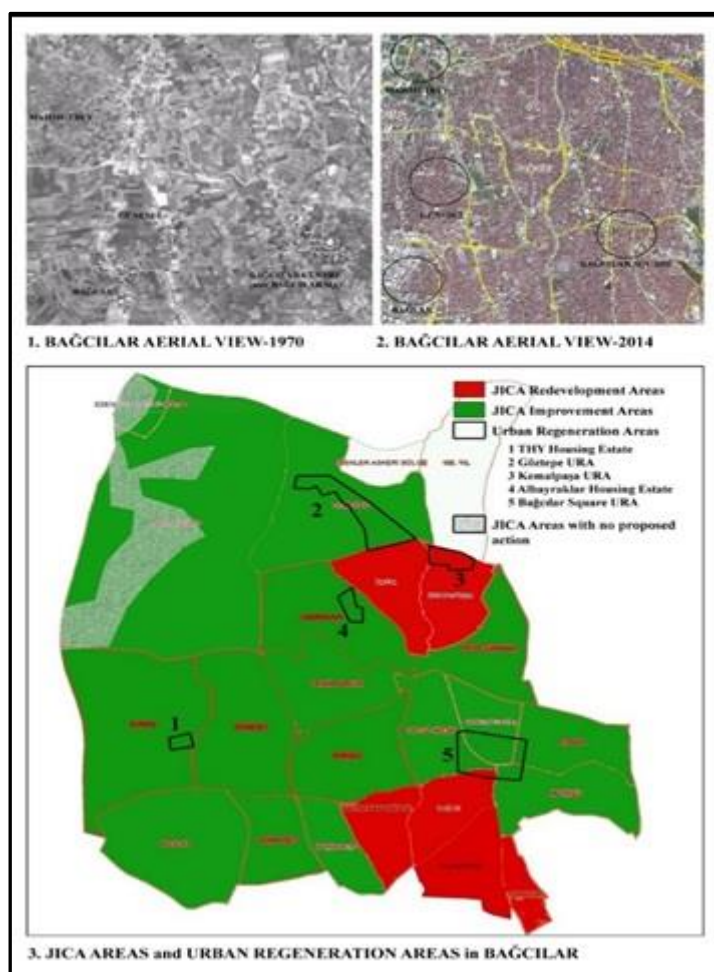
4.2. An overview of urban regeneration in Bağcılar District – Case Study

Bağcılar was a village in open countryside until the 1970s when land brokers began selling shared title deeds for small plots of peripheral agricultural land. From the 1980s the area developed increasingly rapidly and almost wholly illegally, with the exception of a significant number of co-operative housing estates and was constituted as a separate Municipality in 1992. Rapid urbanization intensified through the 1990s and the population was estimated at 754,623 in 2014 (Figure 3 &4). The 2002 JICA-IBB study estimated that 90% of the resultant building stock is made up of earthquake vulnerable concrete frame structures. This stock is dominated by 6-8 stores apartment blocks in primarily residential areas, often with small scale commercial and industrial users on the ground floor (Table 7). JICA identified Bağcılar as one of the 11 most earthquake vulnerable districts in Istanbul. It estimated that 7000 buildings, 20% of the district total, would suffer heavy or moderate damage, causing over 5000 deaths with more than 7000 severely injured. The study recommended strategic improvement or redevelopment in all 22 neighborhoods.

Table 7: Situation of the Building in the District of Bağcılar / Source: JICA Report.

District		Low < %50		Medium Level Of Regeneration Speed % 50 - %75		High > %75		New Urbanized Neighborhood		Total Numbers	
Kod	İsim	Mahalle	Alan (Ha)	Neighbour Hood	Area (Ha)	Neighbour Hood	Area (Ha)	Mahalle	Alan (Ha)	Mahalle	Alan (Ha)
5	BAĞCILAR	0	0	7	375	0	0	15	1,819	22	2,194

In the context of the 2012 Urban Regeneration Law the municipality established an Urban Design Department (UDD) which was given the powers and responsibilities of the three main municipal departments in URAs: Planning, Development and Urbanism, Licensing and Audit. It introduced significant improvements to communications with the public, including giving residents more direct access to municipal staff via shop front style offices.

**Figure 2:** Map of the Bağcılar District / Source: JICA Report.

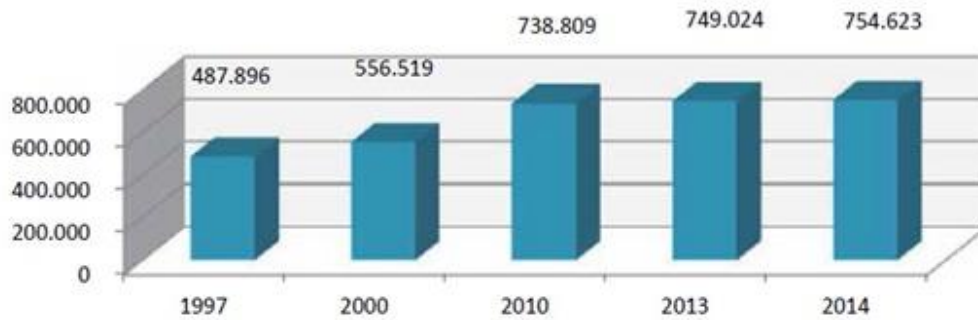


Figure 3: Population Growth of Bağcılar District / Source: Bağcılar Municipality Report 2015.

A multi-disciplinary team of architects, urban planners and civil engineers, secured the designation of URAs: the low rise, low density neighbourhoods, which include Barinkent Compound of Case Study. Since 2012, the municipality has commissioned consultants to deliver a prototype model of project development in Barinkent (see Figure 4) which, in sharp contrast to conventional practice, involved designers working residents from the outset (see Figure 5). But notwithstanding unprecedented levels of collaborative work involvement, the residents were persuaded by a construction company to choose a feasible design and reconstruction is now underway, demonstrating the inherent limitations of the share of construction process.



Number of Buildings:	12
Number of Houses	: 146
Number of owners	: 149
Population	: 556
Area	: 7.837 m ²

Figure 4: Location of Barinkent Housing Estate / Source: Bağcılar Municipality.

The first stage of the design process was to engage fully with the residents through a face to face questionnaire survey of property owners to establish their needs and priorities, and regular meetings between the consultants, the municipality's urban regeneration department and the residents to explain the redevelopment process. The second stage was the development of two

detailed design alternatives which were shared with the residents at an evening meeting at the Municipal Hall attended by the Mayor and Deputy Mayor. At the end of the meeting, another short questionnaire was given to the residents asking for their views on the alternatives. The municipality subsequently published the design alternatives as a booklet. The survey results were used to revise the selected alternative and produce the final version of the design proposal which was submitted to the municipality. The Municipality's preferred design has 146 flats for residents and 51 flats for the contractor in 3 low-rise and 1 high rise blocks. Residents will have to pay 40.000 TL. The private contractor's design has chosen by the residents has a total of 240 flats in 4 high rise blocks- 146 flats for residents and 94 flats for the contractor. Residents will have to pay 27.000 TL (see Figure 5).

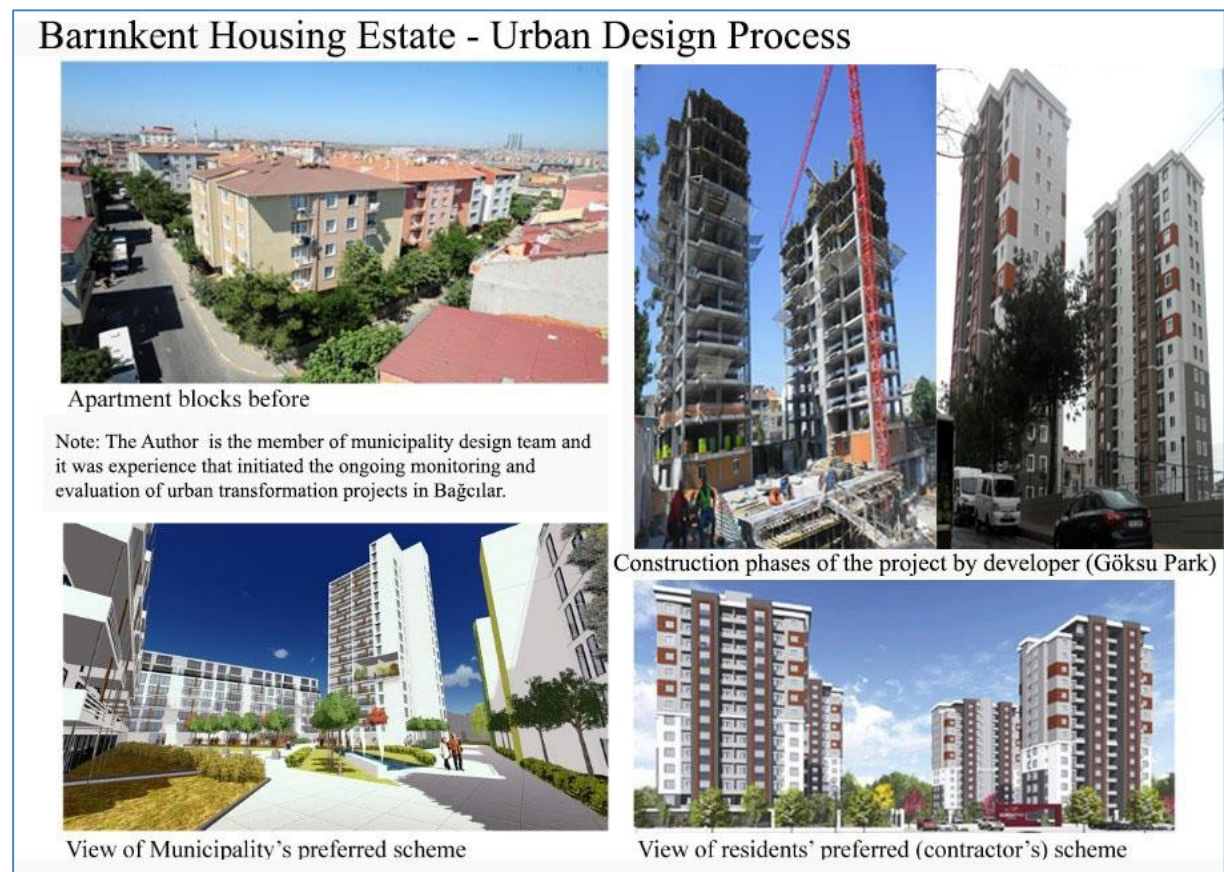
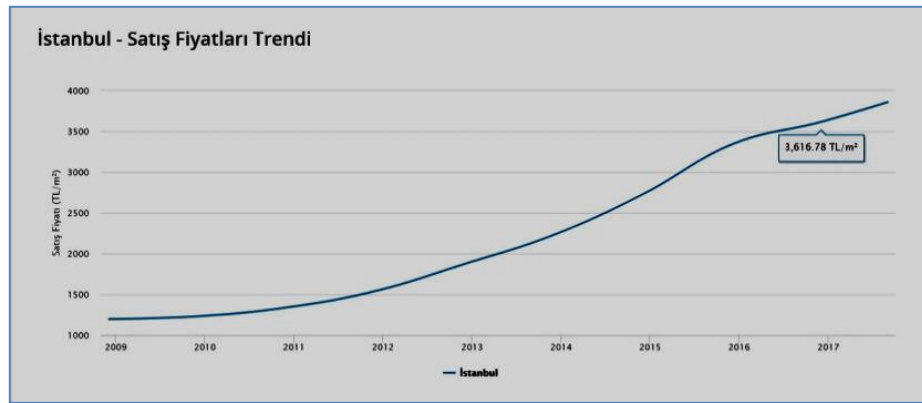


Figure 5: Design Alternatives of Barinkent Urban Transformation Project/ Source: Goksin 2016.

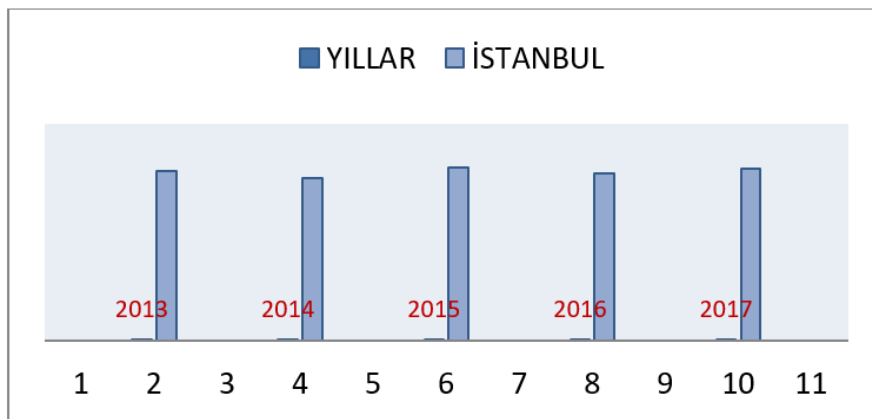
4.3. Housing market in Bağcılar district of Istanbul

An important factor in the success of urban transformation initiatives is the need to relate to urban markets and production sectors in the direction of pre-determined goals and policies. Housing markets and housing production sectors are closely related to urban transformation processes.

The social agenda, participation, partnership, financing, project durations and low profitability ratios, which are at the forefront of the neighborhood scale transformation initiatives, are the biggest obstacles in attracting private sector initiatives. The involvement of the private sector in the process has an important share in urban regeneration projects in the interest of ensuring access to finance and experience.



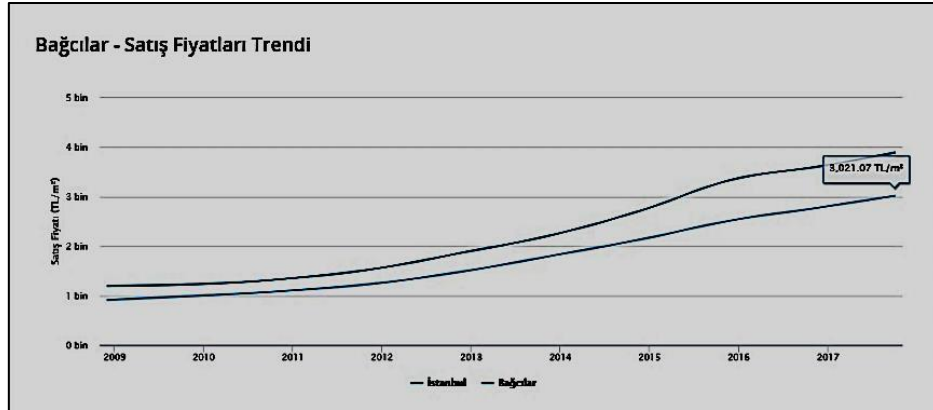
Graph 1a: İstanbul Housing Sale Prices by years /Source: Zingat.



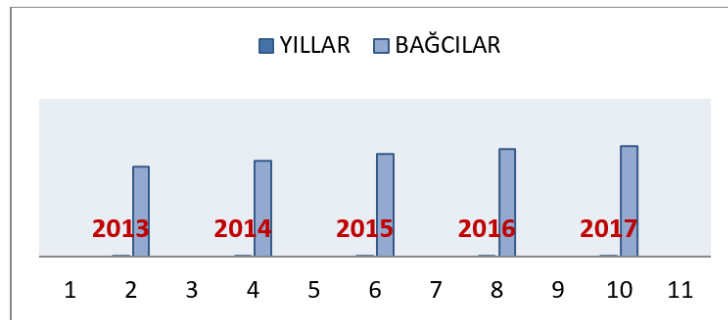
Graph 1b: İstanbul Housing Sale Numbers by years /Source: TUIK.

Istanbul is at the first place in residential sales of rates. Turkey's largest city with 16.336 numbers of residential sales (16.8 percent) taking place at the first line. Accordingly, the

average price of a 100-square-meter residence purchased in Istanbul in the real estate index and regional report for the year 2018 was between TL 296,915 and TL 494,900. House prices for sale in Istanbul have increased by 0.48% in the last one year. (Graph 1a -1b).

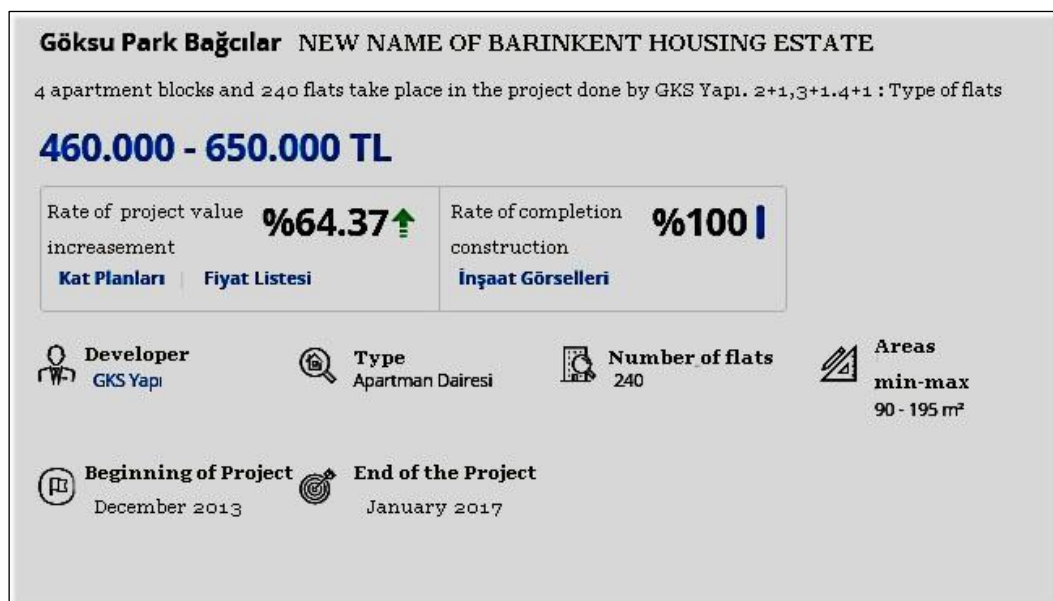


Graph 2a: Bağcılar Housing Sale Prices by years /Source: Zingat.



Graph 2b: Bağcılar Housing Sale Numbers by years /Source: TUIK.

Accordingly, the average price of a 100-square-meter residence purchased in Bağcılar in the 2018 real estate index and regional report was between TL 232.759 and TL 387.900. Bağcılar house prices for sale in the last one year increased by 1.22%. The average residential square meter prices in Bağcılar district are 3.103 TL while the return period is 17 years. (Graph 2a-2b)



Graph 3: Housing Sale Prices of Barinkent Housing Estate (Göksu Park) / Source: Zingat.

4.4. Earthquake Risky Report of Barinkent Housing Estate

Economic Life of the Building (50 Years): It has been determined that the age of the building is 20 years. Implementing Regulation on the Law Concerning the Conversion of Areas Under Disaster Relief Determined as “Risky Structure.” The renewal of the Barinkent apartment blocks was deemed appropriate due to the risk of earthquake.

4.5. Site Surveys of Barinkent Housing Estate

The "urban transformation project" carried out at Bağcılar requires specific measures to improve the social, physical and environmental conditions of high-risk areas of earthquake damage risk through comprehensive and holistic approaches. According to the earthquake risk report, residents of Barinkent Site, where the damaged structure was found, were surveyed in the "Steps of Urban Transformation in Bağcılar" in the framework of the "urban transformation project". The second issue is; urban transformation was carried out in a few sites which were taken as an example and it was aimed to be able to remove the hesitations of various sections and to give a new impetus to future developments. Urban transformation work, which can be

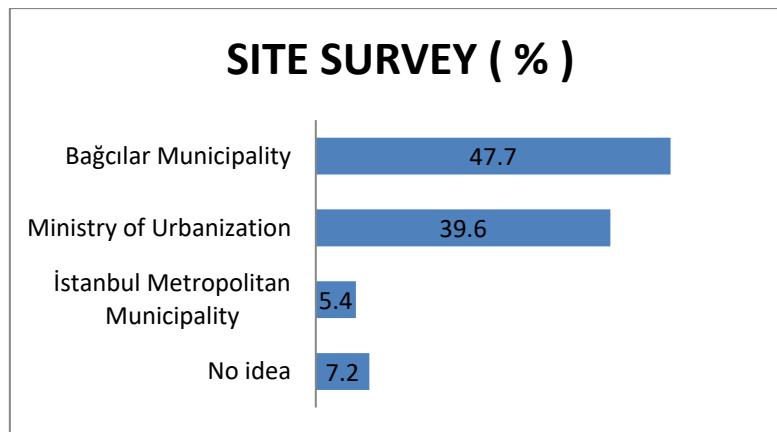
carried out in one or two or three sites for a certain period of time, will become a good example for other sites and regions and will be a convincing event for groups of people to trust. Therefore, with concrete demonstrations, the concerns of the community will be abolished. According to the results of the "Urban Transformation Steps in Bağcılar" survey done by Sakarya University – Department of Sociology, residents of Barinkent Housing are willing an Urban Transformation study with a high rate of 75% and have signed consent. 12% of them have unconverted owners. According to this, 87% of the residents have a favorable attitude towards the urban transformation (see Graph 4).

Bağcılar Municipality Urban Design Site Survey, General View of Urbanization

Questions	Requirements in the flat (%)	Reason of selection the site (%)	Satisfaction of living in the area (%)	State of damage (%)	Satisfaction of living in the district (%)	Would you like to move smaller flat? %	What the requirements to be need? (%)	Demand ratio of urban transformation (%)	Who is leader of urban transformation? %	Financial situation (%)	The most important thing in the environment (%)
Barinkent Real Estate	Study room:51 Guest room:6 Relaxing:3 Kids room:3 Garage:60 M.bedroom:3 Balcony:2	Relatives:54 Quiet:24 Transport:22 People:17 Shopping:6 Others:4	Satisfied:87 Not satisfied:13	Heavy damage:8 Medium damage:41 Less:24 No damage:27	Satisfied:84 Not satisfied:10 Neutral:6	----	Park-garden:27 Prayer:16 School:16 Health center:14 Playground:7 Mall:5 Parking lot:5 Cultural center:3 Sport center:3 Others:3	Agree:72 Disagree:16 Possible:8 No idea:4	Municipality: 48 Ministry: 40 No idea:7 Both:5	Max: 50000 TL	Sport, park, garden:11 Feasible projects:14 Security:10 Landscape:7 Earthquake resistance:6 Technical infrastructure: 4 Parking lot:2

Graph 4: Questionnaire Form of Barinkent Housing Estate / Source: Bağcılar Municipality.

Dwelling of Barinkent are highly willing the urban transformation to be carried out by the Bağcılar Municipality as a majority of 48% of the urban transformation efforts. Secondly, they want the Ministry of Environment and Urbanization to work together with the municipality at a rate of 40%. In the third place, there is no idea of a group at a rate of 7%. (see Graph 5).



Graph 5: Questionnaire Result of Barinkent Housing Estate / Source: Bağcılar Municipality.

5. Conclusion

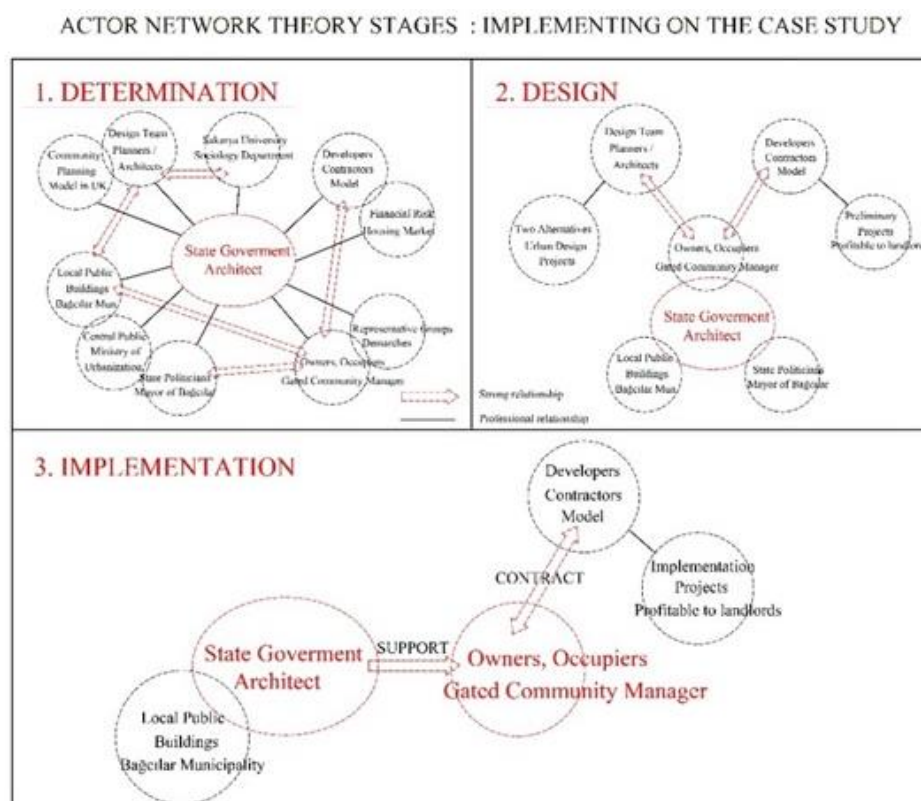
Within the scope of the paper, when the occurrences stages of the actor network are evaluated with the action taken from the data obtained from analyzes and interviews done at the Barinkent Real Estate of Bağcılar District. The emergence of the human actors is in the central (government, political power and the state apparatus formed by the understanding of them) and local (Istanbul Metropolitan Municipality and Bağcılar District Municipality) administrators and investors (housing and construction investors)

- The fact that the central government (government, political power) and the local government have a key role in the urban transformation areas,
- Investments leading to the change of the physical space have a leading role in the central (government, political power) and local (Istanbul Metropolitan Municipality and Bağcılar Municipality) administrations and investors (housing and construction investors), defining the key actors as the conditions created,
- The actor agrees on the economic income-earning projects of the actors who want to take part in the network, thus revealing the deal phase of the actor network; laws, regulations, plans, etc. prepared by the actors in this process. Mediators:
- Network participation phase is realized by two methods; the actors who want to join the network in the first of these are involved in the network by establishing contact with key actors

or other actors in the network and the second is that the actors outside the network are invited to the network by key actors or other actors on the network,

- The network, which is the next stage of network participation, may emerge in two phases of movement (the arrival of the first network in a fixed position, the second in the event that the active actors in the network are not satisfied with the progress or performance of the network, the disturbance of the network, the removal of the disturbing actors from the network, recuperating with the rest of the actors who have been brought in or out of the network); In the case of the Barinkent Housing Real Estate, the actor has acted on the transformation of the physical space and the results of the economic income demands and works of the actors have been reached. (See Table 8).

Table 8: Actor Network Theory Stages (applied on the case study of Barinkent Housing Estate).



The actor network theory within the context of the institutional approach to the reproduction of space in the field and the poststructuralist approach has been examined. Within the framework of the institutional approach, the quantitative and qualitative analyzes of problem-solving and problem-solving methods have been deemed sufficient to explain the relationships and interactions of actors involved in urban transformation. Hence, the need to address the problem within the framework of the approaches that can analyze today's existing structural constructs and the methods of these approaches is obvious. From this need, the analysis of the network resulting from irregular and complex relationships should be evaluated in the context of the Actor Network Theory- ANT, in a post-structuralist context rather than an institutional approach. As noted in the paper, this working paper presents Graduate research in progress and as such acts to open further questions for discussion and investigation. The project aims to continue analysis of the alternative Bağcılar urban transformation cases identified through actor-network analysis. The mapping approach proposed here provides a starting point for this process and represent the transformation between different formations of the network.

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Architectural Facade Design Proposal for Water Production via Air Content

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Abstract

The main aim of this article is to analyse current facade techniques, water producing systems and possible profits from the application of adequate facade designs which could produce water with the consideration of the needs of inhabitants. Nowadays for certain countries lacking the financial power to provide adequate water resources, the need of water harvesting becomes more crucial. The proposed water harvesting systems aim to increase the water resources by the application on the building's facade. On the other hand, existing double skin facades have only been used for shading, ventilation or decorative purposes. This investigation focuses specifically on the design of the facade in terms of the production of water. The case study has taken place in North Cyprus, Nicosia. A selected area will be evaluated and the need of the water will be calculated then the proposal of the new facade model will be introduced. Most importantly this proposed facade model will meet the needs of water consumption of the inhabitants. It produces 420 litre water per day by using solar energy. With this system the application uses the sun energy to extract water from the air, also the application has potential to use as multi-functional purposes since it collects water via humidity with turbine systems, it collects up to 396 litres at temperatures between 86 degrees to 104 degrees (30 to 40 degrees Celsius) and between 80% and 90% relative humidity.

Keywords: Facade Design, Sustainability, Water production, Nicosia.

1. Introduction

Cyprus Island in the Mediterranean Sea has a major gap between water demand and water supply in the TRNC (Turkish Republic of Northern Cyprus). The increase in water demand due to the economic growth is expected to result in a further increase in water supply due to climate change (Türkman, 2002).

The economy of the island is mostly agricultural and tourism. In addition to 250,000 citizens there is also huge amount of students coming to the island every year. The city has highly intensive seasonal movement because of 26000 students (Muslu, 2003). The need of the water supply in the TRNC is provided entirely from underground water resources and 41 dams built on existing streams. The Dams purpose is to prevent these streams reaching to the sea and feeding the groundwater (Sidal, 2006). The total underground water reserve in the T.R.N.C is 74.1 million m³/year (Alkaravli, 2002). According to the United Nations study for Northern Cyprus and the republic of south Cyprus the following scenario shows there will be a water shortage in 2025 and the country is going to suffer the water shortages (Türkman & Elkiran, 2008). It is clear that in the TRNC 74.1 million m of water provided sustainably by aquifers in 2001 with 126 million m³ of water consumption, this shows that there is a serious water shortage and negativity. It can be seen that the aquifers water level drops under Sea level and the sea water gets mixed in to the aquifers (Sago, 1999). There are two billion people and 40 Countries that is estimated to suffer from water scarcity in 2030. Moreover, %47 of the world's population will be living in areas with high water stress (WWDT, 2012). Water scarcity may be the most underestimated resource issue facing the world today.

This project's goal is to create a facade design in order to make humidity be absorbed in the air. This system separates the water molecules and store water in a liquid form. This development is for higher quality of life and sustainable development. With this process the facade is not only used to increase the internal comfort or decrease energy consumption but

also provides an efficient living condition for the users. The percentage of water consumption for one person is about 3.7 liters for a man and 2.7 liters for a woman a day (Water: How much should you drink every day, 2017). Through this integrated system, the opportunities will be analysed. The case study building is selected in Nicosia, Cyprus, due to the higher population and the life conditions, it will be a residential hostel building. After the analysis of the building, the new facade proposal will be rendered with a simulation program and the result will be seen for further discussions. Water production from the facade has a high influence on economy and also it is environmental friendly and a sustainable resource.

Secondly, the water that would be produced has great taste; no chemical contaminates such as pesticides, pharmaceutical drug residue or industrial or human waste, no bacterial contaminates. The AWG (An atmospheric water generator) eliminates all natural occurring contaminates and pathogens such as; bacteria, viruses, parasites, giardia, e-coli and other dangerous waterborne pathogens that kill 3 to 4 million people. (Air and Water: A Right or Privilege for all Citizens, 2017). The integration of this system has highly positive impact on the majority of human life's and has an alternative solution for facade designs.

2. Literature Review

To expose the importance of sustainability in humans' life can be perceived differently to every individual. As it can be seen with some scholars words, the understanding of sustainability is completely different and a huge topic to discuss (Graber, and Dailey, 2003: 11-12). The main approaches of sustainability are environmental, society focused and economical. Moreover it is important to mention the construction, process etc. (Hoşkara, 2009:3). Sustainability is a kind of environmental, economic and social comfort for the majority which means satisfaction of essential needs in order to have a better quality of life and without future concerns. So in this case the building should be environmental friendly, socially and economically sustainable (Graber and Dailey, 2003: 1-89). Due to the economic

developments there are some changes in glass facade systems in terms of technological, energy performance as well as construction methods and materials. They call these facades double skin glass facades (DSGF) and they became very popular (Patterson, et al, 2008: 2-3).

This kind of facades has an air space which mechanically ventilates the air in the cavity. All these devices are designed and integrated in order to improve the indoor climate with active or passive techniques and all of these devices could be controlled via remote control systems (Harrison and Boake, 2003). In general the tectonic of enviromental skins, which called double skin facade systems as esentially a pair of glass 'skins' that are seperated by an air corridor. The double skin facade is higly influencial to the highest temperatures and it has advantages as a wind and sound protector and a sun shading device are all located between the two skins. All elements can be arranged differently into many number of permutations and combinations of both solid and diaphanous membranes (Arons, 2001). We can define double skin facade as a facade that consists of two distinct planar elements which allows interior or exterior air to move through the system.

Although, there are lots of double skin glass facades none of them are used to produce water. Therefore, this research will examine the possibility of producing water on facades. One of the water production systems via air content is a Cooling Condensation type of atmospheric water generator (AWG) shown in figure 1. It has a refrigerant through a condenser and the evaporator coil that cools the air surround it. This causes the water to condense and the fans push the filtered air over the coil, passing through the tank for purification, then to the filtration for reducing the viruses and bacteria which is already collected from the air.

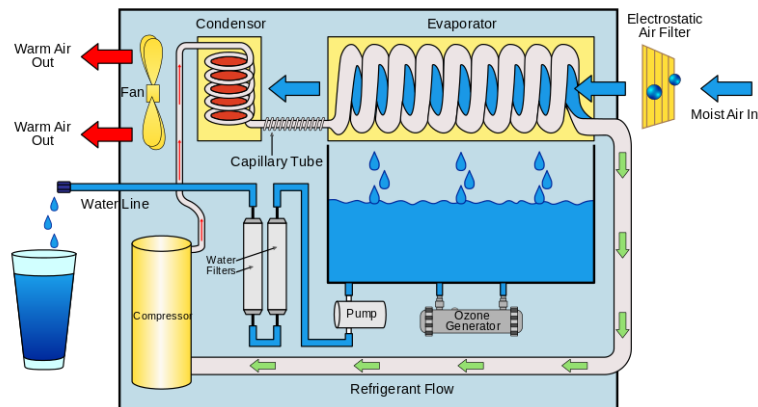


Figure 1. An atmospheric water generator (AWG) (URL 1)

The water production depends on relative humidity and ambient air temperature and size of the compressor. The atmospheric water generators become more effective as relative humidity and air temperature increases. As a rule, cooling condensation atmospheric water generators do not work efficiently when the temperature falls below 18.3°C (65°F) or the relative humidity drops below 30% (Wolber, 2017).

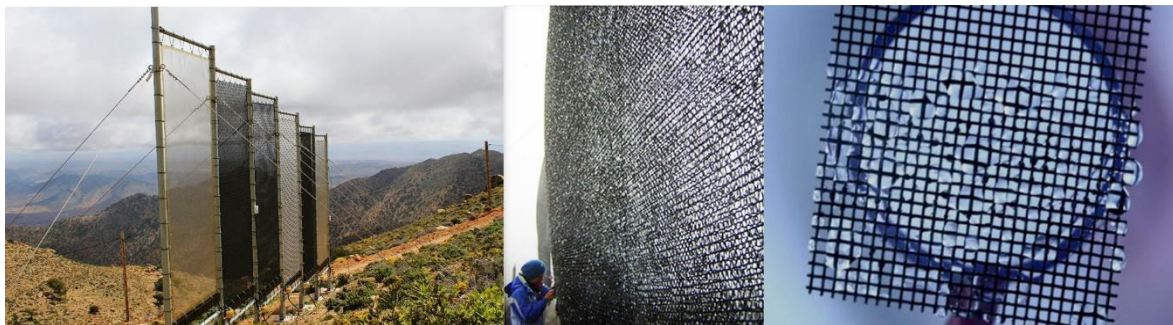


Figure 2. Collecting desalinated water through fog (URL2)

In figure 2. Researchers have found a system that brings drinking water from the air in Chile. They developed a special mesh that can collect the water from the morning fog channeling it into reservoirs. Using a simple system which has suspended mesh structures. They have used this fog water for agricultural use and had a dramatic impact on the lives of communities.

'This water has been naturally desalinated by the sun, we are trying to build meshes to capture it straight out of the air,' said Gareth McKinley who is leading the project. It is a system that still has a laboratory experiment, variation in the mesh spacing as well as the size

and the wettability of fibers in the mesh all affects the volume of water that can be collected each year (Collecting desalinated water through fog, Design Indaba, 2017). The changing of the fibers improved the system 500% mesh based on fog harvesters are passive, inexpensive to fabricate with close to zero mesh-based fog water in this Chilean cloud this process creates %4 drinking water for an entire year.



Figure 3. (Water Production from the Air Billboard) (URL 3)

Figure 3 shows, the Peruvian researchers who are collaborated with an agency to create an unusual billboard that generates drinking water from thin air. Lima University of engineering and technology produced this system to harvest the moisture directly from the air which is then processed through a filtration system. The capable of this system produces 25 gallons (96liters) water a day during the summer. The billboard has produced 9450 liters of clean drinking water for nearby community in the three month since it was first installed. Due to the lack of rain the high humidity makes it possible to harvest water directly from the city's air providing a sustainable alternative source of drinkable water (Peckham & Peckham, 2017).



Figure 4. (A Warka water tower Bamboo Tower That Produces Water from Air) (URL 4)

The Warka water tower is created by Arturo Vittorio and his team at Architecture and Vision, these towers harvest water from the rain and fog. This design is 30 feet tall and 13 feet wide, it is not half as big as its namesake tree which can loom 75 feet tall, but it is striking nonetheless. The spindly tower, of latticed bamboo lined with orange polyester mesh, the systems brings water out of the air providing a sustainable resource for developing countries (Stinson et al., 2017).

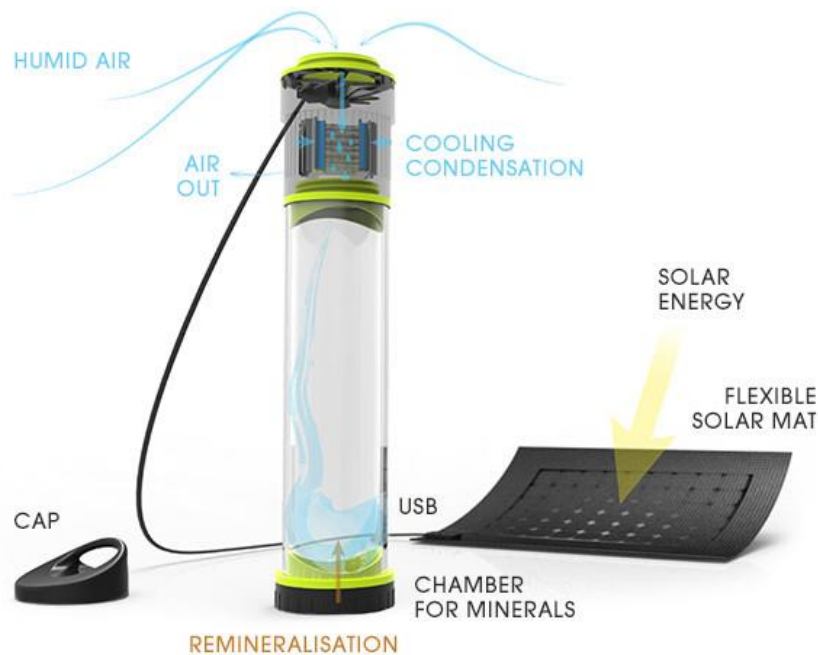


Figure 5. (Fontus Water Producer Bottle) (URL 5)

Fontus designed in Vienna by Kristof Retezar. This device can extract humidity from the air which is shown in figure 5, that condense it into drinkable water. It generates water during long distance ride with a bicycle. Fontus has simple basic principle that condenses the humidity contained in the air. Retezár told Live Science, *"You always have a certain percentage of humidity in the air and it doesn't matter where you are— even in the desert. That means you would always potentially be able to extract that humidity from the air"*. In additionally, *"Fontus can produce 0.5 quarts (0.5 liters) of water in 1 hour in what is considered "really good" conditions, with temperatures between 30 to 40 degrees Celsius) and between 80% and 90% relative humidity"* Retezár said. The prototype includes a filter at the top to keep dust and bugs out of the water, but currently it does not include a way to filter out potentially harmful contaminants. The initial Fontus design was shortlisted for the 2014 James Dyson Award (Beach & Beach, 2017).



Figure 6. (Solar Hydro panels Harvest Drinking Water And Energy At The Same Time)
(URL 6)

In Figure 6, the company source builds a panel which is like a standard photovoltaic but instead of just harvesting solar energy they use the rays of the sun to pull water from the air. Each panel has drawn up 10 liters (2.64) gallons of water per day. This system has standard solar panel that flanked by two hydro panels themselves have two different proprietary materials, one generates the heat, and the other can absorb moisture from the air; together they are able to condense water into an onboard, 30-liter reservoir where it is mineralized with calcium and magnesium. Within this, the water can be siphoned directly to a drinking tap (Pham & Pham, 2017).

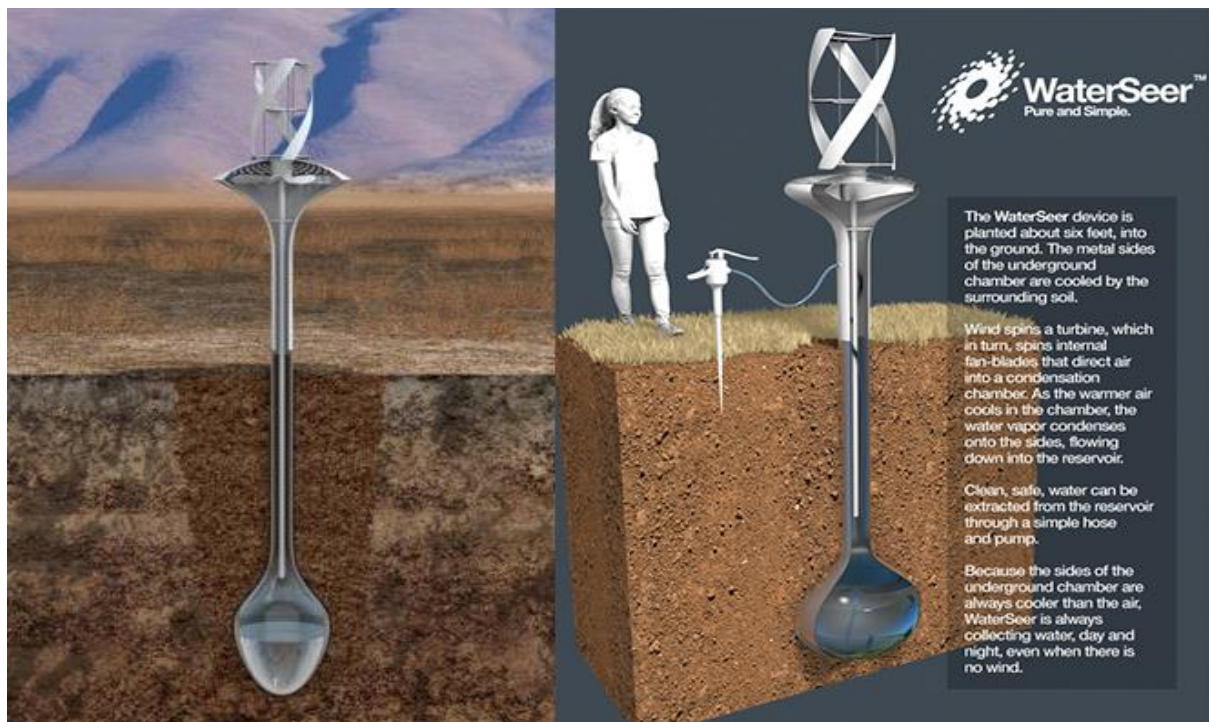


Figure 7. Water Seer (URL 7)

Water Seer is a low-tech, low-cost atmospheric water condenser that could help create water self-sufficiency in communities around the world. It is a device that operates without an external power input and without the need of costly chemicals. It pulls the moisture from the air and condenses it into water use. The temperature difference between the above-ground

turbine and the collection chamber installed six feet underground. They use simple pump and hose to take the water; this device produces up to 11 gallons per day, even in arid regions. It has been developed by Vice and they have collaborated with UC Berkeley and the national peace curbs association, aims to provide a sustainable source of clean and safe water for the millions without a reliable water supply. This device helps to alleviate some of those that has poverty issues (Froelich, 2017).

3. Methodology

The methodology of this research is mainly analytical and descriptive. For this study a case study has been represented in order to show a possible use for the water harvesting in TRNC, Cyprus. This selected building is in Nicosia, Ortakoy and the function of the building is residential hostel. The further details of the case study is explained further within the reading. In addition to the case study, an interview has been undertaken to provide further information about the stated case study. Moreover, all the data collection of this case study analysis has been made with E.Z.B Architecture studio from the interview with the architect of this residential building. The data has been collected to evaluate the new proposed model of water producer facade. Furthermore, the paper provides a theoretical review on the double skin facade designs, the needed amount of water and the system of water production from the air. With the discussion of cases, the paper then will provide a framework to understand the application profits.

Finally, the listed findings are provided to understand the success of the application of the proposed water harvesting facade design. The simulation of proposed model made in Rhinoceros modelling program (Rhinoceros, 2017) and visualized in KeyShot ("3D Rendering and Animation Software - KeyShot", 2017) rendering program.

3.1. North Cyprus Weather Condition and Opportunities.

According to the Meteorology office of TRNC, North Cyprus has Mediterranean climate with hot and dry in summer seasons and warm and wet in winter (Pakishan, 2011).

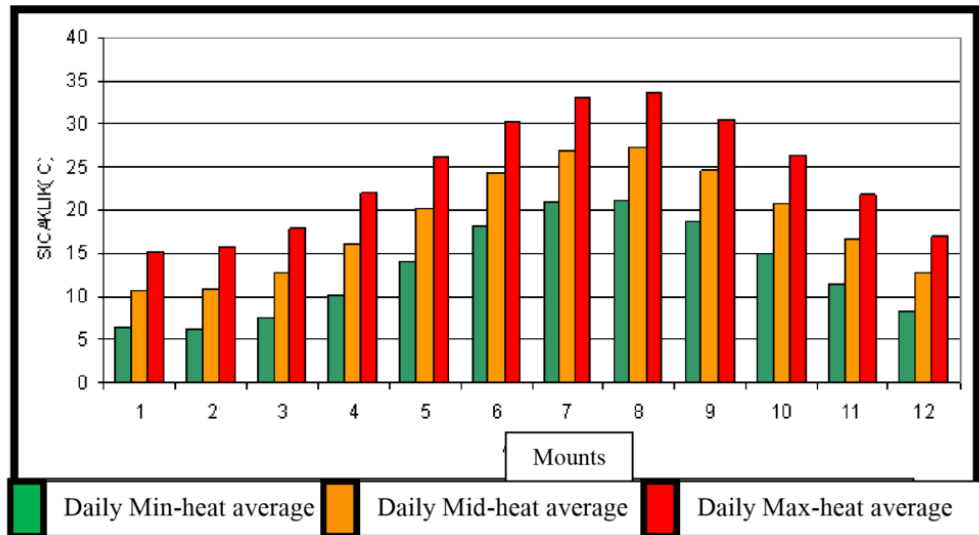


Figure 8, Monthly Amount of Heat during a Year (URL 8)

It can be seen in figure 8, that the average temperature is 19.0 °C .In July the air temperature during the day is (in shaded) 37 °C -40 °C. The coldest month is January that the air temperature during the day is 9.0 °C-12°C. The coldest night of the year is in the month of January, these nights freezing happens due to the decrease of the temperature of the earth down to 0.0 °C.

In order to summarize the opportunities and conditions in Nicosia; there is a strong wind in January and December and a strong sun in June, July and August, the concept of water production from the facade could be valid. Furthermore, the sun exposure is much more in seven months of a year and 9 hours a day in average. Solar radiation is at its minimum in December and January with 9MJ/m², increasing up to 29MJ/m² in June and July. In additionally, for Nicosia, the lowest amount of solar radiation intensity as 110W/m² in December increases to 350W/m² in June and July. Meanwhile the highest air temperature changes from 15.34 °C and 36.23 °C in general. On the other hand, the lowest air temperature

changes from 5.43 °C and 21.54 °C average. Occasionally, during summer time the maximum air temperature can even go up to 44°C and during the winter time the minimum air temperature can be seen as -6 °C. Moving the humidity percentages, the highest amount can change from 25% to 86% during summer times and from 41% to 92% in winter times. In spite of the high percentage of humidity levels in winter time, there is few amounts of rain. Especially in the first month of the year, which normally is the month with the highest rain amount, has 60 mm/month and July and August experience no rains (Özdeniz, 2010).

3.2 Wind and Moisture in North Cyprus

The Wind is very important to produce water on facade for this reason it is very important to understand the wind direction of the region in North Cyprus wind blows from many different directions and this is because of the topography. In Figure 9, shows the maximum wind blow that is 22.2% is from west.

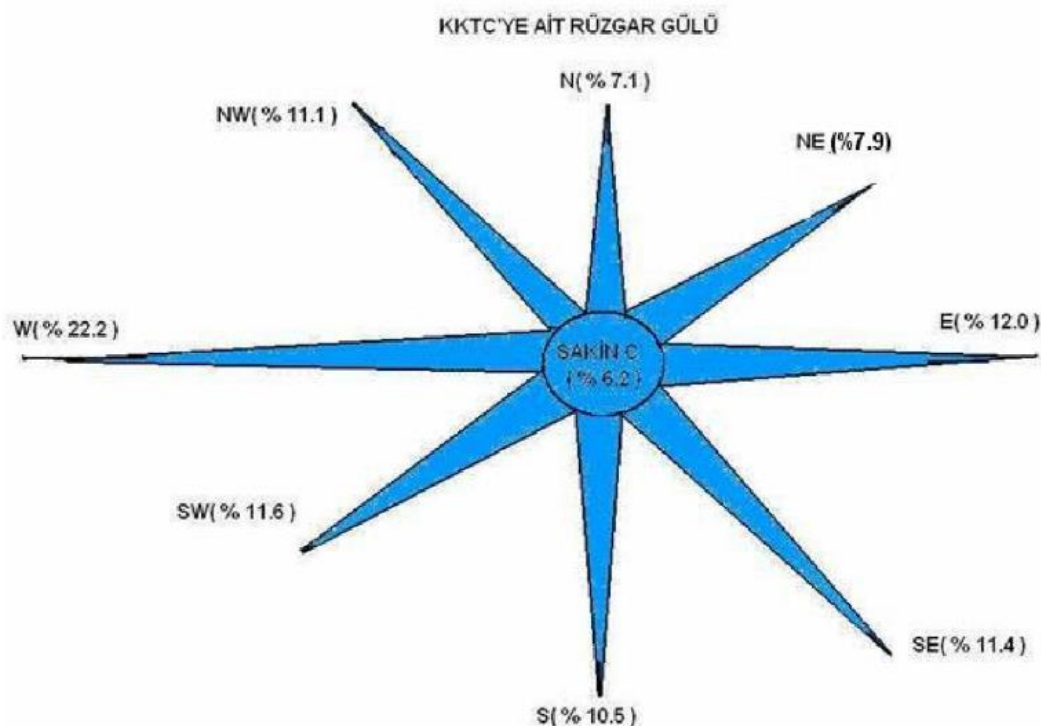


Figure 9, Wind Direction in North Cyprus (URL 9)

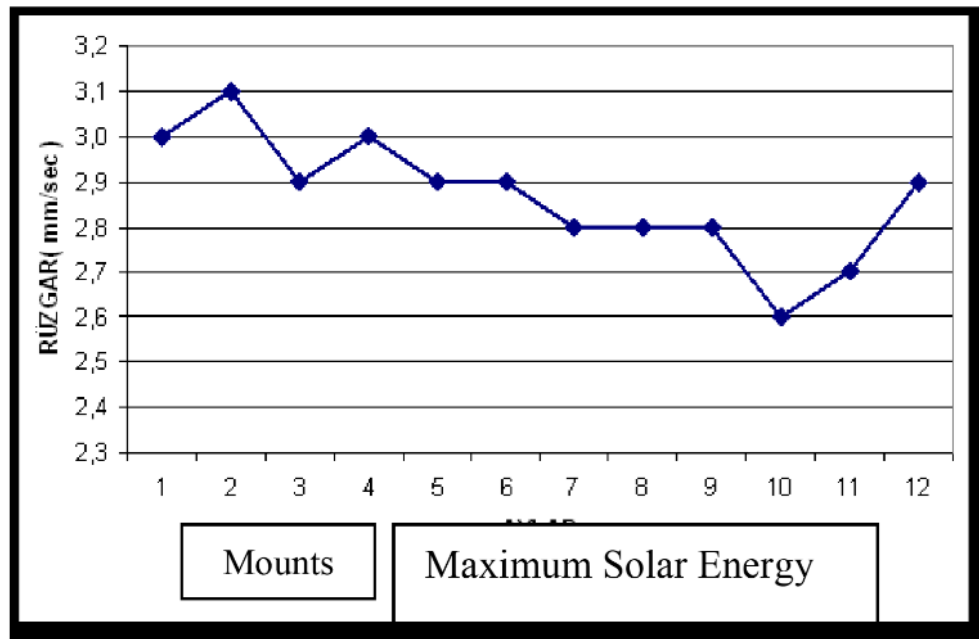


Figure 10, wind Speed in NC (URL 10).

As it is shown in Figure 10, average wind speed is 2.8 m/s that is mostly blown in July, August and September.

3.3. Analyses of the Case: Riverside Residential Hostel Building.



Figure 11, (River Side Residential Hostel) (URL 11)

The building is made by E.Z.B Mimarlik was started from November 2016 and finished in August 2017 the building is located in Nicosia, Ortakoy and the function of the building is residential hostel.



Figure 12, (River Side Residential Hostel Rendered Plan) (URL 12)

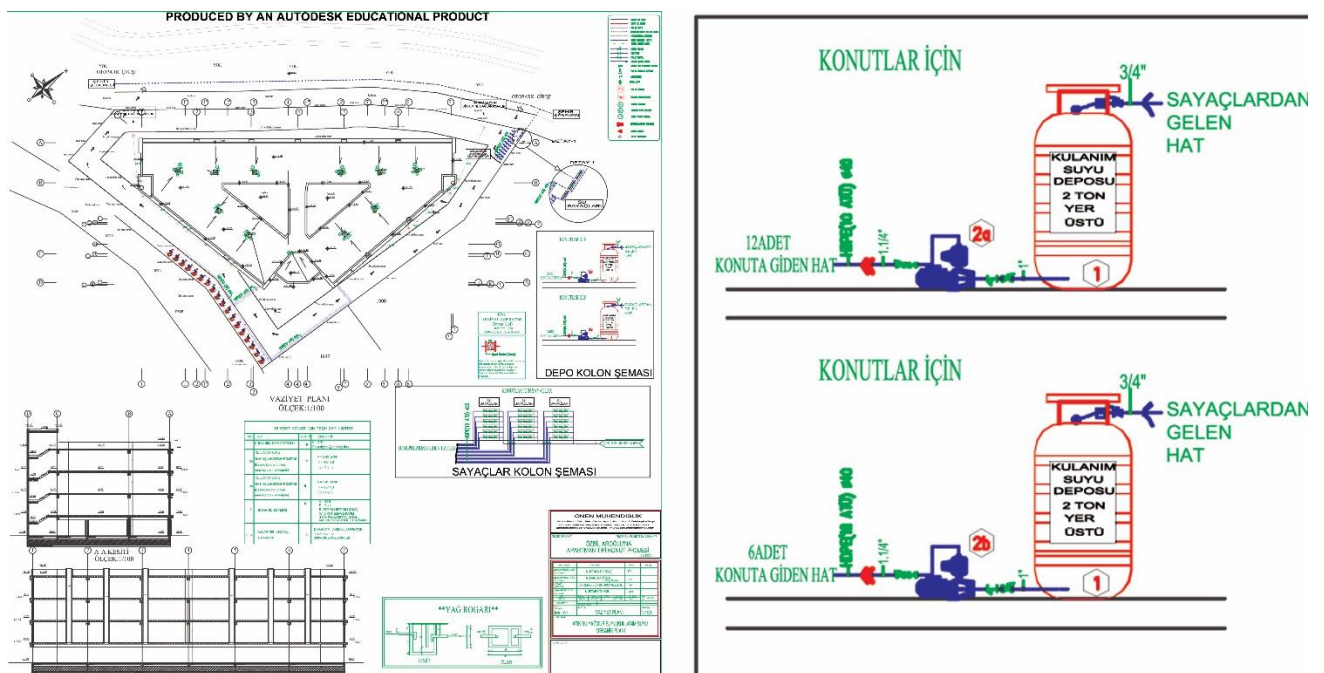


Figure 13, (River Side Residential Hostel Electric and Water Plan) (URL 13)

The building has three floors and used as a hostel for students, each floor has totally 18 bedrooms total capacity of the building is 54 persons and all the bedrooms have their own

individual toilets. The interior of the building separated from each other and each three bedrooms have their own kitchen.



Figure 14, (River Side Residential Hostel Water Tanks and System) (URL 14)

According to the research and the interview with the E.Z.B architectural office the water consumption of each bedroom is approximately 350 liters. As it can be seen above, the waste water is removed from the system that is also visible in Figure 14.

4. Finding and Discussions

According to the research study the new water producer façade design proposal has been analysed in the literature review, finally it has uploaded into the case study the total amount of water has been analysed and the negative and positive parts will be evaluated by recommending design suggestion on hostel building.

4.1 The New Water Producer Façade Design for Riverside Residential hostel Building.

After the interview with E.Z.B architecture studio, the hostel building problems have been analysed, finally the proposal of mesh Micro climatic facade design (SOLTIS FT381) has been uploaded to the facade. This microclimatic facade has solar protection, minimizing lightness, minimizing of secondary structure, aesthetical and short time for installation (“Bioclimatic facade- Serge Ferrari, Serge Ferrari, 2017”). This integration system on the

facade has structural differences between existing models. The model has steel structure empty pipes that can transfer water from the air to the filtration and the water tanks.



Figure 15, (Integration to (SOLTIS FT381) ([URL 15](#))

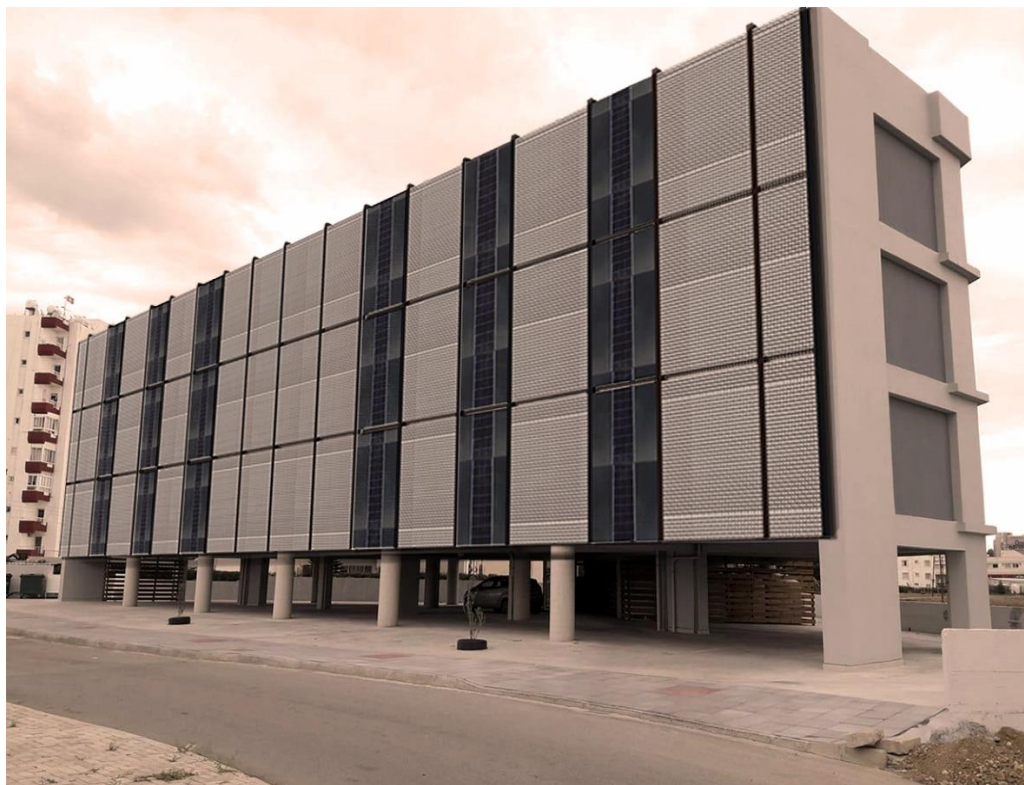


Figure 16, (River Side Residential Hostel Integration of the Water Producer Façade design) ([URL 16](#))

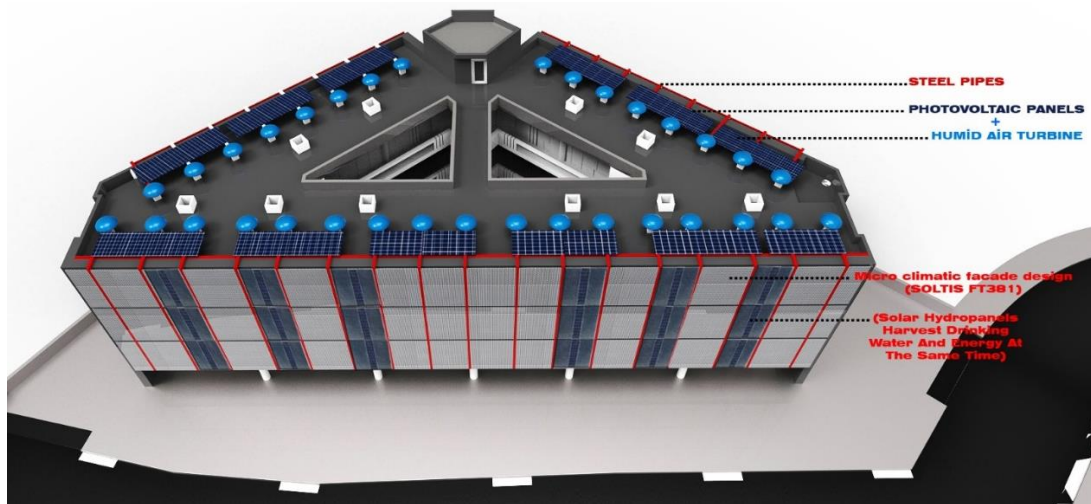


Figure 17, (River Side Residential Hostel Integration of Façade Front and top View)
(URL 17)



Figure 18, (River Side Residential Hostel Integration of the System back side top view)
(URL 18)

In Figures 16, 17 and 18 as it is shown how the Photovoltaic and purification system has been uploaded to the building; the integration of both of the systems have been analysed. The blue circular parts have got an air turbine inside to humid air for the water production that each of them produces 12 liters water per day. In Figure 19, it is shown that the mesh structure pipes translate the water to the catchment basin.

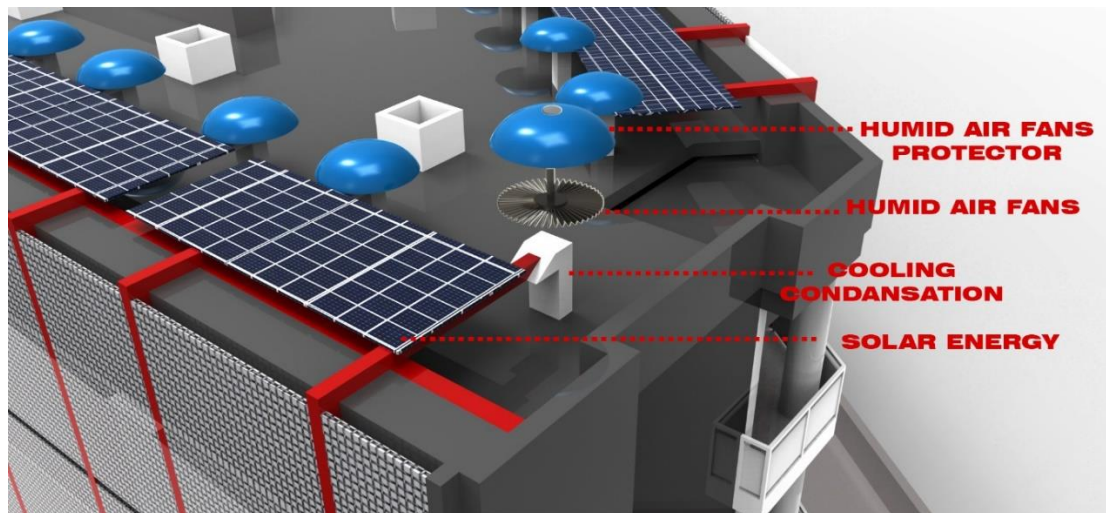


Figure 19, (humidity from the air system detail) ([URL 19](#))

The section of the building in Figure 20, shows the process of how the system work has started from air turbines and photovoltaic panels; each photovoltaic panel has produced 10 litre a day there are 42 photovoltaic panels and 33 purification system. After the water production all the water goes through the catchment basin; inside the catchment the water goes through the filtration process and transfer to the cistern.

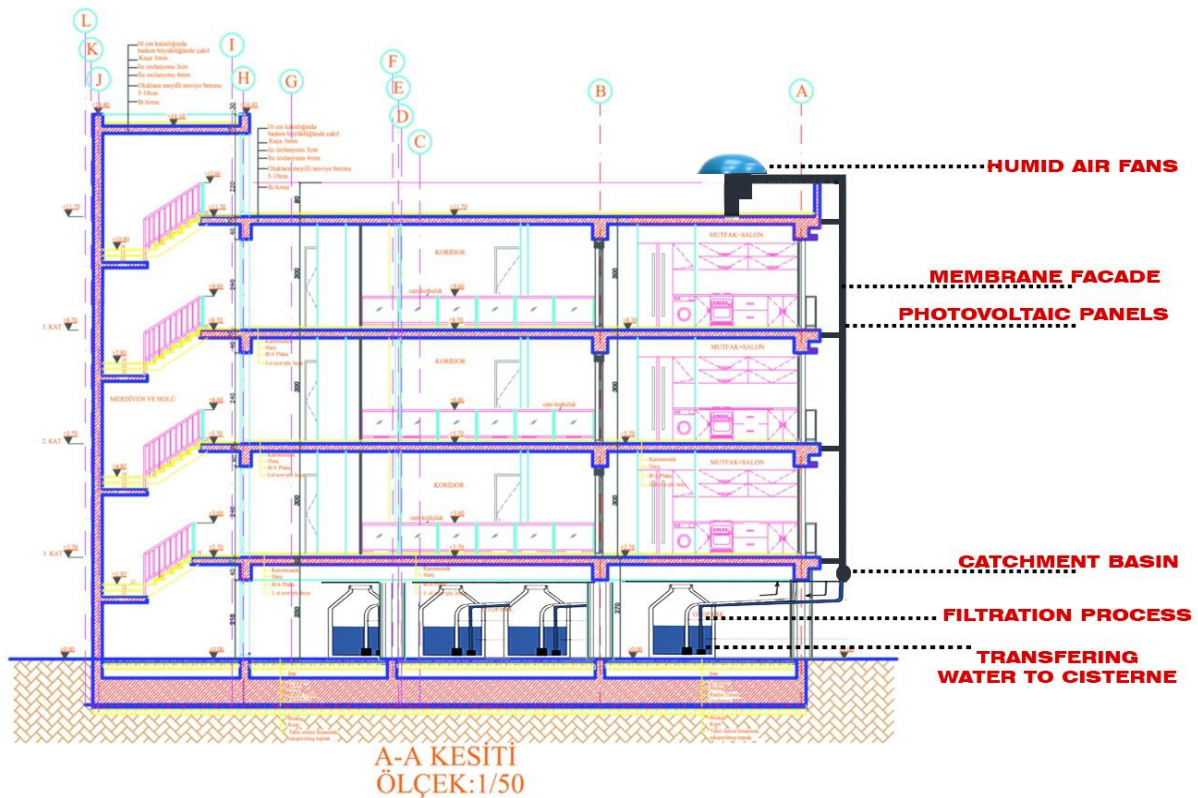


Figure 20, (River Side Residential Hostel Integration of the System) (URL 20)

4.2 Discussion

In order to summarize the opportunities and conditions of Nicosia North Cyprus; in January strong winds are seen and in June, July and August sunny days are seen. Therefore, the concept of water production due to the climate of the country and the region is claimed to be available to produce water from the façade. Furthermore, this application of new facade design can be used for only drinkable purposes. According to the research and the findings, this project produces 420 litre water per day by using solar photovoltaic panel's energy; it also collects 396 litre water by via humidity turbine with temperatures between 86 degrees and 104 degrees Fahrenheit (30 to 40 degrees Celsius) and between 80% and 90% humidity. Totally, the whole system produces 816 litter drinkable water per day. The daily fluid intake is about (3.7) litter 15.5 cups for a man and 11.5 cups (2.7) litters for a woman ("Water: How much should you drink every day?" 2017).The case study shows in figure 14 total residents

who are living in riverside hostel are 54. If the analysis was made according to men's water need the total amount of water they would need 199.8 litre per day and for the women it would be 145.8 litre per day. This calculation shows the water producer facade design is valid for producing daily drinkable water. Both systems collect totally 816 litter water per day and it is more than enough for 54 person. The negative effect of the water producer facade is the changing weather condition in Cyprus especially the humidity of the air; the calculation of 816 litter water could decrease due to the climatic factors such as the sun exposure as it is more seen with the seven months of a year and 9 hours a day in average. Solar radiation as it is minimum in December and January with 9MJ/m², increasing up to 29MJ/m² in June and July (Özdeniz, 2010: 10-80). Moreover, it is impossible to have less than 199.8 litter water or 145.8 litre water a day. Therefore, the facade application appropriately gives the total amount of water which is desired to be drunk during the day.

5. Conclusion

The importance of wind, daily sunshine period, total solar radiation, intensity, dry bulb temperature, mean-maximum and mean-minimum relative humidity, are all shown in the research by bar charts and figures in methodology then in literature survey it is found that the water production the temperature must be 86 or 104 Fahrenheit (30 to 40 degrees Celsius) and between 80% and 90% humidity for the highest result for the water production. (Beach & Beach, 2017).

Due to the findings and literature survey the total water production from the air 12 litters a day from the each purification system. Moreover, the photovoltaic panel has produced 10 litters a day there are 42 photovoltaic panels and 33 purification systems. The total amount of water produce by photovoltaic are 420 litre per day whereas by using solar energy, the humidity turbines collects 396 litters with temperatures between 86 degrees and 104 degrees Fahrenheit (30 to 40 degrees Celsius) and between 80% and 90% humidity.

The opportunities of the weather conditions in Nicosia is the strong wind in January and December or the strong sun in June, July and August, the concept of water production from the facade could be valid for only producing drinkable water from the air. Furthermore, the sun exposure is more in seven months in a year and 9 hours a day in average. Solar radiation is minimum in December and January with 9MJ/m², increasing up to 29MJ/m² in June and July (Özdeniz, 2010: 10-80).

The new water producer facade has been uploaded by simulation techniques and the system process has been evaluated and shown by figures. The main reason behind this research was to investigate the possibility and opportunity of creating architectural water producer facade design that can provide water due to the climate conditions in North Cyprus.

Finally, the importance of water harvesting lies in the process of taking the unused water in the air and preparing it to use by the people in order to increase the quality of life and lifecycle. In this research the existing double skin designs have been analysed and the model of (SOLTIS FT381) structure has been modified to produce water also the humidity turbine has been uploaded to give an extra efficiency for the windy days in Cyprus.

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Establishment of Space syntax to read and analyze urban network; the case of study, Famagusta city of Cyprus

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Abstract

Architects and designers should be familiar with the city developmental process to know about all the city aspects if they are hidden the whole time. This matter shows the importance of studying the urban sections to find out the city critical points. The method is the space syntax in one view which is the consideration of urban network analysis and it would be presented by graphs and maps by a computational description of the selected places. The main target of the space syntax establishment is to study the urban network issue by clarifying the most logical routes in the urban road network. This study has the aim to implement the space syntax as a method to determine urban network problems in order to achieve the new suggestions to increase the urban network integration. In this regards, Famagusta city in Cyprus is chosen to study to present the new suggestion.

Keywords: Space syntax, studying spaces, urban road network, Famagusta city.

1. Introduction

As live organisms, the Cities are in permanent transformations. So, this development asks for suitable design solutions to respond the structural and social demands to make human contacts safe and healthy (Önder, D.E., Gigi, Y. , 2010). Scholars division about cities sustainable development consists of two main issues. As the huge building's collections are linked by a

space, the human activity system is also connected by the urban network interaction (Vaughan, 2007).

Recently, most studies have changed their directions towards using more physics, mathematics, computer science and mechanics etc. Considering this matter, the urban space may access the network by a node structure. Then the edge has a bold position as a complex network with a close similarity to the other networks, for instance, a cooperative relation network with a specific structure by its own (Levinson, 2006)(Cardillo, A., Scellato, S., Latora, V., Porta, S., 2006) (Yuan, P.C., Juan, Z.C., 2013).

The history of urban network analysis is included various issues such as social, informational and communicational networks but nowadays, there is a new issue in this context as the analyze of the urban road network (Wagner, 2008). Scholars' studies show that the groups of connected nodes have more structural data in compare with the single ones. For instance, to find knot or stroke in a city access network is a group of consecutive road parts which has an effect on the street length (Jiang, B., Zhao, S., Yin, J., 2008). Mainly, this issue has started from space syntax to show the urban road network could be like body neural network in which stroke has employed to make linear elements relatively simple and understandable in networks which would be able to show lines movement in network frame and to build natural functional units (Thomson, 2006)(Duan, Y., Lu, F., 2013).Space syntax is born inside the architecture as a spatial analysis theory. It has followed both the architecture field and knowledge. In addition, it has contained philosophy and mathematics, on one side as well as the other sciences on the other side. However, it also contains the philosophical base and mathematical principles in the evaluation cases (Hillier, B., Hanson, J., 1997)(Reveron, 2009).

The aims of this study would be divided into two main parts, the first one is to study and identify the existed urban network and the second part is to propose some new connections to reach the qualified urban network as a suggestion. This study is planned to compare the present position and the suggested condition by pretending two selected methods. The first method is Space syntax logic employed by Depthmap software and the second one is SPSS establishment reached the numbers from the first part of the analysis. As a case study, the newly developed area of Famagusta in Cyprus is selected due to various reasons, such as dense settlements, urban traffic and being close to some places like commercial centers and EMU University campus. This paper has planned to review the literature and regional observations. It has also planned to identify the problematic points and deep place understanding. Based on these, suggestions are planned to diminish recognized problems about the selected area with the aim to grow the network quality in the selected region.

2. Methodology

Based on the regular viewpoint, Bill Hillier says “cities seem that could be seen but cities syntactic analysis shows that it has made to provide physical movements and being understandable to minds”(Stahle, A., Marcus, L., Karlström, A., 2005). Space syntax follows the principles of the graph theory by dividing the urban space into the single units to analyze their relationship with the other parts. Space syntax covers the various points based on space geometrical logic which can discover the invisible seated structure in the human environment. (Steadman, 1983)(Peponis, J.C., Wineman, J., Bafna, S., 1998)(Penn, 2003)(Turner, 2003) (Hillier, 2007)(Tianxiang, Y., Dong, J., Shoubing, W., 2015).

This concept could be useful to study urban contextual features by an axial line employment as one of the main theory columns. The axial space map would have the fewest set of straight lines

which cross via convex space. The collection of all axial lines and convex maps would have the fewest space collection to cover the whole space (Hillier, B., Hanson, J., 1984)(Önder, D.E., Gigi, Y. , 2010)(Rezayan, H., Delavar, M.R., Frank, A.U., Mansouri, A., 2010). In “The Social Logic of Space” Bill Hillier has defined (Hillier, B., Hanson, J., 1984) axial line presents the pathway of unblocked movement. In this concept, each path could be as an axial line and the linked by the other lines as intersections. It could be defined there is a spatial correlation between lines roots with each other. The Urban spaces are contained many numbers of axial lines while the axial maps are contained just fewest groups of axial lines which pass the city; they could be visible everywhere on the axial line map like any other disjoint parts or points which can be joined by the third axial line (Wagner, 2008)(Han, Y., Jin-yeu, T., Jiangang, L., 2009)(Hillier, B., Hanson, J., 1984)(Tischendorf, L., Fahrig, L., 2000)(Hargrove, W.W., Hoffman, F.M., Efroymson, R.A., 2004). The dynamic lines idea is shaped based on the breaking conception of boundaries. Multiple lines of different lengths have functioned to represent the detailed and specific Euclidean agent’s geometry of agents reflected in the free space. By connection lines to the nodes and their junction to the links, it would be possible to obtain the topological network parameters by defining the Total Depth, Integration, etc. (Jiang, B., Claramunt, C., Klarqvist, B., 2000)(Hillier, 2007).

3. Famagusta as a case study

Famagusta city is located in the East of Cyprus on the Mediterranean coast. It is one of the Cyprus historical cities. The core castle had a bold role during the medieval era. In British colony period, Famagusta was focused on tourism and commercial destinations. This fact made the city walls continue to the outer part in Ottoman period. In 1974, this city experienced the civil war which occurred between the Greek residents and the Turkish people with the support of Turkey

government. This war has resulted in the border between these two parts in the South. This matter has caused the development direction has changed from South to North. By developing the North part in Famagusta, Eastern Mediterranean University was established in the middle of two main roads to be accessed by the Northern cities. As mentioned, the university campus is located in the middle of two main roads. This blocked area prevents the direct access to the side roads. By further city development, free lands around the university campus have been built by the high-density inhabitants and commercial units. This kind of inhabitants compress has caused some problems such as pollution and traffic. This study follows the important points on how it would be beneficial to access the university campus as well as the completion of existed urban network. Fig 1 has defined some different regions in the selected area of Famagusta as a case study.

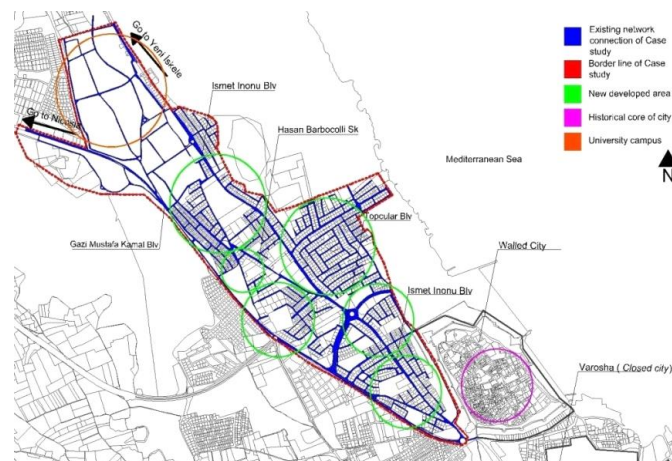


Fig 1. Selected area in Famagusta as a case study

4. Discussion and results

In order to understand the space physical features to examine features effects on human movements, an axial map of selected area is evaluated by employing Depthmap software. This

study has a specific view on integration factor in Rn scale as a global integration and also R5 for local dimension.

The case study area has located in the middle of Gazi Mustafa Kamal Blv and Ismet Inonu Blv, which is in Hasan Barbocolli Sk neighborhood. The interface region between Gazi Mustafa Kamal Blv and Ismet Inonu Blv has a high potential to increase Rn and R5 rate by adding some new connections but unfortunately, as it is mentioned, Hasan Barbocolli Sk can be an example with just a few connections. As fig 1 shows, there are some organic urban patterns in this area and also some free lands that could complete their connections to reach the highest integration.

This study has two main areas and each of them has a kind of specific importance. The primary area is from the university campus to Topular Blv and the second region is from Topcular Blv to Walled city. The first region has more commercial values with most of the economical sources including the university campus. The Eastern Mediterranean University campus has an effective role in this region because of scale and location. Unfortunately, there is a problem with the university campus because the availability is hard to get, in the late evening as well as missing some connections to the side roads. Actually, university campus has the potential to play a more effective role to increase the integration of Gazi Mustafa Kamal Blv and Ismet Inonu Blv. University campus has inner streets which are not connected to the mentioned roads, although this potential could be useful to the residences to reach the Gazi Mustafa Kamal Blv and Ismet Inonu Blv via campus, fig 2.

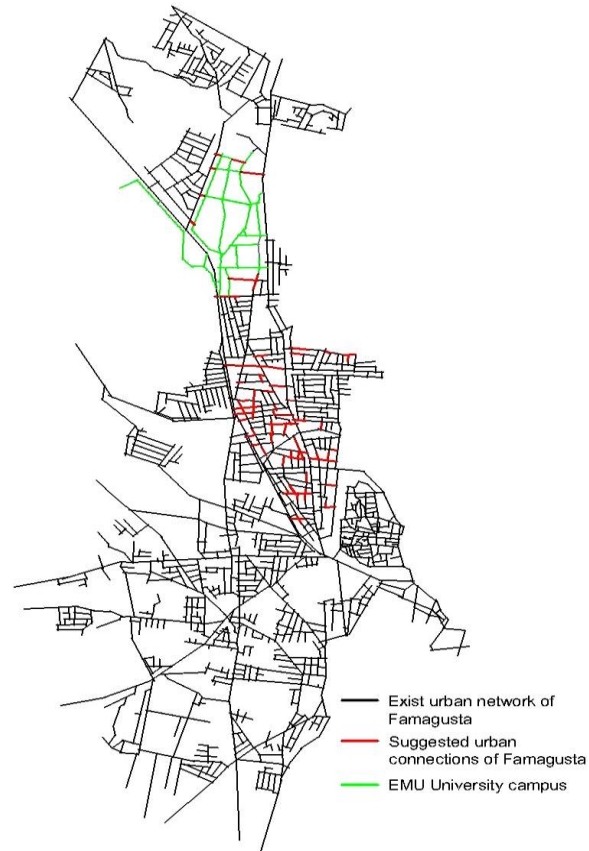


Fig 2. Axial map of the existing pattern and the suggested project.

The Second region in the case study is ended in Walled city. This area which is across from the northern part has more houses and population density. There are many connections remained undone so building them wholly can be effective in the integration of this region with Gazi Mustafa Kamal Blv and Walled city.

Mentioning the aim of this study, Famagusta axial map is established to make the analyzed selected area. As figure 2 shows, the green line is the university campus that is joined to existed urban tissue by the suggested line in red color.

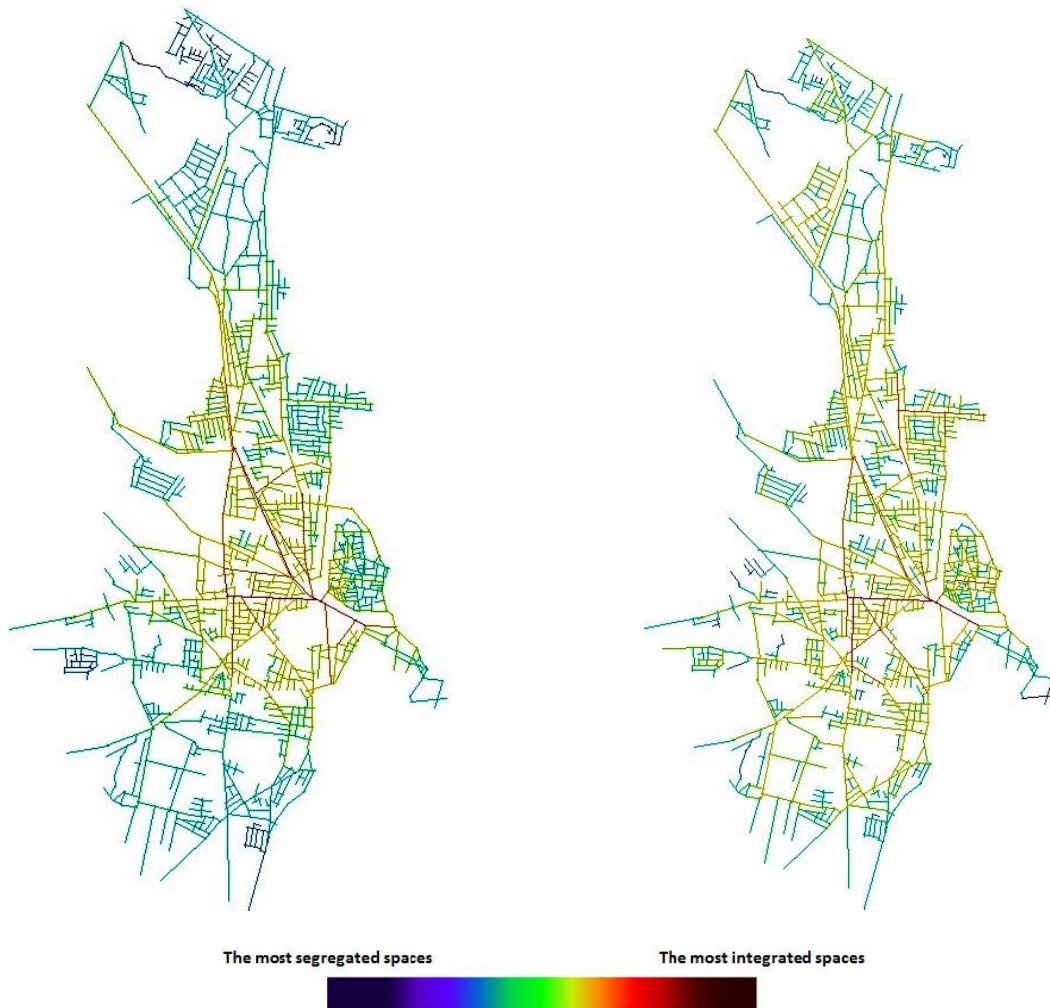


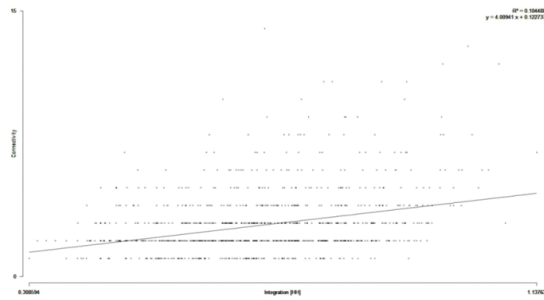
Fig3. The axial map in the present condition and Rn values . Fig4.Axial map at the present condition and R5 values

In order to evaluate the differences between exist condition (fig 3, 4) and suggested plan (fig 5, 6), the axial map of the case study is established in this study mentioning two different scales, global integration value (Rn) and also the local one (R5).

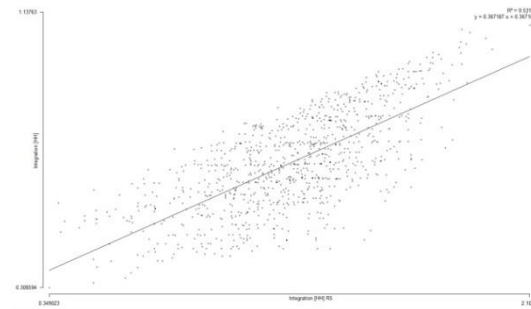


Fig 5. Axial map of suggested connection and Rn values. Fig 6. Axial map of suggested connection and R5 values

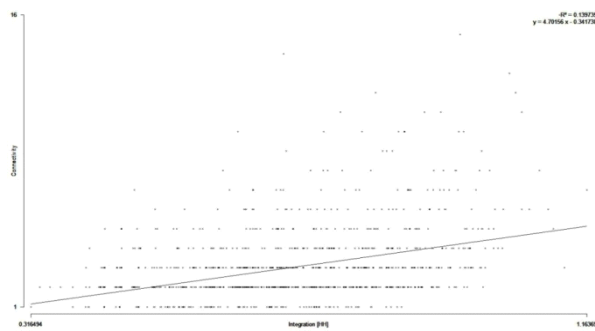
The R2 rate (determination efficiency), a value of global integration (HH) and the connectivity are 0.104 in the present issue. In the suggested project, this rate is increased to 0.139 and, R2 is 0.511 between the integration (HH) R5 and integration (HH) in the existed pattern, although the new pattern has been changed to 0.580.



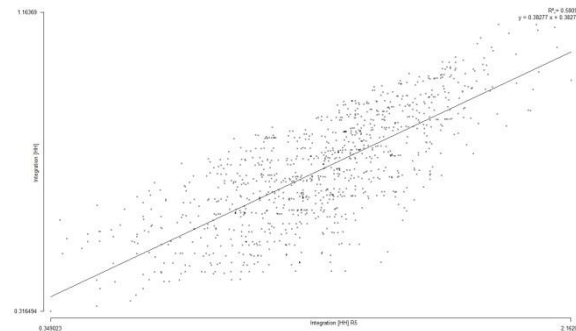
Graph 1. Rn Scattergram in the present tissue, value (R2: 0.104)



Graph 2. R5 Scattergram in the present tissue, value (R2: 0.511)



Graph 3. Rn Scattergram in the suggested project, value (R2: 0.139)



Graph 4. R5 Scattergram in the suggested project, value (R2: 0.580)

Attributed properties of this study have clarified; the average of R5 is 1.23 in the existed pattern, although, in the suggested project, it is increased to 1.28. The maximum R5 value is 2.11 in the existed tissue, but in the new pattern, it is changed to 2.16. In contrast with the maximum value, the R5 minimum does not have any change. In Rn study, the average of the present tissue is increased from 0.682916 to 0.71466. In the global integration, the maximum value is changed from 1.13763 to 1.16369 and for the minimum value; there is also change from 0.345623 to 0.314654.

5. Conclusion

This study is employed by the space syntax and SPSS methods to analyze the newly developed area of Famagusta before and after project implementation which may propose to resolve some identified problems. While in the current tissue, the urban networks are concentrated with low rate value integration, the proposed changes can make more accessibility with higher integration and the lowest places depth. This would significantly improve the overall experience of the area, as illustrated by improvements in the global integration value (R_n) from 0.68 to 0.71. Similarly, the local integration value (R_5) would be increased from 1.23 to 1.28 and also the total depth would be decreased in the global scale from 13593.12 to 13201.06, but just the total R_5 depth is increased from 307.65 to 374.06.

Here is an emphasis while this is not a significant numerical change; the intelligibility level can be changed by the application of the suggested design. The results are also important because the method is applicable to other problematic areas. This study has tried to propose some new suggestions to improve the physical and economic values of the case study by more accessibility also it wants to be useful for the city infrastructure and superstructure.

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Adaptive Use of Passive Shading Devices in Public Buildings: A Case of Famagusta

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Abstract

Energy efficient and sustainable design of public buildings aims to reduce the consumption of non-renewable energy resources by promoting thermally and visually comfortable spaces. Integrated shading devices as part of a passive system is desirable to the successful design of energy conserving buildings. However, limited research exists on the adaptive qualities of shading devices as employed in the public buildings of North Cyprus.

This research discusses the adaptive application of shading devices in public buildings within Famagusta, questioning the contextual use and suitability of PSDs in terms of application. To achieve this, two prominent public buildings in Famagusta (EMU Rectorate building and Lemar shopping mall) were reviewed, presenting findings from shading analysis of a comparative study.

A qualitative and quantitative research methodology was adopted for this investigation. Questionnaires were used for data collection, and for analysis, SPSS was used to obtain percentages from data collected. Findings show a 94% user discomfort with the indoor thermal levels, which corresponds to higher shading demand from the users, at the EMU Rectorate building. The Lemar building survey indicates satisfaction with the levels of indoor thermal comfort, but 86% indicate the partially shaded South-Western building parts are hardest to cool.

Keywords: Adaptive use, Passive Shading Devices (PSD), Public Buildings, Mediterranean Climate, Famagusta.

1. Introduction

The amount of sunlight admitted into a building in warm sunny climates may result in high cooling energy consumption when excessive; Southern and Western oriented windows may permit sustained sunlight which results in passive heating. In nearly all climates controlling and diffusing natural illumination will improve daylighting. The use of external shades in building facades is known to contribute to a decrease in a building's energy consumption and to improve users' visual comfort. This is achieved by controlling the level of sun radiation and daylighting on a building's exterior walls and within the building's interior (Prowler, 2008). The employment of passive building concept for attaining thermal comfort inside a building is a growing concern for the building energy protection. The fundamental principle is to provide shading devices as part of location, size and orientation to require most advantage of the surroundings and indoor thermal (Chan, Riffat et al. 2010).

Passive solar design strategies, as part of a larger solution to current sustainability issues in the world, demand an environmentally friendly and responsible approach in design. Therefore, the adaptive integration of PSDs into the design of buildings seeks to provide comfort and energy savings, thereby solving direct and indirect cost loads (Kats, 2003).

Famagusta is a fast-growing city in Northern Cyprus, an internationally un-recognized developing country which has serious environmental problems. Studies have highlighted the most important environmental problems in the country as Energy problem, Lack of planning, Water pollution, and Environmental pollution, Waste, and Soil pollution in descending order (Eminier et al, 2014). Sustainable Energy policies for the Mediterranean region demand the use of passive strategies for the heating and cooling requirements in the summer and winter periods, to reduce the use of non-renewable fossil fuels to power mechanized thermal comfort systems.

Considering the energy challenges of the region, this case study research aims to analyze the bioclimatic use of PSDs in public buildings of Famagusta, North Cyprus and to achieve this, two public buildings (Eastern Mediterranean University (EMU) Rectorate Office Building and Lemar Shopping Mall) were selected for review based on their application of PSDs. The appropriateness of shading devices employed on both cases was compared for efficiency considering factors like climate, solar orientation and energy performance.

PSDs adapted to the Mediterranean climate of Famagusta should feature deep shade that protects the glazed regions and general mass of (often expansive) public buildings from unwanted heat gains, but should be dynamic enough to admit sunlight in the cooler months.

A review of shading devices and their regional adaptive qualities is discussed contextually, with a brief examination of the climatic conditions in Famagusta. The highlight of this research presents a comparative result of the influence of various passive shading devices. It further reveals the key suitability factors and application dimensions thereof, which informs suggestions on optimal shading devices in the context.

A qualitative and quantitative research methodology was adopted for this investigation. Data collection was done by comparative analysis regarding information derived from observation, and qualitative survey by questionnaire has been carried out to assess the user perception of thermal comfort in both buildings. SPSS was used to obtain percentages from data collected and analysis performed to attain facilitate outcomes.

2. Literature Review

Through the architecture history and related cultures from classical to unrefined vernacular structures, shading has had various advantages that can be found in its applications to history (Sadler, 2005). The use of external shades in buildings influences various quantifiable and perceptual performance criteria. Among these criteria are energy consumption for heating, cooling and lighting; the amount and distribution of daylight; glare effect; the feeling of

comfort and the productivity of the building's users. Some of these criteria can create contradictory demands, such as the need for internal daylight illumination, which can reduce the need for artificial illumination but simultaneously increase the heat gain (Nielsen, Svendsen, and Jensen 2011).

To reduce artificial energy requirements for achieving indoor thermal comfort, intelligent building construction with approach of passive solar architecture is needed. (Ralegaonkar and Gupta, 2010).

Shading devices are the instruments used to reduce the incident radiation to supply thermally comfortable surroundings whereas decreasing the cooling load considerably. That is, shading devices reject the direct radiation and permit the diffuse element solely to be admitted (Duffie, 2013).

Cyprus, one of the largest islands in the Mediterranean has no petroleum reserves and is completely dependent on imported energy from petroleum products (AbuGrain & Alibaba, 2017). Sustainability issues and climate change as an effect of the use of fossil fuels are at the forefront of world issues. A practical 100% solution to these problems have not been developed, however it is clear that renewable energy solutions should spearhead the movement for its reconciliation. Solar strategy design in construction aims to control the flow of natural energy within the built environment thereby reducing mineral generated energy consumption and the attendant pollution emissions while ensuring a better quality of built environment.

An optimum shading device demonstrates a system providing maximum shading for a special period throughout the year (summer), while allowing maximum solar radiation in winter (Bader 2013). The total solar load consists of three components: direct, diffuse and reflected radiation. To prevent passive solar heating when it is not wanted, one must always shade a

window from the direct solar component and often also from the diffuse sky and reflected components (Shahwarzi, 2014).

In the classic text by Victor Olgay (1963), which was revised in 2015, he argues that constructing buildings which respond to their regions through designing with climate in mind is a necessary and central part of modern architecture. Adaptive design and use, of building enclosures and elements seeks to solve constructive problems in a manner which is bio-climatically suitable to a region. This is achieved by exploiting the prevailing climate and user comfort variables, thereby facilitating the change from an artificially produced to a negotiated indoor climate. Assessment of existing physio climatic conditions on a macro and micro scale takes into consideration parameters such as Tilt of the Earth's Axis, Altitude, Azimuth Angles, hourly and daily lines and Sun Path.

Passive shading devices (PSDs) are shading elements adapted bio-climatically to suit the prevailing climate conditions within a region, without employing parts and systems which consume energy generated from the consumption of fossil fuels. They may be fixed in position or adjustable to weather changes on a daily or seasonal period. In achieving passive design, the orientation of the shading element is just as important as that of the building itself. Shading devices are classified as internal or external, depending on placement. The importance of Interior devices such as curtains, roller shades, Light shelves, Venetian blinds, and shutters may often be regarded less in comparison to external shading elements, but they are often less expensive, and adjustable which enables them to easily respond to changing requirements. Besides shading, these devices provide numerous other benefits, such as privacy, control, insulation, and interior aesthetics. At night, they also prevent the "black hole" effect created by exposed windows (Galloway, 2004).

Total energy consumption is decreased when energy consumption is reduced by the application of the horizontal shading device, and lighting energy consumption reduced by

application of lighting control. External shading devices are designed to integrate into the building system and resist external conditions. Thus, they provide energy savings by reducing heat gain due to direct sunlight and by promoting glare free lighting of internal spaces. Hence, electrical and mechanical load are reduced, with concomitant decrease in costs (Kim, et al 2017).

Passive shading devices adapted to the high Mediterranean solar load include

1. Vertical and horizontal shading devices which may be fixed deep overhangs, louvers, fins, blinds, egg-crate and eaves. Movable variants of these elements include shutters, awnings, rotating fins and overhangs, rotating egg-crate and exterior roller shades.
2. Covered semi open spaces including balconies, porches and roofed terraces.
3. High performance materials including glazing with low shading coefficients, tints and reflective screens.
4. Double skin facades.
5. Massing techniques, which considers the shade afforded by a part of building massed over other parts, as well as cantilevers?
6. Vegetative shading elements including deciduous trees, green walls, screen plants, hedgerows and lawns.
7. Shading screens which include canopies, pergolas, Arbors and trellises.

3. Case Study

Cyprus is located at 35° N latitude of the equator and 34° E longitude and is the third largest island in the Mediterranean Sea after Sardinia and Sicily. The city of Gazimağusa (Famagusta) is a coastal town at the Eastern part of Cyprus with 7m elevation above sea level (Ozay, 2005). It is a fast-growing city bolstered economically by tourism, and immigrants occupied by the Eastern Mediterranean University (EMU). Famagusta receives an average of 5KWh/m² of solar radiation 9 hrs. daily, with July and August peaking at an of average

temperature of 36 °C and 8.1 kWh/m² radiations; in contrast, the coldest months are December and January which receives an average of 2.3kWh/m² (Shahwarzi, 2014).

In assessing the adaptive use of shading devices to the region, two significant public buildings in Famagusta have been chosen for comparison to draw the case – The Eastern Mediterranean University Rectorate building and Lemar shopping mall. The case studies were chosen because of their size, relatively contemporary design, and build, having both been constructed within the decade. Additionally, both buildings are remarkably positioned as points of references to their locations, and are popular with regards to their functions. They are both public buildings which are designed to accommodate large numbers of transient people, albeit with two completely different uses.

PSDs employed in the cases are Building massing and cantilevers, Roof eaves and overhangs, Porches/balconies, Fixed Aluminum horizontal running fins (louvers) and Fixed vertical running fins. Internally, both buildings utilized blinds as a support to external shading systems, and also as primary devices.

3.1. EMU Rectorate Office Building



Fig 1. Aerial View of Emu Rectorate Office Building
(Image Courtesy of Google Maps, 2017)

The EMU Rectorate office building was commissioned in 2013 and consists of offices and meeting rooms to house the primary administrative functions of the university.

Its geometrically shaped floor plan contains a central courtyard and rises to two suspended floors. Its facade is finished with a combination of Aluminum Composite Material (ACM) panels, painted masonry and granite tiling. Large walls of glass siding on the interior courtyards and external facade provide full views and admit natural light. The building sits on a large open terrace finished with glossy granite tiles and covers approximately 2,588m² of floor space.



Fig 2. Showing Sunrise on Eastern Elevation and Suspended Floor on Northern Elevation (Chinweokwu and Alibaba's Archive, 2017)

The EMU Rectorate office building features a relatively uninterrupted linear facade with few pronounced mass projections and recesses on its exposed Southern, Eastern and Western elevations. Where present, projections and recesses are of insufficient depth to count as shading devices. However, on its Northern face the building features a suspended top floor, overhanging a porch thus suitably shading glazed walls and windows beneath it. Cantilevers were employed on the Southern and Eastern facades, admitting winter sunlight to windows beneath it and providing partial shade in the summer. Eastern windows overhung by cantilevers received no further external shading treatment, but the Southern windows were aided by closely spaced vertical fins.



Fig 3. Showing Suspended Floors and Cantilevered Masses - Northern Facade
(Chinweokwu and Alibaba's Archive, 2017)



Fig 4. Concrete Pergola over Terrace - Western Facade
(Chinweokwu and Alibaba's Archive, 2017)

The courtyard spaces of the facility feature glass walls promoting a light, airy and open feel to the environment. However, angle of incident sunlight, relatively low building heights and wide spans of courtyard space renders building mass less effective as a shading technique in the spaces open to, and adjoining the courtyard. These spaces received very little external shade treatments, admitting sunlight freely and directly with attendant thermal effects. Consequently, in 2017 corrective work was partially carried by installing aluminum fins on exposed glass facades in the courtyard.

The EMU Rectorate office building employs minimal use of roof eaves, designed instead with parapet walls extending as a continuation of exterior walls, and terminating without eave overhangs. An outdoor terrace on the first floor is covered by a concrete pergola of uncrossed, West facing beams. Closely spaced vertical fins feature on the ground floor of the building, along its Southern facade to limit angle of incidence sun rays.



Fig 5. Showing Facade of Emu Rectorate Office - South Facade
(Chinweokwu and Alibaba's Archive, 2017)

The EMU Rectorate office building employed horizontal, Aluminum louvers as a primary shading device for larger windows.

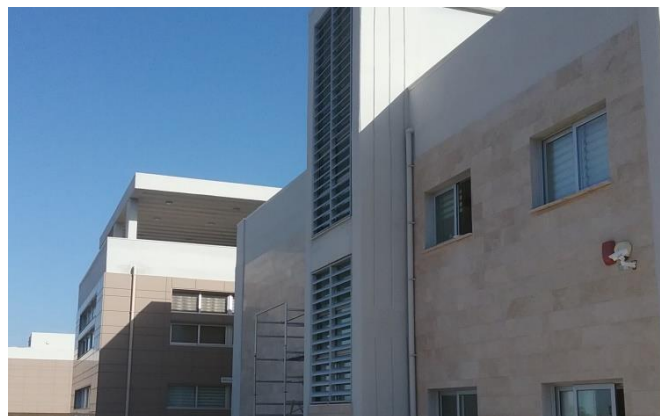


Fig 6. Selective Shading of Windows at Emu Admin Building - West Facade
(Chinweokwu and Alibaba's Archive, 2017)

2. Lemar Shopping Complex



Fig 7. Aerial View of Lemar Shopping Mall (Image Courtesy of Google Map, 2017)

Lemar shopping mall is a public commercial building located along Salamis road, in the Gulseren region of Famagusta, and caters to the entertainment and shopping needs of the residents of Famagusta. The main entrance to the building opens into a central atrium, with a food court running along the left of its ground hall, and a store style shopping center occupying the majority parts of the ground and first floor. The second floor houses a game arcade and cinemas.

The building is formed as an irregular geometric shape, intersected by a curvilinear sliver to one side, and massed to two suspended floors. Its main entrance faces the Salamis Street at a North-Eastern orientation. It covers an approximate floor area of 4,273m².

The approach of Lemar shopping mall (North-Eastern elevation) consists of two main building masses - a cuboid bulk projecting from the main body, and a curvilinear glazed mass, shaped in a half moon to intersect the main structure and rising like a ship's bow. The orientation of the North facing entrance precludes direct sunlight, and is shaded from the East

by the protruding curvilinear glass mass. In this instance shading was achieved by orientation and massing, thus requiring no further treatment.



Fig 8. Main Approach to Lemar Shopping Mall (North-Eastern Elevation) Showing Shaded Entrance to Mall. (Chinweoku and Alibaba's Archive, 2017)

The same configuration is repeated on the South-Western elevation, but with less success, as sustained sunlight occurs from the West and South. Insufficiently recessed curtain walls and windows on the facade admit direct and sustained sunlight from the West, East and South (see Fig 11). The South-Eastern and North-Western facades are largely linear in form, and have fewer projections and recesses.

Lemar shopping complex building is overhung with roof eaves on the South-Western and North-Eastern elevations but devoid of any on other facades, which feature less windows. These eaves prevent the direct admission of overhead sunlight, especially in the hot summer months when it is undesirable.



Fig 9. Continuous Horizontal Aluminium Fins Employed on Upper Facade of Lemar Building (Chinweokwu and Alibaba's Archive, 2017)

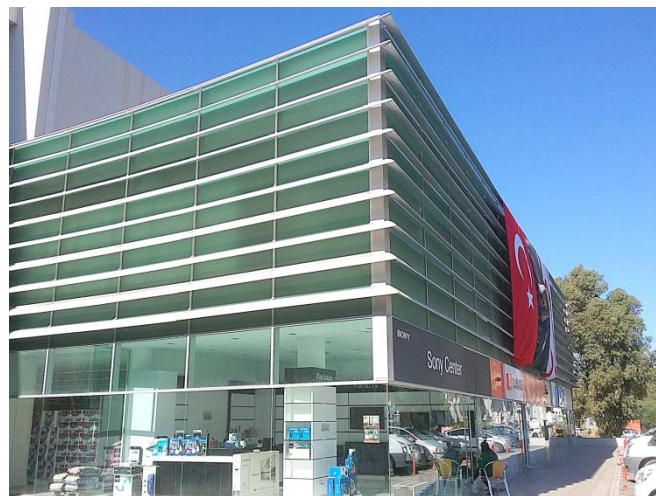


Fig 10. Continuous Horizontal Aluminium Fins Employed on Upper Facade of Lemar Building (Chinweokwu and Alibaba's Archive, 2017)

Horizontally running, aluminum louvered fins were employed as the primary, fixed external shading device for windows and curtain walls on both buildings. The Lemar shopping mall building features louvers for shading on the glazed regions of the upper floors of the building. These inclined horizontal Aluminum fins effectively blind the South-Eastern, South, and

South-Western sunlight from the building. However, several windows beside the primary curtain walls were not afforded any external shading.



Fig 11. South Western Elevation Showing Partial Recessing and Use of Shading Louvers (Chinweoku and Alibaba's Archive, 2017)

The ground floors do not feature the louvers employed on upper floors, and have clear shopping style display. However, they contend with glare and overheating in the summer and comfort months, from reflected sunlight. The Lemar shopping mall employs selective and minimal use of blinds, favoring exposed views to the internal areas in a typical display style. On lower floors where no external shading devices were used, internal vertical blinds were employed as the primary means of shading from direct and reflected sunlight, as well as accompanying glare.

Table 1. Summary of PSD Usage At Emu Rectorate Office and Lemar Shopping Complex

	*PSD type	EMU admin block	Lemar shopping mall
1.	Building massing and cantilevers	<ul style="list-style-type: none"> Few pronounced recesses and projections Cantilever on South and Eastern facade, provides shade in summer, admits winter sunlight. 	<ul style="list-style-type: none"> □ Shading by massing on North Eastern face □ Shading by massing with limited success on South -Western.
2.	Roof eaves and overhangs	<ul style="list-style-type: none"> Absent, employing straight parapet walls. 	<ul style="list-style-type: none"> • Present, selectively employed

3.	1. Porches and balconies	<ul style="list-style-type: none"> • Porch on main entrance face. • Pergola to shade terrace on Western wing. 	<input type="checkbox"/> Absent
4.	Fixed horizontal running fins (louvers)	<ul style="list-style-type: none"> • Present, selectively employed 	<input type="checkbox"/> Present, selectively employed
5.	Fixed vertical running fins	<ul style="list-style-type: none"> • Present, on ground floor of Southern facade. 	<input type="checkbox"/> Absent.
6.	Roller Blinds	<ul style="list-style-type: none"> • Present, venetian blinds. 	<ul style="list-style-type: none"> • Present, vertical blinds, selectively used.

*PSD – Passive Shading Devices

4. Findings and Discussion

In a questionnaire survey to determine the thermal comfort levels of the workers at the EMU rectorate office, 30 permanent, daytime staff were selected randomly to fill out questionnaires on the perception of the solar heating effects achieved inside the building. Constant use of internal blinds as shown in fig 12 and 12.1 below suggests a high incidence of discomforting sunlight. While 37% (n = 11) of the populace indicated content with the level of shading achieved by use of blinds alone, 77% (n = 23) of these had offices with a Northern window orientation thus receiving minimal direct sunlight. 93% (n = 28) of the population indicated the need for more shading for the building overall, as well as indicating that the building admits too much sunlight. 100% (n = 30) of users with offices on the South and Western facades use their blinds all day long in summer, and 93% (n = 28) believe direct sunlight is a major cause of heating in the office spaces at that time. In winter 53% (n = 16) of user offices oriented to the East, West and South received enough sunlight to help warm their office naturally.

EMU Rectorate Office Building

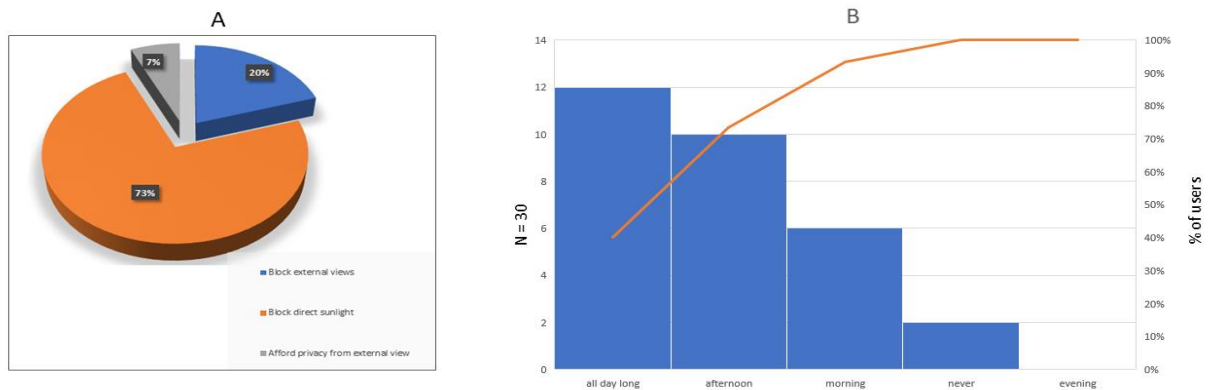


Fig 12. User indication of primary use for blinds (A) and user indication of times of undesirably admitted light (B).

At the Lemar shopping mall, 25 permanent daytime staff and 3 regular patrons filled out questionnaires on the perception of the solar heating effects achieved inside the building. The populace indicated satisfaction with the level of shading achieved generally, 86% ($n = 24$) also observed that windows without shade on the South-Western facade contributed to internal heating in the summer, as shown in fig 13. This region was also indicated as hottest, and 90% ($n = 25$) showed the upper floors of the region as hardest to cool. The results and findings show that while the Lemar shopping mall features greater spans of glazing on its external facade, its employ of a combination of massing techniques and an Aluminum louver system is effective enough to provide the right balance of lighting and thermal comfort generally. Comparatively, the users at the EMU rectorate office building indicated the use of blinds for most of the day, suggesting a necessity to block off excess heat and light rays from the sun.

Lemar Shopping Mall

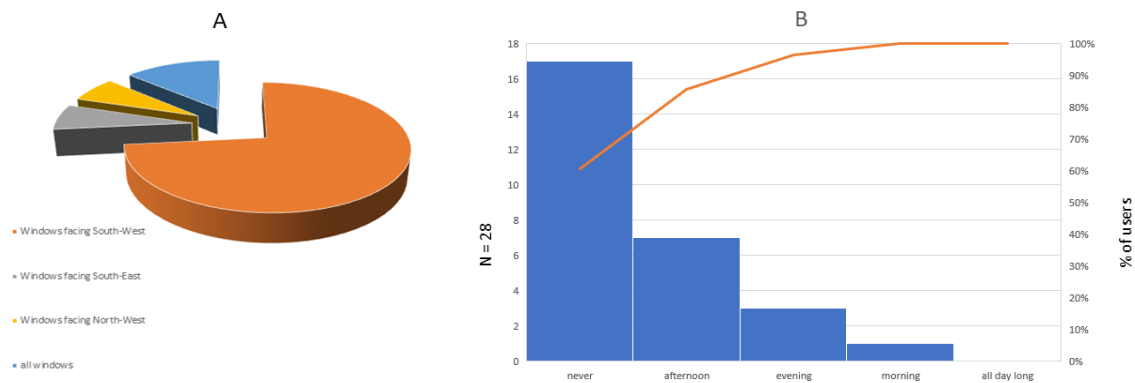


Fig 13. User indication of direction of admitted sunlight (A) and user indication of times of undesirably admitted light (B).

Deficiencies in the Lemar building include compromises on the ground floor in favor of display, as views into and from spaces shaded with the louver system are severely limited. The South-Western facade also feature several unshaded windows and glazing, admitting direct sunlight to a region which users indicated as hottest, and hardest to cool.

The EMU Rectorate building features a greater variety of shading devices, however insufficient quantitative use exposes several windows on all facades to direct sunlight, necessitating a constant use of internal blinds. On the Northern facade, a suspended floor overhangs an entrance porch, which also shades the underlying glazed walls and windows, but the shading advantage is however, better suited to a Western or Southern facade. Likewise, a large Western oriented roof terrace is shaded by a pergola of single dimension beams, also oriented Westward, therefore offering less resistance to the path of incident rays. A lattice frame pergola provides better and enduring shading from different directions. The South facade features close spaced vertical fins, limiting angled sunlight. However, vertical fins were not used on the Eastern and Western facades which receive angled sun rays and where vertical shading elements would be more effective, hinting at the likelihood of aesthetic consideration over the functional.

The use of louvered systems as a primary shading device in these public buildings is appropriate and effective when applied to sufficient coverage. However, other bioclimatic shading methods were employed sparingly or ignored completely. Vertical/horizontal shutters or fins will appropriately shade Western and Eastern windows, as well as deep overhangs which could be extended into Brise-Soleil and egg-crate systems. Canopies and porches provide a cool restful space as well as providing deep shade. Other options include double skin facades, optimized glazing and screens which should be adopted on future projects.

The immediate surroundings of both buildings feature continuous hard surfaces (Polished granite slab external flooring at EMU Rectorate building and a combination of concrete interlocking tiles and bituminous pavement at Lemar mall) which promotes glare from reflected sunrays. Vegetative ground like grasses, as well as shrubs should be employed in immediate surroundings to break incident sun rays. This is applicable to roof terraces as well, in line with sustainable construction goals and especially in situations where differing floor levels provide an opportunity for reflecting rays to impact windows at a lower, unprotected angle. Trees and shrubs around buildings is a desirable way of achieving shade and breaking direct sunlight.

5. Conclusion

The Mediterranean climate of Famagusta requires bioclimatic use of shading devices to preclude direct sunlight in the hot months of the year, through glazed surfaces and building openings. Inversely, these devices should accommodate incident sunlight in the winter to warm up spaces naturally. In both cases the successful use of such devices should significantly reduce the use of fossil fuel energized mechanical systems. Observation of shading devices on two case study public buildings indicates passive design awareness, as employed in their shading systems, primarily employing louvered fins and massing techniques externally, as well as adjustable blinds internally. However, user perception of

thermal comfort levels carried out in a survey of the buildings suggests limited success. This evaluation is backed by observation of inadequate quantitative use of employed shading devices.

In the EMU Rectorate building, externally fixed aluminum louvers and internally set Venetian blinds were employed as the primary means of passively shading the building. Louvers were employed selectively, covering less than 20% of windows and glazed surfaces, and indicating superior consideration for its aesthetic value. Likewise, the Lemar shopping mall entrance region is shaded by applying successful massing techniques in relation to building orientation. The facility features Aluminum louvers as a primary shading device, wrapping around major glazed regions. However, inadequate treatment of glazed regions and windows, on the South-Western facades admits sustained late sunlight, with consequent user perception indicating spaces in the region to be the most uncomfortably heated.

It can be deduced that the PSDs applied to these buildings are more generic than adaptive, as features which are characteristic of passive cooling techniques in the Mediterranean have not been employed sufficiently. Further research is required to build on a module for adaptable passive systems, and the findings from this study will be used as reference data for the design of optimal shading devices suitable to the North Cyprus regions.

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Analyzing the Energy Usage and Carbon Emission in Office Administrative Block: A Case Study of KTG Linton University Administrative Block, Malaysia

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Abstract

It is now recognized that this world of mankind has a serious danger to the global climate, and therefore urgent action is needed to address it. One of the key steps is to reduce the amount of energy and carbon dioxide emissions. The objective of this study is to make an experiment on factors contributing the energy usage of the Administrative block including carbon emission in KTG Education Group University Malaysia, and evaluating the case study using Revit Energy Analysis. While many countries have recognized the importance of the role of Revit energy analysis in energy usage and reduction of carbon emissions, Energy analysis from start to finish. Analyzing a complete or near-final design has little or no effect on a building's operational energy performance. The use of the Administrative Building as case study is to analyze the energy intensity and calculate the carbon emission in the selected room. Two simulations will be performed. The first simulation is based on the existing room and the second is based on improved building design envelope. This paper outlines the result of the two simulations. The Energy Used Intensity (EUI) of the existing room used 284 kWh. In order to fulfill the requirement of Green Building Index NRNC tool, the energy intensity must be below 150 kWh/m²/year. Therefore, new proposed building envelope has been reduced to **129kWh** compared to previous EUI which is 284kWh. Based on Green Building Index NRNC tool, the

improved design has achieved the requirement of energy intensity below 150KWh/m²/year. At the same time carbon emission has been reduce from 148.55kg CO₂ to **67.5kg CO₂**.

KEYWORDS: Energy intensity; carbon dioxide emission; energy usage; Revit energy Analysis;

1. Introduction

The world faces the challenges of global fever and climate change. Human climate change is the greenhouse gases in nature. Carbon dioxide (CO₂) is the most important greenhouse gas, and the world's population is increasing in the first carbon dioxide (CO₂) and soil use (IPCC, 2007).

The most important factor in the use of energy and the erosion of carbon dioxide (CO₂) in urban areas, where most people have some element of high standard of living and rich supply (Fong et al., 2007a & 2007b; IGES, 2004). Therefore, addressing energy-related problems with energy and carbon dioxide (CO₂) should be focused on office areas, and Energy analysis plays an important role in counteracting the global climate, or smaller, reducing the office temperatures of the building.

One of the most important principles in the meaning of energy is to achieve 'progress'. The legally recognized United Nations Development Program (UN) is 'the development of current challenges without challenging future generations' ability to address their needs'. To make progress, there are many things to consider. The United Nations Economic and Social Development Center has set up areas for development, climate change, and "energy" of major policies (UN, 2007). Therefore, climate change and energy issues should be considered as one of the key objectives in the energy analysis system. However, the study shows that population growth and economic growth are the major motor vehicles since increased energy usage and carbon dioxide (CO₂) (Fong et al., 2007a, IGES, 2004). Therefore, it would be a great challenge

to maintain the quality of life in these cities while maintaining energy usage and carbon dioxide (CO₂).

This study examines the current situation of energy usage and reduction of carbon dioxide (CO₂) emission from KTG Education Group University Malaysia, a developing country that is experiencing rapid economic transformation, industrialization and population expansion, with particular emphasis on city context energy usage and carbon dioxide (CO₂) emissions. The study also investigates the current considerations of energy usage and carbon dioxide (CO₂) emissions in the spatial energy process of the administrative building. This paper provides a guide for further consideration in incorporating energy and carbon dioxide (CO₂) issues as the core part of Energy analysis process, in achieving sustainable development based on the concept of low carbon emission.

Global warming and climate change are the two greatest issues to mankind currently. The urgency to fight against them has drawn serious attentions for leaders, scientists and individuals all over the world. In fact, the event that for the first time drawing attentions from the world on the global warming and climate change issues can be traced back to the first “World Climate Conference” organized by the World Meteorological Organization (WMO) in 1979. The conference expressed concern that “continued expansion of man’s activities on earth may cause significant extended regional and even global changes of climate”, and it called for “global cooperation to explore the possible future course of global climate and to take this new understanding into account in planning for the future development of human society” (IPCC, 2004). Subsequent to the said conference, various international efforts have been taken to monitor the climate change and to mitigate it. In 1988, the IPCC was set up and followed by the adoption of the United Nations Framework Convention on Climate Change (UNFCCC).

Presently the primary international policy framework against global warming and climate change is the UNFCCC, specifically the Kyoto Protocol, which sets emission limits for many of the world's most economically developed nations. Under the Kyoto Protocol, the participating developed countries are committed to reduce their GHG emissions on an average of about 5% by the target years of 2008 to 2012 (UN, 1998). For post-Kyoto Protocol, during the United Nations Climate Change Conference 2007 held in Bali, Indonesia, it was decided to adopt the Bali Roadmap, which charts the course for a new negotiating process to be concluded by 2009 that will ultimately lead to a post-2012 international agreement on climate change (UNFCCC, 2007). Also, during the G8 Summit 2007 held in Heiligendamm on 6-8 June 2007, the participating countries have agreed to consider seriously the target of halving of GHG emissions by 2050 (G8, 2007). Presently, the common global target is to cut the GHG emissions, particularly CO₂ emissions, by 50% of the present level by year 2050. In this respect, Japan has launched the national campaign of 'Cool Earth 50', which targeting to cut the CO₂ emissions up to half of the present level, by the year 2050. Also, the State of California of the United States is aiming to cut the emission to 80% below 1990 level, while London has set the target of 60% carbon emission reduction from 2000 level, both with the common target year of 2050 (TMG, 2006).

CO₂ is the most anthropogenic GHG (human being caused) in the atmosphere. CO₂ emissions arise from several sources, particularly fossil fuel combustion in the generation, industry, residential and transport sectors. It is released into the atmosphere primarily by combustion of fossil fuels such as coal, oil or natural gas, and renewable fuels such as biomass (IPCC, 2005).

According to the 2006 International Energy Survey (see Figure 1), the world's CO₂ emissions from fossil fuel consumption are expected to grow at an average rate of 2.1% per annum from

2003 to 2030. World CO₂ emissions from fossil utilization Fuel is expected to increase from about 25,000 billion metric tons in 2003, to more than 40,000 billion tons by 2030.

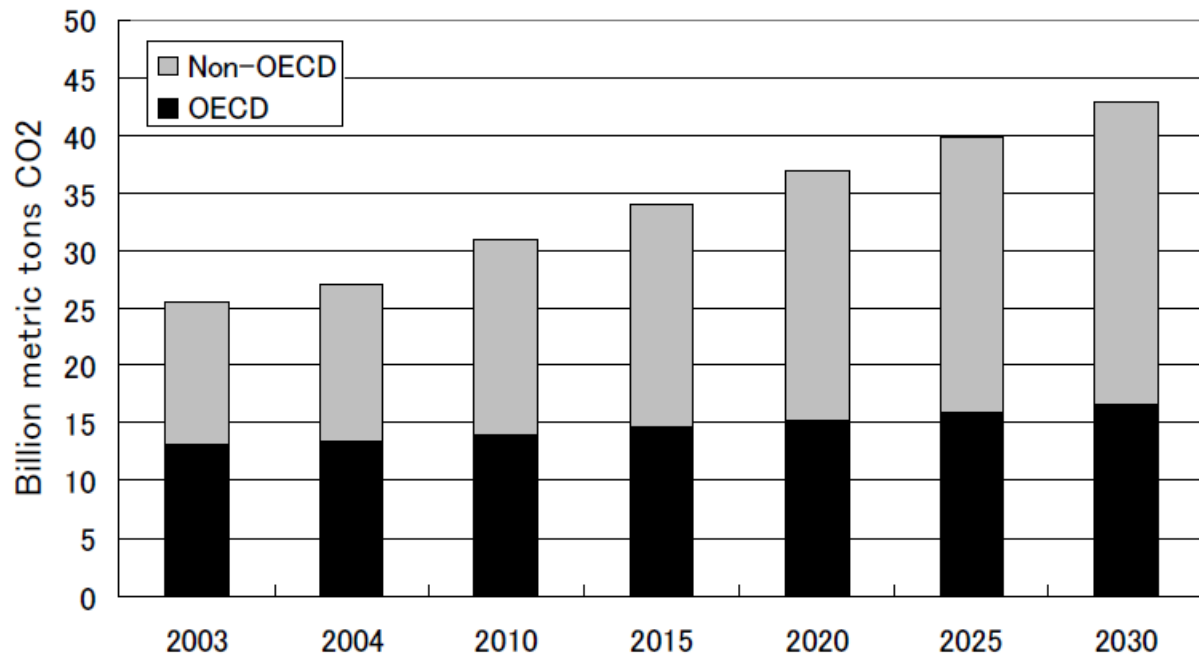


Figure 1: World energy-related CO₂ emissions by region, 1990-2030 (EIA, 2007)

The relative contribution of different fossil fuels to the amount of CO₂-related emissions associated with emissions has changed over time as shown in Figure 2. Increased trend of CO₂ emission trends observed for all types of fuel and they are projected to steadily increase steadily over the projection period up to 2030. However, in the case of emissions from petroleum and other liquids that form the largest share (42%) of the world's total emissions in 1990, have been overcome by coal since 2005. By 2030, it is projected that coal and liquids (petroleum and other liquids) will each contribute 43% and 36% of the total world emissions. The increased coal price reflects an important role in the energy mix of non-OECD countries, especially China and India (EIA, 2007). Also, similar trends are seen in Malaysia. In 1990, China and India combined were 13% of world emissions, but in 2004 the share increased to 22%, largely due to the strong

increase in coal consumption in both countries. This trend is expected to continue, and by 2030 the release of CO₂ from China and India combined is expected to account for 31% of the world's total disbursements, with China itself responsible for 26% of the world's total.

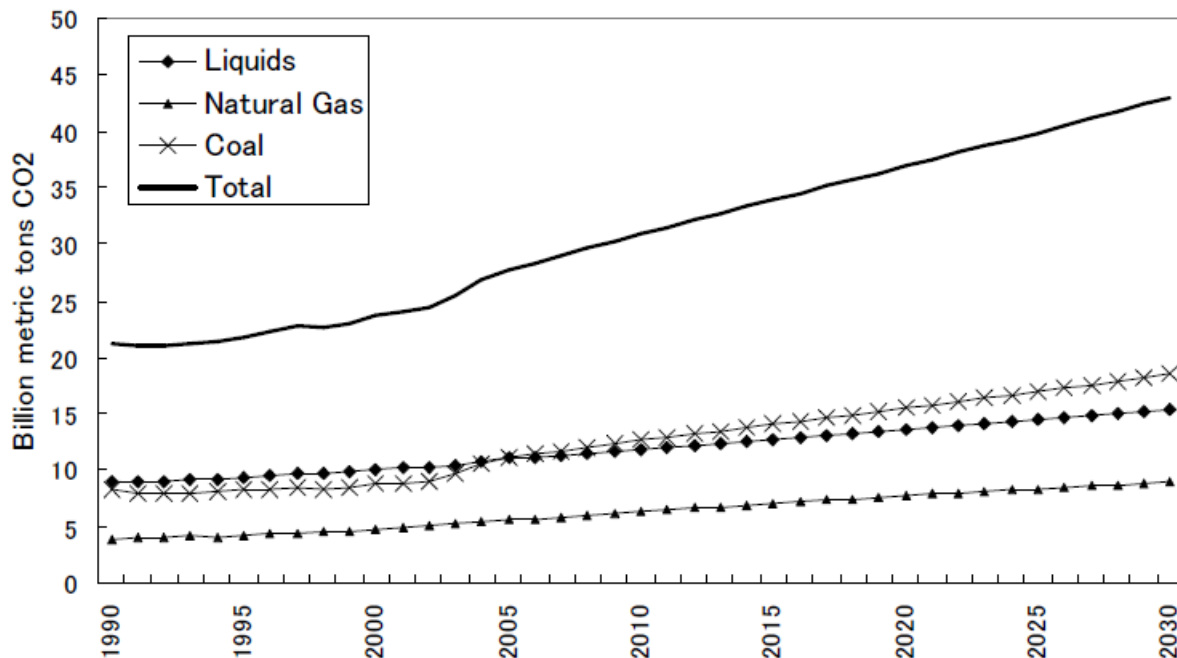


Figure 2: World energy-related CO₂ emissions by fuel type, 1990-2030 (EIA, 2007)

Figure 2 above reveals that world CO₂ emissions are on an upward trend. Each country contributes CO₂ to the atmosphere. From this figure it can be seen that the growth rate of CO₂ emissions from non-OECD countries is higher than OECD countries. 2004 marks the first time in history that CO₂ emissions related to energy from non-OECD countries go beyond OECD countries. Furthermore, since the annual average increase in emissions from 2004 to 2030 in non-OECD countries (2.6%) was more than three times the increase for OECD countries (0.8%), CO₂ emissions from non-OECD countries 2030, at 26.2 billion tons, is expected to exceed 57% of OECD countries.

Building performance improvements are important for reducing emissions of greenhouse gases and reducing energy costs. However, identifying potential possibility for energy efficiency retrofits poses significant challenges. Builders, developers, owners, facility managers, insurers, financiers, and regulators all struggle to get the information they need to support their building decisions.

To evaluate and update the existing portfolio of buildings systematically, the construction industry needs a scalable process to assess building performance quickly, cost-effective, accurate and efficient.

2. Literature Review

According to 2011 Autodesk, Inc. the design and power supply in current buildings represents opportunities to reduce the cost of energy and protection from the risk of energy consumption. According to this, there are several local and regional statistics to improve the project. These documents, such as energy, global climate change, and economic development systems, use energy efficiently for the construction of buildings around the world.

To address these economic and energy issues in terms of funding, contributions, and demand, industry manufacturers must be able to accelerate, plan, and focus on their efforts. However, we are facing the challenge of determining the potential of energy reserves in office existing building information that is crucial to finding outcomes and refining.

Most of the methods used today are expensive and difficult. The most successful experiments are those who rely on energy analysis and follow the steps below:

- Consideration of current data - Architectural (geometry) architecture, user history, hardware and equipment, location information and schedule, etc.

- Provide energy usage - Using the data development information to improve energy efficiency.
- Calibration - Switching awareness systems to energy usage to ensure energy efficiency is compatible with user history in the compliant gate
- Energy levels - Improve energy efficiency to evaluate energy and energy savings for different energy components. Calculate prices to implement the steps and schedule the list of items based on the simplest.

Once the building structure is completed, you are ready to make energy simulation and analysis.

Revit Conceptual Energy Analysis features are used for the analysis.

The Revit Conceptual Energy Analysis works with the energy generation system from a review of the revision process and results according to the user designing parameters such as building location and type, with operational times. The search results view the results of the analysis in a separate window via graphs, charts, and tables. (© 2011 Autodesk, Inc. All rights reserved).

Green Building uses the DOE-2 technician to study energy analysis and provide opportunities for review and complete research if available needed. The user has the ability to continue analysis in some software using fay XML files that can be downloaded from the forms of Revit Conceptual Energy Analysis features and Green building index NRNC tool

In order to fulfill the requirement of Green Building Index NRNC tool, the energy intensity must be below 150 KWh/m²/year. Therefore, the proposed building envelopes is needed to reduce the energy intensity as required and at the same time reduce the carbon emission of the building by the used of Revit Energy Analysis.

The objectives of the analysis is to improve the Energy Intensity and lower the carbon emission of our building, some design improvement has to be done on the analysis.

3. Building Energy Simulation And Carbon Emission

3.1 Findings and Discussion

The experiment target will be on one of the office in the Administrative Building. Produce an Energy Analysis through Revit Software and also calculate the carbon Emission of the particular room.

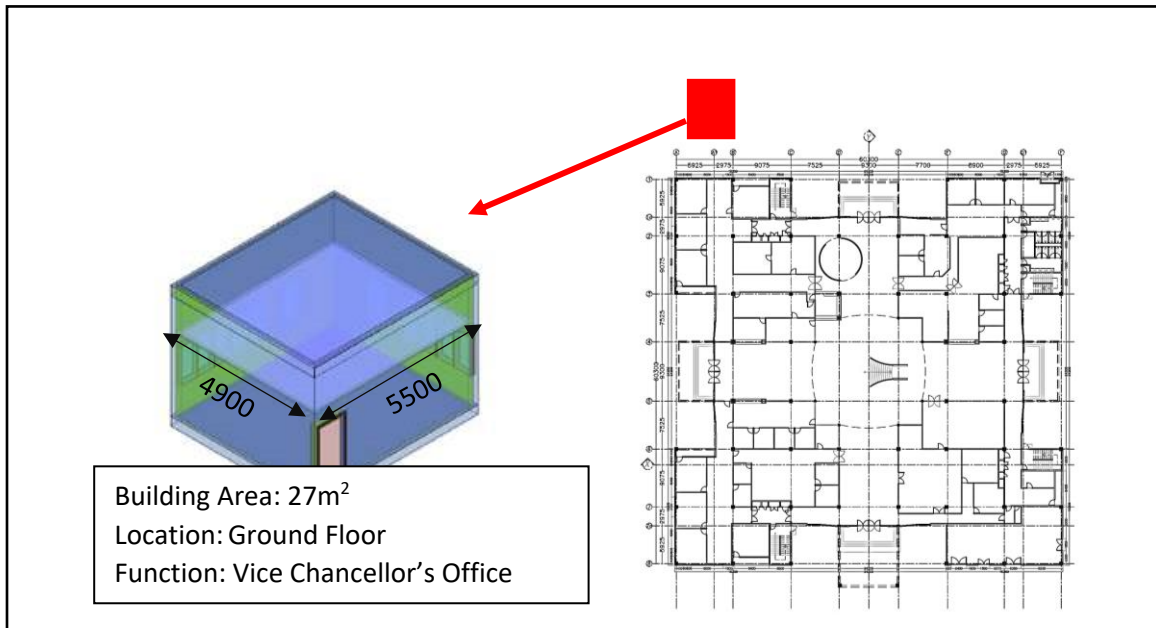


Figure 3: Brief Introduction of Vice Chancellor's Office (KTG University)

3.1.1 The first simulation of the existing room Energy intensity analysis result from Revit software is as followed

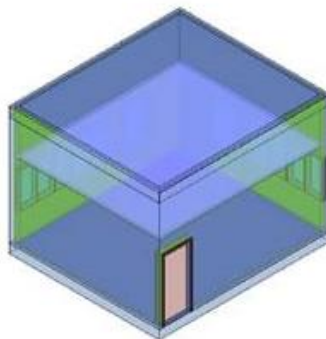


Figure 4: Energy analysis result image (existing room)

Building performance factors

Table 1: Building performance factors Table (existing room)

Location	Mantin Malaysia
Weather Station	7833990
Outdoor Temperature	Max33 ⁰ c/min:26 ⁰ c
Floor Area	27m ²
Exterior Wall Area	74m ²
Average Lighting Power	12.92W/m ²
People	6 people
Exterior Window Ratio	0.11
Electrical Cost	\$0.09/Kwh
Fuel Cost	\$0.78/Therm

Energy Use Intensity

Table 2: Energy Use Intensity Table (existing room)

Electricity EUI	284 kwh/sm/year
Fuel EUI	193MJ /sm/year
Total	1.217 MJ/sm/year

Life Cycle Energy Use/Cost

Table 3: Life Cycle Energy Use/Cost Table (existing room)

Life Cycle Electricity Use	233.642 kwh
Life Cycle Fuel Use	158.373MJ
Life Cycle Energy Use	\$10.494

*30year life and 6.1% discount rate for costs

Renewable Energy potential

Table 4: Renewable Energy Potential Table (existing room)

Roof Mounted PV System (Low efficiency)	2.063kwh/year
Roof Mounted PV System (Medium efficiency)	4.125Kwh/year
Roof Mounted PV System (High efficiency)	6.188Kwh/year
Single 15 ⁰ Wind Turbine Potential	355 Kwh/year

*PV efficiencies are assumed to be 5%, 10% and 15% for low, medium and high efficiency systems

Annual Carbon Emissions and Annual Energy Use/Cost

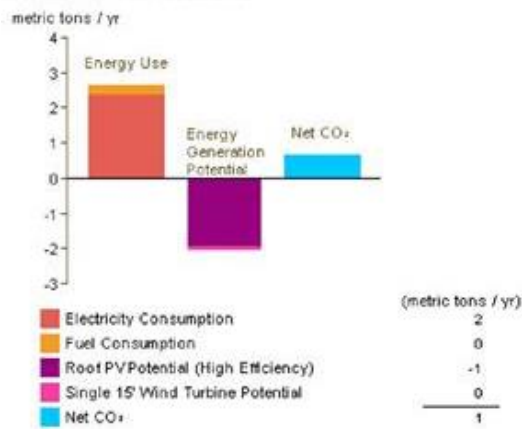


Figure 5: Annual Carbon Emissions chat (Existing room)

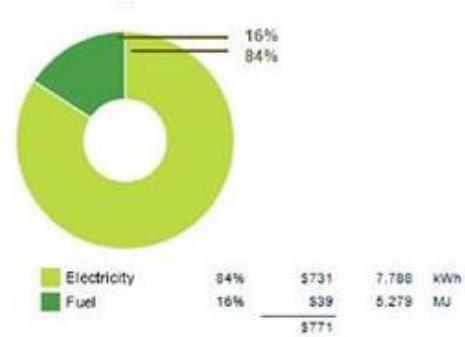


Figure 6: Annual Energy Use/Cost chat (Existing room)

The Annual carbon emission in the chat has an energy use of electricity consumption of 2 metric tons / year with fuel consumption of 0 metric tons / year. The energy generation potential use -1 metric tons / year of roof PV potential (high efficiency) with single 15⁰ wind turbine potential. In all the net carbon emissions is 1 metric tons / year.

The annual energy use/cost chat show the electrical consumption of 84% of electricity and 16% of fuel because of the metric tons / year used in the annual carbon emissions.

Energy Use: Fuel and Energy Use: Electricity

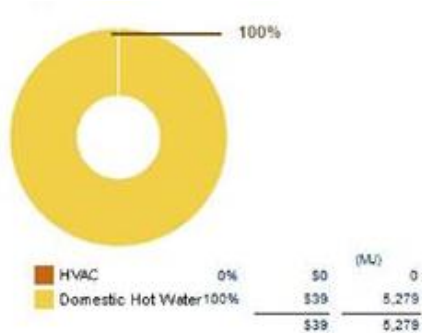


Figure 7: Energy Use: Fuel chat chats (Existing room)

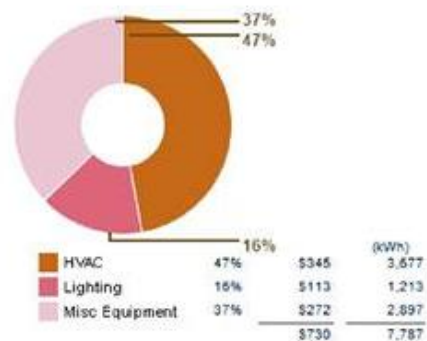


Figure 8: Energy Use: Electricity chat (Existing room)

The energy use: fuel chat show the HVAC at 0% usage and 100% of Domestic hot water used in metric tons / year used energy.

The energy use: electricity chats shows the HVAC at 47%, lighting at 16% and misc equipment at 37% in kwh/year in energy use.

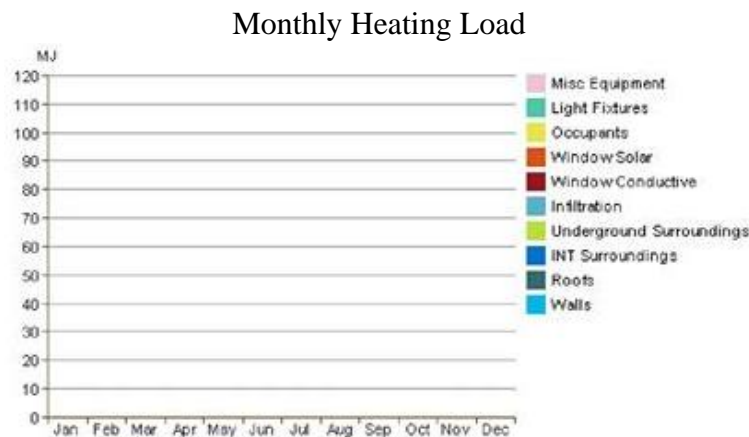


Figure 9: Monthly Heating Load chat (existing room)

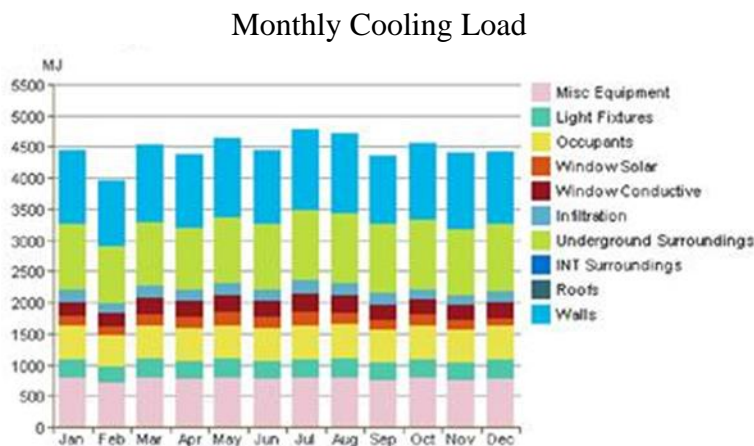


Figure 10: Monthly Cooling Load chat (existing room)

Heating and cooling energy consumption data are combined in Figure 9 & 10. Here, the overall effect of the monthly cooling load features is realized. The figure shows that there is no much

difference between the best case (lowest energy use) and worst case (highest energy use) design scenarios monthly.

3.1.2 The carbon emission calculation of the existing room from the simulation result will be calculated in CARBON EMISSION UNIT

Convert kWh electricity to kg CO₂

In order to convert electricity consumed in kWh to kg of carbon dioxide, the energy use should be multiplied by a conversion factor. This is show in the table below.

The conversion factors for energy sources are:

Table 5: Calculation Formulas for Carbon Emission

Energy source (kWh)	Conversion factor (kg CO ₂ / kwh)
Electricity	0.523
Natural gas	0.185
Burning oil (for heating)	0.245

CARBON EMISSION CALCULATION FOR EXISTING ROOM

Energy use = 284 kWh

Conversion factor = 0.523

Carbon Emission: 284 kWh x 0.523 = 148.5 kg CO₂

If 284 kWh units of electricity were consumed, then 148.5 kg CO₂ was produced.

The Energy Used Intensity (EUI) of the existing room used 284 kWh. In order to fulfill the requirement of Green Building Index NRNC tool, the energy intensity must be below 150 KWh/m²/year. Therefore, new proposed building envelope is needed to reduce the energy intensity as required and at the same time reduce the carbon emission of the building. New.greenbuildingindex.org. (2017).

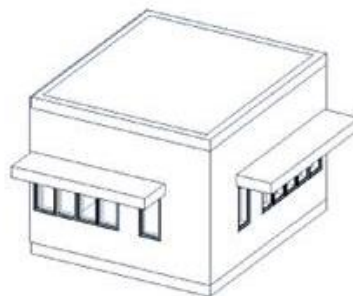
Table 6: GBI NRNC tool EE 5

EE5	ADVANCED EE PERFORMANCE			
	Exceed Energy Efficiency (EE) performance better than the baseline minimum to reduce energy consumption in the building. Achieve Building Energy Intensity (BEI) $\leq 150 \text{ kWh/m}^2\text{yr}$ as defined under GBI reference (using BEIT Software or other GBI approved software(s)), OR	2	15	
	BEI ≤ 140 , OR	3		
	BEI ≤ 130 , OR	5		
	BEI ≤ 120 , OR	8		
	BEI ≤ 110 , OR	10		
	BEI ≤ 100 , OR	12		
	BEI ≤ 90	15		

From the existing building result to improve the Energy Intensity and lower the carbon emission of our building, we had done some design improvement. Proposed designs include:

- Wall insulation is installed to achieve a lower U-value
- Single glaze window is replaced with triple glazed window with a lower U-Value and Solar Heat Gain Coefficient (SHGC)
- 1m horizontal shading device is added to each set of windows.

3.1.3 The second simulation of the improved design room Energy intensity analysis result from Revit software using the proposed designs above is as followed

**Figure 11:** Energy analysis result image (improved design)

Building performance factors

Table 7: Building performance factors Table (improved design)

Location	Mantin Malaysia
Weather Station	1447060
Outdoor Temperature	Max35 ⁰ c/min:20 ⁰ c
Floor Area	27m ²
Exterior Wall Area	68m ²
Average Lighting Power	12.92W/m ²
People	6 people
Exterior Window Ratio	0.10
Electrical Cost	\$0.09/Kwh
Fuel Cost	\$0.78/Therm

Energy Use Intensity

Table 8: Energy Use Intensity Table (improved design)

Electricity EUI	129 kwh/sm/year
Fuel EUI	179MJ /sm/year
Total	752MJ/sm/year

Life Cycle Energy Use/Cost

Table 9: Life Cycle Energy Use/Cost Table (improved design)

Life Cycle Electricity Use	130.669kwh
Life Cycle Fuel Use	147.061MJ
Life Cycle Energy Use	\$6.066

*30year life and 6.1% discount rate for costs

Renewable Energy potential

Figure 10: Renewable Energy Potential Table (improved design)

Roof Mounted PV System (Low efficiency)	2.385kwh/year
Roof Mounted PV System (Medium efficiency)	4.771Kwh/year
Roof Mounted PV System (High efficiency)	7.156Kwh/year
Single 15 ⁰ Wind Turbine Potential	106Kwh/year

*PV efficiencies are assumed to be 5%, 10% and 15% for low, medium and high efficiency systems

Annual Carbon Emissions and Annual Energy Use/Cost

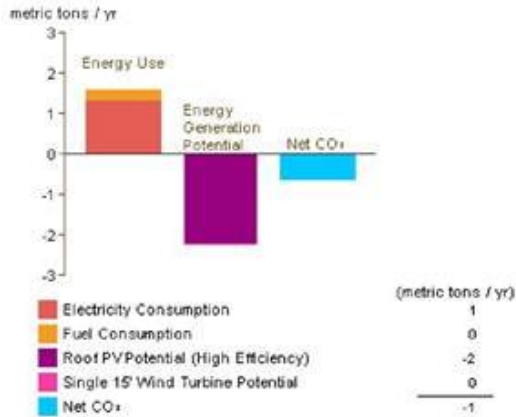


Figure 12: Annual Carbon Emissions chat (improved design)

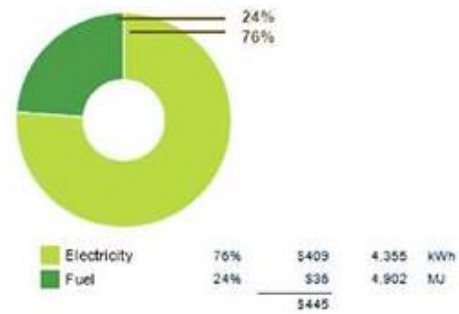


Figure 13: Annual Energy Use/Cost chat (improved design)

The Annual carbon emission in the chat has an energy use of electricity consumption of 1 metric tons / year with fuel consumption of 0 metric tons / year. The energy generation potential use -2 metric tons / year of roof PV potential (high efficiency) with single 15° wind turbine potential. In all the net carbon emissions is -1 metric tons / year.

The annual energy use/cost chat show the electrical consumption of 76% of electricity and 24% of fuel because of the metric tons / year used in the annual carbon emissions.

Energy Use: Fuel and Energy Use: Electricity

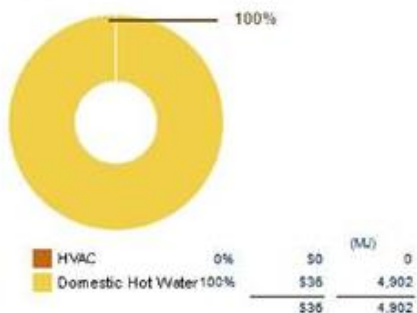


Figure 14: Energy Use: Fuel chat (Improved design)

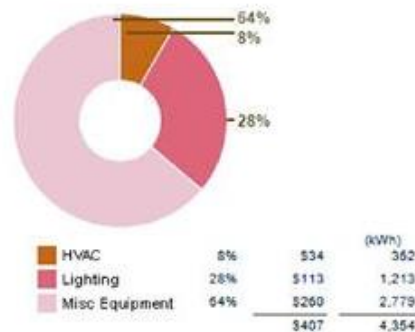


Figure 15: Energy Use: Electricity chats (Improved design)

The energy use: fuel chat show the HVAC at 0% usage and 100% of Domestic hot water used in metric tons / year used energy in the annual carbon emissions.

The energy use: electricity chat show the HVAC at 0% usage and 100% of Domestic hot water used in metric tons / year used energy in the annual carbon emissions.

Monthly Heating Load

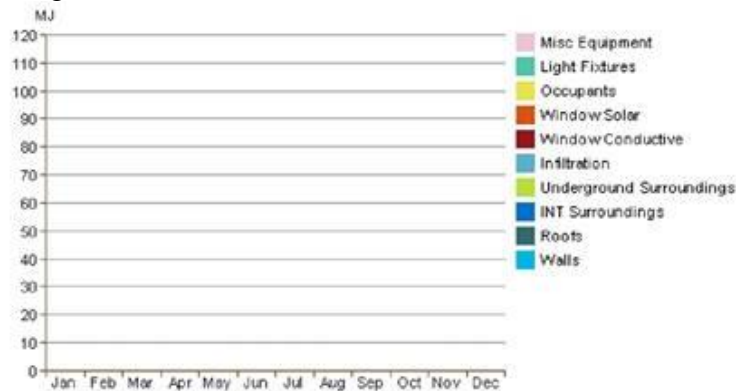


Figure 16: Monthly Heating Load chat (improved design)

Monthly Cooling Load

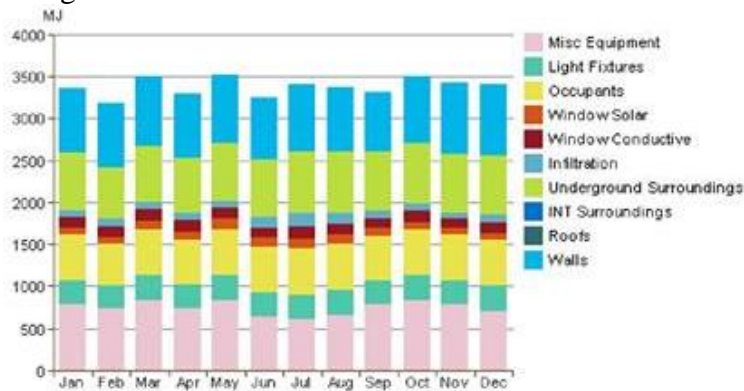


Figure 17: Monthly Cooling Load chat (improved design)

Heating and cooling energy consumption data are combined in Figure 16 & 17. Here, the overall effect of the monthly cooling load features is realized. The figure shows that there is no much difference between the best case (lowest energy use) and worst case (highest energy use) design scenarios.

Annual cooling energy consumption for the all scenarios is given. Figure 17 illustrates the trade-off associated with building overhangs used. The overhang use less cooling energy than the scenarios without. The figure shows that the overhang design element creates a greater separation of the data than the thermal mass. Moreover, the separation between the overhang/no-overhang scenarios increases as the building's glazed areas are oriented toward the sun (in the range of 120 to 210 degrees). The mass's influence is less significant due to the sun's position in the sky during the cooling months of the year. This dampens the heating effect of the mass. The mass's influence could become more significant if natural ventilation or night cooling strategies were employed, creating a mass cooling effect. However, these methods are not explored at this time.

3.1.4 The carbon emission calculation of the improved design room from the simulation result will be calculated also using table 5 convert formula

Energy use = 129 kWh

Conversion factor = 0.523

Carbon Emission:

$$129 \text{ kWh} \times 0.523 = 67.5 \text{ kg CO}_2$$

If 129kWh units of electricity were consumed, then 67.5kg CO₂ was produced.

The Energy Used Intensity has been reducing to **129kWh** compared to previous EUI which is 284kWh. Based on Green Building Index NRNC tool, the improved design has achieved the requirement of energy intensity below 150KWh/m²/year. At the same time carbon emission has been reduce from 148.55kg CO₂ to **67.5kg CO₂**.

4. CONCLUSION:

There are many ways, in fact, that can protect energy usage and reduce carbon dioxide (CO₂) emissions through Architectural software. As the case of Malaysia, being among the developing countries, it is important to find out the best practices with minimum energy consumption and carbon dioxide (CO₂) emission, in achieving the goal of improving the Energy Intensity and lower the carbon emission.

Overall, although it is widely recognized that in achieving low energy consumption and low carbon dioxide (CO₂) emissions building, it is important to conduct continuous research on energy-saving technologies and measures in various energy sectors used such as transport, industry, commercial and residential, and More importantly, it requires a holistic analysis and a clear understanding of the nature of the highest energy use and CO₂ emissions.

Analysis of Revit energy can reduce the cost of variables associated with energy assessments. This allows massive assessment in a short time disabling traditional methods of energy analysis and building audit techniques, thereby assisting the building construction industry to create a low carbon-built environment.

Analyzing the complete or near-end design has little or no effect on the performance of building operations. But leveraging energy analysis as a decision maker throughout the design life cycle- from conceptual forming, through complex BIM modeling-can have tremendous effects. This approach helps architects capture performance improvement opportunities throughout the design development process, which potentially saves building owners with wealth in operational cost of energy and significantly reduces the emission of operating carbon. Revit empowers architects to do just by using Insight, cloud-based energy analysis software that is a service available to Revit and Autodesk AEC Collection customers. Revit Official Blog. (2017).

The main contributor to the global warming phenomenon is energy use and land use change. In this regard, urbanization is one of the most important aspects that cannot be ignored in addressing the problem of global warming, as a major part of energy consumption and emission of CO₂ in the cities. Therefore, space planning that deals with planning for land use and urban structures plays a very important role in controlling energy consumption and CO₂ emissions in urban systems.

While many countries have recognized the importance of space planning in energy conservation and the reduction of CO₂ emissions, in Malaysia, there is still no specific spatial planning policy that is directly related to energy and CO₂ issues. On the other hand, in the process of urban planning, efforts have been made primarily to meet high energy demand (which gives more focus on electricity supply) to support the desired high economic growth. Therefore, this paper aims to emphasize the importance of energy conservation and reduction of CO₂ as a core consideration in Malaysia, from national to local level.

The main contributors to the global warming phenomenon are energy use and land use change. In this respect, urbanization is one of the essential aspects that must not be neglected in handling global warming issues, as the main portion of energy consumption and CO₂ emission is occurring in the cities. Hence, spatial planning that dealing with planning for land use and urban structure is playing a very important role in controlling energy consumption and CO₂ emissions in the urban systems.

While many countries have recognized the importance of the role of spatial planning in energy conservation and reduction of CO₂ emissions, in Malaysia, to date there is still no specific spatial planning policy that directly deals with the energy and CO₂ issues. Instead, in the urban planning process, efforts have been put mainly on fulfilling the high energy demand (which

focusing more on electricity supply) so as to support the desired high economic growth. Hence, this paper aims to emphasize the importance of energy conservation and CO₂ reduction as the core considerations in the spatial planning process in Malaysia, from national till local levels. (NIES, 2006)

In the preparation of the Structure Plan, for example, rather than trying to meet high energy demand, measures need to be taken to reduce energy consumption and CO₂ emissions, to achieve a balance between economic development and environmental conservation. Every proposal in the Structure Plan, to some extent, will affect the energy consumption and emissions of CO₂ in the overall planning area. For example, proposals to convert forest areas into commercial development will not only increase CO₂ emissions and emissions in the area, but will also reduce carbon sink capacity due to loss of green areas. Therefore, proper consideration should be taken on the impact of each proposal on energy consumption and CO₂ emissions. In this case, it is necessary to develop and incorporate decision-making tools to assess the overall impact of the development plan (or reserve options) on urban and regional energy use and CO₂ emissions as a whole. This research can help decision makers in environmental conservation. Ho and Fong (2007).

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The Use of Textile-Based Materials in Shell System Design in Architecture and an Evaluation in Terms of Sustainability

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Abstract

The textile that has emerged from dressing and protection need of people against the variable weather conditions since the primeval ages, has gained performance characteristics with the rise of artificial fibers apart from natural fiber production and with increasing technology, and has gained a good position in architectural applications. The application areas of the textile, that was traditionally used as gear, as indoor element, and as upholstery on furniture, have been varied by emerge of smart and technical textile and its use in construction sector and architecture has been actualized. The main textile based materials used on building and skin systems are Polyvinyl Chloride (PVC), Polytetrafluoroethylene (PTFE), and Ethylene Tetra Fluoro Ethylene (ETFE). Tent, pneumatic building, canopy, pleated roof, umbrella, parasol, outer curtain, shear wall and façade are structural use forms of textile materials. While the interactions between textile and architecture actualized in visual sense, structure and for, technology, and aesthetic sense, the use of textile with its sustainability in architecture also brings advantages. In the paper Eden Project, Water cube, and Alliance Arena where textile based materials are used are studied. It is seen that the textile material, which is easily applied at long-spans and at forms which cannot be handled with traditional materials, became prominent with its recycling and sustainable features.

Key Words: Building shell, textile, textile architecture, architectural sustainability

1. Introduction

We are facing with various statistics about the seriousness of adverse contribution of construction sector to the environment, CO₂ emissions, and depletion of energy sources. It is known that building construction uses %40 of natural sources, %12 of drinkable water, and %70 of electricity and also causes between %45-%65 of tailing (Yudelso, 2008). Therefore, the designers increasingly obey ecological designing principals for the purpose of creating a structured environment more compatible with the natural environment. Concordantly, the manufacturing materials are evaluated by continuously being improved and re-designed to be more sustainable. The textile material, one of these materials, is playing an important role in sustainable architecture, and is potently used in architecture with its features of manufacturing and transportation facileness, need of less supplies, and less energy source.

Textile based materials are used in architecture with their potential to decrease artificial energy requests, to alleviate cooling loads, and solar energy gain. With this usage in architecture, obtaining low energy costs in buildings is provided. For example membranes, which are a textile product are designed as to be easily disassembled and assembled via their flexible structure, are reducing waste amount by recycling after construction. Textile based materials also became prominent with aesthetic contributions to modern architecture along with their countless efficacies at saving natural sources and transferring them to posterities. These materials which are work of advancing technology provide an easiness to convert the structure to an intended form, inspire to exciting new forms with their texture, color, and shape, and add brand value to the structure.

2. Improvement of Textile Use from Past to Present

Textile material has emerged since the existence of human being by the need of protection against heat, cold, and climatic weather conditions. Traditional textile materials used for dressing and protection at the beginning have started to be used for aesthetic and visual

quality purposes in the following periods. Developing technology by the invention of synthetic fiber has emerged a different type of textile. Technical and functional features have taken precedence over aesthetic and decorative features. This category has been accepted as a follow up of traditional textile industry as a separate field of industry and started to be used in architecture (Arslan, 2009).

3. Use of Textile in Architecture at Structure and Skin System

3.1 Material Characteristics of Textile Used in Architecture

There two basic materials used in skin system. They are classified as coated and uncoated. Uncoated ones have thin fiber and woven into the raw material at the places where coating will be applied. Coated materials; glass fiber coated PTFE (Polytetrafluoroethylene), polyester coated PVC (Polyvinyl Chloride), and ETFE (Ethylene Tetra Fluoro Ethylene) are the most widely used ones among the membrane materials. Coated materials make %90 of all membrane materials used in modern architectural projects (Drew, 2008).

3.1.1 PVC (Polyvinyl Chloride) coated polyester

PVC (Polyvinyl Chloride) and its derivations PVDF (Polyvinylidene fluoride), Teflon coated Fiberglass and silicon coated fiberglass are located in among the types of membranes that measured up themselves by their price and performance, and mostly used in construction sector (Pecina, 2012). Working life of PVC coating material is more than 25 years. Coating material is durable and have self-cleaning features. It is cheap and can be find in different colors. Polyester materials coated with PVC and PVDF are the most common waterproof materials. They can be used as weather protection at outdoor areas. Providing a good light transmission, they allow diffused natural light to fill the area to eliminate the need of artificial lighting. They have a good resistance and have a transparency between zero to twenty-five percent (Krüger, 2009). These types of textiles are successfully used for residual-permanent structures with its elastic cracking resistance. Coated textiles practically never necessitate any

maintenance. By virtue of being recyclable, they also ensure to reduce the environmental damages. PVC coated polyester textile materials are very sufficient for demounted (removable and attachable again) structures with their foldable, movable, and storable features (Drew, 2008).

3.1.2 PTFE (Polytetrafluoroethylene) coated fiberglass

Glass fiber coated PTFE which is accepted as one of the membrane materials with its durability feature is the most recommended material for residual projects. It is expensive comparing to others. The material that has a good light transmission provides perfect long term protection and resistance against pollution with mechanical resistance of glass fibers (Beccarelli, 2015). At extreme climate conditions, it is a long term building material convenient to buildings necessitating long span. It is less affected from environmental conditions and ultraviolet lights. With its fire-resistance feature and over 30 years proved working life, PTFE membrane material has a good durability. It's not molded and paled under the atmospheric impacts. It doesn't hold rain water on it via its self-cleaning features. Because of its rain impermeability feature, it can be used as a weather protection for long spans and big scale modules. It is a textile material that has been advantageous with its textile material protection, resistance against chemicals, super incombustibility, ultraviolet light resistance and light reflection features. It has a very high UV resistance (Krüger, 2009).

3.1.3 ETFE (Ethylene Tetra Fluoro Ethylene) coated foil

It is the most used coating material of today (Beccarelli, 2015). ETFE is a material that has high translucency, economic, easily applicable, and has the best features at high scale projects. ETFE based membranes can be used in two different ways such as single layer or ETFE foil pillows. Single layer ETFE provides low insulation, but light transmittance is (%95) more. They can be manufactured at any form and size. Adding ETFE foils to the material, light transmittance and solar heat can be controlled. Multi-layer ETFE pillows can

also be manufactured. Pillows are flexible with their geometric structure, and provides financial and energy conservation with their light-weight.

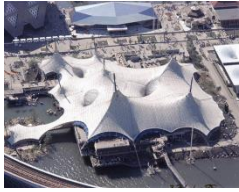



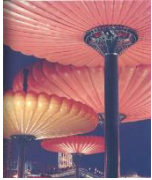


Not requiring advanced steel frames while applying ETFE material with its lightness and very similar glass look on long spans contributes to being frequently preferred at new buildings (Drew, 2008). ETFE material has mechanic feature and a good incombustibility (Beccarelli, 2015). It is a preferred material with its self-extinguishing feature. This type of textile material can be designed to provide compatibility and control against bright solar light, and patterns can be printed on to reduce the brightness. With its over 30 years working life, ETFE isn't affected from environmental weather conditions and pollution. Isn't faded or becomes embrittled in time, in turn, it shows that it is a long-lasting building material. Despite PVC and PVDF are a bit low-priced than ETFE and known better, ETFE is increasingly more demanded in construction sector because of the features it has (Krüger, 2009).

As the best known examples of ETFE material used buildings, Allianz Arena Football Stadium in Munich, Water Cube Olympic Swimming Pool in Beijing, and Eden Project in Cornwall can be counted (Drew, 2008).

3.2 Utilization Types of Textile in Architecture

Having various features and application potentials, textile is an important sustainable building material in architecture, especially for building shell. Textile materials are used for protection against weather conditions, optical protection, and privacy purposes throughout the history. When people adopted a sedentary life in time and started to construct more durable buildings, their utilization purposes became varied. Miscellaneous applications built in past have inspired the new, contemporary utilizations. Utilization areas of architectural textile on building and shell are given below (Table 1).

Table 1. Utilization of Textile on Building and Shell in Architecture

TYPE	SAMPLE	MATERIAL	FIGURE
Tent	German Pavillion at Expo 1967	PVC-coated polyester	
Pneumatic Structure	Tea House, 2007 Germany	PTFE	
Canopy	King Abdul Aziz International Airport Hajj Terminal, 1981, Saudi Arabien	Teflon coated fibreglass fabric	
Retractable Roof	Quba Mosque, 1987, Saudi Arabien	PVC-coated polyester	
Umbrella	Osaka 1970 Expo, Umbrella, Japan	PVC	
Exterior Curtain	Curtain Wall House, 1995, Japan	Curtain woven textile	
Curtain wall/Facade	Zenith Concert Hall, 2007, France	PVC	

4. Visual Interactions between Textile and Architecture

There is visual Interaction between textile and architecture by means of production and aesthetics, and they also share their technology and information. These two disciplines have inspired each other in terms of visibility and form throughout the history.

4.1 At Buildings and Forms

While effecting today's architecture on thought and shape by its utilization way, the textile which has been used as shelter cover since the primeval era also enabled obtaining extraordinary forms in architecture via performance features that were added to it. By the utilization of textile in architecture, it is benefited from the ability of material to create any type of free form. This provides a flexibility level that can be adapted to sculpture form or works of art (Heybroek, 2013).

An example to this is the work of sculpture of Indian origin English artist Anish Kapoor named "Marsyas" at Tate Modern Turbine in 2002. It was made by stretching PVC coated polyester textile membrane to three steel rings forming the frame like a skin (Garbe, 2008).



Figure 1. Marsyas Membrane [Url 1]

4.2 At Technology

By the development of fiber and emerging of smart textile and technical textiles, the textile material have been started to be used in architecture. Glass, ceramic, aramid, carbon fiber, liquid crystal polymer and polyethylene, along with PVC, PTFE and ETFE are being used in composite buildings, thus, they are enhancing the quality and performance of the building. Via textile, it is becoming possible to obtain forms that cannot be possible with traditional materials. The features such as shape, color and odor of smart textiles are being able to vary according to the heat, and the textile that has function of screening on building façade is becoming deflectable according to the angle of sun, to hour, and to weather condition. Printing applications are easily done on high performance smart textiles (Figure 2) (Tani, 2015).

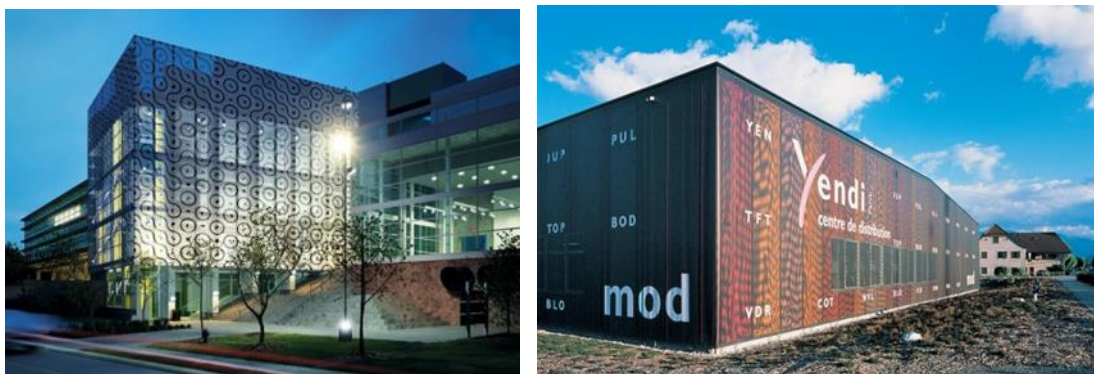


Figure 2. Facade print [Url 2]

4.3 Aesthetic

Textile and architecture are two disciplines that have inspired each other throughout the history. There are marks of architectural era and buildings at fashion parades done by fashioners such as Gianfranco Ferre, Paco Rabanne and Huseyin Caglayan who had architectural education. While the fashioners are preparing their creations, from time to time they adapt from eras such as baroque, gothic on their pattern and forms. Similarly, architects

such as Zaha Hadid, Frank Gehry have profited by the curled forms of textile on their buildings.

Draping or wrapping the architectural buildings with textile material the buildings were brought motion and aesthetic, and sometimes to get a message across to the public was provided. Reichstag German Parliament building was built in 1894, and has been the symbol of German democracy. By the works of artists Christ and Jean-Claude, 100.000 sq. woven polypropylene thick textiles have been dressed to the parliament building. The fabric which was specially woven for this project and exhibited for 14 days was two times more than the building surface. The curled structure of the fabric was used to emphasis the building, to make it magnificent (Figure 3) (Heybroek, 2013).



Figure 3. German Parliament Building [Url 3]

5. Sustainability in Architectural Textile

As a concept, sustainability is a phenomenon which doesn't consume itself and its environment while producing something, and which protects posterities' right to live and their habitat. This concept that gained importance after the world was threatened by problems such as environmental pollution, global warming, deterioration of ecological balance, and waning of water and energy sources, is important for all sectors. Main concerns of the textile used in architecture are:

- Recycling,
- Energy conservation,
- Necessary heat isolation
- Control of solar radiation (of gaining solar heat)
- Control of light transmission into indoor areas
- The best comfort conditions for the users in indoor life spaces,
- Resistance to self-weight, static snow load and dynamic loads (wind, earthquake, shock)
- Resistance to fire,
- Impermeability when wind and rain water are effective together,
- Control of vapor diffusion and vaporization occurrences,
- Noise insulation value,
- Ease of textile mounting and installation,
- Ease of cleaning and maintenance, (Motro, 2013).

6. On Textile Architecture Application Samples

The use of ETFE foil textile material on building shell of Eden Project in England, Water Cube in China and Alliance Arena Stadium in Germany has provided awareness in the world on both visual aspect and in sustainability issues.

6.1 Eden Project



Figure 4. Eden Project [Url 4]

Eden Project is a textile building which was built in Cornwall province of England in 2001 that features the largest greenhouse of the world. The purpose of Eden Project is to teach the vital relation among the flora, people and sources, and to direct them to a sustainable life by encouraging individuals to this. The “textile shell building” made with ETFE material aiming to draw attention to the copula between human and plant ecology, is placed like a chain of soap bubble on to the land 8 crossing domes having 18 to 65 meter radii (La Cuyer, 2008).

Material’s high level elasticity has provided the most excellent realization of extraordinary shape of greenhouses and perfect heat isolation. Holding the air between two layers of ETFE, Hexagonal pillows on the top of steel construction in biome to keep the plants warm features a good isolation material. When Eden building was designed, it was thought that double-glassed domes as structural elements wouldn’t be that much sufficient to fulfill the need to have the highest transparency, thus, ETFE foil which is 100 times lighter than glass is used and the transparency of this material made gathering more light and heat possible (Heybroek, 2013).

The improved isolation features of ETFE significantly reduce the necessary energy to heat two biomes. This recyclable material also helps to keep indoor hotter in winter and cooler in summer (Drew, 2008).

6.2 Beijing National Aquatics Center (Water Cube)

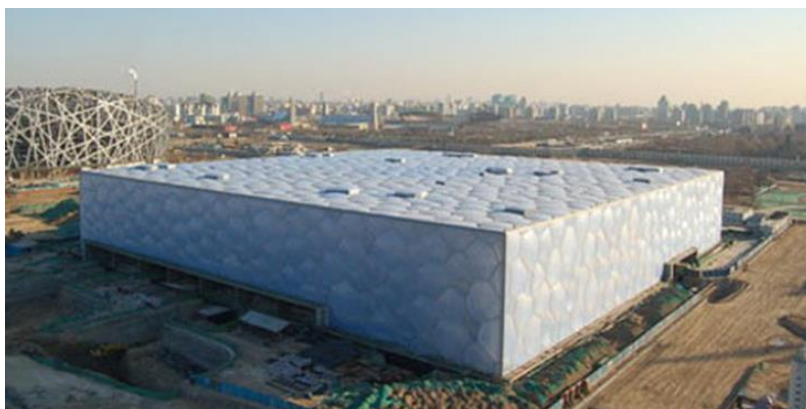


Figure 5. Water Cube [Url 5]

Water Cube building built in Beijing in 2003 is another important example to new generation buildings that have used ETFE air pillow systems just like it was in Eden Project to raise the efficiency to the highest level. Despite its brittle in appearance, it is ideally rationalized to seismic conditions at Water Cube building in Beijing, and it is seismically the most resistant building in the world (Le Cuyer, 2008).

To wrap inside and outside of the building, four thousand ETFE cells were needed (total of 100,000 sq.). ETFE has special features such as semitransparency, high radiation absorption and low UV absorption. Foil provides more light go inside and is a better isolation substance than glass. Coefficient friction of the material prevents dust collection process, cleans itself at every rain, and is more resistant against corrosion effect of solar light. Since airbags also function as sound absorber, this feature provides a significant benefit in terms of the noise created by the pools inside (Gonchar, 2010).

Semitransparent and recyclable ETFE panels provide visual comfort and visual connection with good illumination of the center via sufficient light level throughout the day. Passively heating the building and pool water, and converting the building to a magnificent glasshouse, double shell provides up to %30 saving comparing to high heating costs of indoor water sports centers. Water Cube holds %20 of the solar energy the building receives, consequently, reduces energy consumption at the rate of %30. The coating, with successive savings up to %55 at energy usage, also provides a good illumination of indoor during the day (Le Cuver, 2008). Double layer façade has three different climatic operating modes. During temperate mid-season, the air is let inside by opening the vents in skin. Fresh external air enters in through the outer skin, preheated by the sun in the cavity between skins, and then fills into the pool areas. During summer, when there are hot and humid conditions outside, internal air vent kept closed. Air cooled by passing over water around the building's perimeter enters the cavity through a 1 meter high bank of vents, heats up, rises and is exhausted by roof vents. In

winter, both skins are closed to achieve zero heat loss through infiltration, to maximize thermal performance. To reduce daily and seasonal temperature alterations, the heat flow of the pool water and the concrete pool and building structures are utilized to absorb the sun's heat during the day and radiate it at night. By virtue of its permeability, the building is substantially illuminated by natural light, and illuminating cost is reduced in half (Moolman, 2007).

6.3 Allianz Arena



Figure 6. Allianz Arena Stadium [Url 6]

Allianz Arena that its construction was completed in Munich in 2005 is the largest football stadium having the biggest textile (membrane) skin (İtkib, 2005). In the shell of the construction 2.874 diamond shaped pneumatic ETFE textile foil (pillow) are used. Both to protect the audience against possible external damages, and to make use of solar energy most efficiently, inflated ETFE pillow is used on roof and façade (Orhon, Altın, 2014).

There are light effects illuminating the entire building at Allianz Arena. ETFE foil is programmed to reflect the colors football teams which are using the stadium by illuminating with red, white and blue colors of home football teams (Bayern Munich and TSV 1860 Munich (Jeska, 2008).

To create the light show more than 4000 energy saving LED lamps are used. Digitally controlled LEDs provide %60 energy saving and 362 tons of CO₂ savings comparing to traditional illuminating methods.

0.2 mm thick ETFE membrane with %93 light transparency used on roofs and façades make the solar light available for the lawn in the building. To provide shadowing for the audience, the pillows are either transparent, or printed according to the location of the area. The horizontal tents extensible when necessary provide additional support for solar protection (Le Cuyer, 2008). Partly retractable tent system is equipped both with reflection and noise absorption features to cope up with solar radiation. ETFE membrane is fire resistant and has self-cleaning feature. Maintenance costs are less comparing to traditional construction forms (Flett, Schelbert, 2009).

7. Conclusion and Evaluation

In this paper, choosing architecture and textile that affect each other, the relation between these two separate fields. Today textiles that are produced with technical and performance features they have along with their aesthetic and decorative features have found an immense opportunity to use in architecture and construction sector.

The utilization types of textile made of enhanced materials are tent, pneumatic building, canopy, pleated roof, umbrella, parasol, outer curtain and shear wall/façade. With the utilization of textile in architecture it has been possible to give any type of free form to the building, an identity has been brought to the buildings by the help of technology, different appearance from other buildings have been provided to them. Aesthetically the textile makes the building one of a kind by rendering it attractive.

Three samples concerning utilization of textile based material on shell design in architecture are studied in the paper. These are Eden Project in Cornwall/England, Water Cube in Beijing/China, and Allianz Arena Football Stadium in Munich/Germany. The forms that are

unrealizable with traditional materials have been implemented easily with these ETFE textile materials used on shells, roofs and lateral walls of these buildings. They have many favorable feature such as being recyclable, having very good insulation feature, reducing energy need by making use of optimum solar energy, fire resistance, self-cleaning feature, necessitating less maintenance cost comparing to traditional buildings. Unique worldwide samples composed by textile materials intensively used with these aspects attract millions of tourists by carrying brand value, and become the symbol of the city they situated.

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An Actor-Network Theory (ANT) Research in the Context of Building Production: Istanbul International Financial Center BDDK Building

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Abstract

Actor-Network Theory(ANT) has been suggested by Latour in 1980s as a criticism of classical sociology. ANT is an interdisciplinary methodology that handles the heterogeneous rallying of human and non-human actors' relationships, their effects to each other within a non-technical network and their on a par affects to network. ANT can be applied to all disciplines with collectible data regarding a study, given ANT's ability to analyze the network and estimate the success of a project. Architecture discipline is suitable for applying ANT, since the network includes both human actors and non-human actants such as documents, materials, etc.

This study aims to explain how various factors such as building production tools, legislations, user requests, contracts between contractors, architects, employers and other actors can alter and shape relationships within a network, by applying the ANT.

The main source of problems in the process is each actor's desire to manipulate relationships for its own interests. It is possible to reach the targets regarding administration, planning and finance with risk-mitigating and predictable building production processes. As increasing complexity and rising number of actors brings along new risks to building production, ANT aims to foreshadow possible risks in the process by interpreting the relationship between actors. Within this context "Istanbul International Finance Center-BDDK Building Project" has been studied as research object due to its multi-actor, dynamic, large scale processes. For this research, interviews had been conducted with actors of the process in order to understand

their approach to process and general state of affairs, documents had been studied and an actor-network had been mapped out. In conclusion section, the interaction of actors and actants, their influences on network and the risks has been discussed with the help of mapped actor-network.

Keywords: Actor-Network Theory (ANT); Black-Box; Actor-Actant; Building Production

1. Introduction

In present conditions of Turkey, the value of real property of the structures serving for diversified functions (shelter, health, education, commerce, culture...) comes from their prestige value rather than their value of exchange. By 2000, several developments took place that had impact on building production mechanisms particularly in large cities like decrease in volume of urban land stock, shift in high income group's investment and housing preference from apartments to housing estates, emergence of new life styles that arise the need to combine sheltering function with multiple functions, which eventually lead to mix-use projects becoming popular. This new building production mechanism surfacing in Istanbul like the other large cities of the world has led to widespread of major mix-use projects that started taking place of production of single function buildings, and on the other hand it has led to commodification of urban land, transforming these lands into most significant real estate investments, thus turning the city's into an investment area where all kinds of structures are perceived as an economic value.

And it has become the primary objective of the state to ensure economic growth by developing regulations that fully support the production of buildings as a means of raising funds for construction investments. This position is crowned with a series of facilitating legislative regulations and mega projects thanks to the government that set its 2023 vision as great economy, a strong society, advanced democracy, habitable environment and trademark cities. In this respect, major projects developed by the government like 3rd Airport, 3rd

Bridge and access roads, Marmaray, Istanbul Park, Istanbul International Finance Center(Ataşehir)(IIFC) and Kanal Istanbul basically brought with them the attainability of other projects, hence numerous investment opportunities.

2. Objective

Uncontrollable rise of the construction sector(with the support of the state) considered as the locomotive of economy, expansion of building scales, complexification of design and implementation processes; thereby involvement of almost infinite number of actors and actants in the process(contracts, materials; and even aesthetic, ethical, commercial, technological, social factors etc.) and dynamic interaction of all living-non-living actors, which lead to modification and transformation of the process itself, can become obstacles impeding the completion of the projects according to cost and time planned. This more complex relations of actor-network in the building production process cannot be studied only on basis of the relations between the actors, it is also necessary to make detailed analysis of both the relations of the actors with one another and with actants (non-human).

Within this context Actor-Network Theory (ANT) is the tool for demonstrating the network of associations among heterogeneous components that exist together, that can be changed and combined, in other words ANT is the sociology of associations, not the sociology of social.

In other words the purpose in the theory of ANT is the amalgamation of human and non-human components (not humans contrary to classical sociology).It is believed that when using ANT, it is possible to go back and correct mistakes whenever required or to continue until the correct result is achieved in cases when mistakes are not realized. Also when analyzing the relations between human and non-humans and the effects of these relations, it becomes possible to make sense of the conflicts that arise and the consensus reached.

Thus the desired level can be attained by determining the degree of change the actor and actant makes in many areas like planning, finance and management through projects that

anticipate and mitigate the risks and that facilitate the process by overcoming risk factors such as dynamic and complex relations in today's complex building production processes which involve multi actors and materials, revisions, the obligation of the actors to work together; difficulties experienced in sharing of information.

Especially the transformation experienced in building production in the last decade and the fact that projects are getting more complex makes ANT an essential. Despite all the complexity of the construction process, ANT brings numerous benefits; however considering the lack of sufficient resources and awareness in the field of building production and architecture, this study aims to lead the way to further studies and construction practices.

3. Scope

In addition to the literature discussing the ANT in conceptual frame, this study attempts to clarify how this theory can be implemented in practice. Within this context, it was aimed to set up the relations of actor-network between the actors and actants involved in the "Rough-Construction" phase throughout the entire production process of BDDK Building within the scope of the state supported mega project, Istanbul International Finance Center(IIFC) project. IIFC BDDK Building was chosen as the topic of this study since the project involves multiple actors and the processes are composed of extremely dynamic phases.

Within this scope, interviews were made with actors that had active roles in this process, all actors-actants having a part in each process were listed in line with information shared and correspondence-documents collected, and understanding what has been experienced throughout the process, the factors that were effective in decision making were ascertained.

This study sets forth how the actor-network mapped with the data compiled under sections stated below, and how this network can be used to analyze the associations between actors and actants;

- i. Determining the basic concepts of ANT(actor-actant) in terms of real persons-entities involved in a project,
- ii. Demonstrating actors-actants' roles as identifiers and transformers in the process of building an actor-network,
- iii. Overcoming these challenges using ANT and determining and finding solutions for risk factors(problems)

4. Problems

The goal in building production is to finalize a project in planned time and the level of quality desired, using the resources required. Considering especially the developments in the sector during last decade, we see a quiet complex structure due to involvement of multiple participants from various disciplines (architecture, engineering, procurement, contractor, designer, bankers, consultants, politicians, economists) with different perceptions and knowledge. There is a direct relation between the increase in number of participants (multi-actor) and problems encountered in the process.

While resources used and persons involved in the process(actors and actants in terms of ANT) impact the decisions being made, these actors and actants vary according to the quality and size of the project (in other words: unique). Participants to be included in the project in accordance with the objectives are directly or indirectly affected from the success or failure of project, and they eventually affect the project. (Tuna 2011)

In area with so many ambiguities, as each different actor believes in fighting its own corner so does various risks, disagreements and conflicts arise in project processes with multi-actors. Both the actor itself and other actors are affected and changed by unique risks inherent in each project. It is possible to minimize and even eliminate these kinds of disagreements and conflicts using ANT. When we go through theses, articles and other resources within last decade in this respect, while presenting the relations in building production, there are actors

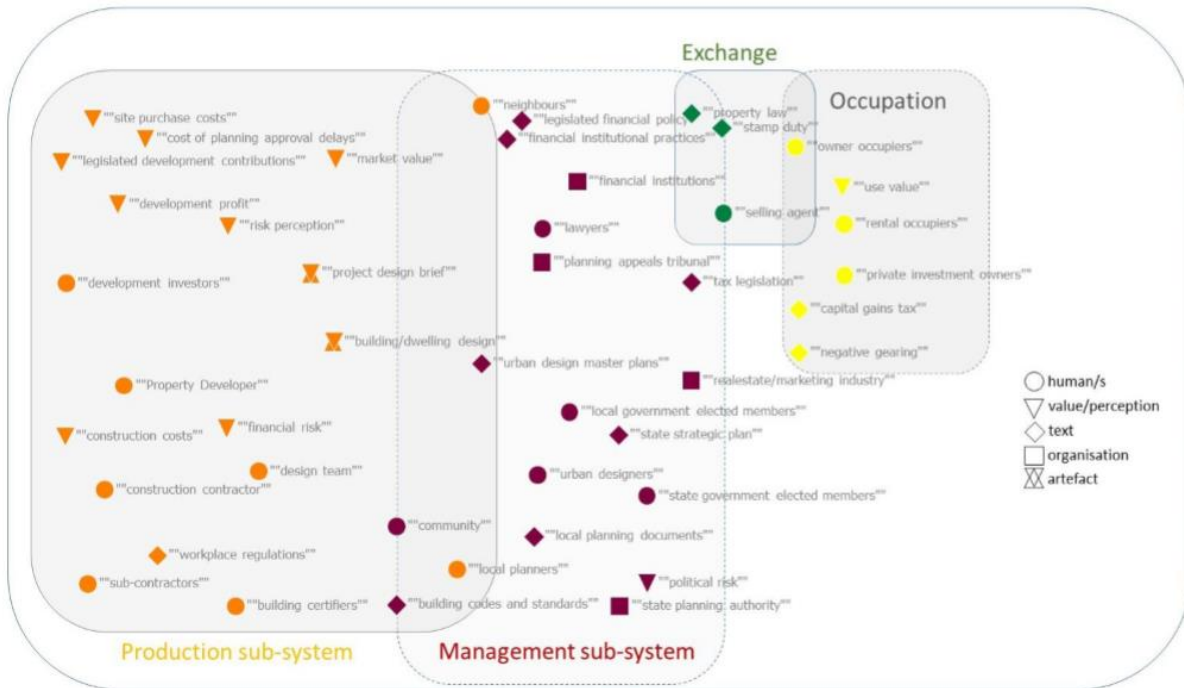
that play a part in the process encounter with below risks.(Problems are listed in Table1;Annex1 can be reviewed for details of how problems handled in resources).

Table1.Problems encountered by actors in building production according to resources in last decade (Developed by Author).

PROBLEM/RESEARCHER	AMANI SULIMAN BU-QAMMAZ	GÜRSEL GÜLER	DENİZ İLTER	GÜL BAŞAK ÇEBE	NUR ATAUL	BEGÜM SERTYEŞİLİŞİK	BARİŞ KAPLAN	TUĞBA PAŞALI TUNA	MEHMET ZEKİ PESTİL	SELİN MERSİNKAYA	HAKAN KUŞAN	GÖKÇE DENİZ GÜL	KATHLEEN M.J. HARMON	SİBEL AKDOĞMUŞ	DOÇ. DR. E. TAŞ&Y. ARICI	E.KATERİNA OSIPOVA A & PER ERIK ERIKSSON
Employer	X		X	X	X	X		X	X	X				X	X	
Adviser Firm			X												X	
Designer				X												
Third Party	X		X												X	
Engineer / Architect						X		X	X	X					X	
Contractor	X		X	X	X	X		X	X	X				X	X	
Sub Contractors	X		X	X	X	X	X	X	X	X				X	X	
Supplier			X		X		X	X	X	X					X	
Consultant				X				X	X	X						
Client			X						X							
Building Inspection Authority									X							
Financial Provider								X								
Education Committees / Universities								X	X							
Socio-Cultural Differences		X	X	X			X								X	
Team Spirit			X									X				
Labor Force / Staff	X		X	X	X	X	X						X		X	
Communication		X	X	X								X	X		X	X
Project Management			X	X	X				X	X				X	X	X
Construction Process		X	X		X		X				X			X	X	X
Due Date			X		X								X		X	

Working Schedule	X			X			X							X	
Economical / Financial	X	X	X		X		X				X		X	X	X
Materials / Machines	X	X	X	X	X	X	X		X				X		
Design / Details / Project	X		X	X	X	X	X	X			X		X	X	X
Technology		X			X										
Environment	X	X			X		X				X				X
Site Conditions	X	X		X	X									X	
Access to Site	X		X												
Weather Conditions	X		X	X			X				X			X	
Force Majeur	X	X	X	X		X	X				X		X		X
Risk Diversification / Responsibility			X			X						X			
Accident / Security / Insurance	X			X		X			X						
Approval Delays	X		X	X		X	X						X	X	
Political Developments / Municipality	X	X			X		X		X		X				X
Codes / Legislations / Legal System		X	X	X			X		X		X			X	X
Regulations	X														
Commitment														X	
Bid (Documents)			X				X							X	X
Specifications			X	X			X		X			X		X	
Contract	X		X	X	X	X	X					X	X	X	
Documentation			X												
Quantities	X														
Inflation / Rate Fluctuation / Tax Increase	X			X											
Cash Flow / Progress Payment	X		X	X		X	X					X		X	X
Market Conditions							X								
Job Definition and Content	X		X			X								X	
Unreal Expectations			X									X			
Cost			X											X	
Revisions	X		X	X		X						X		X	
Quality / Standarts	X		X	X		X	X					X		X	
Compensation				X											
Controversy						X									

It is possible to say that listed risks are determinative and transformative among actors and actants that play a role in building production and they have equal impact and action. All these factors are included under 'Black-Box', which is one of the basic concepts of ANT where all components of the system can be analyzed without making distinction between human and non-human. The relations of all actors with actants and the effects of these relations are examined. Understanding the complexities and the roles of actors-actants in the process it is possible to restructure and revise the process. In this respect Palmer has tabulated risk factors in the process as follows. (Figure.1)

Figure1. Risk factors for various processes in the building production (Palmer 2014).

5. ANT in terms of Building Production

ANT is a concept originally used in sociological researches. Along with its use in various fields like medical science, economy, information, recently ANT has come into use in architecture and urban design. The foundations of the theory were laid by Latour, Callon and Law's studies on science, technology and society in 80s. However to our regret, most Turkish resources on ANT in the field of building production and architecture are the result of urban scale studies and remain only as theoretical information. For this reason, in Turkey, awareness on this method and its application is so little to mention. Seçilmişler & Yenen (2011), Çelikel (2013), Geçkili (2015), Gündüz (2014) are the few names in our country who studied this topic.

According to Law, even though of ANT included the word "Theory" in it, this concept can be regarded as an approach or a method of analysis. Sociology defined as science of society is the scientific study of society, but ANT (as the title of Latour's book on this subject states) can

be considered as 'Reassembling the Social'. ANT explores the stabilized relations. ANT is a criticism of social science studies and an action taken to complete shortcomings.

Under its book with the title of Reassembling the Social, Latour (2005) refers to the word social in respect of ANT as associations and defines classic sociology as 'Sociology of Social' and ANT as 'Sociology of Associations'. It emphasizes that these associations seen in ANT exist between human and non-human. Appaduari says objects are also a part of social network just like humans and that this network can be shaped with the associations. Latour (2005) expresses that social sciences tracks the traces of only a single social bond whereas contrary to classical sociology ANT explores many bonds together with human and non-human.

In this sense, contrary to modern philosophy, ANT claims both humans and non-humans determinative and at the center of everything in theory.

So it is clear that ANT is not a term used in architecture and building production, and according to Latour, ANT arises from societies not being diluted(heterogeneous) nor strong(homogeneous). For Latour and Law, human and non-human actors are the focal points of ANT, and they define ANT as a heterogeneous network. These associations (connections) between the actors and actants form the network;also network and actor/actants form the Black-Box. At this point it is important to keep in mind that the word 'Network' is different from the word 'Technical Network' used in engineering and ANT explores the social relation between the entities. The most important quality of ANT is that it can address humans (actor) and non-human (actants) within the same network. According to Latour, methods, new associations can be observed whereby all entities are applied by monitoring all these actors and actants.

5.1 Actor Network

Network is addressed as a series of nodes created by these actors; these nodes are connected to one another via networks and these networks can be integrated with new nets and expand infinitely.

Actors and actants within the network should continuously strive to maintain the current status of networks and to transit to new statuses. Therefore actor and actant must influence the network and definitely make a difference. According to Latour, some new actors will become part of the network while some leaves the network during the discussion and alliances that arise until the systems are balanced. These discussion and alliance processes experienced may originate from human and non-human. Law suggests that by analyzing all elements of the system without making distinction between human/non-human, it is be possible for all disciplines to use ANT, whereby the researchers can obtain all studies made in this respect

Architecture may be included within the scope of ANT as well since the actor-network is not composed only of humans but also of non-humans like artefacts (contracts, laws) Also these artefacts shape the network and have a determinative role. For all these reasons stated, the necessity to use ANT comes from the fact that challenging drivers like continuous information sharing, revision of studies and complex processes are at the same time the consolidating drivers.(Adam, A.&Gluch,P.& Julin,J.2014)

As non-humans like artifact drivers are part of the network in design applications, trying to find a solution with the help of ANT will make it possible to resolve problems experienced in this complex process. To understand the function of actor-actant in terms of ANT in building production, it is necessary to observe whether this actor-actant has influence on the other participants.

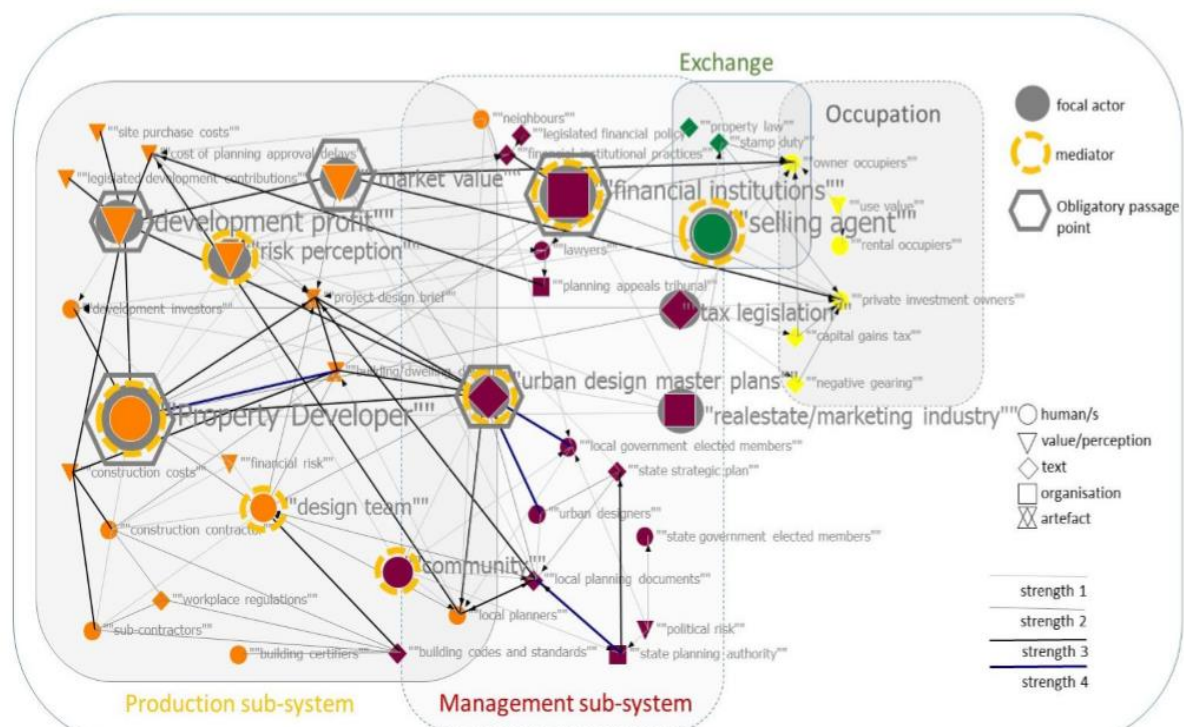
It is assumed that all entities that are human(architect, engineer, designer) and non-human(technology, materials, machinery) have equal action. Mahmoud(2015,p.7)

According to Callon, buildings are not totally products of architecture, many actors-actants are also involved in production process.

Adam and et.al(2014) suggest that structures are not just the result of works of a good designer, also the result of the relations to be established with a human/non-human society. Within this scope Latour states that artifacts may be designed to replace humans. These artifacts may be changed with actor's actions and decisions. However problems may be experienced as each actor tries to protect it's own interest. Therefore without making any hierarchical pre-assumption about the members of network, we need to check associations that these members establish with other members.

Palmer(2014) includes the factors like delays,financial risk, construction cost, contractor, architecture, engineer, public, political risks, in the actor-network mapped.

Figure2.Actor-Network in Building Production Processes (Palmer 2014)



According to Seçilmişler&Yenen(2011), ANT is explanatory theory, especially in the production process of disordered structures. ANT may help understanding the problems among groups, and any conflict and settlement of these conflicts, which arise since each different actor tries to shape the relationship based on its own interest.

6. Network Participants: Actor/Actant

According to Black-box, networks determine the relations between actor and actants.

Network: Association(relation-connection) formed

Actor: Human entities that effect the network(e.g.manager)

Actant: Non-human entities that effect the network.(As actants become part of the network, materials do no longer cause a problem and are considered as equal with the actors(human). Accordingly it will be possible to examine how relations of actor-actant are shaped and changed) (e.g.:contracts, all artifact objects)

While emphasizing in theory that objects are not different from humans; it is also highlighted that artefact, i.e. human made things (e.g.laws) can replace actions. This way, non-humans can perform equally, in other words humans are not superior to other objects. In this respect; the main question here should be 'Whether the actor has any effect on the action of another actor'. In short the actor is the actuator. ANT is a theory that explores which consequences cause these interactions (being influenced by other things) and what kind of effect these interactions have. The important thing here is to observe (objectively) how something progresses.

7. Black-Box

Black-box is formed by stablyzing the actor-network for a while. This helps understanding the roles of actors in the network and the complications experienced. Also as errors arise in the network of complex social relations, feedbacks on network may be possible to reach desired level in various topics.Some figures who worked on ANT specify that the color of the

network is directly proportional to the strength of the bond between the elements in black-box.(Figure.2)

According to Latour there are many inputs-outputs and unknowns in Black-Box. At this point Yaneva and Heaphy states that these actors which exist in the network must expedite the process over the network and among each other or must make differences like changing their opinion on a specific issue. Nevertheless all actors are equally accepted to the network without bias.Latour emphasizes that the act of "Opening the Black Box" helps to understand which actor-actants' influence shapes the products produced during this process.

In building production, Black-Box can be interpreted as the actor's communication with the outside world during the process. Opening of 'black box' can be specified as the act whereby other participants(actor-actant) take into consideration the actor or actant factors included in the process like employer, designer, specification, contract, progress payment and revise the processes based on these factors. This way it may be possible to achieve facilitating, foreseeable and risk mitigating processes.

Palmer (2014) lists these actors that exist in the black box as contractor, architecture, engineer, political risks, private investment owners and local authority policies. (Figure.1)

When we list all the actors in the black box for the building production, we see that they are extremely compatible with the risk factors. And in our field survey we tried to opening this black-box.

8. Field Survey:BDDK Building

In the meeting of Council of Ministers dated 17.01.2012 the decision for Istanbul International Finance Center(IIFC) investment was reached(the meeting held with participation of Deputy Prime Minister Minister of Environment and Urbanization, Chairman of TOKİ(Housing Development Administration of Turkey), Emlak GYO General Director and president of other institutions specified). Accordingly it was stated that within the scope

of IIFC there will be the buildings of Vakıfbank, Halkbank, Ziraat Bankası, BDDK, IMKB and SPK. Following this meeting, a 4-year IIFC Preparation works phase took place and upon completion of the preparation works, in October 2016 started the construction of BDDK Building, which we used as basis in our field survey. The completion date for construction works of all buildings of IIFC is anticipated as 2020. BDDK Building, is one of the building within the scope of IIFC, and the construction site is 127,809m². The 28-floor building constructed over 7-basement floors is located in the city of Istanbul, county of Umraniye.

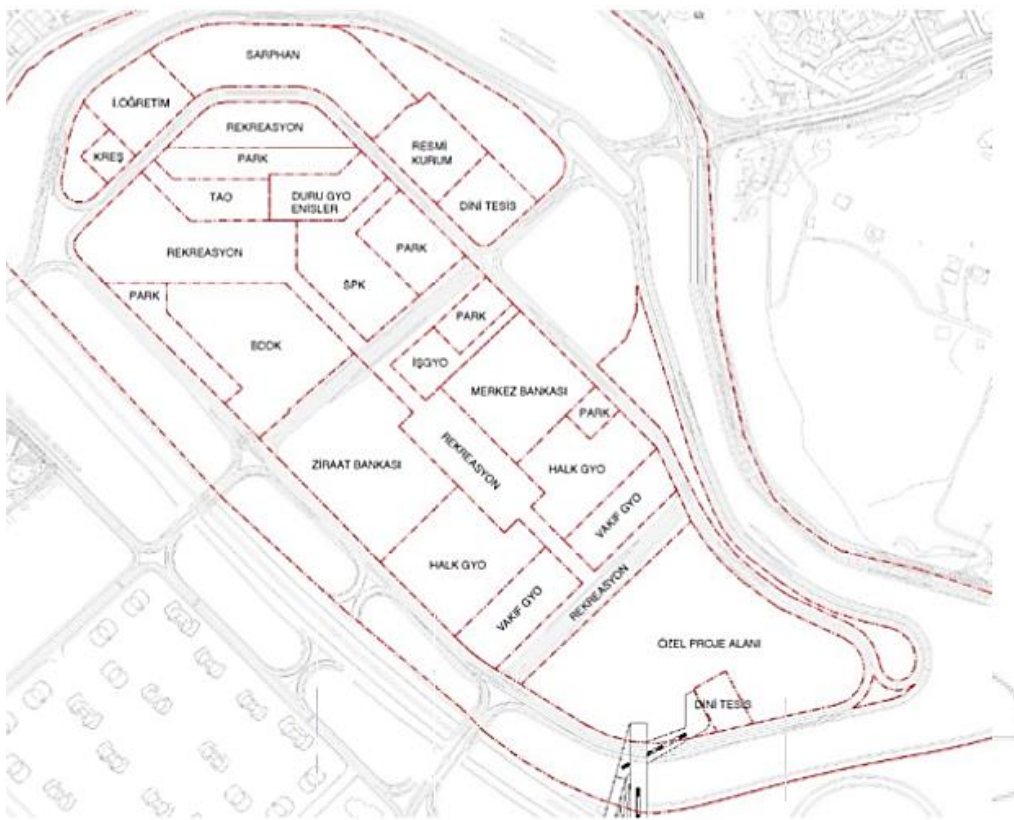


Figure3.IIFC Layout-plan(ARUP)

It is believed that due to following reasons BDDK Building has ideal data regarding mapping networks in terms of ANT:

-there are multi-actors(the Prime Ministry presented the main theme, the project is shaped according to requirements of BDDK, the building is constructed with the partnership of the state-private sector.

- numerous laws, institutions, actors, materials and various systems are involved in the process
- it is a large scale mixed-use project
- composed of many detached sections
- a mega project
- revised frequently
- complex processes

8.1. Method Applied

Following the literature research, a field survey was organized and interviews are made with YDA İnş. San. ve Tic. A.Ş.(Contractor-actor) employees who played an active role in the process, and general information was collected about the general situation, approaches in respect of the project, factors that affect decision changes and the processes carried out. Data were collected and correspondences between individuals, institutions and companies were examined. Following, we tried to map an actor-network with the help of these data.

- i. Tables were prepared about the work items, actor-actants that took part and the documents required to be followed; and the actants were represented with vectors.
- ii. Subsequently an actor-network is created in the clearest way possible.

8.2. BDDK Building Investment Decision

Regarding the BDDK Building, for which field survey was carried out, on 18.03.2017 and 25.03.2017, interviews were made with BDDK Building Project Manager-Civil Engineer Fethi Evren Oytun (actor) and Deputy Project Manager-Master Architect Ahmet Emre Başar(actor) from YDA İnşaat(actor). In interviews, information were collected about BDDK Building investment decision, tender process, design and construction process. In addition to these informations that company shared (specifications, contracts, projects, reports, guides, organization chart). Later again on 15.01.2018, 18.01.2018 and 22.01.2018 interviews were made with DPM M.Arch Ahmet Emre Başar (actor) about items of work and documents were

handed out on 16.01.2018 and 19.01.2018. At this point it would be useful to mention that the actor-network is created according to the information disclosed by the company and it is perfectly natural that there may be documents forgotten or missed out.

In the Council of Ministers (actor) meeting, the decision of investment was reached for (IIFC) located in Istanbul-Ataşehir, promoted as ‘Mega Project’, and all design criteria (actant) for the buildings within the scope of IIFC were determined. In this meeting, locations of each buildings are determined by Emlak GYO (actor) protocols and the PROJECT COORDINATOR is appointed to ensure completion of work on time and EMPLOYER is assigned to prepare the concept projects (actant) of IIFC.



Figure4.IIFC Concept Project Image(ARUP)

Along with this, since the parties who will own the buildings of public institutions at IIFC are not specialized in the business of construction, TOKI (actor) was appointed for the construction of the buildings of these institutions according to concept projects determined by EMLAK GYO. Following this, TOKİ put out a tender as the EMPLOYER-ADMINISTRATION for each public institution building and has contracted (actant) with various construction companies. At the end of the tender process EMLAK GYO (EMPLOYER-actor) has selected ARUP (actor) as DESIGNER for IIFC concept project and AKDENİZ İNŞAAT (CONTRACTOR-EXCAVATION WORKS) (actor) was awarded for of all IIFC Land Preparation. AKDENİZ (actor) subcontracted ERGÜ (SUBCONTRACTOR-actor) for excavation works and TERRA (SUBCONTRACTOR-actor) for revetment works.

(Normally rough-construction process are carried out by the same employer, so the land preparation process made in advance is an exception for this project)

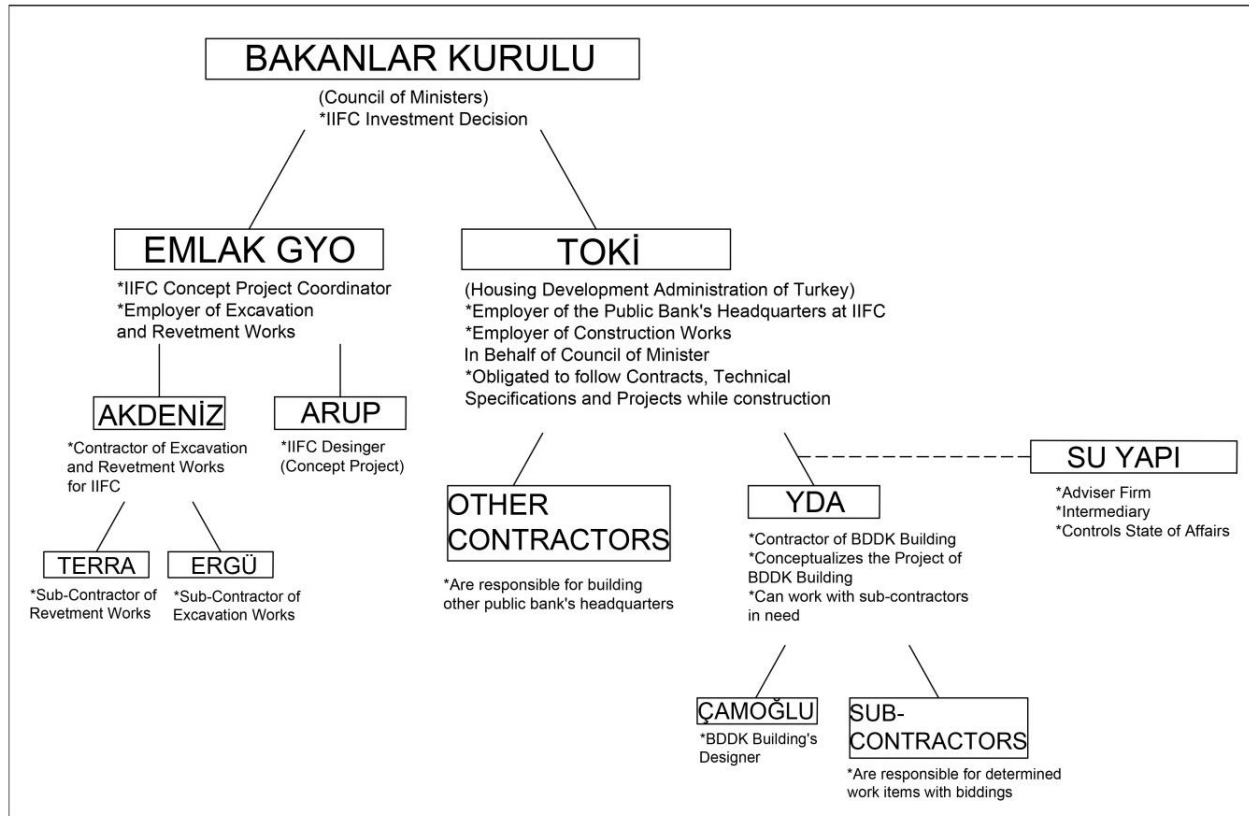


Figure 5.IIFC Investment Decision and Organization Chart for Tender Processes (Developed by Author).

YDA (actor) was awarded the tender for the BDDK Building.

'It will be easier to handle the subject by considering BDDK as the user of a state-owned building, instead of treating BDDK as the employer.' TOKI (actor) is the employer in the construction process.' (A.E.Başar, Voice Call, 25 March 2017)

YDA (Contractor-actor) is responsible for preparing the project (actant) for the BDDK Building pursuant to design criteria (actant) set forth under the concept project (actant), for obtaining approvals-permit (actant) and for meeting the tender conditions (actant) pursuant to the Specifications (actant) prepared by TOKI (actor) and for completing the construction within the time set (actant).



Figure6.Image of BDDK Building (ÇAMOĞLU MİMARLIK)

After tender, Su Yapı (actor) was appointed as the Adviser Firm to ensure the communication between TOKİ (actor) and YDA (actor). As the BDDK Building is a state owned building, there will not be an extra Audit Firm (actor) like there is in a normal project.

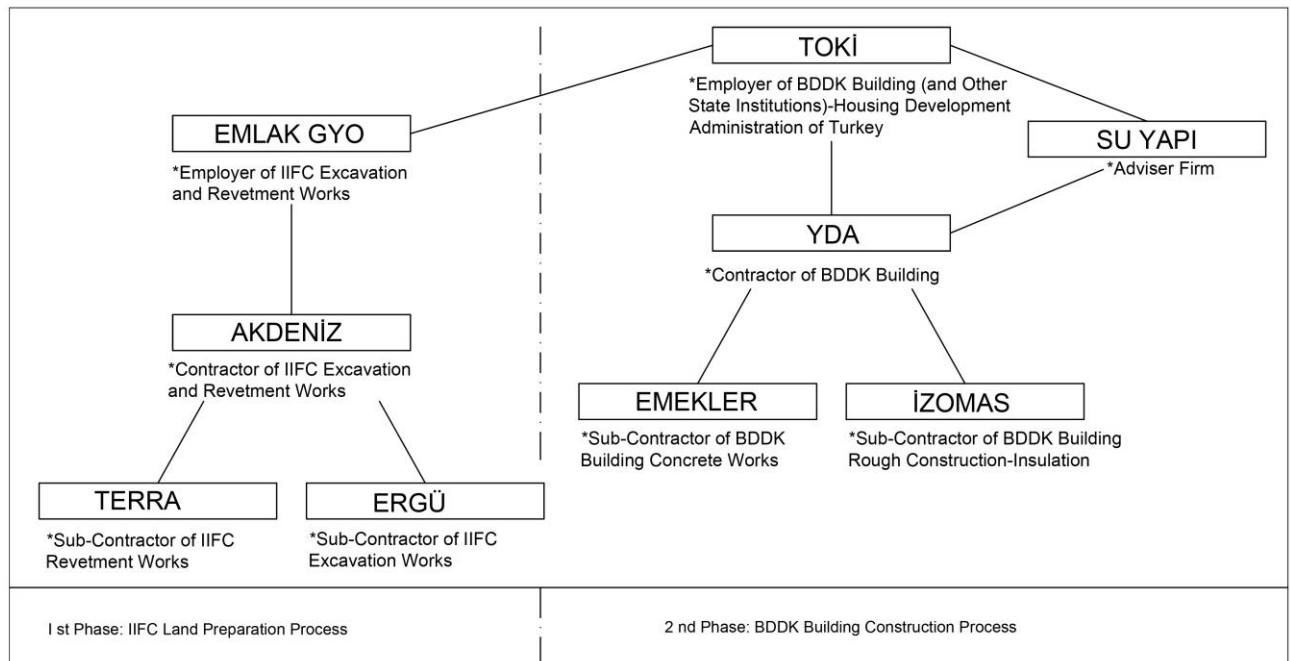


Figure7.BDDK Building Rough-Construction Organization Chart(Developed by Author)

8.3. BDDK Building Design Process & Permit etc. Approvals

YDA (actor) made an agreement with Çamoğlu (actor) as Designer. (At this point Çamoğlu (actor) is responsible for architectural design according to the concept project

prepared by ARUP on behalf of Emlak GYO. Also, who is responsible for designing the project starting from obtaining the permit to implementation of the project on behalf of YDA). Furthermore, advisers stepped in whenever required during the design phase.

The relevant project were made to check compliance of the project with main design criteria and the concept project by TOKI (actor) and Emlak GYO(actor).

Also, Ministry of Environment and Urbanization Committee of Aesthetics (actor) checked the compliance of the project to Building Law (actant).

Soon after this, the relevant municipality (actor) granted the building permit.

Subsequently YDA (actor) selected the materials pursuant to the Technical Specification (actant) prepared by TOKI and the Approved Construction Drawings.(actant)

8.4. Construction Phase

Since the building is within the scope of IIFC, YDA(actor) specified the BDDK Building construction phase work items for the Rough-Construction work of BDDK Building where excavation works had been carried out in advance(this is an exception for this project). Some work items were completed by YDA(actor) and also subcontractors(actor) were assigned for the construction of approved work items(At this point it should be kept in mind that due to uniqueness of each project or due to reasons like urgency, disagreements or expertise requiring works, different actors-actants may be required for each work item, and sometimes these actors may be responsible for more than one work item as is due under the contract and specifications or vice versa multiple actors may be responsible for one work item. Contracts signed by YDA(Contractor-actor) with Subcontractors cover all Technical Specifications within the scope of contracts that TOKI(Employer-actor) signed with YDA(Contractor-actor).(As work items are performed by way of subcontracting)

9. Mapping Actor-network during Rough-Construction

We tried to explore the 'Rough-Construction' stage of the BDDK Building, the subject of the field survey, in terms of Actor-network Theory. The reason why only one stage of the project is explored is to reflect the most simplified form of the 'Actor-network' which is a highly complex structure. For this purpose actor-network is built based only on documents; actants like materials, interviews are not included in the network. As can be seen in Table2, work items of Rough-Construction stage, actors, documents(actant), that regulate the relations between actors, all specification-norm-standards(actant) included in documents are listed.

Table2.BDDK Building Rough-Construction Work Items, Actors-Actants (Developed by Author)

ROUGH CONSTRUCTION						
IIFC Land Preparation Process		Work Items	Actor	Document	Specifications / Norm / Standard	
BDDK Building Rough Construction Process	Excavation Works	Revetmant	*EMLAK GYO (Employer of Excavation and Revetment Works) *AKDENİZ İNŞAAT (Contractor of Excavation and Revetment Works) *TERRA ZEMİN (Sub-Contractor of Revetment Works)	•IIFC Soil Investigation Report *IIFC Design Guide •IIFC Reports for Engineers *Contract of Revetment *Contract of IIFC BDDK Building	•Technical Specifications of Geotechnical Desig Criterias •Guide of General Directorate of Highways •TSE	
		Excavation	*EMLAK GYO (Employer of Excavation and Revetment Works) *AKDENİZ İNŞAAT (Contractor of Excavation and Revetment Works) *ERGÜ HAFRİYAT (Sub-Contractor of Excavation Works)	•IIFC Soil Investigation Report *IIFC Design Guide •IIFC Reports for Engineers *Contract of Excavation *Contract of IIFC BDDK Building	•Performance Based Design Regulation for High Rise Buildings in Istanbul •General Specifications of the Construction Affairs	
	Concrete Works	Reinforcing Bar	*EMEKLER (Sub-Contractor of Concrete Works) *YDA (Contractor of BDDK Building) *TOKİ (Employer of BDDK Building- Housing Development Administration of Turkey) *SU YAPI (Adviser Firm)	•Structural Design Criteria Report •IIFC Reports for Engineers •IIFC Soil Investigation Report *IIFC Design Guide *Contract of Concrete Works *Contract of IIFC BDDK Building *Advising Contract of IIFC BDDK Building *Nonconformity Report *Daily Reports *Monthly Reports	•Technical Specification of Statics •Turkish Association for Bridge and Structural Engineering- Specification of Concrete Works- Steel-Wooden •Turkish Association for Bridge and Structural Engineering- Specification of Structural Loads •Specification of Building Construction at Disaster Areas •General Specifications of the Construction Affairs *Specification of Concrete *Specification of Reinforcing Bar •Specification of Wind for Building Construction at Seismic Zones •Specification of High-Rise Buildings at Istanbul •High-Rised Buildings Earthquake Regulations at Istanbul • Tall Building Initiative, Design Guidelines for Performance-Based Design of Tall Building	• TSE • IBC • UBC • AISC • ACI • ASCE • San Francisco Tall Building Code • Los Angeles Tall Building Code • ASTM • CTBUH • NBCC • EUROCODEs'
		Formwork				
		Concrete				
	Insulation Works	Sealing	*İZOMAS (Sub-Contractor of Rough Construction-Insulation) *YDA (Contractor of BDDK Building) *TOKİ (Employer of BDDK Building- Housing Development Administration of Turkey) *SU YAPI (Adviser Firm)	•IIFC Reports for Engineers •IIFC Soil Investigation Report *IIFC Design Guide *Contract of Insulation Works *Contract of IIFC BDDK Building *Advising Contract of IIFC BDDK Building *Nonconformity Report *Daily Reports *Monthly Reports	•TSE •Architectural Specification •Technical Specifications of Employer •General Specifications of the Construction Affairs •Specification of Energy Performance for Buildings •Specification of Fire Protection for Turkey •Specification of Building Construction at Disaster Areas	
	Mechanical Works	Reservations	*YDA (Contractor of BDDK Building-Obligated for Rough Construction Mechanical Works) *TOKİ (Employer of BDDK Building- Housing Development Administration of Turkey) *SU YAPI (Adviser Firm)	•IIFC Reports for Engineers *IIFC Design Guide *Contract of IIFC BDDK Building *Advising Contract of IIFC BDDK Building *Nonconformity Report *Daily Reports *Monthly Reports	•ASTM •ASHRAE •ARI •AMCA •ANSI •EN •EUROVENT •ISO •NFPA •SMACNA •TSE •CIBSE	
		Waste Water Discharge Connections (Inside Foundations)				

		Electrical Works	Static Grounding	*YDA (Contractor of BDDK Building-Obligated for Rough Construction Electrical Works) *TOKİ (Employer of BDDK Building- Housing Development Administration of Turkey) *SU YAPI (Adviser Firm)	•IIFC Reports for Engineers •IIFC Design Guide •Contract of IIFC BDDK Building •Advising Contract of IIFC BDDK Building •Nonconformity Report •Daily Reports •Monthly Reports	•Technical Specification of Project •General Specifications of the Construction Affairs	•Electrical Installation Regulations •Specification of Lightning Protection •Specification of Static Grounding of Ministry of Energy and Natural Resources •TSE
		Infrastructural Works	Waste water System	*YDA (Contractor of BDDK Building-Obligated for Rough Construction Infrastructure Works) *TOKİ (Employer of BDDK Building- Housing Development Administration of Turkey) *SU YAPI (Adviser Firm)	*Contract of IIFC BDDK Building •Advising Contract of IIFC BDDK Building •Nonconformity Report •Daily Reports •Monthly Reports •IIFC Reports for Engineers	•TSE •Technical and Administrative Specifications •General Specifications of the Construction Affairs •Specifications of Ministry of Environment and Urbanisation Directorate General for Construction Affairs •Specification of External Waste Water Network •Specification of Internal Waste Water Network •Technical Specification of Infrastructural Works •Technical Specification of Project	
			Drenaj System (Foundation)				
			Storm Water System				
Technical Infrastructure Connections and Recirculate							

In Table 3 we see vectors assigned to 'Rough-Construction' phase's actors in order to prevent complications on Actor-network caused by actants(contract, specification-norm-standards-other documents) which actors have in respect of relations they establish with other actors so a simple actor-network can mapped. Otherwise a highly complex actor-network would have been achieved. (Figure.2)

Table3.Assigning vectors to actors for the actants that are part of the BDDK Building Rough-Construction process (Developed by Author)

	VECTOR	ACTOR	CONTRACTS	SPECIFICATIONS	STANDARDS	LAWS AND REGULATIONS	OTHER RESOURCES	
Excavation Works	A1-K	•EMLAK GYO •AKDENİZ İNŞ.	•Contract of IIFC BDDK Building	•Technical Specifications of Geotechnical Desig Criterias •General Specifications of the Construction Affairs	•TSE	•Performance Based Design Regulation for High Rise Buildings in Istanbul	•IIFC Reports for Engineers •IIFC Soil Investigation Report •IIFC Design Guide •Guide of General Directorate of Highways	
	A2-K	•AKDENİZ İNŞ. •TERRA ZEMİN	•Contract of Revetment					
	B1-K	•EMLAK GYO •AKDENİZ İNŞ.	•Contract of IIFC BDDK Building					
	B2-K	•AKDENİZ İNŞ. •ERGÜ HAF.	•Contract of Excavation					
Concrete Works	C1-K	•YDA •TOKİ	•Contract of IIFC BDDK Building	•Technical Specification of Statics •Specification of Reinforcing Bar •Turkish Association for Bridge and Structural Engineering-Specification of Concrete Works-Steel-Wooden •Turkish Association for Bridge and Structural Engineering-Specification of Structural Loads •General Specifications of the Construction Affairs •Contract of Concrete Works	•TSE •IBC •UBC •AISC •ACI •ASCE •San Francisco Tall Building Code •Los Angeles Tall Building Code •ASTM •CTBUH •NBCC •EUROCODES' •TBI	•Specification of Building Construction at Disaster Areas •Specification of Building Construction at Seismic Zones •Specification of Wind for Building Construction at Seismic Zones •High-Rised Buildings Earthquake Regulations at Istanbul		Structural Design Criteria Report • IIFC Reports for Engineers • IIFC Soil Investigation Report • IIFC Design Guide
	C2-K	•EMEKLER •YDA	•Contract of Concrete Works					
	C3-K	•TOKİ •SU YAPI	•Advising Contract of IIFC BDDK Building					
	C4-K	•YDA •SU YAPI					•Nonconformity Report •Daily Reports •Monthly Reports	

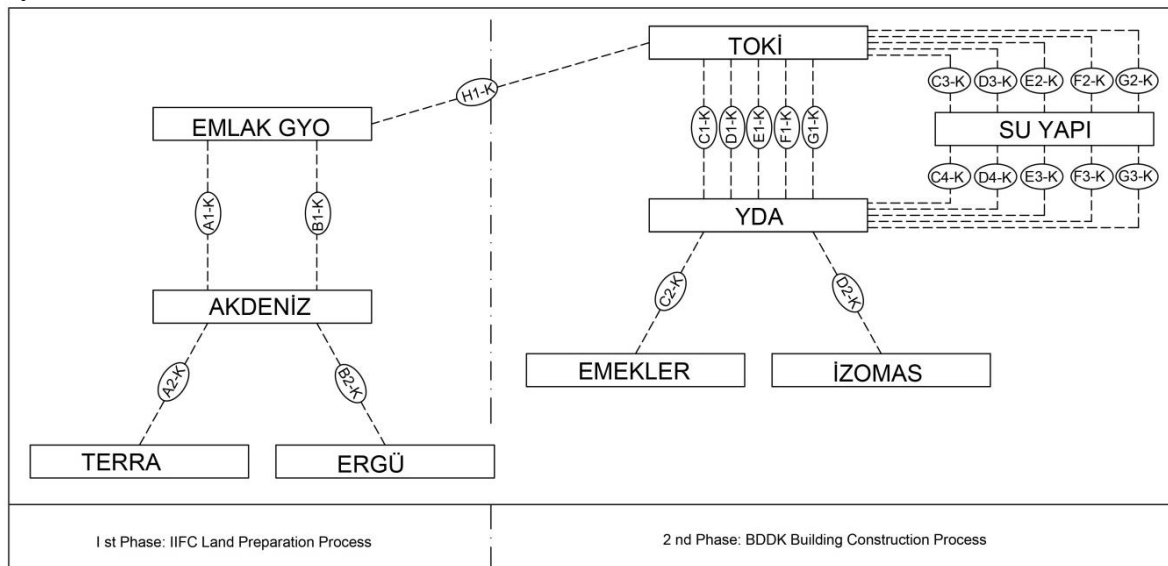
	VECTOR	ACTOR	CONTRACTS	SPECIFICATIONS	STANDARDS	LAWS AND REGULATIONS	OTHER RESOURCES
Insulation Works	D1-K	•YDA (1) •TOKİ	•Contract of IIFC BDDK Building	•Architectural Specification •Technical Specifications of Employer •General Specifications of the Construction Affairs	•TSE		
	D2-K	•IZOMAS •YDA	•Contract of Insulation Works				
	D3-K	•TOKİ •SU YAPI	•Advising Contract of IIFC BDDK Building				
	D4-K	•YDA (1) •SU YAPI					•Nonconformity Report •Daily Reports •Monthly Reports
Mechanical Works	E1-K	•YDA (2) •TOKİ	•Contract of IIFC BDDK Building	•Technical Specification of Mechanics •General Specifications of the Construction Affairs •Application Guide for Plant Engineers	•CIBSE •ASTM •ASHRAE •ARI •AMCA •ANSI •EN •EUROVENT •ISO •NFPA •SMACNA •TSE	•Specification of Energy Performance for Buildings •Specification of Fire Protection for Turkey •Specification of Building Construction at Disaster Areas	
	E2-K	•TOKİ •SU YAPI	•Advising Contract of IIFC BDDK Building				
	E3-K	•YDA (2) •SU YAPI					•Nonconformity Report •Daily Reports •Monthly Reports
Electrical Works	F1-K	•YDA (3) •TOKİ	•Contract of IIFC BDDK Building	•Technical Specification of Project •General Specifications of the Construction Affairs	•TSE	•Electrical Installation Regulations •Specification of Lightning Protection •Specification of Static Grounding of Ministry of Energy and Natural Resources	
	F2-K	•TOKİ •SU YAPI	•Advising Contract of IIFC BDDK Building				
	F3-K	•YDA (3) •SU YAPI					•Nonconformity Report •Daily Reports •Monthly Reports
Infrastructural Works	G1-K	•YDA •TOKİ (1)	•Contract of IIFC BDDK Building	•Technical Specification of Infrastructural Works •Advising Contract of IIFC BDDK Building •General Specifications of the Construction Affairs •Specifications for Construction of Affairs Ministry of Environment and Urbanisation Directorate General for Construction Affairs •Specification of External Waste Water Network •Specification of Internal Waste Water Network •Technical Specification of Project	•TSE		
	G2-K	•TOKİ (1) •SU YAPI	•Advising Contract of IIFC BDDK Building				
	G3-K	•YDA •SU YAPI					•Nonconformity Report •Daily Reports •Monthly Reports
Relation just for Conceptual Project	H1-K	•EMLAK GYO •TOKİ (2)			•TSE	•Performance Based Design Regulation for High Rise Buildings in Istanbul •Specification of Building Construction at Disaster Areas •Specification of Building Construction at Seismic Zones •Specification of Wind for Building Construction at Seismic Zones •High-Rised Buildings Earthquake Regulations at Istanbul •IIFC Concept Project	•IIFC Design Guide •Structural Design Criteria Report •IIFC Reports for Engineers •IIFC Soil Investigation Report

We can see Table4 which vectors (actants) will use to contribute for mapping the network (which actant a vector encompasses) by actants. Actor-Network (Table.5) is formed by adding to organization chart composed of actors, the actants we symbolized with vectors.

Table4.Vectors according to actor's associations during the BDDK Building Rough-Construction process (Developed by Author)

	SU YAPI	TOKİ	EMLAK GYO	YDA	AKDENİZ İNŞAAT	EMEKLER	TERRA	ERGÜ	İZOMAS
VECTOR			A1-K		A1-K, A2-K		A2-K		
			B1-K		B1-K, B2-K			B2-K	
	C3-K, C4-K	C1-K		C1-K, C2-K, C3-K, C4-K		C2-K			
	D3-K, D4-K	D1-K		D1-K, D2-K, D3-K, D4-K					D2-K
	E2-K, E3-K	E1-K		E1-K, E2-K, E3-K					
	F2-K, F3-K	F1-K		F1-K, F2-K, F3-K					
	G2-K, G3-K	G1-K		G1-K, G2-K, G3-K					
		H1-K	H1-K						

To explain the actor-network seen in Table5, first it should be stated that actors who are part of the 2-stage BDDK Building rough-construction process are laid out in the form of an organization chart. Then the actors that have connections are coupled up with the help of network (shown with dotted lines). Since the actants that determine relations between these actors will be connected to network, group of actants shown with vectors (e.g. all actants that A1-K vector encompasses are given in Table3) are included in this network mapping.

Table5.Actor-network Mapping in BDDK Building Rough-Construction Process (Developed by Author)

In the 1st Stage, which is the (Land Preparation Stage), the employer EMLAK GYO actor contracts out the Excavation& Revetment works to AKDENİZ İNŞAAT(Contractor) together with actants within the scope of A1-K(Table.3) and B1-K(Table.3) vectors. Akdeniz İnşaat accepts the actants added to A1-K vector determined for revetment work as A2-K vector and

via these vectors it subcontracts the revetment works to TERRA. Likewise it takes the excavation works from AKDENİZ İNŞAAT via B1-K vectors and subcontracts these works together with B2-K vectors to ERGÜ. When passing from 1st Stage of the Rough-Construction to the 2nd Stage, we see that H1-K vector establishes a bond with TOKİ between EMLAK GYO via IIFC concept-project actants. After that, as the employer of BDDK Building, TOKİ assigns to YDA the BDDK Building for rough-construction works through contracts signed (actant), specifications made (actant) and standard-regulation-other sources (actant) (C1-K, D1-K, E1-K, F1-K, G1-K vectors). So C1-K, D1-K, E1-K, F1-K, G1-K vectors encompass the actants that will determine the relations between actors. When YDA (contractor-actor) assigned the work to EMEKLER (subcontractor-actor) within the scope of C1-K vector, new actors (subcontractor) creates the C2-K vector together with the new actants (specification, contract, standard-regulation-other sources). At this point it is important to mention that the reason why we see the C2-K vector and EMEKLER actor in addition to the C1-K vector and TOKİ-YDA actors is that the work is subcontracted (no relation between TOKİ and EMEKLER). YDA, has individually undertaken work items that require expertise. (Via actants determined with E1-K, F1-K, G1-K vectors) and subcontracted other work items that are outside the scope of its area of expertise and has assigned reinforced concrete works to EMEKLER via C2-K vector and insulation works to İzomas via D2-K vector.

In some projects as there is no need for subcontractors, so number of networks established may be less. Or quite the opposite, when a single work item requires multiple areas of expertise, relations with much more actors may be required (For example in this project, Revetment works shown with A1-K and A2-K vectors and Excavation Works shown with B1-K and B2-K are being carried out by different actors and actants as such works require expertise). So the number of these vector (accordingly the actants) and actors-actants depends

directly on the method of work and this may be different in each project. So, in the work performance process, actants have as important function as the other actors.

Along with this SU YAPI (adviser-actor) renders consultancy services under C3-K vector between actors YDA & TOKI, while auditing the progress of the work (accordingly to actors-actants and the method of application) on behalf of TOKI (employer-actor) since YDA (contractor-actor) is the contractor. Here C4-K vector is between YDA and SU YAPI. According to C4-K vector, SU YAPI will be inspecting the reports kept about the progress of work and the conformance to specifications, contracts, standard-regulation-other sources, which constitute the entire actants determined in respect of performance of work, so these reports will be included in actor-network as an actant. So there may be multiple vectors between same actants in different vectors. This may create problems between actors. So, opening the black-box and analyzing the actor-network will help to find where the problem cause.

Since only the rough-construction phase was explored, the actor-network is extremely simple. Naturally we would have a highly complex network if we applied the actor-network to the entire project (Figure.2). It should be kept in mind that there are many actors and actants in network. However actor-network mapping according to data provided by the company and it is also extremely simplified to explain the subject much more easily.

10. Conclusion

According to outcome of the literature review made regarding Actor-Network Theory, an attempt was made to demonstrate by applying this theory on a project, that actors (humans) and actants (non-humans), in other words all entities that affect the production process, may have transformative effects on another. The form of relations between actor and actants were explored on the basis of black-box concepts.

Applying the ANT on a real project helped us to see how actors and actants can change and transform relations. Problems experienced during the construction process does not necessarily arise directly from actors or actants with whom a bond is established, such actor-actant may be acting under the influence of other actor-actants.(For example subcontractor must comply with the specifications set forth by the contractor.However the employer is the one that really sets forth this specifications in the first place)

This study reads into how the relations of actor and actants with the actor-network are shaped by other actor(s)-actant(s) and sets forth the origin of the problems that may be experienced during rough-construction stage.(Vector-actants determined in Table.3)

Considering that it will provide many solutions, ANT can be used in building production projects with such complicated relations. In Turkey,whenever ANT is mentioned it is usually associated with theoretical discussions.This study may set a good example to studies that will be made in the future.

As the result of the highly complex chain of actor-actants included in the BDDK Building Project,we deliberated on the issue of having a more simplified actor-network. We tried to resolve this by assigning vectors to actants and eventually mapping a very clear actor-network. In case of any problem, one simply needs to check the actor and vectors(and the actants under vectors) on the actor-network to understand which actor-actant causes the problem. It is clear that vectors and actors on the actor-network are influenced from each other and that sometimes one vector influences the decisions of another vector.(For example, since the work is subcontracted, in addition to actants under C1-K vector, C2-K vector is formed with the new actor and actants determined)

Hereunder an actor-network mapping for 'Rough-Construction' process of BDDK Building, which is the subject of our field survey. Thanks to this actor-network, it is possible to easily detect which actors make associations with one another through which vectors.It was seen

that specially for the BDDK Building production process, the rough-construction stage was a two-staged process and different actors-actants were involved in each stage. It is understood that there were two employers for the Rough-Construction stage (EMLAK GYO & TOKI) and that these two employers were associated with each other only in terms of compliance with the concept project (via H1-K vector) and besides this, the work done is completely different. As these two employers both subcontracted the construction works during the rough-construction phase, new actors (and actants) are in the network. So for example one of the actants under B2-K vector may be the cause of the problem that may be experienced in excavation works but it may be possible that these actants are determined by Akdeniz, B1-K vector and EMLAK GYO actors. But when we check the actor-network once again to resolve the problems experienced in excavation works, it is understood that IIInd stage has nothing to do with the excavation works so it would be irrelevant to check these actors-vectors to find the cause of the problem. In a sense, this helps with the time management. By simply checking this actor-network, the root of the problem is easily figured out and it becomes possible to resolve the problem experienced.

ANT may help identifying the problem clearly by explicitly showing all the factors (actors-actants) in the system of relations where this problem underlies, and thus it may help overcoming problems experienced, which will eventually lead to achievement of targets set for many processes like management, finance, planning, construction.

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List of Appendices

Appendice1. How problems handled in literatures that addressed in Table1 (Developed by Author)

<p>'RISK ASSESSMENT OF INTERNATIONAL CONSTRUCTION PROJECTS USING THE ANALYTIC NETWORK PROCES' -Ms. Thesis-AMANI SULIMAN BU-QAMMAZ</p>	<p>·Priorities and risk factors could be applied to other projects.</p>
	<p>·Actors could be directly effected by risks. Increasing in number of actors are in direct proportion to problems.</p>
	<p>·Employer, codes, contracts, working schedules, payments and majeure forces are important risk factors.</p>
	<p>·Risk levels could be effected by actors' previous experiences. All associations are unique since each actor are different.</p>
	<p>· Elements of risks and previous experiences may effect following decisions, as well as project success. Element of risks are complicated.</p>
<p>'İNŞAAT PROJELERİNDEÇALIŞANLARIN RİSK YÖNETİMİ VE RİSK AZALTICI TEDBİRLER KARŞISINDAKİ TUTUMLARI: ANTALYA ÖRNEĞİ'-Ms. Thesis-GÜRSEL GÜLER</p>	<p>·Process of building construction are so complicated since there are various actors. So that, eliminating the risks are not possible but may minimize.</p>
<p>'İNŞAAT PROJELERİNDE UYUŞMAZLIK ÇÖZÜM YÖNTEMİ SEÇİMİ İÇİN ÇOK KRİTERLİ KARAR VERME MODELİ' -Ms. Thesis-DENİZ İLTER</p>	<p>·Analysing just client's expectations may cause controversies in process of building construction.</p>
<p>'TÜRKİYE'DE YAPILAN İNŞAAT PROJELERİNDE YAPIM AŞAMASINDA MALİYET VE SÜRE AŞIMINA NEDEN OLAN FAKTÖRLERİN İNCELENMESİ' -Ms. Thesis-GÜL BAŞAK CEBE</p>	<p>·Process of building construction are multi-actor and they includes both consecutive and intersecting phases. So this complex network causes various problems.</p>
	<p>·Each actor in a construction project (Contractor, employer, project manager, etc.) look from one's aspect the underlying reason (for the problem).</p>
	<p>·Studies about these problems shows as each problem has an effect on other factors.</p>
<p>'İNŞAAT PROJELERİNİN UYGULAMA AŞAMASINDAKİ RİSKLERİN YÖNETİMİ' -Ms. Thesis-NUR ATAKUL</p>	<p>·Due to it's long-termed, complex phased and unique phases in process building constructions includes various risks.</p>
	<p>·Economical and political uncertainties (So that cost and due dates) may occur controversies between actors.</p>
<p>'AN INVESTIGATION ON THE APPLICATION OF STANDARD CONTRACTS IN THE TURKISH CONSTRUCTION INDUSTRY' -Phd. Thesis-BEGÜM SERTYEŞİLİŞİK</p>	<p>·The main point is to get to the root of the problem at the process of building construction.</p>
	<p>·A problem at the process may effect other problem occur (Directly or indirectly)</p>

<p>‘YAPI ÜRETİMİNDE ZAMAN YÖNETİMİNİN ÜRÜN KALİTESİNE ETKİSİ’ -Ms. Thesis-TUĞBA PAŞALI TUNA</p>	<p>·The aim of the building construction process is that to complete the project at due date with determined cost.</p>
	<p>·Time, quality and cost are effecting by each other at building construction processes. So scheduling (working schedule) must be realistic.</p>
<p>‘KENTSEL DÖNÜŞÜM SÜRECİNDE NİTELİKLİ YAPI ÜRETİMİ’ -Ms. Thesis-MEHMET ZEKİ PEŞİL</p>	<p>·Different actors at process means various opinions, criticism, experiences and advices. These factors effects design and planning process.</p>
	<p>·Actors who play roles at process of building construction are effecting by political, economical, environmental and technological factors. Well organized actors causes qualified buildings .</p>
<p>‘YAPI ÜRETİMİ KAPSAMINDA İNŞAAT SÖZLEŞMELERİNDE TARAFLAR ARASINDAKİ ANLAŞMAZLIKLAR VE ÇÖZÜM ÖNERİLERİ’ -Ms. Thesis-SELİN MERSİNKAYA</p>	<p>·The product of process is quite complex and large-scale. So this processes means production series (also different actors and materials may be entegrated to processes)</p>
	<p>·Contracts, specifications and projects prevents conflicts, controversies, uncertainties, risks and disagreements between actors.</p>
<p>‘İNŞAAT PROJELERİNDE RİSKLERİN BULANIK MANTIK MODELİ İLE DEĞERLENDİRİLMESİ’ -Phd. Thesis-HAKAN KUŞAN</p>	<p>·Building trade is effecting by external factors and it includes various risks.</p>
	<p>·Risk level is a subjective characteristic in process of building construction for each actor.</p>
<p>‘CONFLICTS BETWEEN OWNER AND CONTRACTORS: PROPOSED INTERVENTION PROCESS’ -Article-KATHLEEN M.J. HARMON</p>	<p>·Since each process of building construction is unique, each association will be unique according to project. Previous experiences effects new associations.</p>
<p>‘KAT KARŞILIĞI İNŞAAT İŞLETMELERİNDE MALİYET MUHASEBESİ VE UYGULAMALARI’ -Ms. Thesis-SİBEL AKDOĞMUŞ</p>	<p>·Process of building construction is multi-tasked action. So various of actor and creature are be in touch with each other efficiently.</p>
<p>‘İNŞAAT SEKTÖRÜNDE ADR KULLANIMI VE SEÇİM KRİTERLERİNİN KAMU VE ÖZEL SEKTÖR AÇISINDAN İNCELENMESİ’ -Article-DOÇ. DR. E. TAŞ&Y. ARICI</p>	<p>·Complex, large scaled and multi actored projects may cause problems. Project scale and number of actors are be directly proportionate to controversies.</p>
	<p>·There are sources, procedures and legislative regulations which regulates and prevents these controversies. Various actors and institutions are repsonsible for controlling and implementation of these actants</p>
<p>‘HOW PROCUREMENT OPTIONS İNFLUENCE RISK MANAGEMENT İN CONSTRUCTION PROJECT’ -Article-EKATERİNA OSİPOVA A & PER ERİK ERİKSSON</p>	<p>·Contracts are the most important factor for forming relations between actors. Contract articles are providing expected performance at process of building construction.</p>
	<p>·Associations and alliances formed by contracts between actors reveal opportunities.</p>
	<p>·Good communication is also a key for problem solving and financial gain.</p>

Analysis of the Extent of Red Light Running in Minna, North-Central Nigeria

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Abstract

This research pursued the objectives of assessing the awareness, perception, and levels of adherence of road users to traffic rules and regulations. The study was carried out in Minna and the major signalized roads were the target of the research. The research applied the survey research methodology, which involves carrying volumetric count of vehicles running the red lights on the signalized routes. The research therefore, found out that, majority of the violators of the traffic signals were the motorcycle riders, closely followed by the tricycle operators; the commercial vehicle owners also form a major percentage of violators of the red light rules in the city. The research, therefore, recommended that, strict measures aimed at ensuring immediate compliance with the traffic signals should be implemented, through fines and sanctions on violators to impoundment of offending vehicles. The research concluded that, if instant measures are not put in place to check the menace of the red light running, it will have serious adverse effect on the social and economic strata of the city.

Keyword: Red Light, Traffic Signals, Traffic Regulation, Red Light Rules, Operators.

1. Introduction

Over the years, the basic measures to address road traffic accidents (RTAs) in Nigeria have been characterised by a lack of strong political will, concern and priority. Usually the responses

experienced have been characterised by high vigilance following a major road accident, which gradually dies off with the passing of time (Khayesi, 2004). Manifestation of violation of road traffic rules in Nigeria includes; failure to use seat belts, over speeding, reckless driving, dangerous overtaking, driving without authorized plates, lack of fire extinguisher, making phone calls while driving, failure to obey traffic lights, traffic signs and over loading among others. Private and commercial motorcyclists are not left out of this malaise.

Adherence of road users to traffic rules and regulations is an on-going challenge in Minna metropolis the capital of Niger State. Traffic rules are said to be violated when drivers and pedestrians deliberately disobey formally prohibited or socially accepted codes of driving behaviour. Niger State government introduced traffic light across the major busy or heavy traffic areas in Minna as a way of ensuring compliance with road traffic rules by drivers. However, despite these efforts, there has been continued and increasing non-compliance with road traffic rules by drivers, including those driving personal vehicles and motorcycles. This research work carried out a clear assessment of underlying factors that influence road users of not adhering to the traffic rules and regulations in Minna metropolis.

Motorcyclists, Motorists and passengers are among the most vulnerable road users and represent an important group to target for reducing road traffic injuries (Johnson and Adebayo, 2011). Traffic rules play a very important role in a country. These rules are made to avoid traffic, congestion in towns and cities. Traffic rules in Nigeria are primarily designed to prevent and reduce road accidents and clear obstructions on the high way to ensure free flow of traffic. But a recent study conducted by Federal Road Safety Commission revealed that more than 80 per cent of all road accidents which cause serious injuries, loss of properties and lives were attributed to poor knowledge of traffic rules and regulations by motorists and non-adherence to them.

Road crashes started in Lagos, Nigeria in 1906. Ever since, it has been a major killer in Nigeria (Tunde, et al., 2012). The attempt to reduce the number and severity of road crashes necessitated the formulation of road traffic regulations to guide operation, conduct and other issues relating to the road and the road users. There are various categories of road users ranging from vehicle owners, motorcyclists, cyclists, tricyclists and pedestrians. The use of motorcycles for commuting passengers gained accelerated momentum in Nigeria after the economic recession of the early 1980s (Tunde *et al.*, 2012).

The study will add knowledge on understanding what rules and regulation risk factors contribute to the occurrence of road traffic accidents and related injuries in a restricted risk area in Minna metropolis. The data obtained in this study, can be used by the road safety authorities for planning and evaluating road safety measures. The data can also be utilized by the health authorities in Minna metropolis and possibly at the nation level for planning health care delivery at Minna metropolis. The recommendations given if considered are going to benefit the public at large on prevention of road accidents. The outcome of this research can be used by Niger State Ministry of Finance i.e. by charging the road users that is not adhere to traffic rules and regulation. The data can also be utilized as baseline data in future related researches. The aim of the study is to assess the rate at which the road users in Minna comply with the traffic rules and regulations within the town. In order to achieve this aim, the following objectives were set that is; To; assess the awareness and perception of road users to traffic rules and regulation in Minna metropolis; examine the levels of adherence of road users to traffic rules and regulations; appraise the factors that influence the non-adherence of road users to traffic rules and regulations; and evaluate the impacts of road traffic rules and regulation on the road users.

The theory of planned behaviour predicts an individual's intention to engage in behaviour at a specific time and place. It posits that individual behaviour is driven by behaviour intentions, where behaviour intentions are as a function of three determinants; an individual's attitude towards behaviour, subjective norm and perceived behavioural control (Ajzen, 1991). Ajzen (1991), proposed the Theory of Planned Behaviour (TPB) wherein the individual's behaviour is best predicted by one's intentions, intentions are in turn predicted by attitudes about the behaviour, the subjective norms (a person's perception of important other's believe that he or she should or should not perform the behaviour) encasing the execution of the behaviour, and the individual's perception of their control over the behavior. Theory of planned behaviour provides a useful conceptual framework for dealing with the complexities of human social behaviour. The theory incorporates some of the central concepts in social and behaviour science, and it defines these concepts in a way that permits prediction and understanding of particular behaviours in specified contexts. Attitudes towards the behaviour, subjective norms with respect to the behaviour, and perceived control over the behaviour are usually found to predict behavioural intentions with a high degree of accuracy. In turn, these intentions, in combination with perceived behavioural control, can account for a considerable proportion of variance in behaviour. In order to understand the origin of the theory of planned behaviour, a brief history is given thus; the theory of planned behaviour was proposed by Icek Ajzen in 1985 through his article 'from intentions to actions: A theory of planned behaviour. (Ajzen, 1985) The theory was developed from the theory of reasoned action, which was proposed by Martin Fishbein together with Icek Ajzen in 1975. The theory of reasoned action was in turn grounded in various theories of attitude such as learning theories, expectancy value theories, consistency theories (such as Heider's balance theory, Osgood and Tannebaum's Congruity Theory, and Festinger's Dissonance Theory) and attribution theory

(Fishbein, 1975). According to the theory of reasoned action, if people evaluate the suggested behaviour as positive (attitude), and if they think their significant others want them to perform the behaviour (subjective norm), this results in a higher intention (motivations) and they are more likely to do so. A high correlation of attitudes and subjective norms and behavioural intentions, and subsequently to behaviour has been confirmed in many studies (Sheppard, 1988). Since 1985 till date, the theory of planned behaviour has been applied in various fields as accounted for below. First, compliance with speed limits is well suited to explorations based within the theory of planned behaviour because compliance with speed limits can be considered as an intentional and conscious act on the part of the driver. In particular, the driver has control over the behaviour they intend to do and therefore should be able to make their intention a behavioural reality. Ajzen's theory of planned behaviour was recently applied to social networking. Baker and White (2010) conducted a study examining the use of the theory of planned behaviour to predict adolescents' use of social networking. A questionnaire was given to 160 students that measured the component of Ajzen's theory and then they were asked to return a week later to report their social networking site use in preceding week. Their study found support for the theory of planned behaviour's component of attitude, perceived behavioural control, and group norms in predicting intentions to use social networking sites. They then found support that intentions predict behaviour.

Robinson and Doverspike (2009) applied the theory of planned behaviour to individual's intentions to enrol in either an online version or a traditional classroom version of an experimental psychology class. A sample of 112 psychology majors, ages ranging from 18 to 51 years old, completed a questionnaire which included a fabricated description of an experimental psychology course at the university. The theory of planned behaviour component s accounted for 12.3percent of variance in the intention of quitting with the strongest impact coming from past behaviours.

Although the theory of planned behaviour has been applied to diverse studies, it has also been criticised as seen below; the theory of planned behaviour is a well-known theory addressing the relationship between attitude and behaviour. However, research using this theory does not always produce the expected high correlations amongst the components of the theory, or account for a high proportion of the behaviour.

The theory of planned behaviour which is a psychology based theory has been criticised for its effectiveness when applied as a conceptual framework in research findings. There is evidence that theory based interventions are more successful (Abraham et al). Below is the relationship between the theory of planned behaviour to traffic rules and regulation; Social norms are among the strongest predictors of behaviour (Ajzen, 2006; Blanton, et al. 2008). In driving, these norms are motivated by the benefits drivers foresee in making any 'sensible' action, 'the good thing' or 'what one ought to do'. These motivations are contextual since they depend on the individual, people around the actor and other external factors. For example, while driving, is it sensible to switch off the phone, put it on 'silent' or leave the volume on? Decision by drivers on such issue may be in violation of set rules and this may be encouraged by the absence of rewards for compliance. That is why a study (Ajzen, 2006) found that fictional films demonstrating life-threatening use of motor vehicles are perceived as heroic humorous although they violate well formulated and interpreted road traffic rules. The effect of social norms in driving is reconfirmed by Gaymard (2009) in the assertion that interventions to increase the level of compliance with road traffic rules have not been effective because formal rules and human conduct are studies from an individualist perspective rather than being a socially shared knowledge and understanding.

People respected by drivers influence their compliance with traffic rules (injunctive norms). Researchers like Bjorklund and Aberg (2005), Gopi and Ramayah (2007) and Lee et al. (2007) in

a study on drink-driving, and Stasson and Fishbein (2006) in a study on the use of safety belts confirms this relationship. The respected people include peers, spouses, mentors, role-models and bosses. Injunctive norms are motivated by rewards associated with each action and that is why respected people 'who practice what they preach' have a stronger influence on the actors than the passive ones (Smith and Louis, 2008).

Descriptive norms describe perception of what most group members actually do and this is a result of a conviction that 'if everybody is doing it, then it must be a sensible thing to do' (Rivis and Sheeran, 2003). These actions may include speeding violations due to time pressures, impatience, annoyance and hospitality towards other drivers (Walsh, White, Hyde and Watson, 2008). These actions may lead to driving too closely behind a vehicle, violations of right of ways, risky overtaking and cutting in on other motorists. Perceived behaviour control is the extent of performance of a specific behaviour by an individual according to their discretion (Rivis and Sheeran, 2003; Gopi and Ramayah, 2007; Walsh et al. 2008). Hence, perceived behaviour control (Kraft et al 2005) can be internal (e.g. knowledge, skills, willpower) or external (e.g. time, cooperation of others). Such environment provides opportunities for actions that may be contrary to rules or socially accepted codes of conduct, like risky overtaking. Certain studies on driving revealed that perceived behaviour control was the main predictor of actual behaviour (Newman, Waston and Murray, 2004; Gopi and Ramayah, 2007; Walsh et al. 2008). Road obstructions and road control system moderates the relationship between perceived descriptive norms, perceived injunctive norms, perceived behaviour control and compliance with road traffic rules.

Traffic signals are intended to promote safe and efficient traffic flow at busy intersections. However, the level of safety achieved is largely dependent on drivers' compliance with the signals. Research shows that many drivers routinely violate red signals, placing themselves and other road

users at risk for serious collisions. Analyses of red light violation data from 19 intersections in four states found that violation rates averaged 3.2 per intersection per hour (Hill and Lindly, 2003). Similarly, a study conducted during several months at five busy intersection approaches in Fairfax City, Virginia, found that violation rates averaged 3 per intersection per hour (Retting et al., 1999). During peak travel times, red light running was more frequent. Crashes resulting from red light running are a frequent occurrence. A nationwide study of 9,951 vehicles involved in fatal crashes at traffic signals in 1999 and 2000 estimated that 20 percent of the vehicles failed to obey the signals (Brittany et al., 2004). In 2005, more than 800 people were killed and an estimated 165,000 were injured in crashes that involved red light running (Insurance Institute for Highway Safety, 2006). About half of the deaths in these crashes were pedestrians and occupants in other vehicles who were hit by the red light runners.

Road Traffic Problems: Rangwala (2011) stated that the problems of traffic on roads result from the performances and requirements of the following three components; Fixed facilities for the accommodation of traffic on the road; Human beings using the road; and Vehicles on the road; The traffic controls and improvements can be reduced to the behaviour of the three components namely education, enforcement and engineering.

Chances of road accidents occur due to complex flow pattern of vehicular traffic, presence of mixed traffic and pedestrians. Traffic engineering should aim at safe movements on roads to bring down occurrences of road accidents to the minimum possible extent. According to Rangwala (2011), it was found that in most cases, the following four general observations can easily be arrived at; Most of the road accidents occur on straight roads; Favorable range of speeds at which most of the accidents occur is 15 – 30 km per hour only; The greatest number of sufferers in road accidents is that of the pedestrians; The human failure was responsible for most of the road

accidents. He suggested measures to ensure safety of pedestrians to include the provision of traffic islands coupled with proper markings for pedestrians crossing at the road intersections among others. Red Light Running (RLR): Red-light running is a serious intersection safety issue across the nation. According to the United States National Highway Traffic Safety Administration's (NHTSA) Traffic Safety Facts 2008 Report, there were more than 2.3 million reported intersection-related crashes, resulting in more than 7,770 fatalities and approximately 733,000 injury crashes in 2008. NHTSA's Fatality Analysis Reporting System (FARS) reports that red-light running crashes alone caused 762 deaths in 2008. An estimated 165,000 people are injured annually by red-light runners. The Insurance Institute for Highway Safety (IIHS) reports that half of the people killed in red-light running crashes are not the signal violators. They are drivers and pedestrians hit by red-light runners.

According to the findings of Institute of Transport Engineers (2003), in the United States of America, a crash caused by a driver who runs a red light is more likely to result in serious injury or death. Most people run red lights because they are in a hurry, when in fact they only save seconds. The findings also revealed the following facts: Deaths caused by red light running are increasing at more than three times the rate of increase for all other fatal crashes; More people are injured in crashes involving red light running than in any other crash type; Reduction in red light running through a comprehensive red light camera program will promote and protect the public health, safety and welfare of Irving citizens.

Road traffic accident occurs worldwide but the incidence is more in developing countries. Annually, about 1.24 million people die each year as a result of road traffic crashes. Road traffic injuries are the leading cause of death among young people, aged 15 to 29 years. 91 percent of the world's fatalities on the road occur in low income countries, even though those countries have

approximately half of the world's vehicles. Half of those dying on the world's roads are 'vulnerable road users': pedestrians, cyclists and motorcyclists. Without action, road crashes are predicted to result in deaths of around 1.9 million people annually by 2020. Only 28 countries representing 416 million people (7 percent of the world's population) have adequate laws that address all five risk factors (speed, drink-driving, helmets, seat belts and child restraints) (WHO, 2013).

In Nigeria today, hardly a day goes by without the occurrence of a road traffic accident leading to generally increasing incident of morbidity and mortality rates as well as financial cost to both society and the individual involved. Nigeria has the highest road traffic accident rates as well as well as the largest number of death per 10,000 vehicles (Sheriff, 2009). One may be tempted to believe that the level of awareness on the causes of road traffic accidents is very low among Nigerians put differently; Nigerian roads have become killing fields without protection of their users. Travellers heave a sigh of relief if they make their destinations (Eze, 2012). Contrary to the general belief that Nigerians possess very low level of awareness on the cause of road traffic accidents, previous research has shown that Nigerians know quite a lot about what could cause road traffic accidents (Asalor, 2010).

The failure of drivers to comply with basic road safety legislations is the main cause of serious crashes in the world at large and in Nigeria today. Compliance with the road safety is the act of obedience of rules guiding the usage of the roads by road users. The sequential objectives of these rules are; to avoid conflict among road users; prevent events that are unpleasant to the road users; and mitigate the effect of the unpleasant events. Non-compliance carries penalties and penalties as defined by the road traffic regulation agencies differ from country to country (Southgate & Mirrlees-Black, 1991; Zaal, 1994).

Olagunju (2009) observes that lack of efficient and effective traffic law enforcement has been responsible for several accidents in the country especially among motorcycle operators. Olagunju also noted that participants at a one-day workshop on motorcycle operations in Nigeria organised by the Federal Road Safety Corps in March 2006 expressed dismay at the level of disobedience to traffic rules and regulations by the riders. The conduct of these commercial motorcyclists characterised by poor knowledge of traffic rules and regulations, engaging in drugs and use of Mobile phones while riding resulted in many motorcycle accidents. Motorcycles account for one out of every four vehicle involved in crashes in Nigeria. The basic question has always been that do these motorcycles comply with basic requisite safety rules? In a study of 500 motorcyclists in Kagang, Selangor, Malaysia, it was found that 54.4% of the motorcyclists used helmets properly; 21.4% used it improperly; while 24.2% did not wear helmets. Age, gender, race, formal education, prior accident, experience and type of licence held were found to be significantly related to the usage of crash helmet (Kulanthayan, et al. 2000).

A rural study of crash helmet usage in Nigeria has found zero compliance rate (Owoaje, et al 2005) apart from helmet usage, other studies with compliance with regulations such as Arosayin (2007) found compliance rate with driver licence at 57% among commercial motorcyclists in Illorin, Nigeria. The non-compliance was estimated about 43%. The main reasons given for not having driver's licence were high cost of acquisition and weak enforcement. The same survey also found total compliance with the minimum age requirement and engine capacity. In terms of crash helmet, the compliance rate was at 13.5% due to weak enforcement (Arosayin 2009).

Iribogbe, et al. (2009) found among 996 commercial motorcyclists in Benin City, Nigeria that 26.5% had no driver license while 73.5% had it. Only 27.255 of those who had license actually took a road test before they were issued the license. It further showed that 56.4% of the operators

had crash helmets but do not use them regularly due to what they termed 'inconvenience' and high cost. Incidences of under aged drivers were also recorded as the minimum age found in the study was 16years against the stipulated legal minimum of 18 years. Evidences of the use of motorcycles with lower capacity were found in the works of Oluwadiya, et al. (2009). The range of engine capacity was between 85cc and 125cc. In the study, about 15% of the operators carry more than one passenger; and 96.5% were found not wearing safety helmet.

Nwachukwu (1998) post that the observance and enforcement of road safety laws and regulations has contributed positively to the significant reduction of loss of lives and property on the roads. He further states that these laws and regulations have suffered violent abuses from motorists and unscrupulous members of the public as well as misinterpretations. The author adds that there are instances where special Mobile courts are circumstance; and defaulter who is sentenced to a term of imprisonment with option of fine. According to Nwachukwu (1998) the idea of Mobile court is to facilitate the trial of road traffic offenders thereby ensuring discipline on the highways.

2. The Study Area

2.1 Description and Location of Setting

Niger State was created on 3rd February, 1976 from the defunct north-western state by the Late Head of State, General Murtala Ramat Mohammed. The State however, came into being on 1st April, the same year. At the inception of the State Administration in 1976, there were only eight local government areas. Right now they have grown up to twentyfive local government areas. The state is located on latitude [10° 00'N and longitude 6° 00'E](#). State has a total population of 3,950,249 (NPC, 2006) with a total area of 76,363 km² (29,484 sq. mi).

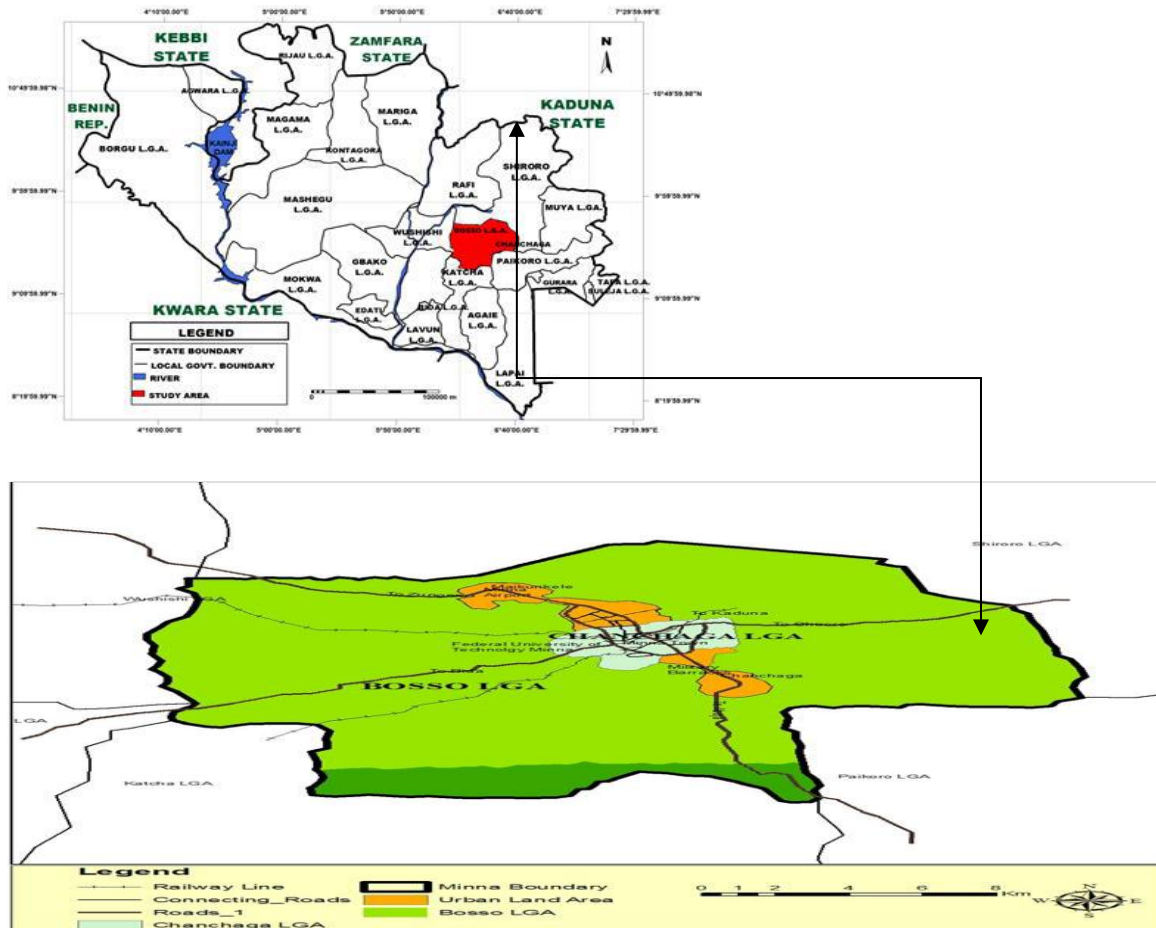


Figure 1: Location of Niger State and Minna
Source: Ministry of Land and Housing, (2014).

Minna town lies on latitude $9^{\circ}.38' \text{ N}$ and Longitude $6^{\circ}.33' \text{ East}$. Minna combines the statuses of a State capital with that of a local government area headquarter (see Figure 1). The town span from Tudun Fulani in the Northwest to Chanchaga in the South. Minna is about 135 km away from Abuja Federal Capital Territory, and 300km away from Kaduna city to the north. Within Niger state, it is about 90 km away from Bida to the south, 100km away from Suleja to the east and about 130 km from Kontagora to the west (Minna Master plan, 1979).

3. Materials and Method

This research work is designed, putting into keen consideration; the compliance of road users to traffic rules and regulations in Minna metropolis and seeks to measure the level or rate of compliance within the city and also recommend possible solutions to the issues of non-compliance to traffic rules and regulations in Minna. Researches of this type usually involve data collection and the two basic sources of data collection for this work are primary and secondary sources. Primary sources involve the methods applied to obtain relevant raw data for the work. The secondary sources involve information from relevant organisations, internet, local and international and journals.

Three methods were adopted for this research in order to source out primary data and they include: Traffic count, Data capture and Oral interview. The traffic count was carried out for six (6) hours daily during peak hours (08:00am-10:00am, 12:00pm-02:00pm and 04:00pm-06:00pm) for two week days (Monday and Thursday) and one day of the weekend (Saturday). The traffic count was conducted at six points namely; Shiroro road intersection, Top Medical/Paiko road intersection, and Obasanjo Complex Road for a period of three days (Monday, Thursday and Saturday), while another three points namely; Government House road, high point international school junction along Shiroro road and Mobil axis for only a day.

The vehicles were categorised into five (5) to facilitate discerning the category of violators. The five categories include; commercial motorcycles, private motorcycles, tricycles (KEKE NAPEP), commercial cars/buses, and private cars/buses. All the categories were observed simultaneously throughout the duration of the count. Digital camera was employed to acquire images of different violating situations during the period of the survey. The two major stakeholders of the road which

includes the road users and the officials that regulates and controls traffic were interviewed in order to get viable information that would help fulfill the objectives of this research.

The road users that were interviewed were categorized into commercial and non-commercial road users. For commercial road users, the major road transport union stakeholders within Minna metropolis (NURTW, NSTA and National Commercial tricycle and motorcycle owners and rider's association Minna branch) were interviewed and for private road users, individual motorcycle and vehicle owners were interviewed. The law traffic control/regulation Officers within Minna as relating to traffic control (Vehicle Inspection Officers, Federal Road Safety Corps Nigerian Security and Civil Defence Corps officers and the Nigerian police force) were also interviewed in order to evaluate the level of road users to traffic rules and regulations in Minna metropolis and also assess the impact of traffic rules and regulations on road users in Minna metropolis.

The secondary data collected for this dissertation includes; Literature on compliance of road users to traffic rules and regulations, local and international journal publications, and other internet publications, these were used for the purpose of building up literature on the subject of Compliance of road users to traffic rules and regulations as it relates to this research topic and to examine the level of compliance of road users to traffic rules and regulations and also to Evaluate the impact of traffic rules and regulations on the road users. Interviews and traffic count field survey would be used to collect primary data from the road users within Minna Metropolis. The questions for the interviews and mode of traffic counts would be designed according to the four objectives of the research. This structure is aimed at ensuring that, enquiries and questions asked are of relevance to, and addressing specific objectives of the research. This research adopted the descriptive statistical method for its data analysis.

4. Analysis and Discussions

4.1 Assessment of the Awareness and Perception of Road Users to Traffic Rules and Regulations

The first objective of this study is to assess the level of awareness and the perceptions of road users within Minna Metropolis to Traffic rules and regulations, this was achieved by conducting in-depth interviews with the various road users within Minna Metropolis in line with the scope of the research namely; National Commercial Tricycle and Motorcycle Owners and Riders association Minna branch, private vehicle and motorcycle owners within Minna metropolis, Niger state transport authority (NSTA) drivers, National Union of Road Transport Workers (NURTW) and individual tricycle and motorcycle owners.

The level of awareness of the various stakeholders was evaluated based on the interview conducted. The National Union of tricycle owners and rider's association opined that the members of the association are very familiar with the rules and regulations guiding traffic signals in the Metropolis, a position also taken by the National Union of Road transport workers; Motorcycle operators and private vehicle owners interviewed for the research. This position is however, at variance with the observations made in the cause of the field work as the survey conducted indicated that all the classes of road users identified in the metropolis often violate the red light rule. This is further reinforced by the scenario captured in Plates I, II and III.



Figure 2: Red Light Running by Taxis



Figure 3: Red Light Running, NSTA Bus



Figure 4: Red Light Running, Private Vehicles

4.2 Level of Adherence of Road Users to Traffic Rules and Regulations

Personal observation of road users was carried out within Minna on selected strategic points where traffic lights are positioned to examine the level of adherence of road users to traffic rules and regulations. The traffic count was conducted at six points namely; Shiroro road intersection, Top Medical/Paiko road intersection, and Obasanjo Complex road for a period of three days (Monday,

Thursday and Saturday), while another three points namely; Government House road, High Point International School junction along Shiroro road and Mobil axis for only a day. The survey was carried at specific peak hours when traffic is known to be much; 8:00am to 10:00am, 12:00pm to 2:00pm and 4:00pm to 6:00pm. The results from the counts are thus presented in Table 1.

Table 1: Red Light Running Along Shiroro Road, Minna.

DAYS	Vehicle Categories	Commercial Motorcycles	Private Motorcycle	Tri – cycles	Commercial Vehicles	Private Vehicles	TOTAL	
	Time						Hrs	Days
Mon 08-08- 2016	8:00am – 10:00am	218	38	26	3	39	324	2100
	12:00pm – 2:00pm	443	199	71	5	285	1003	
	4:00pm – 6:00pm	328	175	49	0	221	773	
Thurs 11-08- 2016	8:00am – 10:00am	157	44	11	0	48	260	1930
	12:00pm – 2:00pm	448	106	54	5	182	1095	
	4:00pm – 6:00pm	313	83	24	2	153	575	
Sat	8:00am – 10:00am	198	34	16	1	26	275	

13-08-2016								1850
	12:00pm – 2:00pm	419	186	37	2	201	1007	
	4:00pm – 6:00pm	276	80	23	0	189	568	
TOTAL	2800	945	311	180	1344			5880

Source: Medayese *et al.*, 2016

It can be observed from Table 1, that the highest red light violations were recorded in the afternoon specifically between the hours 1:00pm and 2:00pm; this is as a result of the dismissal of Vehicle Inspection Officers (VIO) who is normally actively stationed on the road between 8:00am and 1:00pm daily. The drastic change as observed from the number of violations in the Morning and later in the Afternoon makes it very obvious that road users tend to obey the stop signal on the traffic light because of the presence of Enforcement Agencies such as the Vehicle Inspection Officers. Also, Table 1 shows that the commercial motorcyclists are by far the worst culprits of traffic light violation. This can be attributed to their swift maneuvering ability and the non-existence of motorcycling license.

Table 2: Red Light Running Along Top Medical Junction/Paiko Road Intersection

Days	Vehicle Categories	Commercial Motorcycles	Private Motorcycle	Tri – cycles	Commercial Vehicles	Private Vehicles	TOTAL	
	Time						Hrs	Days

Mon 08-08- 2016	8:00am – 10:00am	218	67	46	13	79	423	2380
	12:00pm – 2:00pm	403	203	101	17	385	1109	
	4:00pm – 6:00pm	328	195	89	15	221	848	
Thurs 11-08- 2016	8:00am – 10:00am	161	54	31	9	78	333	2273
	12:00pm – 2:00pm	488	126	124	15	282	1035	
	4:00pm – 6:00pm	353	93	94	12	353	905	
Sat 13-08- 2016	8:00am – 10:00am	198	32	36	10	76	352	2029
	12:00pm – 2:00pm	409	154	137	18	291	1009	
	4:00pm – 6:00pm	286	90	93	10	189	668	
TOTAL	2844	1014	311	179	1344			6682

Source: Medayese *et al.*, 2016

The Table 2 shows that most red light violations were done generally in the evening specifically between 04:00pm – 06.00pm, commercial motorcycles with a record of 2800 out of 5579 being the worst culprits. Generally, out of the 5579 violations recorded, commercial vehicles (motorcycles, tricycles, cars,) violates more than private vehicles. This is due to the nature of

activities within the area which is majorly commercial. The least vehicle category that violate are the commercial vehicles. This is so because of the drastic reduction in patronage with the introduction of tricycles and availability of commercial motorcycles in Minna metropolis.

Table 3: Red Light Running Along Obasanjo Complex Road, Minna.

DAYS	Vehicle Categories	Commercial Motorcycles	Private Motorcycle	Tri – cycles	Commercial Vehicles	Private Vehicles	TOTAL	
	Time						Hrs	Days
Mon 08-08-2016	8:00am – 10:00am	210	38	36	2	39	325	2268
	12:00pm – 2:00pm	471	299	91	7	285	1153	
	4:00pm – 6:00pm	328	185	49	3	225	790	
Thurs 11-08-2016	8:00am – 10:00am	167	54	43	2	48	314	1858
	12:00pm – 2:00pm	448	136	74	5	182	845	
	4:00pm – 6:00pm	343	93	104	6	153	699	
Sat 13-08-2016	8:00am – 10:00am	198	34	33	1	26	292	1738
	12:00pm – 2:00pm	319	184	107	2	201	813	
	4:00pm – 6:00pm	278	80	84	2	189	633	
TOTAL	2920	1055	611	30	1340			5864

Source: Medayese *et al.*, 2016

The commercial motorcycles and private vehicles top the chart of red light violation along Obasanjo Complex road as seen in Table 3. This proves that commercial transportation is the most employed means of transport on this route because of the commercial activities that takes place there.

Table 4: Red Light Running Along Mandela Junction, Shiroro Road.

Vehicle Categories	Commercial	Private	Tri -	Commercial	Private	TOTAL
Time	Motorcycles	Motorcycle	cycles	Vehicles	Vehicles	
8:00am-10:00am	52	21	16	2	209	300
12:00pm-2:00pm	93	56	58	0	288	495
4:00pm-6:00pm	77	58	49	0	394	578
TOTAL	222	135	123	2	891	1095

Source: Medayese *et al.*, 2016

From the Table 4, it can be seen that private motorists are the worst culprits since commercial vehicles rarely ply the road because it is an exit route from the metropolis and there is no motor park along the road. It was also observed and recorded in the table above that most violations occurred in the evening because most people who come into the town from Abuja arrive in the evening and those who exit the town using that route also take off in the evening.

Table 5: Red Light Running along Government House road, Minna

Vehicle Categories	Commercial	Private	Tri -	Commercial	Private	TOTAL
Time	Motorcycles	Motorcycle	cycles	Vehicles	Vehicles	
8:00am-10:00am	57	16	16	9	36	134
12:00pm-2:00pm	95	31	73	32	98	329
4:00pm-6:00pm	102	64	98	64	119	447
TOTAL	254	111	187	105	253	910

Source: Medayese *et al.*, 2016

It can be seen from Table 5 above that the number of red light violations are not as much as the other roads because aside Zenith bank, there is no other major activity or building along the road.

Table 6: Red Light Running Along Mobil Axis, Minna.

Vehicle Categories	Commercial	Private	Tri -	Commercial	Private	TOTAL
Time	Motorcycles	Motorcycle	cycles	Vehicles	Vehicles	
8:00am-10:00am	85	38	75	8	142	348
12:00pm-2:00pm	574	173	443	17	883	2090
4:00pm-6:00pm	398	92	407	13	906	1816
TOTAL	1057	303	925	38	1931	4254

Source: Medayese *et al.*, 2016

Most red light violations were between the hours of 12:00pm-02:00pm and 04:00pm-06:00pm and commercial motorcyclists and private motorists are the highest number of violators recorded along Mobil axis. The well-known Obasanjo Complex which attracts a good number of people lack enough parking spaces for workers and customers and therefore people are forced to park their vehicles along the road side. This eventually causes traffic jam along the road on a frequent basis and those who escape the jam, are in a hurry to get to their destination and they end up running the red light ahead. This is one of the major reasons for violation around this area.

Table 7: Comprehensive Report Showing the Number of Violators at the three major Traffic Points from Survey Locations.

DAYS	SHIRORO ROAD INTERSECTION	TOP MEDICAL/PAIKO ROAD INTERSECTION	OBASANJO COMPLEX ROAD
DAY 1 MONDAY	2100	2380	2268
DAY 2 THURSDAY	1930	2273	1858
DAY 3 SATURDAY	1850	2029	1738
TOTAL	5880	6682	5864

Source: Medayese *et al.*, 2016

Table 7 presents a summary of the number of violators from the different categories of road users that ply the three major traffic points in Minna metropolis. In general, the number of violators as seen from the field survey of traffic counts of violators coupled with the records from the Road Traffic Enforcement Agencies/Regulators, it is clear that there is a high degree of violations. This is in sharp contrast to the position of the road users on adherence to road traffic rules as earlier interviewed. This shows that there is no integrity in the response gotten from road users. This calls for the need to further examine the factors influencing the road user's non-adherence to road traffic rules and regulation. The table also reveals that the traffic violations recorded along Shiroro road is the least among the other locations. This is due to the presence of Vehicle Inspection Officers who are stationed on the road from 08:00am till 01:00pm on weekdays and it also proves that road users adhere or comply with traffic rules more with the presence of Law Traffic control/regulation Officers on the roads. Furthermore, it can be seen in the table above that most violations occur during weekdays because workers all over Minna metropolis tend to be in a rush to get to work early enough in the morning and also, parents pick their children from school during the day

especially between 02:00pm and 04:00pm. All these reasons contribute to the level of adherence of road users during the week days.

4.3 Factors That Influence the Non-Adherence of Road Users to Traffic Rules and Regulations

In order to examine the factors that influence non-adherence of road users to traffic rules and regulations, various interviews were conducted with road users of various categories and respective law enforcement agencies that are in charge of regulating/controlling traffic and ensuring safety on the roads within Minna metropolis.

The results of the interviews are given below:

4.3.1 Interview with Commercial and Private Road Users

As stated earlier, the commercial road users maintained the position that they judiciously obey the red light rule so it was impossible to get the stakeholders interviewed to give the reasons for violation. However, private vehicle owner/road user admitted that he does not comply to traffic rules because the traffic lights are not programmed so he uses His discretion to move or stop.

4.3.2 Interview with VIO and FRSC Officers

The Vehicle Inspection Officers opined that the major reason why road users in Minna metropolis (especially motorcyclists) run the red light is lack of patience and lawlessness of road users, they came to this conclusion because of their observation of the attitude of road users along Shiroro road where they are stationed on a daily basis from 08:00am to 01:00pm daily on week days to regulate and regulate traffic the VIO officers observed that the road users tend to obey the red light more in their presence than in their absence because of fear of being penalised. A scenario of road

user's attitudes in the presence and absence of traffic control/regulation Officers along Top Medical Junction road is presented in Plate IV and V.



Figure V: Instance of Adherence of Road Users to Traffic rules in the Presence of FRSC Officers



Figure V1: Instance of Road Users Running the Red Light in the Absence of FRSC Officers

4.4 Impact of Road Traffic Rules and Regulation on the Road Users

Results from the survey carried out at the six designated traffic light intersections in Minna metropolis and the interviews conducted with FRSC/VIO Officers, there is little or no impact of road traffic rules and regulations on the road users in Minna metropolis. According to one of the FRSC Officers interviewed; *“There has been no notable difference in the number of accidents recorded or the level of adherence to road traffic rules and regulation by the road users in Minna metropolis, before and after the traffic lights were installed at the six designated intersections considered in this research.”* This is because there is little or no enforcement of road traffic rules and regulations by the Enforcement Agencies of Government, which has led to the continuous low level of adherence among road users in Minna metropolis to road traffic rules and regulation. Understandably, there are certain factors that are responsible for the little or no enforcement on the part of the FRSC/VIO Officers;

- i. Inadequate man power to man all traffic lights intersection 24 hours a day, 7 days a week.
- ii. Bad example to traffic rules and regulation being set by government officials and the “who is who” in the city.
- iii. Indiscipline and poor orientation among the road users in Minna on “driving on the road” and “the dangers of violation of road traffic rules and regulation”.

4. Recommendation

- i. It was observed that traffic wardens were seen with batons and sticks used to warn or discourage intending red light runners. This could be adopted as any offender stands the risk of being beaten or his vehicle damaged if not caught and prosecuted either by Mobile courts or main courts.

- ii. Imposition of penalties on offenders – the research suggests imposition of fines, jail term on any erring vehicle user. The penalties could be displayed in billboards or on the posts of the traffic lights.
- iii. Installation of red light cameras – this is an automated device that is connected to the red light signal and captures the image and plate number of violating vehicle when the red light turns on.
- iv. Introduction of cross bars – cross bars is automated horizontal bars that are connected to the traffic lights. It should be in a way that when the green light changes to yellow or amber as the case may be, the bar starts coming down. It should be very visible from a distance and should be adorned with reflective. This would go a long way to enhance the adherence of road users within Minna metropolis to traffic rules because they would be left with no option than to obey the red lights in order to secure their vehicles from any form of damage that could be related with colliding with the cross bars.
- v. Employing tracking agents – in this case, tracking agents should be employed and stationed on every traffic light point as practiced along Shiroro road. The agents are to be equipped with motorbikes and vehicles with public address system to facilitate catching of violators. By extension, it will create employment to the unemployed and also generate funds that could be ploughed back into the maintenance of the lights once tracked and booked. Finally, the adoption of any recommendation or combinations of the recommendations if not all is very imperative to reduce the incidences of red light running violation and its attendant consequences.

5. Conclusion

In conclusion, the research study shows that there is high level of awareness of road traffic rules and regulation among road users in Minna Metropolis. However, there is high level of non-adherence to road traffic rules and regulation by the same road users. Also, it was observed that in the case where a vehicle user violates, there is usually the tendency of others following suit. This is as a result of the inability of FRSC/VIO to enforce the penalties of non-adherence to road traffic rules and regulation. The research further reveals that there is no serious enforcement of penalties to violation of road traffic rules and regulations on the part of the Law Enforcement Agencies of Government in Minna Metropolis.

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Investigating the Synergy of Integrated Project Delivery and Building Information Modeling in the Conservation of the Architectural Heritage

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Abstract:

Architectural heritage conservation projects are one of the most risky and complex projects in the construction industry. Many studies have reported frequent performance failures in terms of time, cost and quality. To implement a quality management in the conservation projects and enhance their performance; we propose the adoption of two emerging and innovative approaches: Integrated Project Delivery (IPD) and Building Information Modeling (BIM). Through an analysis of literature review (journals, white papers, norms and standards) on the subject, a comprehensive qualitative study in theoretical term has been carried out to define the potential advantages of the synergy between the BIM and IPD to face conservation issues and constraints through project lifecycle. Finally, we draw some general conclusions, summarize the implications for practice and set out recommendations for further research.

Keywords: Integrated Project Delivery; Building Information Modeling; construction management; architectural heritage conservation.

1. Introduction

Architectural heritage building is a complex system that embraces interlinked tangible and intangible values (Attenni et al., 2017). A worldwide awareness calls for the conservation of cultural heritage to preserve, enhance and integrate it harmoniously into the contemporary

living environment; and ensure the development of cultural tourism (ICOMOS, 1999). Conservation project is a complex and sensitive approach required various skills and knowledge; In addition to the risky and uncertain nature of these projects, their fragmented and hierarchical delivering has affected project effectiveness; notably cost overruns and delays which are significantly higher in heritage conservation projects than in overall public works contracts (Guccio & Rizzo, 2010).

In this context; complex conservation projects require the adoption of emerging and innovative approaches, it needs more sophisticated project management models with flexible contracts to take care of the contingencies (Debopam & Satyanarayana, 2017); to enhance communication, collaboration and remove obstacles during project lifecycle. Recently, emerging digital technologies are dealing with digital document and interconnected Cultural Heritage information on a variety of delivery platforms, devices and environments; they are changing architectural heritage conservation in increasingly profound ways: functionalities, relationship and roles, to implement a quality approach and eliminate weaknesses in current project delivery systems.

In latest years, the BIM field has become a topic of great interest within the developed technology and methods notably 3D laser scanning and photogrammetry which generating 3D cultural heritage models (Logothetis et al., 2015; Dore & Murphy, 2012; Cheng et al., 2015). The power of BIM is their ability to integrate different skills, information throughout the entire project lifecycle (conceptualization and programming, survey, conservation, exploitation, maintenance). The BIM has a limited use by heritage professionals around the world (Historic England, 2017; Arayici et al., 2017); moreover a few academic researches explore the BIM added value in the management of heritage conservation project considering its whole aspects and process.

To turn into BIM in the construction industry is obviously a process of change not only in execution processes but also in functional capabilities and contractual agreements, it aims to provide better project delivery solutions (Migilinskasa et al., 2013; Hamdi & Leite 2014); nevertheless the fragment of traditional approaches and the fights for individual benefits goes against the collaborative atmosphere for BIM implementation.

Thus, integrated project delivery emerged as an innovative approach and relational alternative delivery methods based on collaborative decision making, shared values and common goals. It can effectively reduce inefficiencies and wastes that are embedded in the current design and practices of the construction industry (AIA, 2007; Kent & Becerik-Gerber, 2010; Azhara et al., 2014).

AIA (2007) indicates that the full potential benefits of both IPD and BIM are emphasized when they are used together; although it is possible to achieve IPD without BIM (Kent & Becerik-Gerber, 2010), many studies stated that BIM is essential to efficiently achieve the collaboration required for IPD.

Despite the complexity of architectural heritage conservation projects and the frequent failures of its management within traditional delivery methods, there is a total lack of research concerning the adoption of IPD in the conservation sector. In this research we intend to highlight theoretically the potential benefits of the synergy between the BIM and IPD to face conservation issues and constraints.

The rest of paper is structured as follows: Section 2 introduces some necessary concepts and definitions related to the architectural heritage conservation projects and highlights related works. Section 3 presents and reviews related works to Building Information Modeling. Section 4 presents the relationship between Building Information Modeling and heritage conservation project. Section 5 presents integrated project delivery and reviews some related

works. Section 6 presents the link between IPD and BIM and depicts the benefits of the synergy between them. Section 7 is the core of the paper, it discusses and analyses the benefits of an integrated approach for managing heritage conservation projects based on the junction of IPD and BIM processes. Section 8 concludes the paper and gives prospects to be continued in the future.

2. Heritage Conservation project

Architectural heritage conservation is a dynamic intervention aims to bring out the hidden architectural qualities of heritage; to restore its state of conservation and ensure its sustainability; it takes place in complex contexts involving intricate interactions of multi-disciplinary fields; including architects, engineers, historians, archeologists, chemists, environmentalists, geologist, surveyors, craftsmen, building economist , structural, mechanical and electrical engineers , town planner and other specialists , the involving of the building owner or his representative with all this expertise which demands a high degree of experience, communication and knowledge of building materials and construction improve decision making (Harun, 2011). Unfortunately, literature showed that heritage conservation is fragmented (Azizi et al., 2015 ; Avrami et al., 2000; Smith, 2005; Ismail & Azlan, 2010; Perovic et al., 2016); and a different organizational cultures and philosophies ranging from archaeologists/ architect (Kamal, 2008); the developer/ the preserver (Azizi et al., 2015).

Several authors mentioned that heritage conservation projects are one of the most risky, complexes and uncertain within the construction industry, they are often confronted by a number of issues which make management of these projects extremely challenging (Azizi et al., 2015). Each conservation project is view as a unique and non-duplicate, involves indeterminate scope, a large number of variation in quantity of work and change orders make during project execution because of unavailability of information about the original structure;

and pre-existing and unforeseen site and/or building conditions identified late only once the work is started (Daoud, 1997; Mckim et al., 2000; Mitropoulos & Howell 2002; Zolkafli, 2012; Perovic et al., 2016; Roy & Kalidindi, 2017; Naaranoja & Uden, 2007). As a result cost overruns, delays, level of contingency allocation are significantly higher in heritage conservation projects (Guccio & Rizzo, 2010; Reyers & Mansfield, 2001).

Conservation legislation for historic buildings is not specific and inflexible. Numerous researchers highlighted that conservation work suffers because of unskilled personnel and limited technical knowledge due to the lack of documents and guidelines that defines the purpose of these projects and reflects upon the processes or a methodological recipe for managing it. (Azizi, 2015; Azizia et al., 2016; Barbosa et al., 2016; Worthing & Dann, 2000)

3. Building Information Modeling

The Building Information Modeling is defined as a set of interrelating policies, processes and technologies that generate a systematic approach for managing the critical information within a digital model, it enables all project participants to collaborate more accurately and efficiently than traditional processes forming a reliable basis for decisions throughout the life cycle of a building (Succar,2009; Azhar et al., 2012; NBIMS,2007). The first theoretical approach of BIM is mainly the 3D modeling using a computer tool; the term “Building Information Model” was used by Eastman for the first time in 1975. Later, the concept of 4D-modelling (3D + time factor) appeared in research discussion of Rischmoller et al, (2000) and the vision for the 3D to nD project was defined by Lee et al. in 2002 to integrate prototyping platform for the construction and engineering industries. However BIM was adopted in pilot project even mid-2000.

Recently, many cases studies have been adopted in research to define the potential advantages of BIM in construction projects covered operational, managerial, organizational,

and strategic factors. Several reviews are highlighting the multiple potential benefits of using BIM environments for different type of projects, actually the term BIM has given rise to other terms like: Existing Buildings Information Modeling (EBIM); Historic/ Heritage Building Information Modeling (HBIM); City Information Modeling (CYM); Urban Information Modeling (UIM); and Green BIM. In spite of this evolution, BIM benefits are not really covered; the BIM implementation is still in its formative stage, and should continue to struggle to achieve lifecycle BIM uses (Shou et al., 2015).

BIM implementation has concerned different delivery environments, it acted as a catalyst for change, and as a result, it has received significant consideration in manuals, publications, standards and contracts. Today, the construction industry investigates the synergy between new approaches and BIM to bring other additional benefits of the technology and supporting its implementation; such as Lean (Sacks et al, 2010; Eastman et al. 2010); Agile method (Tomek & Kalinichuk, 2015), integrated project delivery (AIA California council, 2007).

4. Building Information Modeling in heritage conservation project

The BIM technology generates a new evolution of integrated and efficient information management for the conservation process due to its attitude to store semantic inter-related information, on favoring the dissemination of the intangible values of the building during its life cycle (Garagnani & Manferdini, 2013; Brumana et al., 2017; Angelini et al., 2017). The latest years, Numerous studies proposed a methodology for linking together Heritage-BIM and different digital technologies and simulation notably laser scanning and photogrammetry, for the presentation, analysis and document the complicated structures remotely, efficiently and precisely contrary with preceding survey techniques (Logothetis et al., 2015; Dore & Murphy, 2012; Cheng et al., 2015, Gigriarelli et al., 2017). Zhao (2017) considered laser scanning as hot topics related to BIM research. It can be used to capture dense 3D

measurements of a facility's as-built condition and the resulting point cloud can be manually processed to create an as-built BIM; Historic England (2017) defined Historic BIM as “a multi-disciplinary process that requires the input and collaboration of professionals with very different skillsets”. Having access to an as-built heritage building facilitates interpretation of the nature of building, monitor its changes and document each investigation and intervention activity in the proposed model, it ensuring the availability, accessibility, consistency, coordination and coherence of all the knowledge related to a historical/archaeological artifact; which supporting the make interventions decisions. In (Simeone et al., 2014, Cheng et al., 2015) authors argued that the identification of emergency situations, the scheduling of intervention activities and the planning of routine management and maintenance artifact increase the productivity, profitability and accuracy of a project.

The application of BIM in conservation has given rise to other terms: Historic Building Information Modeling, Heritage Building Information Modeling, HBIM, BIM for heritage and BIM for historic buildings, they have been used almost interchangeably (Historic England, 2017).

The initial development of BIM in conservation project can be referred to the existing BIM experience from the building industry. The benefits of BIM for managing heritage conservation projects are not currently covered; a few published prototypes with limited use reports the significantly different requirements of BIM in these project (Angelini et al., 2017; Simeone et al., 2014; Arayici et al., 2017; Historic England, 2017).

5. Integrated Project Delivery

As the construction industry has become more complex, specialized, and uncertain, traditional project delivery methods become inefficient and litigious (Azhar et al., 2014; El adaway et al., 2017). Integrated project delivery emerges as a solution of the critical need of

alternative relational contracts for reducing current inefficiencies and wastes of the construction industry and makes it more predictable, accurate and responsible outcomes (Matthews et al., 2003; Kent & Becerik-Gerber, 2010; Azhara et al., 2014).

Numerous published articles, reports, and white papers discuss the differences between traditional project delivery and IPD to help owners choosing appropriately for their projects. The traditional systems are hierarchical and fragmented, based classically on transactional bilateral agreement; focus on sub-optimization of project participants, a limited cooperation and innovation. In contrast, IPD is a relational multiparty agreement between a minimum of the owner, designer or engineer, and builder; it defines the connection point between subsystems and negotiates their interfaces; IPD is a convergence of opportunities brought about by technology and business process innovation, it requires a cultural and organizational change within new roles and competencies for achieving project purposes in a collaborative environment over the individual interest of each one, in an effort to mitigate risk (Autodesk, 2008; Taylor et al., 2012; Neve et al., 2017; El-adaway et al., 2017).

Neve et al. (2017) perceived IPD as a Virtual Enterprise Paradigm on incorporating the five elements of integrating an IPD project identified through the researches of Kim & Dossick (2011) and Fischer et al. (2017), i.e. contract, culture, organization, lean construction and BIM, which interrelate and enhance one another's effectiveness. IPD is not a 'one-size-fit-all' approach, different IPD integration levels are demonstrated, certain characteristics of a particular project or delivery model such as legislative restrictions, policy limitations or cultural barriers may affect the level of integration that can be achieved (AIA 2007; Yee et al., 2017; NASFA et al., 2010; Sive & Hays, 2009; Burcin Becerik et al., 2010).

Many researchers highlighted the advantages of IPD method through different case studies, analyzed for lessons learned and shortcomings of the current IPD practices and adoption;

Although there is a large unexploited potential of IPD integration and its adoption is still limited and in its beginning (Yee et al., 2017; Shou et al., 2015; Azhar, 2014), more evidence needs to be searched to prove the fully adopt IPD as a project delivery method (Yee et al., 2017; Kent & Becerik-Gerber, 2010).

6. Building Information Modeling and Integrated Project Delivery

Much of BIM and IPD researches are indicating the several links and the benefits of their synergy. BIM is mentioned in almost all of the documents that discuss IPD; they point that integrated projects can greatly benefit from BIM implantation. However, IPD is suggested by researchers as the best project management method to leverage BIM functionalities.

6.1 The IPD joined to BIM

As mentioned above, the organizational changes required by BIM to implement it effectively are restricted by current contractual arrangements. The IPD seems to be a delivery method that could most effectively facilitate the adoption of BIM in construction project. The IPD team reaches a clear understanding regarding BIM and leverages the tool's capabilities; the IPD contracts is one of the most effective ways to deal with BIM technical and legal risks (AIA, 2007; Kent & Becerik-Gerber, 2010; Azhar, 2011). While BIM is used the most on IPD projects to a high level of sophistication, BIM or advanced information technology applications are not a prerequisite for IPD, nevertheless BIM is one of the key factors to accomplish effectively the integration required in one database to achieve better decision-making during the IPD project lifecycle (Kent & Becerik-Gerber, 2010; Xie & Liu, 2017); moreover, it can present an important role to leverage the potential advantages of Lean principals (Sacks et al., 2010; & Eastman et al., 2010), and adds major value for IPD public owners in the exploitation phase (NASFA et al., 2010).

6.2 The potential advantages of the synergy BIM/IPD

The successfully implementation of BIM / IPD system is a mechanism for involving all key participants for optimal results (AIA, 2007; Ilozor & Kelly, 2012), the instruction of participants over their roles and responsibilities takes an important place to successfully implement these two innovative approaches (Shendkar & Patil, 2017); it could significantly increase a collaborative supply chain management (Khalfan et al., 2015); enhancing proper communication, collaboration among stakeholder, reduces the confusion between them, supporting decision making process; therefore assuring cost and time optimization (Ilozor & Kelly, 2012; Shendkar & Patil, 2017); reduce the risk of design errors and omissions (Xie & Liu, 2017). Even though, many researches identify the need to verify this synergy through quantitative studies and in the different type of project.

7. Discussion and analyses

Project complexity is one of the key characteristics that should be considered in the selection of the appropriate project delivery strategy by an organization; the complexity of conservation projects which are pluridisciplinary, uncertain and risky may achieving the benefits of deep collaboration generated by the BIM environment and IPD contract. This section discusses and investigates the benefits of using BIM in conjunction with IPD to provide solutions to the problems faced by the project team on managing the conservation of architectural heritage.

7.1 The conceptualization and the programming phase:

Starting from the beginning of the project, the early involved key participants through a Multi-Party Contract Agreement may define and synchronize earlier participant roles and responsibilities, jointly developed and validated projects objectives and obtain more inputs. The subcontractors and heritage consultants can be brought into the IPD agreement by flow-

through provisions in their respective agreements with the contractor and the conservator architect, or can be included in the IPD agreement by “joining agreement” amendments. In this phase, Laser scanners can be used to create an as-built BIM; a primary investigation for the building is established to determine its values, problems, define goals and choose the appropriate type of intervention depending on its condition. If the building is severely damaged, an emergency protection system is considered in the modeling building/site. Preventive measures have to be designed before the initiation of restoration works in order to prevent further damages and enhance safety conditions during the process of examination and have to be applied by the contractor earlier by implementing lean tools.

The schedule and budget will be estimated based on organization’s business case and may be linked to the BIM Model to enable rapid assessment of intervention decisions. The IPD contract must respect the specific conservation funding and guidelines, identify the appropriate organizational and business models, consider interests and seek involvement of selected third parties, such as building official(s), local heritage field organizations, associations of the protection of cultural heritage, and other stakeholders. It may identify key communication methodologies, materials, tools and technologies; such laser scanning and photogrammetry; plan the implementation of BIM and facing interoperability issues (protocols and standards, BIM management plan, etc.). Key provisions, regarding compensation, obligation and risk allocation which are due to uncertainties and unforeseen conditions, should be clearly defined and should encourage trust, open communication and collaboration.

7.2 The survey phase:

Professionals from different expertise and interests involve earlier at the appropriate time in this phase which is the key point of the conservation project to establish a detailed survey

with great sensitivity, a global and detailed approach to the building starts to identify its problems, so as to preserve and valorize the rare qualities of the buildings materials, architecture and craftsmanship. The contract may contain specifics sections about responsibilities, material and technologies used in the building examination. The 3D model generated by the 3D laser scanner involves a hybrid approach to visualization of heterogeneous datasets; due to its structural, physical, historical and cultural complexity including tangible and intangible values; through a reverse engineering and analysis of existing conditions; each investigation are documented in the as-built BIM, where a massive quantity and stores semantic inter-related information are represented as well as external documents, it integrates of geometric and non-geometric datasets (historic information, photographs and drawings, legacy data, geospatial geophysics and remotely sensed data, etc.)

7.3 The design phase:

During the design phase, an interdisciplinary collaboration/integration between the fields, arts, and technologies of conservation generates and evaluates various design alternatives at an early stage using integration platforms; the BIM model allows to test scenarios for analysis of virtual proposed interventions and determine what the team will accomplish, simplify the task of understanding designs to help client deal with this complex product and a conservation code regulations will be incorporated into the design process. Intervention decisions are made at an early stages where informed decisions have the greatest effect focusing on “best for project” basis, In IPD the team develop a commitment to the overall project, not just to their individual component, based on open, direct, and honest communication, ideas are judged on their merits, not on the author’s role or status; which reduce the differences between engineers/architects, archaeologists/architects, developers/ preservers; and augmented

opportunities for innovation and improvement; however, detailed decision process and ultimate authority of the participants varies significantly depend on needs of specific projects and participants; clients or end-users are engaged in simultaneous reviews of different scenarios, due to the digital representation they can more easily identify conflicts between their requirements and the proposed systems will provide. The selected alternative may has both minimum effects on heritage values and is most efficient; this is arguably more important in the case of significant historic assets, where any change in the historic fabric must be carefully considered and justified, the broad experience of the diverse team benefits target value design.

A BIM database that integrates all existing construction interface-related information of subsystems (interface events, interface descriptions, and interface conditions) defined by the collaborative work, and makes verification and validation of the design more efficient with an automated clash-checking to solve interface problems, thereby eliminating unnecessary mistakes and delay at site. Visualization of building model is tied to cost and schedule models, they are better informed due to collaborative approach, to perform based clash detection in addition to the traditional static clash detection, and commitments to them are more firm to allow visualization of deviations from planned sequences and earned values.

All these approaches provide an opportunity to perform precisely and efficiently the environmental performance analyses and sustainability-enhancement measures on delivering modeling protocols contributing guideline and specification to support the LCM across time and reduce life cycle cost of operating heritage building; in addition, the team work provides an opportunity to share knowledge, embrace learning for the repair and maintenance of historic architecture and traditional techniques and augment cultural consciousness.

7.4 The construction phase:

During construction phase, construction administration will be primarily a quality control and cost monitoring function, unlike traditional project where issues are addressed and solutions achieved to actual real-life problems; because of the higher intensity of preceding phases where an efficient information management has provided between the involved participants and conflicts have been resolved virtually; it enables a better understanding of design intent so RFIs are fewer required during the intervention stage. The BIM model maybe used to augment, manage and enhance the RFI process, less office construction administration effort is required because submittals have already been integrated into the model; enable more strategic use of prefabricated materials and systems to speed construction, less waste and injuries because work is being performed in a controlled environment and more material is factory generated, in addition, modeling the site environment after a collaborative reviews between parties before starting work helps plan logistics, assure good access and egress, and gain control of public protection risks.

Communication between professionals and craftsmen and general laborers enhance understanding of scope of work; nevertheless, the fact that scope definition is often uncertain, inaccurate and new information surfaced during the process of restoration works may affect the original restoration decisions necessitates the continuum of emergency measures even during the application process. In IPD project Work can be organized in small batches to reduce variability and increase the reliability of planning and scheduling of work; BIM advantages presented on an adjusted model based on “as built” conditions, automated quantity take off which is linked to the BIM model improves flow by reducing variability and ensures that the quantities are always accurate when changing the design at a later stage; the online access helps to bring the most up-to-date design information to the work face.

In traditional approach, each party minimizes their own risk, and most of risks are usually transferred to the contractor in most cases; IPD contracts combine the risks of all team members. Contractual provisions in the IPD agreement regarding liability waivers motivated to seek solutions to the increased risks and uncertainties problems in conservation operation rather than assigning blame; increase communication and creativity; reduce litigation costs and limit unnecessary contingencies; in addition the division of project contingency into many smaller allocations impairs effective contingency management.

7.5 The exploitation phase:

After the intervention is completed, the BIM model can be used to compare actual to planned performance; it will be the basis for the monitoring, management and routine maintenance of the building. The IPD team brings more facility management expertise into the process; a complete building information model will be integrated into the building operating system and provided to the owner for their long term use, the BIMFM system allows facility staffs effectively to identify, track, coordinate, and access facility maintenance work in the 3D environment and used for asset management. However the interoperability provides a potential for interfacing with other enterprise systems such as CMMS, CAFM.

The 3D virtual heritage model opens a wide spectrum of further applications (sharing for education, research, entertainment, tourism purposes, etc.); in addition offers a way to transmit knowledge about heritage places to future generations.

8. Conclusion

This paper has presented a broad overview of the potential advantages of the implementation of integrated project delivery as a delivery method and the implementation of building information modeling in heritage conservation projects. The successfully implementation of BIM / IPD system can deliver efficiency conservation projects and enhance its performance.

It is a mechanism for involving all key participants for optimal results where integrate different skills, information and various stages throughout the entire lifecycle of the conservation project (conceptualization and programming, survey, conservation, exploitation, maintenance) to involves the sharing of data-rich 3D models among stakeholder, reduces the confusion between them, enhancing proper communication, collaboration, and supporting decision making process, minimizing risks, and uncertainties, therefore assuring cost and time optimization on eliminating wastes. It is expected that this paper could contribute some benefits to the owners to choose the appropriately method and process to achieving a conservation project of heritage building. Further research is required to discuss the feasibility and the practicability of related concepts to successfully implement BIM / IPD in architectural heritage conservation projects; notably, how certain characteristics of such particular project may affect the level of integration that can be achieved, and what adds to a standard BIM and IPD contract in this context. It recommended to proven the theory by implementing it on some projects. Moreover; it is necessary to identify the potential synergy BIM /IPD in each type of conservation project separately.

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The Coordination Of Actors In Urban Regeneration Projects: Fikirtepe, Istanbul, Turkey

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Abstract

It is necessary for urban regeneration projects to be carried out successfully in coordination with other actors. During the process of realising regeneration, many actors and strategically-given decision plays a crucial role. The ways how actors/factors are involved in the process, the relationships founded among them and investigating the methods followed during the process constitute the content of this study.

The purpose of this study is to develop an approach with regard to the coordination established between actors/factors participated during the regeneration process. This study covers the regeneration activities realised in Fikirtepe and its surrounding area, and it aims to solve the relationships among the actors during the time of planning and applications by using semi-structured technique, one of the qualitative research methods, and detailed interviews. Thanks to the data gained from the detailed interviews effectiveness of the actors has been determined. By the help of the findings obtained from Fikirtepe region, the relationships and coordination among the actors has been revealed and a new approach has been created (and suggested) concerning the effectiveness and coordination.

Keywords: Fikirtepe; urban regeneration; actors; partnerships

1. Introduction

The concept of urban transformation have emerged with the interventions made to regenerate the areas that had collapsed both in social and economic terms. These interventions were

generally in the form of implementation of projects that will contribute to the economic development of the city in housing zones, old vacant ports and industrial zones where the population decline was observed or where low income groups live under poor economical and physical conditions (Ataöv and Osmay, 2007).

In our country, the issue of urban transformation has become one of the most discussed and disputed topic with the problems of urbanization and settlement that became more visible specifically following the catastrophes in 1999 Marmara and Düzce earthquakes. (Kalağan and Çiftçi, 2012).

When we take a look at the path of transformation in Turkey and legislative regulations made in parallel with this we see that urban transformation is defined as 'regeneration' but with the applications seen in time, the concept varied within itself and gained new dimensions. In order to have successful outcomes in urban transformation projects, it is necessary to carry out the transformation in a coordinated manner with all stakeholders. Multiple actors from local government to centralized management, and strategic decisions have a role in the transformation process. The approaches that these actors bring in throughout the urban transformation process, their relations and partnerships are the topics explored in this study.

To analyze the relations of the actors in planning and implementation processes of the urban transformation projects carried out in the study area, Fikirtepe neighborhood and its vicinity, in-depth interviews were made using one of the qualitative research methods, the semi-structured interview technique. Multi-actor structure of the transformation projects in and around Fikirtepe makes it possible to determine urban transformation actors and the way actors are included in the process and to map the relations of these actors.

2. Literature Review

2.1 Definition and Saco of Urban Transformation

Urban transformation is defined as comprehensive vision and action which leads to the resolution of urban problems and which seeks to bring about a lasting improvement in economic, physical, social and environmental conditions of an area that has been subject to change (Roberts/Sykes 2000). Urban area that undergoes a change may be a historical settlement, an industrial zone that lost its function or a housing zone with a lot of social and location related problems. The process that involves interventions made to economically, socially and physically resolve the problems of the region is generally referred to as "urban transformation". An urban transformation project should be based on detailed analysis of urban area's condition and effort should be made to reach an agreement with best possible engagement and cooperation of all related stakeholders in regeneration of the area (Roberts / Sykes 2000). In its UK experience, Turok (2005) associates urban transformation concept with three basic attributes.

1. It's objective is to change the nature of an area (space) and to involve the residents of the area and the other actors who have a say in the future of that area.
2. It covers various objectives and activities that intersects with basic functional responsibilities of the state depending on specific problems and potential of the area.
3. Special corporate structure of this partnership may change however it includes a structure that generally works among different stakeholders.

Urban transformation practices now have a multi-actor structure different than the previous years. It is a multi-dimensional action process where a wide range of actors act together, rather than the applications involving only the public or private sector. The tree basic elements

referred above can be listed as engagement, roles and responsibilities of the public and partnerships.

2.2. Actors, Associations And Engagements In The Urban Transformation

Main actors involved in the urban transformation process are the public sector (centralized and local government), private sector, local residents, voluntary sector and other relevant groups (Turok 2005, McCarthy 2005). The members of the parties of the urban transformation projects, their qualities, quantities may vary according to the quality of the transformation project, the objectives, spatial scale (approach for districts or the entire city) and may shape according to the purpose of transformation and other conditions (Turok, 2005). The term "partnership" that emerged according to the agreement reached as the result of political interests in UK draws the conclusion that a closer bond between the public and private sector and direct engagement of the local communities are required (McCarthy, 2005).

Basically four main reasons stand out in response to the question why partnerships are required: first of all a multi-actor partnership is able to cover all aspects of the problem. This will help an efficient and fair distribution of the funding where all sectors are engaged, which makes it the second reason of the partnership approach. And third of all, vertical and horizontal engagement of all actors and organizations results with coordination of activities, funds and efforts planned for the same purpose. The fourth reason is to ensure, contrary to the top-to-bottom centralization approach, the engagement of the local community with a more extensive role, since it is the most affected party from the transformation. Partnerships made in the urban transformation with engagement of actors and large-scale engagement of actors that work in coordination, in an integrated way, by creating financial resources and versatile strategies in order to resolve the multi-dimensional and complex structure of urban problems play an important role in urban transformation efforts. The partnership is formed with both the

organizational structure and the structure created to set policies and the actors that enable achieving the common targets. Based on this, to begin with it is necessary to define the roles of the actors that stand out in urban transformation processes (Beswick, 2001).

- 1) Public sector; In the transformation efforts, there is a strong public sector engagement that is managed by relevant public institutions. It is composed of local authorities (generally the representatives of various units), economic development institutions, university and colleges, representatives of regional and national administrations depending on the targets set. (Turok, 2005). Beswick (2001). Beswick suggest that the public sector, which we can define as the fundamental actor of the urban transformation process, generally leads the urban transformation projects with its supervisory and regulatory role in this partnership process. Another important function of the public sector is its ability to minimize the private sector risks by making the spatial planning of the area and generating information about political requirements in the area (Mccarthy, 2005). It is one of the most important qualities that enables the private sector to be part of the transformation process. (Özden, 2008).
- 2) The most important quality of the private sector and what sets it apart from the public sector is its fast operation power, design skills and professionalism, which improves the quality of urban transformation. Private sector looking for attractive opportunities to undertake urban transformation activities, usually pays attention to the physical and economic aspects of the transformation work to be carried out. The biggest contribution of private sector to urban transformation efforts is about resources and areas of expertise.
- 3) Local actors are individuals like residents in the area who will be directly affected from the project, members of social groups and large landowners. Turok (2005) stated that local engagement may be easier in urban transformation projects with a social aspect.

In order to have a long-term transformation, the residents who live in the area must own the process and engagement of the local community must be ensured in order to win trust of the resident of the area.

- 4) Voluntary agencies are extensive in content and functional terms, and they are formed of civil society structures who play the role of independently handling the non-profit organizations, voluntary organizations like foundations and groups that provide funds to the society and various issues of the community and enlighten the public. (Turok, 2005).

Efficient urban transformation should be based on engagement and cooperation of numerous actors and stakeholders including local municipalities, states, national governments, landowners, investors and corporations and organizations at all levels. The idea behind the partnership is that it gathers together different actors and participants in the urban transformation process in order to create a synergic effect. In its widest sense, a partnership can be defined as a coalition of interest regulated officially, which includes actors from different sectors (public and private) and which creates a common policy and common agenda and action plan (Lang 2005).

As urban problems have a multi-dimensional and complex nature, it may help coordinating partnership activities and exceeding beyond boundaries of traditional policies (Roberts/Sykes 2000). Partnerships for urban regeneration is based on risk sharing by transferring the liability of the public sector to private sector (Davies 2004). In the urban transformation process, mainly three types of public-private sector partnership interventions are cited (Split, 2005):

Public sector managed leadership model: This model is composed of political actors and planning experts in the government and local governments. It is the model where the most

authoritarian interventions take place in the urban transformation process both in operational and spatial terms.

In the public sector managed leadership model, basically the public sector provides regulative scope in the decision process, develops corporate/legal frames regarding incentives and restrictions and this way the public interest is maximized. (Alp, 2012)

It is the type of cooperation formed generally by the centralized government and local municipality, and sometimes by more than one municipality. In this model, municipalities act as entrepreneurs in regards to land services. Private sector does not have a very extensive role in this partnership structure it only carries out some construction works on contractual and commission basis. In short, municipalities have the total control and power in this process (Split, 2004).

Public-private sector partnership model: Public-private sector partnerships have emerged as a partnership model that followed the privatization policies in 1980s and found itself an execution area very rapidly. The objective of this application is to meet the housing needs by making use of public lands and taking advantage of the private sector experiences.

Public private sector partnership model is composed of actors from both sectors and semi-public representatives. It is considered as the most efficient, productive and balanced partnership model in the urban transformation process. In this type of partnership model, actors form sector-based partnership coalitions and develop regeneration strategies specific to the process. In this type of partnership models, actors form sector-based partnership coalitions and develop required regeneration strategies (Alp, 2012).

General characteristic of this type of partnership model may be defined as having the strong financial means of the private sector and the efficient function of public sector, which is guidance and regulation (as required).

What sets this type of partnership apart from the others is that the cooperation with private sector continues not only on the construction phase but also throughout the operation phase and a construction and operational partnership is formed with the private sector (Split, 2004).

Private sector-managed leadership model; are composed of investors in private sector, land owners and/or semi-public representatives. This model is dissimilar to all other models in the urban transformation project as the most liberal type of strategies both on operational and spatial level are developed with this model (Alp, 2012).

3. Case Study

When we analyze the development of urbanization movements in Turkey, we may divide it into two periods: before and after 1950. Country's urban population that demonstrated a very slow increase until 1950 (with its own dynamics) has entered a stage of very rapid increase after this date as the result of the immigration to the cities arising from the structural transformations in the rural areas (Isik, 2005).

In Turkey, partnerships made with private sector are mostly seen in areas where the land value is high. Today, metropolitan cities where the real estate market is highly active have become the center of attraction for investors. Transformation projects carried out at areas where the land value is high, appear before us as projects that are self-financing and that can generate profit with the development rights and functions of use that are changing.

It is seen that organization among actor groups and form of relations develop and become different within the scope of unforeseen problems. Public sector that is much superior in legal terms due to the powers it possesses, requires the experience of the private sector in issues like workforce and organization and two sectors complement one another and speed up the projects. However planning and managing this relation accurately is the most important criteria for successful completion of a transformation project.

Urban transformation model organized by Ministry of Environment and Urbanization at Fikirtepe and its vicinity reveals out that the partnership structure between the private and public sector has not been fully developed yet, the project process was not planned accurately with decisions reached throughout the process, and the parties continue to find the accurate execution by trying to understand the problems encountered in implementation and reaching new decisions. Urban transformation project for Fikirtepe and its vicinity is analyzed by breaking it down to stages in order to understand which roles the public, private, and civil sector and local community actors should play in which stages of an urban transformation project.

3.1 Site

Fikirtepe is located at Anatolian side of Istanbul, at the center of Kadikoy country, at the point of intersection of Bosphorus Bridge and D-100 highway and is very close to TEM access roads. Also it is easily accessible with public transportation. Despite its central position, we can say that it is a shanty settlement made up of unplanned structures deviating from public housing laws, its population is high, level of income and life quality is low and it is deprived of municipal services. Buildings are generally old, two and three story buildings without construction permit. Project site is defined as special project site under 1/5000 master plan and is declared as an urban transformation site by the Istanbul Metropolitan Municipality.

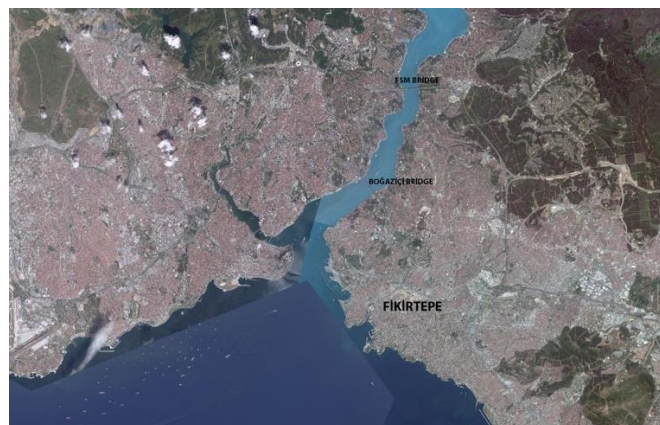


Figure 1: The location of Fikirtepe in Istanbul

Fikirtepe, elected as the study site was used as a picnic area until 1950s and after that unplanned urbanization occurred due to immigration after 1950s and in 1970s, the number of this unplanned structures increased and due to expansion of the city, the area is no in a central location and became a topic on the agenda of urban transformation process. This project has a special spot among transformation projects being carried out in Istanbul both due to its scale and the new transformation approach envisaged.

Fikirtepe area is composed of 60 city blocks. Each one of these blocks with an approximate area of 20 decare have 100-120 parcels and houses 300-400 households. With the new master plan, the structures in the form of city blocks are granted the right to use 100% additional floor area ratio, and the objective was to follow a gradual construction system and to turn the ownerships formed of very small parts into ownerships with larger parts. The plan allows individual settlements as well. However the main approach of the plan is to realize structural regeneration and transformation in line with granting extensive development rights by expanding the parcels.

It is believed that when development rights are granted to larger parcels, title holders will start to merge and eventually a structural transformation will start. As the new master plan grants the structures in the form of city blocks, the right to use 100% additional floor area ratio, a lot of construction companies tried to make agreements with the local community on flat for land basis and tried to collect parcels to form a city block. Construction companies that made an agreement with the land owners on flat for land basis, are giving the land owners flats under the new project according to square meter of their lands, and the companies also cover their rental fees until the end of the project and pay their moving in costs.



Figure 2: Current Structure in Fikirtepe

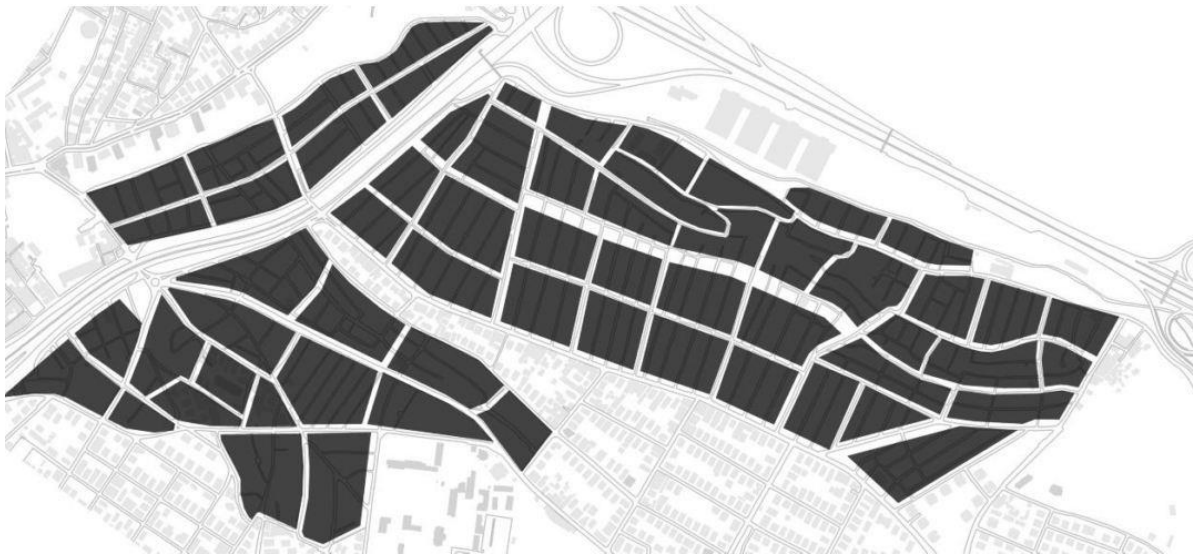


Figure 3: The Structure in Fikirtepe following transformation

Fikirtepe and its vicinity is explored in 3 phases in terms of efficiency of the actors in the transformation process:

Table 1: Fikirtepe Urban Transformation Process

FIKIRTEPE URBAN TRANSFORMATION PROCESS	STAGE	ACTORS
22.02.2011 IMPLEMENTARY DEVELOPMENT PLAN	1ST STAGE 2011-2013	ISYANBUL METROPOLITAN MUNICIPALITY- KADIKÖY MUNICIPALITY
28.02.2013 CANCELLATION OF PLAN	2ND STAGE 2013-2016	MINISTRY OF ENVIRONMENT AND URBANIZATION- ISTANBUL METROPOLITAN MUNICIPALITY
28.12.2016 PLAN NOTE AMENDMENT	3RD STAGE 2016-2018	MINISTRY OF ENVIRONMENT AND URBANIZATION

1. Stage: 2011-2013; The period from the time the transformation process was initiated by Istanbul Metropolitan Municipality with the cooperation of Kadikoy Municipality until the Ministry of Environment and Urbanization declared the area as risky in 2013,
2. Stage: 2013-2016; The period until Ministry of Environment and Urbanization has been authorized as the sole authority of the new process that was initiated by Istanbul Metropolitan Municipality and Ministry of Environment and Urbanization, the public authorities for the area that had been declared as risky,
3. Stage: 2016-2018; The new process initiated with the partnership of Ministry of Environment and Urbanization and Kiptas and Ilbank;

4. Methodology

In this study, in order to accomplish the objectives of the study, semi-structured face-to-face interviews were made with the actors playing a role in the urban transformation process at Fikirtepe and its vicinity. Separate forms were issued depending on the participants and actor

groups interviewed. Semi-structured in-depth interviews were made with the actors at determined stages and questions and answer method is used in the process.

In this study, as the determinative feature of the qualitative researches is to discover the perspectives of the persons interviewed with, in order to explain the process that took place in the area and to understand the actors and relations, semi-structured interview technique composed of open and closed end questions was used as the data collection method. Accordingly stages and actors were determined. Afterwards in-depth interviews were analyzed with the help of these stages and titles.

To begin with, documentations regarding Fikirtepe Urban Transformation project were examined in-depth by taking into consideration the roles, responsibilities and perspectives of various stakeholders. Then in order to analyze the approach of the stakeholders to the partnerships and the transformation process, from the perspective of engagement, interviews that were semi-structured as 3 stages were made from 2016 to 2018 with 45 actors who were directly or indirectly involved in the project.

The interview questions were envisaged to underline any challenges that had been encountered to date, to discuss the ways to resolve these and to examine the strategies for facilitating engagement and partnerships of the private and public sector.

5. Findings

Different options of implementation for the transformation envisaged under Fikirtepe Implementary Development Plan and project implementation methods that require arrangements like increase of floor area ratio depending on parcel combinations etc. had caused the implementation process of the plan to differ from the implementation processes that were carried out until then. Many title holders in the area preferred to unite their parcels with the other title holders, instead of acting individually, in order to benefit from the highest floor area ratio granted to city blocks under the plan.

5.1 First Stage

Within the scope of the study regarding the transformation process, 1st stage starts upon approval of the 1/1000 scale plan by Istanbul Metropolitan Municipality in 2011. As the actor that started the Urban Transformation Process, IBB followed the strategy of monitoring the process rather than being involved in the process. At the beginning IBB had the authority to make the planning required to resolve the problems in the area but later it refrained from being part of the implementation process. At that stage, Istanbul Metropolitan Municipality who was the only authority under the plan, did not take part in the process and land acquisitions were made based on the contracts made between the title holders and investors.

The people interviewed stated that major challenges were experienced at this stage as the floor area ratio determined was high and as the agreements were being made between the title holders and the contractors, and they said *“contractors should be inspecting the process, the local community incurs loss as the awareness raising was insufficient and that most people had to sell their land share due to extension of time,, .*

In the settlement process, the content of the contract concluded between the title holders and companies was configured entirely in line with their demands and no public institution had any control or guidance at this stage. Interviewed person with code YH1 mentioned that *contracts were not sufficient*, and the one with code GK3 stated *“we do not trust the investors,, .*

1st stage is carried out under the supervision of the Metropolitan and Kadikoy Municipalities, with the title of authorized institutions, and the stage ends after the plan for the process is cancelled and Ministry of Environment and Urbanization is authorized within the scope of the law no. 6306 on transformation of areas under Disaster Risk. 1st stage is mostly the period when first impressions about the transformation process in the area starts to shape.

5.2 Second Stage

2nd stage is in fact an important first step taken to find solutions for the challenges encountered with the plan in the 1st stage. First of all, there was a requirement at the beginning to have approval of 100% of the title holders for applications to be made on city block basis which lead to substantial problems and later with law no. 6306, 2/3 majority was considered acceptable, which paved the way for these applications. At the Preliminary Project and building permit stages, both municipalities (IBB and Kadıköy Municipality) were authorized, the time of approval processes extended, so the Ministry of Environment and Urbanization started to manage the process as the sole actor at the beginning. Then the plan was amended and the Ministry shared this authority with Metropolitan Municipality. Due to problems like urban and social reinforcement areas not being sufficient, sustainability of reinforcement areas not being maintained as spatial distribution of reinforcement areas to be acquired from the areas to be assigned to the public, is not configured with a holistic approach, and the administration to whom the reinforcement areas will be assigned to not being clear, it was decided to increase the ratio of the reinforcement area to be assigned to the public from 20% to 25% and to assign these areas to the treasury.

Interviewed person with code CSB1 states the following “*the ministry was involved in the project process in order to clear the way for the process that faced a bottleneck* „ ; interviewed person with code CSB3 says “*the main target is to expedite and facilitate the process* „ ;

The Ministry holds the authority for the amendment of the plan and building permits and has granted the authority to approve the project to Istanbul Metropolitan Municipality. As officially Kadıköy Municipality is no longer part of the transformation works. Another important step taken to expedite the agreements was the Urgent Expropriation Decree enforced by the Ministry. This way the state would have the authority for expropriation in respect of the city blocks on which an agreement could not be reached and the process will progress more rapidly.

However the expropriation process lasted much longer than estimated so shortly after it was decided to annul the decree for expropriation.

Another important development in the process, in respect of organization among the actors, was the formation of Fikirtepe Platform by 17 members of Fikirtepe Urban Transformation Association that continue their Urban Transformation studies in Fikirtepe, with the purpose of ensuring secure and regular housing in the area. Platform Member with code ÖS1 states his opinion;

“Urban transformation at Fikirtepe gained outstanding speed with the support of Ministry of Environment and Urbanization”.

One of the most important problems in this process was the lack of a reconciliation platform where actors could meet. That’s why contractors’ platform has become very efficient in determining the common problems of the private sector and communicating the problems to relevant authorities.

IBB and Ministry of Environment and Urbanization acted unofficially as problem resolution units. Title holders and contractors participated in meetings at Metropolitan Municipality and Ministry premises from time to time in order to both explain their problems and to reach a consensus.

Another important development in terms of expediting the process was the omnibus bill enacted in 2016. By including the provision permitting sales on city block basis, urgent expropriation cases were dropped and share sales started.

Companies informed the Ministry of Environment and Urbanization about the agreement ratio in the city blocks they are interested in and the Ministry evaluates whether these city blocks are subject to sale. In case an agreement of 2/3 is reached, the rights of the remaining 1/3 is sold to

the other residents of the city block. This omnibus bill paved the way for permitting sale of the rights of 1/3rd of the title holders, which was an important development that expedited the process.

However since city block based agreements took long and evacuations on area basis were made and as the contractors had to pay rent for a long term as public institutions could not reach a settlement among themselves which caused delay of required documents, they faced financial difficulties. At this stage some companies declared bankruptcy and tried to reach settlements with foreign partners. At this point it was highlighted that as a right granted under the law “*rent fees should be paid by the public,,.*

5.3 Third Stage

One of the most important phase of urban transformation process of Fikirtepe and its vicinity is the addition of the decision “*preliminary project approval will be cancelled and implementation will be done only according to the architectural project to be approved by the Ministry of Environment and Urbanization*” with the amendment of the plan in 2016. With this decision, Istanbul Metropolitan Municipality that was included in the transformation process as required by its authority, is no longer an actor in the process as required by the plan note. And this amendment of the plan is the start of the 3rd stage. The interviewed person with code CS4 emphasizes that;

“*this amendment was made to achieve progress in the process*”.

Likewise interviewed person with code OS11 states that “*The Ministry should be part of the transformation process exercising its control authority*”;

Ministry of Environment and Urbanization continues its activities to complete the transformation in the area rapidly by providing interim solutions, while negotiating for partnership with companies in the area that are facing financial difficulties. To avoid suffering

of the public due to projects that could not have been completed by the companies because of the financial difficulties they face, the Bank of Provinces running under the Ministry and Kiptaş, an affiliate of Istanbul Metropolitan Municipality, formed a partnership to complete the 2 projects that were suspended. In this partnership protocol signed by Ministry of Environment and Urbanization, the Bank of Provinces and Kiptaş, the Bank of Provinces is responsible of the financing and Kiptaş is responsible for the construction.

6. Discussion

Urban transformation process being implemented at Fikirtepe area chosen as the site for this study, was explored to uncover the role of the actors in the transformation process and engagement among actors and partnerships. The findings suggest that transformation works should be carried out in coordination with all stakeholders in order to have a successful outcome and that a more efficient and productive relation is required between the private and public sector (Roberts and Sykes, 2000). It is specifically anticipated that the effects of partnership structures of the actors will become evident in the long term (Garcia, 2004).

In order to have a feasible urban transformation, long term planning should be made and partnership and cooperation between actors should be ensured by taking into consideration all the transformation factors. Solid coordination and strong communication network among the parties is required to realize the partnership model, it should not be just an economic agreement.

In the study exploring the urban transformation project for Fikirtepe and its vicinity, some of the major issues that arise as problems in the urban transformation processes in our country are elaborated. These are;

The members of the parties of the urban transformation projects, their qualities, quantities may vary according to the quality of the transformation project, the objectives, spatial scale (approach for districts or the entire city) and may shape according to the purpose of

transformation and other conditions (Turok, 2005). Actors and their roles in the transformation area should be determined. Authorities and responsibilities in the management and organization of urban transformation area should be defined clearly.

The public sector, the actor initiating the transformation projects, needs to take the leadership role throughout the process. The authority and task sharing among public institutions must be clarified as a priority. It is considered that the public sector, which we may describe as the main actor of the urban transformation process, needs to take on supervisory and regulatory role in the partnership process and in general the leadership role in the urban transformation projects (Split, 2005). Public sector should be able to minimize the private sector risks by generation of knowledge regarding spatial planning and political requirements in the area (Mccarthy, 2005).

If the local community does not clearly understand the methods and reasons of transformation, the expectations of the target group will vary and this will lead to loss of trust. The project scenario should be developed together with the residents of the area and the community must take an active role in the project and its implementation.

It is observed that organization among actor groups and relation patterns listed under unforeseen problems are developing and changing. Public sector that is much superior in legal terms due to the powers it possesses, requires the experience of the private sector in issues like workforce and organization and two sectors complement one another and speed up the projects. However planning and managing this relation accurately is the most important criteria for successful completion of a transformation project.

Public wants to be a part of the negotiation process among title holders and contractors until an agreement is reached between the parties (contract based) just like in Fikirtepe case. However it's role should be to balance the relations between actors and to control the transformation project. Government should protect the rights of the actors, encourage engagement of various

organizations that will make significant contributions to urban transformation and should determine the responsibilities. Multi-actor partnership structure has the ability to cover all aspects of an urban problem.

As Scharpf (1997) says each actor in the urban transformation process has its own strategy and style. Each actor is in fact an institution on its own. However since the result of the selected strategy depends on the strategies of the other, the objectives are interdependent. Also we should not forget that people always act in the interest of their own so it is not possible to explain the interactions purely objectively. (Scharpf, 1997). Actor groups that can organize take decisions much easily. The size of the group show that people are controlled by the group they are part of and their actions are limited accordingly. (Douglas, 2007).

7. Conclusion

Models that involve all actors in the planning and implementation process are required to figure out the multi-dimensional and complex structure of urban transformation projects. These models should be formed under the leadership of the public sector and engagement of all relevant actors in the transformation process should be ensured. The primary role of the public sector should be to guide, supervise and regulate.

In Turkey, a multi-actor partnership approach should be adopted with participation of private sector, voluntary sector and local community along with the public sector. As actors take more roles in urban transformation projects, economic, social and managerial aspects will develop. To incorporate the private sector in urban transformation projects, some of the incentives expected by the private sector should be given and attractive terms should be provided. Local community should be incorporated in the transformation process at the planning phase and must be informed about updates at each stage of the process and their engagement should be ensured.

Urban transformation projects should be clearly configured and planned right from the start and partnership structures that will follow-up the changing conditions and keep these under control needs to be developed.

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Effects of Architectural and Urban Design Project Competitions on Built Environment and New Discourses Brought Thereby

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Abstract:

Competition system is considered to be the most objective project selection method in a country's architectural and urbanism organization and is a mechanism which promotes professional creativity. Both national and international competitions have a significant potential in terms of providing knowledge and accumulation to contemporary architecture history. It is stated by the studies conducted on design competitions that while competitions contribute to the architecture environment of the country where they are held, they also provide opportunity for monitoring the architecture and accordingly changing discourse of the environment. The aim of competitions is to obtain "the best project" for a building or building group or a specific area, designs of which are predetermined. When we think globally, we can say that competitions are the most essential component of a country's architecture and environmental culture. Issues like, which buildings and open areas are obtained, the amount of allocated labor, time and money, if the selected project was applied or not, how the selected project was criticized and etc. are indicators showing the level of a country's architecture and urban design application. Competitions, at the same time are tools for drawing attention to the issue of how effective the role of designers (architect-urban designer) in the development of a society is.

Type, nature, objective, issues, expectations of design competitions and the benefits they provide to the built environment are discussed in the general sense in this study. In this context the buildings which have been built by competitions and which are known as the important examples of the architectural history of Turkey and the world have been examined by

taking into consideration their periods. The importance of competition models in the European and Nordic countries, where new and different discourses are brought forward, extreme points of design are questioned and criticizing and groundbreaking unique products are revealed, are underlined in the conclusion part of the study. Furthermore, it has been stated that competitions are one of the methods to obtain qualified buildings and environments in Turkey, there are problems in their being sufficiently developing, leading and raising awareness. The reasons why there are still a few qualified buildings (besides exceptions) have been stressed. Recommendations as to institutions organizing design competitions, creation of specifications for design competitions and establishment of jury in design competitions have been offered for eliminating issues in design competitions.

Keywords: Competition, culture of competition, architectural design, built environment, urban design

1. Introduction

Design competitions, results of which are anticipated with anxiety, are conducted in numerous countries with an eye to select the best in their disciplines. Both national and international competitions have a significant potential in terms of providing knowledge and accumulation to contemporary architecture history. It is stated by the studies conducted on design competitions that while competitions contribute to the architectural environment of the country where they are held, they also provide opportunity for monitoring the architecture and accordingly changing discourse of the environment. Sure enough, considering the remarkable buildings of the second half of the 20th century, the project competitions and the competition colloquiums as regards the cited buildings are observed to have significant influences on architectural and urban environment in terms of theoretical discussions and innovations.

Objective, nature and achievements of the project competitions are discussed primarily in the study. In this context the buildings which have been built by competitions and which are known as the important examples of the architectural history of Turkey and the world have been examined by taking their periods into consideration. The importance of competition models in the European and Nordic countries where new and different discourses are brought forward, extreme points of design are questioned and criticizing and groundbreaking unique products are revealed are underlined. On the other hand, it has been stated that competitions are one of the methods to obtain qualified buildings and environments in Turkey, there are problems in their being sufficiently developing, leading and raising awareness. Recommendations as to institutions organizing design competitions, creation of specifications for design competitions and establishment of jury in design competitions have been offered for eliminating issues in design competitions.

2. Objective of the study

The objective of this study is to determine the effects of new ideas, technologies and talents brought forward through the architectural and urban design project competitions on the built environment. Contributions of competitions made in the U.S.A., some European countries and Turkey and the applications obtained by such competitions on architecture and urban environment obtained within this framework have been explained.

3. Architectural and Urban Design Project Competitions and Achievements

Different definitions of project competitions are available in different sources. According to the "International Union of Architect / UIA" regulations which are valid in international projects, competitions are held in order to find the best solution among many designs and ensure that the designer is included in the process during the application phase of the project (UIA, 2000). SAFA, the Finnish Architects Association, which is highly experienced in competitions, defines competition as a method of obtaining the most important projects which is focused on quality and developing the fine skills of the profession and which contributes to the

beauty of the built environment for a democratic society. Competitions are regarded as opportunities for professionals to train themselves more, test new theories and improve their skills. It is stated that competitions provide learning experience to participants of the competition during the competition process by virtue of evaluation alternatives from different points (URL 1). The concept of competition in Turkey is defined as "an organization necessary for the realization of a subject related to architecture, landscape architecture, engineering, urban design projects, urban and regional planning and fine art works ..." (Regulation on Architecture, Landscape Architecture, Engineering, Urban Design Projects, Urban and Regional Planning and Fine Arts Competitions", 2004).

As it can be understood from the definitions, a competition is aimed to obtain the "best project" for a specified building or built environment or for a specific area. Competition system is the most objective system in selection of architectural, urban design and urban planning projects. It is a mechanism which establishes the society's connection with architecture and which promotes professional creativity. At the same time, competitions are important tools for drawing attention to how effective the role of designers (architect, urban designer, landscape architect) is in the development of society (Rönn, 2009).

A competition is a platform where a tool and new ideas are produced, new arguments are put forward and the most extreme ideas are questioned in order to obtain a design. The achievements of competitions, in this context, can be summarized as follows:

- Encouraging fine arts and architecture,
- Selection of a qualified project in line with the architectural and urbanism approach of our day,
- Contribution to the development of urban texture by virtue of application of qualified projects,
- Contributing to the development of the architectural and urban environment thanks to their educational and developmental aspects,

- Encouraging designers for new quests and researches and educating them,
- Ensuring designers to be able to see the projects together and have a chance to compare them,
- To bring different architectural-urbanism approaches together on a common platform by virtue of international competitions and cause designers to think in universal dimensions,
- Determination of talented young designers,
- Creating new business areas by giving the chance of application to the winning designers and
- Assuming an important role in the development of architecture and urbanism in the country thanks to the idea archive that created thereby as well as its means of accumulating knowledge to new generations.

4. Design Competitions in the World and Turkey and New Discourses Brought Thereby

4.1 Design Competitions in the World and Important Buildings

The first registered competition in history which has directed the world architecture was carried out for Acropolis which was elected and applied by the people of Athens to symbolize the end of Persian wars in 448 B.C. This is followed by the competition organized in 1419 for designing the dome of the Cathedral of Florence. The competition which Filippo Brunelleschi won is considered as the first product of the Renaissance (De Haan and Haagsma, 1988).

The approach of obtaining the best project by virtue of competitions has been often practiced in the U.S.A. and Europe as from the 19th century and there are numerous buildings constructed by means of competition. The rate of constructing buildings by means of competitions in Europe is more widespread compared to the United States. This fact is based on two factors. The first factor is the different approach to architecture while the second one is the nature of the institutions which conduct the contests. In the United States, the architectural

bureaus consider the issue as being large capitalist investor organizations, while artistic approaches are applied by small-scale architectural bureaus operating in Europe (Akansel, 2003). Another factor is "the European Union's European Competition Regulations" is. According to the regulation which has come into force in 1992, it is obligatory to obtain projects of large-cost public investments by virtue of competitions. Furthermore, the manual prepared by American Institute of Architects (AIA) on architectural design competitions directs employers to competition while referring to the neutral position of AIA as a professional organization during the process at the same time (AIA, 2010; Şentek, 2013), (URL 2).

Germany is an exemplary country in terms of competitions. Competition rules were set in 1867 in Germany. Projects of all public buildings are obtained through competitions thanks to the tradition of competitions dating back to 1870s. "German Competition Principles and Directives Applied for the Fields of Physical Planning, Urbanism and Architecture/GRW 1995" defines competition as; "not only the best design concept but also the project owner who will implemented the project by developing at a later stage is obtained by virtue of intensive works performed by transparent methods through an impartial jury" (Özbay, 2003). The fact that nearly 35 competitions are organized each month in Germany is an important indicator in determining the level of urbanism and architecture, and professional development of the country. Wettbewerbe Aktuell (WA) publishing competition projects periodically since 1980, is Germany's most prestigious competition magazine (URL 3).

There are also laws in France and Spain to build all public buildings by virtue of design competitions. The giant projects obtained by national and international competitions in France draws attention of both French and the world people. Competition rules were set in 1872 in England through the Royal Institute of British Architects (RIBA). The Finnish Architects Union (SAFA), founded in Finland in 1919, created the "Board of Competitions" in 1947 (URL

4). The mentioned board is obliged to submit the most accurate information to the competitors and write the specifications. In Finland, the buildings obtained through competitions held by the state as well as private firms, are among the important world examples. It can be seen that the rules to be applied in design competitions were set by the regulations in the 19th century in European and Nordic countries as well as in America. The projects selected and applied by virtue of the competition projects have created a database reflecting the architectural and urbanism approach of that period they have been made in (idea archive) and have played a significant role in the development of those country's architecture and urbanism.

The selected buildings obtained through competitions and known as important examples of architecture and urbanism history by the innovations they have brought and the countries where they are located in are mentioned in the following tables (Tables 1 to 5).

Table 1. Selected competition examples from the U.K.




ENGLAND	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
London	British Parliament Building		1835	97	Charles Barry, Augustus Welby Northmore Pugin	Architect Barry, who has adopted the classical style in general, has tried the Gothic style, the most appropriate national English style of the time in this contest
London	Crystal Palace		1854	233	Joseph Paxton	The building has become the first example of glass facade applications. All components of the construction have been manufactured industrially and assembled on site through utilization of prefabrication method.
Wales	Cardiff Parliament Building		1998	55	Richard Rogers	The building has expressed democratic values of "openness and participation" thanks to its transparent architecture while becoming an example for new public buildings in England.

Table 2. Selected competition examples from Germany.







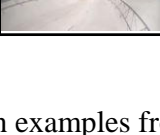
ALMANYA	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
Berlin	Reichstag / Parliament Building		1872 /1992	14	Paul Wallot / Norman Foster	The glass dome attached built on the Reichstag after the unification of Germany, expresses the 21st century's understanding of democracy and freedom. It is a spatial design of the "individual-public-city" trio in the abstract sense.
Berlin	Berlin Philharmonic Concert Hall		1960		Hans Scharoun	It is considered as one of the masterpieces of expressionist modernism thanks to the originality, dynamism and sculptural mass thereof.
Stuttgart	Art Museum		1989		James Stirling	It is one of the most successful examples of postmodern approach.
Berlin	Jewish Museum		1989	165	Daniel Libeskind	It is important in terms of adoption of deconstructivist movement in Europe.
Frankfurt	Commerzbank Tower		1991		Norman Foster	It is one of the world's rare smart buildings. It has pioneered the development of environmentally sensitive ecological structures in Europe.
Berlin	Postdam Square Urban Transformation Project		1991	16	Master: Hilmer-Sattler/Kollhof-Piano-Rogers-Moneo-Izosaki	Private sector managed leadership model has been chosen as the organizational model. The public has undertaken the role of directing and supervising while professional chambers-non-governmental organizations have undertaken the role of acting as representatives of the public.
Wolfsburg	Phaeno Science Center		2000		Zaha Hadid	It has been designed in deconstructivist style with the dynamic, ambitious and intriguing sculptural appearance thereof.

Table 3. Selected competition examples from France





FRANCE	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
Paris	Paris Opera House		1861	171	Charles Garnier	The building bearing the traces of French and Italian Renaissance in Neo-Baroque style has pioneered the emergence of Neo movements.
Paris	Pompidou Cultural Center and Museum		1970	681	Renzo Piano ve Richard Rogers	It has a special place in architecture history due to its being shown as a prototype of 'high-tech' movement.
Paris	La Grande Arche		1982	424	Johan Otto von Spreckelsen	"big projects" approach of President François Mitterrand, is expressed as the power demonstration of the government in architectural language.
Paris	Parc de la Villette		1982	471	Bernard Tschumi	It has provided a brand new perspective to the urban park concept. It is the park with the largest landscape plan of Paris.

Table 4. Selected competition examples from Finland







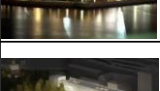
FINLAND	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
Helsinki	Finland Bank		1876		Ludvig Bohnstedt	The building has been constructed subsequent to the first architectural competition conducted in Finland.
Helsinki	Central Station		1904	21	Eliel Saarinen	The building has brought to the agenda the request for designing large public buildings in modern style.
Helsinki	Kiasma Contemporary Arts Museum		1992	616	Steven Holl	The building, representing the uniqueness of art, received the AIA award in 1999.
Helsinki	South Port of Helsinki		2012	201	Boegbeeld, Meren syleily, Stadi terassi and Tori	The competition is considered important in terms of its being an example of the concept of "participatory design".

Table 5. Selected competition examples from Austria, Australia and Sweden

PLACE	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
AUSTRIA / Vienna	Austrian Post Office Savings Bank		1903	32	Otto Wagner	The building in which steel and glass was used for the first time and in which ornamentations were not used is one of the buildings which have guided the 20th century's modern architecture.
AUSTRALIA / Sydney	Sydney Opera House		1956	233	Jørn Utzon	The building completed in 17 years despite the high cost and design problems thereof has been included in the world heritage list in 2007.
SWEDEN / Stockholm	Stockholm Public Library		2006	1170 /6 teams	Heike Hanada	The project for the old Stockholm Public Library designed in 1928 by G. Asplund having an original architectural value, has been chosen as a result of a competition having the highest number of participants.

Issues such as the conditions in which the designs are prepared, the place of the designs in social, political and cultural contexts specific to that place and the actors of the competitions and significant effects of discussions made on these issues on the architectural and urban environment of the country have been observed in the examined world samples of competition projects.

4.2 Design Competitions and Important Buildings in Turkey

Obtaining architectural projects, through competitions in Turkey, dates back to 1860s. The first competition held in Turkey was the project competition organized in 1867 for the summer residence of the British embassy in Tarabya district (Cezzar, 1991). The competition had to be conducted in the UK because conditions for opening a competition in Turkey were not suitable in that period,

however there is no information on whether the winning project was implemented or not. This competition was followed by the Turkish-German Friendship Foundation Competition held in 1916. The project of Bestelmeyer's project from Germany which won the 1st prize in the competition could not be applied due to the outbreak of World War 1 (Figure 1). Paul Bonatz, one of the participants of this competition among other participants such as Martin Elaesser, Teodor Fisher, Hans Poelzig and Bruno Taut (one of the important names of modern architecture), later served in Turkey (Özkan, 1975).

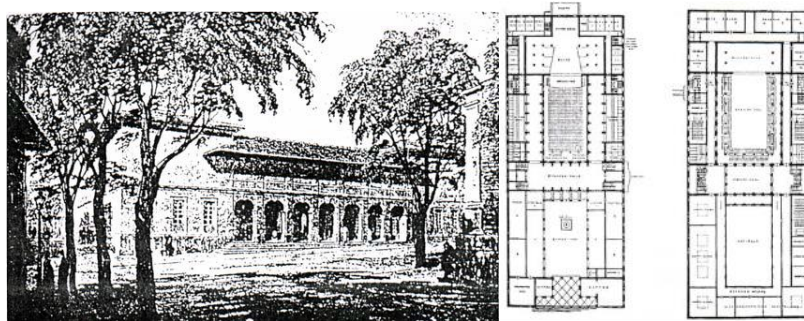


Image 1. First Prize for House of German-Turkish Friendship




Project competitions in Turkey have undergone significant changes periodically in parallel with the political and social developments of Turkey. In this context the process of competitions in Turkey from the establishment of the Republic until present was examined in four periods.

1930- 1950: Beginning Period of the Competitions

The principle of taking the modern cities of Europe as model and thus achieving the level of contemporary civilizations was adopted in the development of cities within the newly established Republic of Turkey in this period. Architectural project competitions organized for the prestigious public buildings of the newly established state has become a means of expressing the ideals of the state while also being an important means of directing designers. Initially important public buildings were designed through "international competitions" and by virtue of foreign architects. Subsequently, important buildings and urban areas started to be projected through "national

competitions" upon the successes of the Turkish architects in the later periods. The most important approach of the period was the desire of spreading the architectural culture throughout the country by virtue of competitions (Özbay, 1993). Outstanding projects of this period are specified below.

Table 6. Selected competition examples of 1930-1950 period.

TURKEY (1930-1950)	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
Ankara	Exhibition House		1933	26	Şevki Balmumcu	This building represents the modernist style of the period. It is considered as Ankara's architectural and cultural icon. It has become an important reference point in the success of Turkish architects against foreign architects.
Ankara	Grand National Assembly of Turkey		1937	14	Clemens Holzmeister	The building symbolizing the power of the Turkish Republic is considered a milestone in the Turkish architectural line evolving from modernism to nationalism (Neoclassical).
Ankara	Mausoleum of Mustafa Kemal Atatürk		1941	49	Emin Onat, Orhan Arda	The victory of Turkish architect with the design in the neo-classical style thereof reveals the importance of architectural project competitions in the struggle given by Turkish architects against foreign architects.

1950-1980: Modernism Period / New Life and Culture of Architecture






Since the 1950s, the effects of the National Architecture movement began to weaken subsequent to beginning of transfer of the developments in the world architecture gradually to Turkey. After smoothing the way for liberal economy, the private sector began to be included in the architectural environment which was determined publicly until then. The architectural environment began to change in line with the quest for new architectural forms and technical possibilities, (Batur, 1983; Sözen, 1996), (URL 5). Regulations as regards of competitions were put into effect in 1952 under the "Regulation on Architectural and Urbanism Competitions" issued by the Ministry of Public Works and Settlement. Project contests, especially for public affairs within the new regulations encouraged the establishment and development of private sector architectural firms. Meanwhile, establishment of the Chamber of Architects made an important contribution to the institutionalization of project competitions.

Cultural liberalism showed itself in theory and practice of architecture in Turkey in 1960s. The efficiency of trade associations and universities also increased in this period. Ministry of Public Works played a decisive role in project competitions, and "regional planning" and "urban planning" disciplines started to gain effectiveness thanks to the establishment of new institutions such as the State Planning Organization. Urban planning and design, which was previously the subject of architecture, became multidisciplinary (Aygün, 2004), (URL 6). İller Bankası (the bank of provinces) contributed to the development of the scientific content of urban planning by virtue of the zoning plan competitions organized for big cities. As it can be seen, the greatest works were carried out by the public and through competitions in the years 1950-60. Competitions opened during this period became a main activity area for private sector architectural firms and were defined as "school environments" providing a second chance of education to Turkish architects (Tekeli, 1998).

Some restrictions were imposed to competitions in the 1970s due to Turkey's economic conditions. (Such as making the size of windows smaller in order to save energy, preferring cheaper materials and using sloping roofs instead of flat roofs). An approach of preferring ordinary designs instead of innovative designs began to emerge with the foregoing restrictions. The language of modern architecture became neoclassic and architecture was reduced to ordinary project types through ministerial competitions (Balamir, 2003).

Important projects of this period are specified below.

Table 7. Selected competition examples of 1950-1980 period

TURKEY (1950-1980)	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
İstanbul	İstanbul Justice Palace		1948	37	Sedad Hakkı Eldem, Emin Onat	The project of the structure has pioneered the concept of "midway modernist" (between neoclassical and modern architecture) design with functional planning approach and simplicity thereof.
İstanbul	İstanbul City Hall		1953	28	Nevzat Erol	It is the first "native" example of International Style in architecture.
Ankara	Middle East Technical University Ankara Campus		1961	55	Behruz Çinici, Altuğ Çinici	architecture. "Béton brut technique" has been developed here for the first time in Turkey. Precast concrete, plexiglass and plastic industries have also been encouraged.
Ankara	Stad Hotel		1964	55	Doğan Tekeli, Sami Sisa, Metin Hepgüler	It is one of the most qualified applications of brutalism. It has become one of the pioneer buildings of the period with the use of gross concrete in addition to its success in mass plastics.
Konya	Central Bank of the Republic of Turkey		1976	5	Coşkun Erkal, Filiz Erkal	The structure, which has original modern lines, enriches to the region with its different architectural facade in the historical texture surrounding it.




1980-2000: Neo-Liberal Political Period

A process in which the social interventions of the state decreased while the powers and responsibilities of local governments increased began subsequent to the application of neo-liberal policies at the end of the 1970s (Şahin, 2010). Effectiveness of professional organizations and universities decreased in this period when the country's architectural environment was affected (Bozdoğan, 1998). The planned development process was neglected and the discourses of modernization began to be abandoned during the 1980s. The invited/restricted competitions organized by the private sector in line with neo-liberal policies led to a turning point. While "modern" style was abandoned in architecture, "postmodern" designs began to emerge also in competitions. The urban design phenomenon gained significance in these periods by virtue of competitions. The "Urban Design" concept was used for the first time in the competition platform

in Turkey in 1981 by the "Eskişehir Fair and Entertainment Culture and Leisure Areas Urban Design" competition (Çimen, 2013).

The trend named New Modernism and expressed by a simple and geometric language is observed in project competitions organized in the second half of the 1990s and in the 2000s. A significant decrease was observed in the number of competitions in the 1990s, with termination of the task of the Ministry of Public Works and the Ministry of the Presidency on this issue. 6 competitions were organized each year in average between 1990 and 2002. It is observed these values, compared with Germany (300-500 per year, 30-35 per month) are inadequate. Selected important projects of this period are specified below.

Table 8. Selected competition examples of 1980-2000 period

TURKEY (1980-2000)	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
Eskişehir	Eskişehir Fair and Entertainment Culture and Leisure Areas Urban Design		1981	43	Cengiz Eren, Canan Erselçuk	The "Urban Design" concept was used for the first time in Turkey. The competition pioneered many urban design competitions which were organized subsequent thereto.
Ankara	Halk Bank Headquarters Building		1983	5	Doğan Tekeli, Sami Sisa	The building has been symbolized by turning it into a concrete city gate in line with the high block approach brought by the function.
Muğla	Muğla Dalaman Airport's International Terminal		1999	96	Emre Arolat, Bünyamin Derman	The building represents the integration power of Turkey's architectural environment with its new design which is also called Neomodernism.

Post 2000: Changing World Conditions and Globalization

The 2000s in which the political and social buildings have entered into a reorganization process in line with the changing world conditions have revealed the need for discussing the architectural environment and occupational problems in Turkey. In this context, "The Regulation on Architecture, Landscape Architecture, Engineering, Urban Design Projects, Urban and Regional Planning and Fine Arts Competitions" entered into force in 2002 to regulate the principles and procedures related to competitions. This regulation, which covers defining the competitors,

professional chambers and the rights and authorities of the project owners, has become a legal tool which all public institutions and organizations have to comply with during the competition process. The 2000s have become the years in which the content and presentation of competition projects have changed due to the impact of globalization. The development of modeling (simulation) technologies in the design process has caused the creation of a virtual design process. The content presentation of the competition projects have become impossible to be dealt with separately from the utilization of technology. The use of appealing demonstrations incompatible with human perception in the projects submitted to the competition in recent years, has made the competition juries to make choices by being affected through the presentations rather than the ideas (Şahin, 2010). The importance of "image" instead of "solving problems in designs" has made the competitions a tool of the production and selection of the images. "Image" causes production of exciting projects, but the selected projects are not implemented due to the inadequacy of construction standards and the tender regulations. The economic dimension of the competition has increased too much. This has reduced both participation in the competition and inexperienced jury members have made selections of by being affected from presentations rather than ideas, and numerous quality projects have been overlooked (Özbay, 2013). Selected important projects of this period are specified below.

Table 9. Selected competition examples of post 2000 period

TURKEY (Post 2000)	BUILDING	PHOTO	YEAR	PART.	WINNER ARCHITECT	INNOVATION
İzmit	Izmit Coastal Area Urban Design Project		2010	49	E. Garip, B. Garip, A.Ö. Albayrak, K. Özyayın	Condition of presence of at least one architect, one city planner and one landscape architect was stipulated. Three landscape architects were included in the jury of the competition.
İzmir	Izmir Metropolitan Municipality Opera House		2010	177	M. Kütükçüoğlu, E. Uçar, M. Üçer, O. Akın, C. Bilgin	Location context was emphasized on coast-public space-structure relation culture and art was symbolized by architecture
İstanbul	Yenikapı Transfer Point and Archeopark Area Project		2012	9	C. Bozkurt, Atelye 70, Aytaç Architects/ Foreign Partners	together different transportation alternatives. An Archeopark Area has been established after the archaeological findings. The project has been discussed in terms of its organization and
Düzce	Düzce University Konuralp Campus Development Plan		2015	56	D. Kaptan, S. Uğurlu, S. Kurt, O. Tabanoğlu, E. Göray, A. Köksal	The University is considered important in terms of addressing campus plans as a whole and in line with sustainability principles and setting an example for other university campuses.

5. Problems of Design Competitions' in Turkey

Although the competitions in Turkey are one of the methods to obtain qualified building and environments, there are certain problems in creating awareness. The number of competitions is still low although they are organized since 1930's. Many of the designs obtained by competitions organized at various fields have not had the chance to be applied. The failure to implement these projects, which may lead to significant changes in the environment, requires re-questioning what the meaning is for not only the designers but also the institutions which organize such competitions (Şahin, 2003). On the other hand; it raises questions that competitions which are accepted as the most democratic project selection method, are sometimes used as a tool by the governments to make legitimate the project they want to have. The basic problems in design competitions in Turkey can be stated to be as to institution organizing the competition, formation and working of the jury, creation of the specification and the competitors. Expected results cannot be received from competitions due to problems listed as follows:

The Competition Authority

- Institution organizing the competition cannot correctly determine the way and objectives of the competition,
- Investments allocated to the competition projects are postponed or canceled due to the economic inadequacies of the institutions,
- Loss of time and money based on the fact that many of the winning competition projects including large-scale work in architectural and urban design type cannot be implemented by municipalities or ministries,
- Announcements cannot be made openly to everyone due to limited of the competitions organized by the private sector,
- Deficiencies in the arrangement of the colloquiums organized at the end of the competitions and in the exhibition of the projects. Lack of debates with high level to make the designer group and audience (local people) take action.
- Failure to create a "user participation" organization during the design and construction stages. The lack of sharing of project selection and the competition results and the place with the users (for example, making the final selection by the jury members by allowing the participation of the local people as in the Helsinki Harbor Competition and the Toronto Coastal Arrangement Competition),

Formation and Working of the Jury:

- The prerequisite for obtaining qualified environment and buildings through competitions is "qualified and competent jury". The identity of a jury member in a competition is critical. There are shortcomings in the criteria in creation of the jury lists specified in Article 19 of the Regulation on Competitions in Turkey. Although the aforementioned criteria are necessary; it is criticized that the persons who are accepted by the professional

communities in terms of honesty, transparency and proven design ability are not included in the juries sufficiently.

- Failures as to ensuring the determination ways and objectives of competitions correctly of which the jury member is responsible , forming the requirement program, controlling of the functional areas, determination of the requirements correctly, ensuring compliance with the competition regulations, making the control of the booklet and the documentation to be given to the competitor, giving importance to the question and answer phase and issues of continuity, seriousness and fair execution,
- Failures as to the jury's working principles: Disagreements between the jury members or keeping the duration of evaluation short, inadequate comprehension of the projects, unexplanatory jury reports and delays in the publication process,
- Not being able to find a work worthy of first prize from time to time or giving the first place to more than one party and making price bargains with the winners,
- When the flashy presentation style of the computer environment precedes the content of the design and the qualified projects are ignored (visual presentations are being liked by the jury members)
- Creating the Specifications:
- Not preparing the specifications in a clear enough way to show the requirements of the institutions organizing the competition,
- Not taking the design subjects (content-scope) into consideration in determination of the prize amount in specifications,

In terms of the Competitor:

- The failure in application of the winning team's project or application thereof by different people or teams,

- Not meeting the material and moral efforts of the participant spent in the project preparation process,
- Unbalanced award distribution (examples are also found in the world),
- Keeping the delivery time short in some competitions,

In addition, lack of participation to discussions and criticisms taking place within a narrow framework consisting of several internet forums (kollokyum.com, arkitera.com and etc.) also prevents access to the expected level of competition.

6. Conclusion and Evaluation

Competitions, when considered universally, are an important component of a country's architectural and urbanism culture. Which buildings and open spaces are prepared by competitions, how much labor, time and money can be allocated to competitions, whether the selected project is applied or not and how the applied project is criticized is one of the indicators of the country's level of urbanism and architecture. Proposed projects can be defined in terms of their design qualities. For example; Exceptional, ordinary, innovative, strategic, fashion, experimental, provocative, protest and such qualities can be made. The literature on competitions states that competitions contribute to the theory and culture of the architecture and the built environment. Architects develop a conceptually readable vision by comparing their ideas by virtue of competition projects and practices. Theoretical and empirical works made on design competitions are important sources of information for professional practice (Çağlar, 2013).

In the European and Nordic countries where the competition phenomena is examined, it is observed that there is a process in which the critical points of design are questioned, and the critical and epoch-making original products are produced by virtue of architectural and urban design projects, which speak new and different words. However, although it is stated that

competitions are "methods of achieving qualified buildings and environments" the number of qualified buildings is still low. Although there are significant opportunities competitions provide to the architectural environment in Turkey, there are problems identified in the fifth article.

In order to solve the problems mentioned hereinabove, transparency, openness, democracy, sharing, competitiveness and objectivity issues must be rearranged in the process beginning from the announcement of the competition until the resultant product (participating projects) is criticized. This is because; design competitions create a public platform in which all the stakeholders, including institutions, politicians, investors, designers, researchers and students, participate, as well as laymen (local people) participate. As such, competitions should be buildingd as tools for obtaining qualified urban environments and constructions.

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Factors Influencing the Perception of Urban Space

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Abstract

All over the world, the phenomenon of urbanization has always faced problems of preserving the essence and identity of cities. The various means of elaboration and urban action are often called into question for their inability to conserve and develop coherent urban forms.

Since the seventies of the last century, the legibility of an urban landscape has always been an objective in the urbanization process. The clarity of an urban landscape, as mentioned by K. Lynch in his book 'The image of the city' in 1969, is the ease of identifying the elements of the city and structuring them into a coherent scheme; it is about the perception of the urban space. Therefore, the perceived image of urban space is the pre-existing base of the gaze, which appeals to multiple gains such as aesthetics, beauty and other cultural principles and values that depend on who is watching. A better knowledge of the mechanisms of human visual perception has an impact on the conception of the image, which depends on several factors. What are these different factors of perception of the urban space? How do they influence the ability to perceive objects in a living environment? Our Paper traces the chronology of the work of perception of an urban space. By shedding light on the different factors influencing this perception.

Keyword: Perception, urban space, urban design.

1. Introduction

Since the beginning of the 1960s, K. Lynch has relied on surveys of perception of metropolitan cities in the United States by the inhabitants. He described the components of these cities

according to their limits, their landmarks ... etc., inducing a reorganization according to a perspective mechanism.

The perceptual process is the set of tools, means and factors that allow individuals to construct images and mental representations of a space. However, the characterization of an urban space is linked to the perception of this space. Indeed, the elements of representations of a space are different, even the visual image, the value, the symbols, the smells .. etc. According to B. Mérenne Schoumaker (2002, p.83) *"Every human step is based on representations, that is to say images of reality. This one can never be reached directly and its seizure is always partial. It depends both on the perceived object and on the one who perceives it, on what it is, on its ideology, on its environment, namely on its values "*.

2. Definition of perception:

"Perception is a psychological operation, it implies that we receive a message, which we interpret through the brain that structures and organizes it" P. Pinon 1991

To perceive is also, *"to choose in the infinity of possible combinations, that which gives us the most useful, if not the most exact image of reality according to affectivity, aggression, fear, desire"* Le petit Larousse illustré.

The word perception therefore means either the sensory capacity or the process of assembly and processing of sensory and sensitive information.

The perception of the visual messages depends on the visual acuity of the subject, that is to say his ability to perceive objects according to the ratio between the size of the object and the distance between the eye and the screen.

3. The mechanisms of perception of urban space:

"Urban space is not perceived in an arbitrary way by citizens, there is a certain mechanism to see space as an image. The reading of the various spaces depends on the activities, the concerns of each

one (...), the city-dwellers have clear images of the neighborhoods situated between their residence and the urban periphery, because it is the direction that they take to go to the campaign or in peripheral shopping centers. The rest of the urban fabric, having no "use", has a vague character because it is not frequented "A. S Bailly, 1975

The space is above all, the relation that is between a subject and an object, the behavior of the individual in this space is represented as an image. From the perception of objects in the context of the environment, to the "symbolic" perception of a neighborhood, a city or an urban ensemble, various modalities of perception determine and influence these values.

Perception plays the role of support. The behavior consists in reaching the most appreciated regions of this support, because before seeing its final behavior attached to the decisions of the man, one must also see the deep reasons of these decisions.

Perception is a process that moves from the simplified model of the reality, perceived through motivations and constraints, then evaluated according to various factors. It serves as a catalyst or a blockage to behavior. Each element directly or indirectly affects the rest of the system. In this closed system, the behavior in turn, can transform the lived reality and modify the information that the individual will receive.

To better develop a space you have to know the image that people have of this space. This knowledge will guide the action. Thus, a better knowledge of the mechanisms of human visual perception has an impact on the design of the image which depends on several individual and collective factors.

4. Factors influencing the perception of urban space:

The urban space materializes both a physical reality and a sensitive reality perceptible on a human scale. It is of course understood by the majority of people as the result of a single individual sensory perception (smell, sight, and hearing) of a geographical area delimited by the field of vision. According to this definition, urban space does not exist without observers,

and there are as many urban spaces in the same point of view as there are observers, because each of them is endowed with physiological characteristics of its own, marked by a distinct emotional sensitivity and culture.

"If the landscape is a complex phenomenon, it is also because it involves the perception and the gaze of several observers: without these looks we can not speak of landscape. This perception depends not only on its physical components, but also on the values, the intellectual baggage and the sociocultural condition of the observer". Scott, Alister 2002

Therefore, the perceived image of urban space is the pre-existing base of the gaze, which involves personal notions such as aesthetics, beauty and other cultural values.

'However, the perception of an urban space is influenced by a multitude of individual factors, but also by collective values, and different individual and collective factors thus influence the direct perception of the urban space. These factors act in a more or less conscious way on the individual in the same way that this individual carries certain criteria in order to evaluate the qualities of an urban space.' Rivard, 2008.

Facteurs clés	Auteurs*
Mémoire	Marcus, 1978; Ohta, 2001;
Le bagage individuel	Brabyn, 1996*; Hitchmough et Bonugli, 1997*; Ohta, 2001
Impression	Bullen et al., 1998 et 1999*; Moore-Colyer, 1999*; Ohta, 2001
Imagination/ Association	Ohta, 2001
Jugement esthétique	Ohta, 2001
Attraction de la nature	Hodgson et Thayer, 1980*; Ohta, 2001
Évaluation	Ohta, 2001
Origine biologique	Appleton; 1990*
Associations culturelles	Hull et Revell, 1995*; Gold, 1980*
Familiarité	Kaur, 2004; Krause, 2001
Âge	Bernaldez <i>et al.</i> , 1995*
(*références tirées de la revue de littérature de Scott, 2002)	

Figure 2.3 Facteurs clés qui affectent la perception du paysage selon Ohta, 2001 et Scott, 2002

Source : Erick Rivard, ‘‘ Approfondir l’analyse objective du territoire par une lecture subjective du paysage. Le cas de la Cote de Beaupré ‘‘ Master of Science in Architecture, University of Laval, 2008.

4.1 Internal factors influencing the perception of an urban space:

4.1.1 Individual factors:

Urban spaces are of great value to the public. Indeed, quality of life and sense of belonging are often dependent on urban space. The perception of these urban spaces is different from one individual to another, because it is based on the culture and experience of each. Ohta (2001) finds that there are individual factors that influence the perception of urban space. These factors are the memory attached to places and personal baggage. Through these two major influences, the author distinguishes other filters: the imagination (or the association), the impression, the aesthetic judgment, the sense and the attraction of the nature, which all have a role to play in urban space evaluation.

1.Memory:

Some research on the relationship between man and urban space highlights the importance of memory on landscape cognition, Ohta and one of them.

According to Ohta (2001) the apprehension of the urban space updates the observer with concrete individual memories, but also more general memories that come from the media. These memories are based on past personal experiences and the general knowledge of observers. The research results Ohta precisely demonstrate the importance of sense to build memory: the observers can recall specific smells, sounds and special tactile sensations associated with photography.

2. Individual luggage:

Individual baggage plays an important role in the perspective process. *"It will first be noted that the individual, or rather the group, is not virgin. It has a history, born of the accumulation of previous experiences and perceptions, of learning in a broad sense, according to an expression often used"* - Roger Brunet 1974.

Individual luggage, according to Ohta, plays an important role in the interpretation and appreciation of urban space. This baggage may be formed during the person's previous contact with his environment, education, customs, personal values, and other individual characteristics and personal experiences.

3. Feeling:

According to Ohta, feeling is mainly composed of: sensation, sensory modality, and time / season, this is the first impression that the individual "feels" in his first contact with a new or a usual place, or his "feeling" when he uses other sensory modality than vision, such as a touch or sound experience, and of course the unique feeling that catches each individual when the day changes or even the season

4. Imagination / association:

"By focusing on the complicity of memory and imagination as falling under this second temporal consciousness that is accessible beyond oblivion, Ricoeur raises the question of the breakdown in which it is established in relationship with the consciousness of the present. This break is none other than that which underlies the relationship between imagination and perception ".Délia (2017)

The imagination offers us, for its part, another possibility, that of making present what is absent, of integrating into a form of direct intuition that which is now given only indirectly, via the memory or the expectation of a reunion. Any set of realities which can not, for different reasons, be perceived directly, can be imagined, which keeps them in the circuit of an experiment.

5. Aesthetic judgment:

The aesthetic judgment is made in several levels: the components of the space, the colors and the photographs. The individual judges the aesthetically perceived space according to the presence and arrangement of the particular elements in that space, also judges the composition

of the colors in part or as a whole. According to Ohta, a photograph seen even looking at a single space, people sometimes interpret it as a picture and sometimes as a real scene, with different differences between these two points of view. When people are aware of the limits imposed by the photographic framework, their evaluation of a space is likely to be influenced by the gap between the actual scene and the photographic representation of it.

6. Attractiveness of nature:

According to the result of the study done by Ohta, it was clear from the interviews that nature has great charms for most participants. They have often expressed the opinion that, "we, humans cannot compare with nature". Although there are subtle differences in the expression of this point of view by participants, sometimes they have, expressed their opinions on the problems of the destruction of nature, and their desire to escape their daily lives and return to nature, comparing it to urban environments full of artificial things.

7. Evaluation:

The evaluation of a space, generally represented by I like / I do not like, or Good / Bad, are generic terms for the affirmative or negative evaluation of a space. The evaluation also includes various points of view that have been introduced as criteria of "love / dislike" and "good / bad", but which focus specifically on the composition and context of each space, this composition includes contrasts between colors and other elements of the landscape that draws people's attention when they are evaluated.

8. Biological origin:

Long before a child can explore his environment with his hands and feet, he is busy exploring it with his eyes. What's going on in the baby's mind as he looks, blinks, looks that way and that? Does he only feel a chaotic patchwork of color and brightness or does he perceive and differentiate distinctive forms? The reason has always fascinated philosophers and scientists because it's related to the nature and origin of knowledge.

" Is man's ability to perceive the form of objects inborn or must it be learned? Experiments indicate that it is innate but that maturation and learning plays important roles in its developmen '' Robert L.Fantz

9. Familiarity:

" Moreover, the perception of space is discontinuous, which is also a matter of information: some more familiar points are strongly enlightened ... " Roger BRUNET, 1975

Memory is therefore used when it comes to familiarity, which makes the difference between the perceptions of a familiar space with another.

10. Age:

The relationship between age and perception has not received much attention, although the current literature in this area now seems to be accelerating. This is probably due to the greater complexity of the perceptual process, to the methodological problems involved.

Comalli en (1967) has divided the perception, which can be affected by age, into different categories; namely, the speed of recognition, the perception of space and the perception of time, all these categories are influenced by the age factor.

4.1.2 Collective factors:

" The perception of urban space also varies according to the basis of the group belonging to the individual. That is to say that according to the orientations set by the group in terms of development for example, their perception will be to go in the same direction. " Ohta; 2001.

Based on Kevin Lynch's study, the visual appearance of a city is not necessarily perceived in the same way by all who live, approach or cross it. Their mental image may be shaped by different feelings or practical needs: need to identify, aesthetic imperatives, desire to belong to a community, etc. The question lynch asked is: is there precisely, between the different images that man has of his city, a common background of elements and relationships that the planner can use to model or remodel a "Urban character" more satisfying?

These factors show that an architectural or urbanistic project is not designed for one person, but for a group of people.

4.2 External factors influencing the perception of urban space:

The quality of the relationship between the subject (the man) and the object (environment) depends directly on the perception of the latest. But concerning our perception of this environment, it is defined by several factors. These factors have been identified by several authors including Goodman (1968), and can be summarized as follows: Comfort, safety, aesthetics, variety, sense of place and social interaction.

4.2.1 Comfort in the urban space:

"Physiological comfort is a basic human need. The temperature of the air, its movement and its humidity, are the main factors affecting the comfort of the man " D.Canter, P.Stringer 1975

"This comfort should be the main interest in the design of outdoor spaces and should be a fundamental criterion, if the space is designed as a point of attraction for the population. Unfortunately, it is the discomfort of our contemporary cities that is the subject of a joint complaint. " Goodman 1968

4.2.2 Security:

" Safety is a human need as well as physiological comfort. The lack of territorial definition, the lack of lighting, the lack of surveillance and the anonymity of space can lead to security problems. " Newman 1972

Today many boulevards, streets, sidewalks ... have been developed in the city, for the comfort and safety of the user. However, the security of the public space is above all, the power to move without fear and without constraints, or it is easy to find and orient. To see and to be seen, to hear and to be heard are essential points constituting this sought-after security.

4.2.3 Aesthetics in the urban space:

Aesthetics in general means something beautiful, functional and balanced overall.

4.2.4 Variety and urban space:

It plays an important role in humans for their balance. Variety has an impact on the human organism, its interaction with the environment, and to better understand the phenomenon, four varieties have been identified by psychologists: complexity, novelty, surprise and ambiguity.

4.2.5 The meaning of the place:

The meaning of place, according to Relph is a notion related to character and personality. Some places provide psychological satisfaction. They possess "the spirit of the place", "the genius of the place" or the "sense of place". The spirit of the place is another aspect, another dimension of identity that links together the different components of the place, the physical setting, the activity and the meaning.

5. Conclusion:

In terms of this study, we have concluded that urban space is not a clear and simple thing to define or study. Especially if we already know that few researchers have been interested in this question which remains little invested in the field of research.

As result of this little research we hope to define in a general way the urban space and the different modalities of its perception. Thus its image as defined by Lynch, and that this image is perceived differently by people according to different internal and external factors.

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Cultural landscape devastation as a consequence of poor Sustainable Urban Development practice Case study: Kostanjica, Boka Bay, Montenegro

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Abstract

Natural and Culturo-Historical Region of Kotor, Boka Bay, Montenegro, is well known for its exceptional beauty, evaluated by UNESCO. The unique universal value has been embodied in the cultural landscape: vernacular architecture harmonized with the cultivated terraced landscape on the slopes of high, rocky mountains. Kostanjica is an old settlement in Boka Bay, former fishermen village, recognized for valuable elements of the cultural landscape: chestnut tree and laurel forest, terraced gardens with arable land, fruit gardens, traditional architecture in stone: clusters of houses, piers and docks, pedestrian pathways, pavements, retaining walls, well integrated in the autochthone Mediterranean vegetation. Since Montenegro has pronounced itself Ecological state in 1991, environmental protection has become the highest priority in all Sustainable Development agendas and policies. Furthermore, preservation of regional peculiarity and fostering distinctive identity of a place, is one of the crucial sustainable development goals. However, when it comes to the implementation of sustainable principles and objectives in practice, the result is disappointing. Not only the SD goals remain unfulfilled and environment unprotected, but also the inappropriate Urban Development practices cause devastation of space and the landscape. The ongoing Development of tourist resort “Boka Gardens” in Kostanjica has revealed these harmful, unsustainable tendencies in Montenegro. On the grounds of investor’s urban planning and profit-driven architecture, the unique and valuable cultural

landscape of Kostanjica has been devastated to the extent that Boka Bay's UNESCO status has been jeopardized. The paper researches causes of this damaging phenomena, seeking for ways of overcoming profoundly harmful building practices, thus leading to the more efficient and sustainable urban development.

Keywords: Cultural Landscape; Sustainable Urban Development; Investors' urban planning.

1. Introduction

Cultural landscape is defined as a synthesis of natural and anthropogenic factors within a landscape, emerged over time. This includes a well-balanced, symbiotic relation: vegetated landscape has been shaped and cultivated by humans building their settlements, and, at the same time, natural, influential resources of a landscape (topography, vegetation, sources of water) directed the transformation of the artificial environment, providing essential conditions for life. The balance and harmony achieved through this synthesis of man and nature can be preserved only through sustainable development: "In the past, societies were either sustainable or they died out. Because their buildings were so harmoniously enmeshed with their surroundings, culturally authentic and imprinted with values at once spiritual and ecological, they couldn't but have beauty that speaks to us today" (Day, 2002). Ecological aspect of sustainable development has always been of a crucial importance, since nature has provided life for humans and therefore its protection and preservation has been a necessity, a survival condition *sine qua non*, especially during the pre-industrial times. Nowadays, unfortunately, we have to be reminded of how important the environment is; hence, how beneficial its preservation and protection is for our life. The Case Study of Kostanjica, a small, former fishermen village in Boka Bay, Montenegro, provides an insight into negative and highly unsustainable tendencies of Investors' urban planning and profit-driven architecture, devastating for the cultural landscape, a unique and valuable spatial, natural and Culturo-Historical resource. The analysis of this harmful phenomena includes exploration of

some influential social, political and cultural factors that have led to its occurrence. Furthermore, theoretical and empirical aspects have been involved. Finally, some exemplary architectural principles and models will be addressed in order to approach a solution to this socio-cultural problem that threatens Boka Bay to be erased from UNESCO's World Heritage list. This deteriorating spatial phenomenon not only deprives the community of a valuable natural and cultural resource, but also jeopardizes the ecosystem and natural cycles, and thus the life in this area, which is the reason why it has to be halted and the consequences minimized. In addition, the sustainable development principles have to be addressed and applied since it is the only way for us to maintain healthy life for ourselves and the future generations.

2. Sustainable development in Montenegro

Montenegro is a small Mediterranean country well known for its natural beauties. Situated among Balkan Mountains, in the southern part of the Adriatic Sea, it is a contrasting mosaic of steep mountains, clear blue sea, sandy and rocky beaches, dramatic river canyons, varied lakes, rich and abundant wildlife.

Attractive and diversified landscape is one of the most important natural resources of Montenegro. According to Spatial plan (2012), ten landscape types have been distinguished, among which the four of Mediterranean character. These landscape categories have been divided into 21 landscape units, among which is the unique Boka Bay.

Landscape is an image of a scenery that cannot be observed merely on the basis of individual elements, but as a spatial- ecological, economic and cultural entirety (Pasinovic, 2008). Cultural landscape, a combination of autochthonous, natural elements and various local traditions, has emerged as a result of complex cultural, historical, social and economic conditions and circumstances reflected on the natural background. Perceived as both, natural and cultural heritage, it contains a significant potential and value in terms of the ecological

and cultural sustainability. Therefore, its protection and revitalization is a precondition of the sustainable development.

Owing to its complex history which included various nations and civilizations supremacy over this area (Ancient Greeks, Romans, Illyrians, Venetian Republic, Russia, France, Austro-Hungarian Monarchy), and the authentic, natural landscape beauties, Montenegro includes numerous valuable and unique cultural landscapes. Boka Bay is the only bay on Montenegrin coast, exceptional in the quality and value of both dramatic natural environment and architectural and cultural heritage, described in the notes of the Russian officer Vladimir Bogdanovic Bronevski in 1836: “I haven’t seen more terrifying and yet more beautiful place. Giant, rocky hills in reddish color, piled up irregularly one upon another. Lovcen is the highest mountain showing its peak above clouds. The longitudinal bay looks like a lake lying on the bottom of a dark, deep basin whose shores are interspersed with settlements and fortresses. Wonderful buildings, numerous ships and vegetation of fertile gardens in the narrow valleys decorate this truthfully romantic place creating a splendid contrast to the gloomy appearance of the barren hills in the surrounding” (Grgurevic, 1997).

2. Sustainable development policy and agendas

The first recognition of sustainable development principles in Montenegro was in the regional *Spatial plan of Southern Adriatic*, introduced in 1969, sponsored by United Nations and the SFRY¹ Government. Sustainability was the main criteria in the so called “development points” defined by Montenegrin, French and Italian urbanists and planners, 23 years before the Rio Declaration on Environment and Development in 1992. It was the first *Spatial plan of the Republic of Montenegro* in 1986 that mentioned the “environmental protection”.

The awareness of valuable, abundant, natural resources and beautiful nature has led to the *Declaration of Ecological State*, proclaimed in 1991, while Montenegro was still a Republic

¹Socialist Federal Republic of Yugoslavia (existed until 1992)

of SFRY. This Declaration implying that nature is the source of health and inspiration of our freedom and culture, and thus its protection is the highest priority, has been later implemented in the Constitution of Montenegro. In 2001, a strategic document called *Ecological State of Montenegro Development Directions* was legislated, upon which a *National Council for Sustainable Development* has been appointed.

Soon after Montenegro gained its independence in 2006, the spatial development policy has been reformed, following the legislation and models of the European Union. The first *National Strategy for Sustainable Development* was issued in 2007, followed by *Environmental Law* (2008), *Nature Protection Law* (2008, amended in 2013) and *Cultural Heritage Preservation Law* (2010) which has introduced the term **cultural landscape**.

The European Landscape Convention of the Council of Europe, also known as *Florence Convention*, brought in 2000, the first international treaty devoted to protection, management and planning of European Landscapes, has been approved in Montenegro in 2008. According to this Convention, **landscape** has been recognized as an integral part of the Environment, the manifestation of Cultural and Natural Heritage diversity and the foundation of the Regional Identity.

Finally, the *National Strategy for Sustainable Development until 2030*, brought in 2016, involved comprehensive analysis of the sustainable development in Montenegro, through various social, cultural and ecological aspects.

2.1 Environmental protection in practice

Despite the fact that Montenegrin sustainable development policy and legislation have followed successful models and practices of the European Union, the space, and thus the cultural landscape, has not been protected and preserved. The cultural landscape devastation has occurred as a result of excessive and uncontrolled urbanization, inadequate distribution of

touristic capacities, illegal building² and inappropriate projects of infrastructure. The most significant difference between the legislation and realizations appears in the coastal zone, since this area is the most attractive for both, local and foreign developers. “Investors’ urban planning”, that is the urban planning directed by fulfilling investors’ needs and wishes where private interest takes supremacy over the public one, has been a negative practice in Montenegro for more than a decade. Even though this trend has been occurring throughout the entire coast, the Boka Bay has been the most affected by it, due to the closed morphology of the Bay where interventions in space are the most easily noticeable, while the elevated risk of being erased from UNESCO World Heritage list makes the problem more serious and relevant.

In the *National Strategy for Sustainable Development until 2030*, numerous weaknesses and problems in the sustainable development system have been recognized, such as poor interinstitutional cooperation, as well as insufficient and underqualified human resources. Furthermore, there is no unified environmental informational system, nor the functional cadaster of the polluters. In addition, public and private interest have not been synchronized and methods of environmental protection are more of a reactional than a preventive character. Overall, neither administrative nor the operational (technical) capacities for the application of environmental protection regulations have been developed. In terms of the cultural landscape, spatial devastation occurs mainly due to the lack of integrative approach towards environmental and cultural heritage protection. Regional Institute for Protection of Cultural Monuments, founded in Kotor after the catastrophic earthquake in 1979 has been the only institution responsible for the Architectural Heritage protection in the Bay. However, its authority has been limited to the protection of the valuable buildings, without the reference to

²It is estimated that around 100.000 illegal buildings exist in Montenegro. Legalization Law has been brought in 2016 aimed at ending the practice of illegal building and protecting the space and the environment

the environment³. The harmony of the urbanized space and autochthone green areas represented in the cultural landscape of Boka Bay is a precious synthesis of natural and cultural heritage and therefore its preservation is of crucial importance for sustainable development and the development of tourism in the area (Lalosevic, 2010). In addition, new building transforms not only the appearance of the landscape (aesthetic aspect), but also the natural environmental elements such as topography, vegetation, climate, and ecosystem. This is the reason why maintaining ecological balance is essential for sustainability in Boka Bay, as well as the **integrative approach** to the heritage protection that would address equally natural and architectural (artificial) aspects of the cultural landscape.

3. Cultural landscape of Kostanjica

Boka Bay is naturally and culturally unique bay in the northernmost part of the Montenegrin coast. Its Natural and Culturo-Historical beauty has been recognized by UNESCO: “The Outstanding Universal Value of the Culturo-Historical Region of Kotor is embodied in the quality of the architecture in its fortified and open cities, settlements, palaces and monastic ensembles, and **their harmonious integration to the cultivated terraced landscape on the slopes of high rocky hills**. The Natural and Culturo-Historical Region of Kotor bears unique testimony to the exceptionally important role that it played over centuries in the spreading of Mediterranean cultures into the Balkans”(URL 1). Kostanjica is a small, former fishermen village located in the north-west area of the Bay of Kotor (Figure 1), founded in Ancient times and expanded during the Venetian Republic supremacy over Boka. It is distinguished by vernacular architecture harmonized with the sloping landscape by terraced gardens, local natural building materials (stone and wood) and autochthone vegetation. In addition, narrow coastline including piers and docks made of stone, accompanied by traditional stone houses,

³ Attempts made for the Institute to expand the authorities to the environment have failed, as it was the case with an initiative to provide employment for a landscape architect within this institution

represents achieved balance and harmony of the natural and anthropogenic elements (Figure 2). This Cultural Landscape represents peculiarities of the place by reflecting socio-cultural patterns emerged from the needs and the way of life of the people who have inhabited this area over the centuries (fishermen, sailors, agriculturalists). It is a valuable Heritage expressing identity of Boka Bay, but only if perceived as an inseparable unity of natural and artificial, of vegetated landscape and architecture rooted in it.

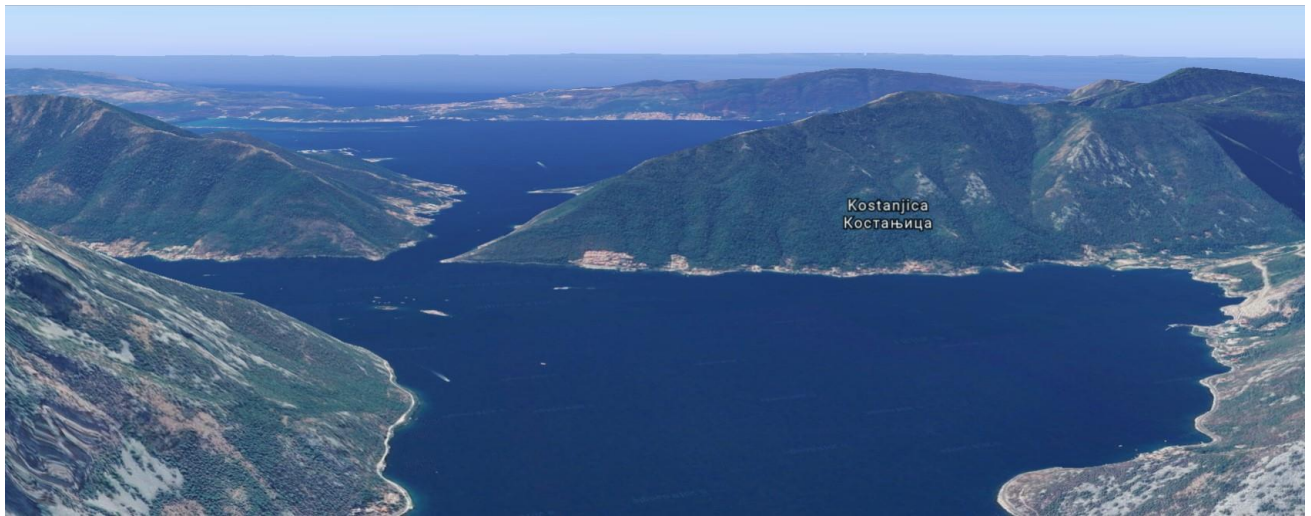


Figure 1. Location of Kostanjica- northwestern part of the Bay of Kotor (Source: URL 2)



Figure 2. Coastline of Kostanjica- harmony of natural and anthropogenic elements (Source: SAHP)

3.1 Study of Architectural Heritage Protection in Kostanjica (SAHP)

The Cultural Landscape of Kostanjica has been profoundly analyzed in the Study of Architectural Heritage Protection, done by Boka-based experts for Architectural Conservation and a landscape architect, completed in 2008, prior to the Amended Detailed Urban Plan of Kostanjica, brought in 2009. Several main elements of the cultural landscape have been distinguished in the Study:

- **Terraced gardens** with arable land and fruit gardens, a representation of the cultivated landscape- hill slopes adjusted to agricultural use (Figure 3).

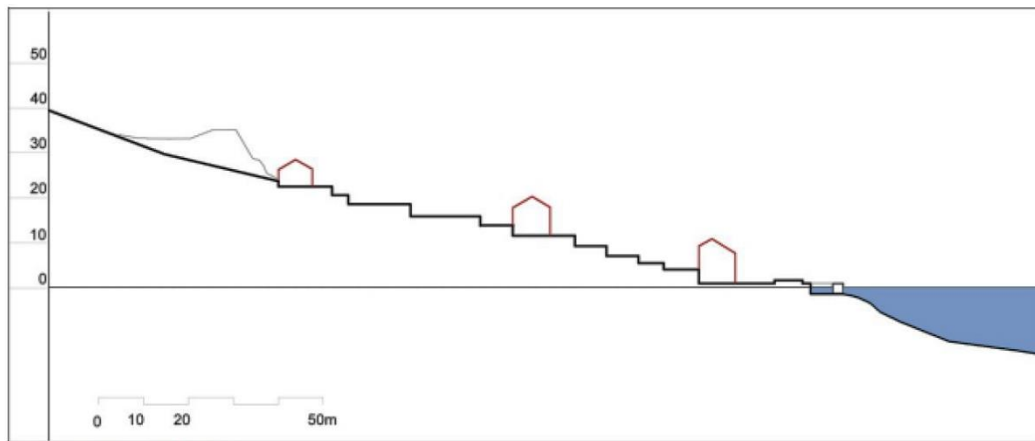


Figure 3. Terraced landscape of Kostanjica (Source: SAHP)

- **Chestnut tree and laurel forest**, an abundant natural resource of Kostanjica⁴. Chestnut was used for food, and its wood as a building material, while laurel was mainly used as a food spice in some local dishes.
- **Pedestrian pathways**, paved in stone, connecting the distant settlements in the hillside with the coastline, in two directions: following the topography contour lines and perpendicularly to this direction as staircases (Figure 4).



Figure 4. Pathways- stairs in stone (Source: SAHP)



Figure 5. Coastline of Kostanjica: piers, docks and old stone houses (Source: SAHP)

⁴ The name Kostanjica origins from the local word for Chestnut- “kostanj”

- **Coastline** with piers and docks, made of stone blocks, remains of once dominant fishermen and maritime culture in this area (Figure 5).
- **Clusters of traditional houses**, valuable examples of vernacular architecture in stone.
- **Landscaping elements** in the courtyards (stone pavement, retaining drywall, staircase on the ground, pergola- “odrina”, stone bench- “pizuo”).
- **Autochthone vegetation** in the gardens and courtyards (citrus fruits, olive trees, grapevine, flowers).
- **Water features** (old water tank, well).

Specific heritage and **cultural landscape protection guidelines** emerged from the Study: (1) **Preservation** and Revitalization of the **chestnut tree and laurel forest**⁵; (2) **Preservation** of the **cultural landscape elements** (terraced vegetated gardens, traditional landscaping elements); (3) **Maintaining the existing spatial concept of the settlements** (large open green areas between the clusters of houses). Furthermore, the **directions for newbuilding** areas were: (1) Maintaining the **minimum of roads**, introducing new roads only if absolutely necessary and by respecting the topography contour lines and existing retaining walls; (2) **moderate and low-density newbuilding**; (3) Consideration of the existing spatial capacities (land slopes, landscaping methods and elements) by planning **buffer green zones** towards the existing traditional architecture.

3.2 Amended Detailed Urban Plan of Kostanjica

In 2009, a year after publishing the Study, the Amended Detailed Urban Plan of Kostanjica was legislated, providing regulations and design guide lines for building in the area.

The Plan underlines that the entire area of Kostanjica is within a Natural and Cultural Heritage zone requiring the most cautious approach to planning and building. Therefore, preservation of the nature, sea, landscape, architectural and cultural heritage is the highest

⁵ The zone of chestnut tree and laurel forest has been clearly marked in the Study

priority. In terms of the natural landscape, autochthone vegetation and land morphology should be preserved. Newbuilding in general and the touristic capacities in particular, should be adjusted to the existing topography, vegetation and to the entire natural and artificial environment. In addition, the conservation conditions and guidelines from the Regional Institute for Protection of Cultural Monuments have to be fully followed. Abundant, autochthone forest in the surrounding of the traditional settlements (chestnut tree and laurel forest) provides optimal air comfort, that is protects the air from pollution; and thus has to be preserved.

Landscaping regulations imply that the terrain around buildings has to follow the **natural land configuration**, as well as the retaining walls. Also, it is prohibited to cut the authentic vegetation, especially chestnut and laurel trees. In addition, each new-formed urbanistic plot has to include new planted at least three laurel trees and one chestnut tree.

However, when the Map from the Study and the Map from the Plan are overlapped, the new urbanized area partly covers the zone of chestnut tree and laurel forest, meaning that it is not possible to preserve authentic and highly beneficial vegetation and build according to the new Plan.

Furthermore, when it comes to the more specific building regulations, there is a scarcity of graphic and numeric representations in the Plan. The only parameter of the vertical regulation is the maximal number of floors- three floors above ground regardless of the nomenclature. In this regard, no drawing section through the terrain has been provided in the Plan, nor the sketches of terraced buildings and retaining walls adjusted to the existing, natural land slope. If this was done, it would've been evident that it is **impossible to preserve and respect Natural Topography** of the land and yet build according to building lines and vertical regulation. To clarify, when new buildings are located according to the building lines, the ground floor level is already several meters (up to two floors) above the existing terrain-the

accessing road. This is the explanation for the excessive height of the retaining walls appearing throughout the newly urbanized area of Kostanjica. Vertical regulations provided in detailed urban plans have to limit the height between the accessing road and the ground floor (usually up to one meter), in order to avoid having too high buildings in disharmony to the surrounding and the topography. In this case, there was not any kind of height limitation, neither for the ground floor level, nor the retaining walls. When the section through the newly urbanized area is compared to the section through the area where the traditional settlements are (given in the Study), significant height difference of 25 meters on the same distance from the sea occurs (Figure 6). This demonstrates the **extreme land slope**, three times steeper terrain in the new urbanized area than in the area of traditional settlements, which clearly confirms the lack of possibility to build in the newly urbanized area without destroying the natural land topography. Moreover, building on such a steep terrain is not feasible since it requires extensive excavations, especially in the case of rocky soil, such is this one.

Nevertheless, there is an advantage of building on such a steep terrain, which initiated this case of investors' urban planning. No building can block the view for the neighbor behind. Each apartment features 'captivating panoramic view' towards the sea, beautiful town Perast and the two islands in front of it. Also, the apartments are in close proximity to the sea and the rocky beaches. Hence, the selling price of these exclusive apartments will be significantly higher than average.

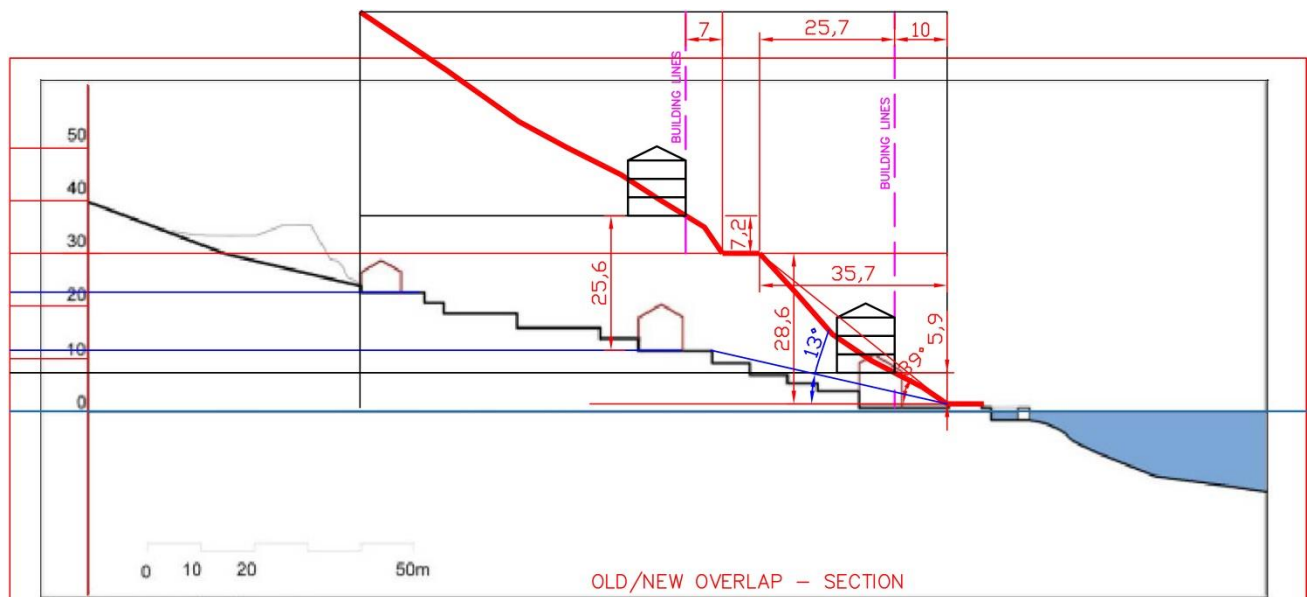


Figure 6. Section through the old/new urbanized area- overlap (Source: Kosara Kujundzic)

Going back to the cultural landscape protection guidelines from the Architectural Heritage Protection Study, evidently **none of them has been respected** in the Plan. Preservation of the chestnut tree and laurel forest has not been provided since the extended urbanized area partly covers the zone of the forest planned for new building. Also, traditional terraced vegetated gardens have been excluded from the new building and landscaping, replaced by the massive retaining walls needed in order to access ground floor level from the road. Finally, the existing spatial concept of the low density settlements and large green areas between the houses has not been maintained, since the building capacities given in the Plan imply dense building and numerous houses on a relatively small area.

Furthermore, the Plan has neglected the newbuilding directions from the Study by introducing a wide new road disrespectful to the topography contour lines (Figure 7), with only purpose to access urbanistic plots on the higher level, which was not necessary, but certainly improves the comfort for those buildings occupants; and thus confirms the private interest supremacy over the public interest- landscape and environmental preservation.

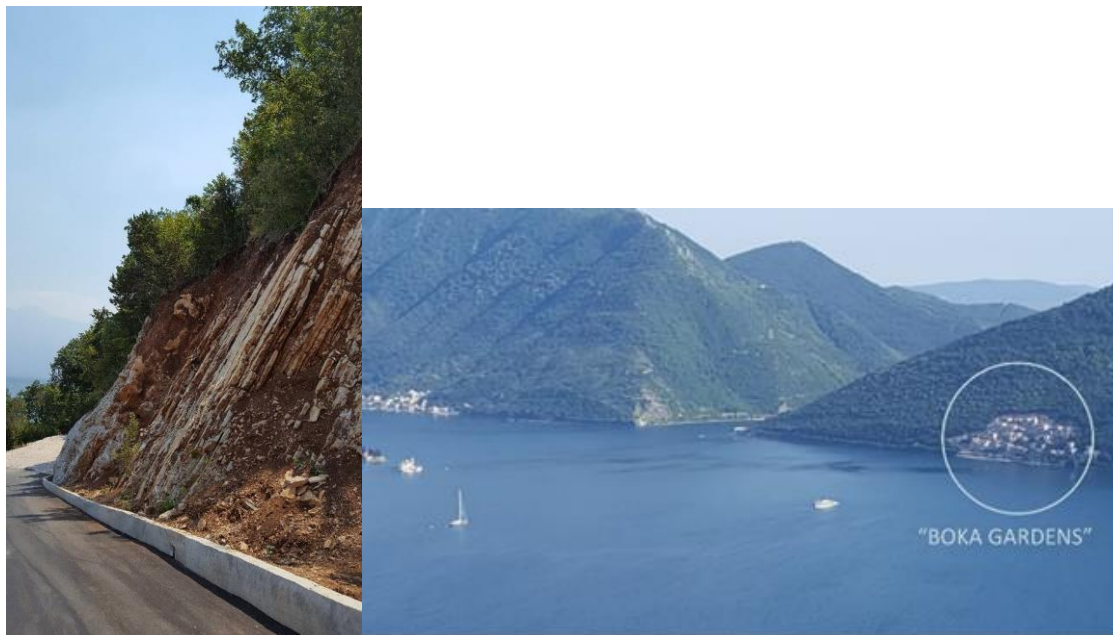


Figure 7. (left) The new road (Source: Kosara Kujundzic)

Figure 8. (right) Tourist resort 'Boka Gardens'-location (Source: Kosara Kujundzic)

4. Case study: Tourist resort 'Boka Gardens'

The ongoing Development of Tourist resort 'Boka Gardens' has been under construction since 2012. Located in the extended urbanized area of Kostanjica that used to be covered by chestnut tree and laurel forest (Figure 8), it consists of 32 terraced houses with apartments for sale. In order to build this resort, extensive excavations of the rocky ground had to be made, destroying the natural existing topography. The devastation of the natural landscape has been completed by cutting the chestnut tree and laurel forest, precious natural resource embedded in the local tradition.

Nevertheless, the design and building has been following the Amended Detailed Urban Plan of Kostanjica, that is the poor and insufficient directions given in the plan, and yet it causes spatial devastation, which imposes the question which plan came first: the Urban Plan, or the Business and Design Plan for the Development?

Since the height of the retaining walls was not specified in the Plan, nor the height of the ground floor in reference to the accessing road, the new buildings have extensive height apparently exceeding the height of ‘three floors above ground’ (Figure 9). Even though the floors nomenclature is ground floor, first floor and second floor or loft, which matches the vertical regulation given in the Plan, buildings appear oversized, significantly higher and bigger than the traditional archetypal models, in fact, without any reference to those. It seems like the land has been entirely occupied and there is no vegetation left, in opposition to the harmony of the natural environment and architecture achieved in the traditional settlements.



Figure 9. Excessive height of the new building and the retaining walls (Source: Kosara Kujundzic)

Furthermore, the design is described as ‘Mediterranean style Architecture’. However, these houses by all means have no resemblance to the traditional architecture in stone, rooted in local building tradition, harmonized with the surrounding. The buildings do not belong to Boka Bay region, and could be equally placed elsewhere. In terms of the architectural elements, green shutters are the only vague link to the traditional wooden shutters. All the

rest is a different architectural vocabulary. Complex roof planes, in opposition to the pitched roof on the local houses, distinctive eaves that cannot be found in traditional architecture, the locally unfamiliar manner of building in stone without any structural logic behind it. The arch is another element rarely and differently implemented in the vernacular architecture of the Bay. Overall, the new building is extremely disrespectful to genius loci and the cultural landscape of Kostanjica, causing a serious devastation of both, natural and architectural Heritage.

The apparent devastation of the cultural landscape has provoked numerous reactions of the professionals and the civil sector. The citizen of Boka have performed a theatre play called ‘Koto(r) o Kotoru’⁶, addressing political, social and cultural problems in Boka Bay. The case of Kostanjica has been included, presented in the ironic postcard distributed to the audience (Figure 10), where ‘Boka Gardens’ resort is shown in the background of the beautiful artificial island Lady of the Rock, which is one of the most valuable Culturo-Historical sites in the Bay. The postcard clearly demonstrates the tremendous destruction of the landscape and the island view from Perast.



⁶ The title has ambiguous meaning and can be translated as “Kotor about Kotor” or “who (talks) about Kotor”

Figure 10. “Greetings from Perast”, an ironic postcard from the theatre play ‘Koto(r) o Kotoru’
(Source: Kosara Kujundzic)

5. Seeking solutions

The Investors urban planning reflected in the Amended Detailed Urban Plan in Kostanjica and the ‘Boka Gardens’ Development emerging from it, have resulted in irreversible spatial devastation. However, strategies and operational plans have to be made in order to minimize the consequences.

World Heritage Committee (UNESCO) hold a session in Istanbul in 2016 during which a great concern for Montenegro in general and Boka Bay in particular has been expressed, related to the uncontrolled building and urbanization that have jeopardized the status of Kotor on the World Heritage list. The session resulted in a decision – request delivered to the Montenegrin Government to provide insight and synchronization of all the urban plans in Boka Bay through the comprehensive Heritage Impact Assessment Study (HIA), based on the Guidance on HIAs for Cultural World Heritage Properties, established by ICOMOS. The specific section of the HIA study referred to Kostanjica, especially to the ‘Boka Gardens’ resort area, as the case of a major cultural landscape devastation.

This case has not only shown the flaws in the urban planning process directed by investors’ private interest, but also urban development process deprived of monitoring and governing actions. To clarify, there is no control during the building process related to the landscape issues. As previously mentioned, the Institute for Heritage Protection doesn’t have any authority regarding the natural aspect of the cultural landscape. Also, no control over the landscaping process in practice exists. That is, no institution is in charge of the landscape issue during the building process. The furthest the control reaches is during the obtaining

building permit stage, when landscaping project included in the main project has to be done according to the urban plan.

5.1 HIA (Heritage Impact Assessment) Study

Heritage Impact Assessment Study (HIA) is a document aimed at maintaining Kotor on UNESCO's Word Heritage List, by regulating excessive spatial pressure of the touristic economy and commercial real estates. According to the methodology and nomenclature of UNESCO, the two relevant categories have been distinguished in the Study: *exceptional universal value attributes* (graded from 1 (lowest) to 5 (highest) value), and *danger/risks impact factors* affecting the attributes. The most important attributes refer to the cultural landscape, as **views** (axes), among which are the two related to Kostanjica: (1) the view from Perast toward the islands: Lady of the Rock (artificial island) and Saint George (natural island), and (2) the view from Risan toward Moringj and Kostanjica. Both views include devastated area of Kostanjica whose cultural landscape is mentioned in several categories of the Study, such as: "harmonized integration in the cultivated terraced landscape in the Mountain foothills", "the relation sea-coastline-mountains" and "the settlements adjusting to the natural environment" (HIA, 46-48). In addition, the transformations in this area have been recognized as close to catastrophic, that is almost the total devastation of one of the most important views (the view from Perast toward the islands) in the Natural and Culturo-Historical Region of Kotor (HIA, 18-19). In order to achieve a high level of Heritage Protection in Kotor area and Kostanjica, the following spatial elements have to be preserved: primordial landscapes with coastal settlements; **horizontal structure** of the **landscape** (excluding the possibility of continuous and dense building); **vertical structure** of the **landscape** (the silhouette and the integrity of the green slopes); **architectural values** of the **traditional coastal settlements**, and **visual marks** such are the islands close to Perast and their natural background (Kostanjica). The Heritage Protection methods referring particularly

to devastated areas in Kostanjica are: **inserting vegetation** (mostly trees) between the buildings and **halting further building in the area** (suspension of the Amended Detailed Urban Plan of Kostanjica), until the new Plan done according to the conclusions and directions from HIA is brought (HIA, 238-242).

5.2 Paradigmatic architectural models

In order to protect the Natural and Cultural Heritage, the *positive arrogance* approach has to be taken. This approach is **peculiar to Montenegro**, based on the concepts of the **ecologically and culturally sustainable development**, founded on the **regional vernacular values**, relied on the **transparent political processes** and the **Heritage-worthy Education**; and integrated in the **locally regulated world economic trends** (Radovic, 2005).

One of the most important sustainable (humane) design principles, aimed at Preservation of Natural Conditions; and thus improving the quality of life for humans and other species is to **Respect Topographical Contours**. Modification of the existing natural topography has negative effect on the environment: “radical terraforming is not only expensive but devastating to the site’s microclimate. Alteration of contours will affect how water drains and how wind moves through a site” (Jong-Jin and Rigdon, 1998). Therefore, buildings should adjust to the natural topography, and respect the existing topographical contours. A good example of this principle is Competition “Artist residence in Boka” winning project of Japanese architect Tomohiro Hata. The author designed the façade and retaining walls in stone, directed completely according to the topographical contours (Figure 11). Like this, terraced houses are blended into the surrounding, achieving harmony with the natural environment.

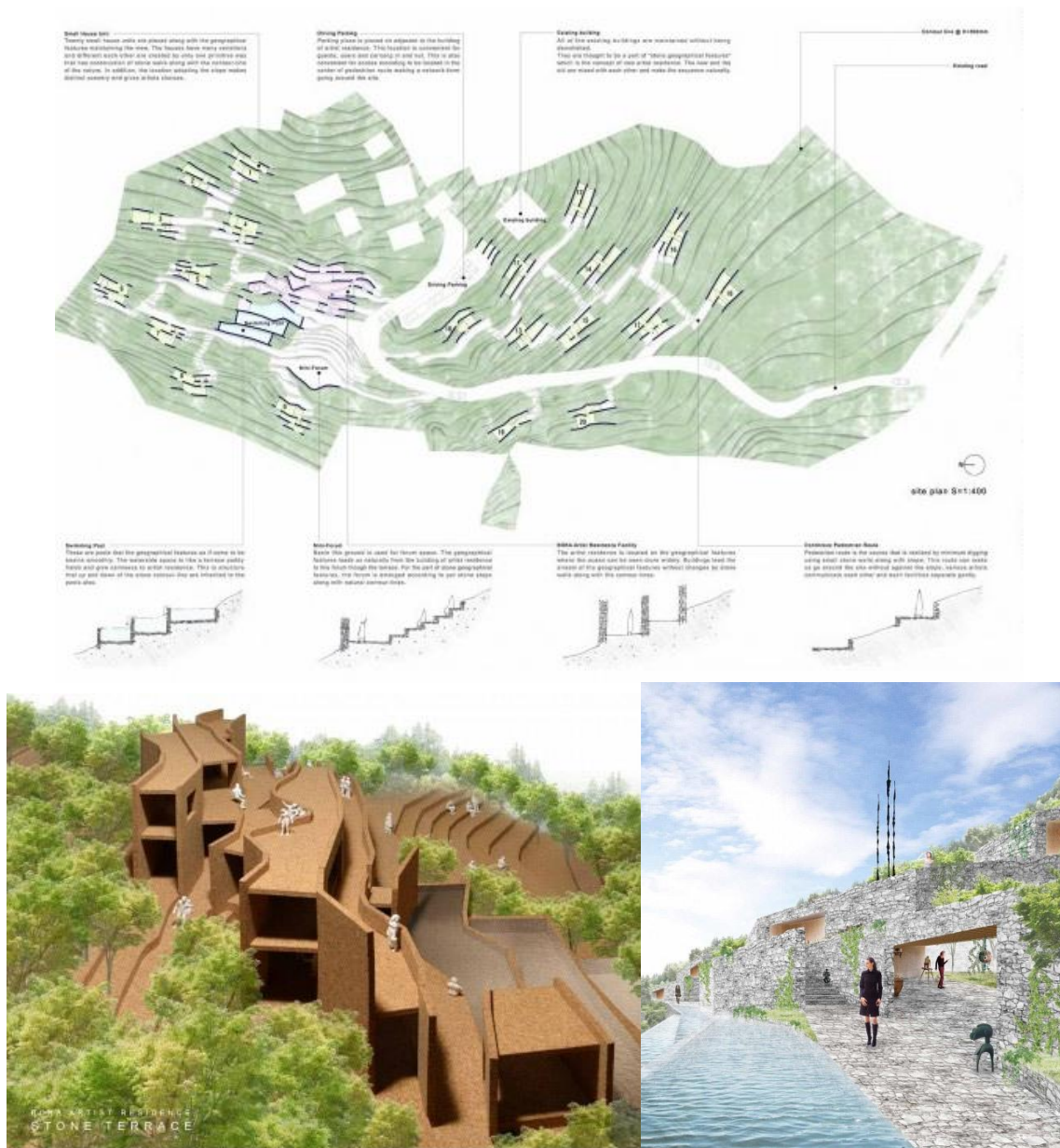


Figure 11. A Competition “Artist Residence in Boka” Winning project of Tomohiro Hata (Source: URL 3)

In the guidelines for urban planning and architectural design referring to the Kotor area (Lalosevic, 2010), respecting the natural topography is one of the principles. The retaining walls height should not exceed 2 meters (Figure 12). As previously mentioned, in the case of Kostanjica, the retaining walls have reached the height of two floors (7 meters).

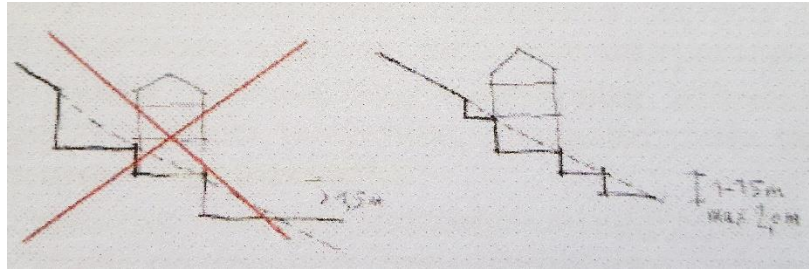


Figure 12. Design guidelines- retaining walls (Source: Lalosevic, 2010)

A successful example of architectural regionalism is house in Bigova (Kotor Municipality). This house, designed by Professor Vasilije Milunovic, is a contemporary realization **reflecting peculiarities of the place**. The **autochthone vegetation** and **terraced landscape** enabled the house harmonizing with the environment. In addition, the architectural elements typical for this region such as **shutters, pergolas, reddish roof tiles** and **stone** as main façade material, have been interpreted in the creative, contemporary manner (Figure 13).



Figure 13. House in Bigova- context-related design (Source: Kosara Kujundzic)

6. Conclusions

The case study of “Boka Gardens” have revealed many weaknesses of the Sustainable Urban Development practice in Montenegro. This touristic resort has evolved as a consequence of Investors’ urban planning and profit-driven architecture.

Despite the fact that a comprehensive Architectural Heritage Protection Study has been made prior to it, the Amended Detailed Urban Plan of Kostanjica haven’t followed the guidelines and principles from it, providing a base for the spatial devastation due to the insufficient and poor regulations, especially in terms of the vertical regulation. Newly urbanized area has partly covered the zone of chestnut tree and laurel forest, a precious natural resource of Kostanjica. Furthermore, a new, wide road has been introduced, demanding excessive excavations and destruction of the natural topography. Also, densely urbanized area has replaced the traditional low-density settlements.

The “Boka Gardens” Tourist Resort have been following the scarce and inadequate regulations from the Plan. New buildings are not adjusted to the surrounding in any sense. In terms of the size, the houses appear heavy and massive, due to the oversized, two-floor high retaining walls. In addition, not only the indigenous vegetation has not been preserved, but also the new trees have not been planted, so that the resort looks greenless as opposed to the abundant vegetation in the surrounding.

In order to overcome profoundly harmful tendencies of landscape devastation by inappropriate newbuilding, an integrative, multidisciplinary, interinstitutional approach have to be taken, followed by precise, clear regulations and methods of the landscape protection. The paradigmatic models of the competition winning project of Artist residence in Boka and the regionalist approach in the house in Bigova provide a valuable architectural examples of achieved harmony with the environment.

Finally, cultural landscape has to be recognized and included in all significant sustainable development agendas and strategies, as well as in the operative measures of the landscape protection. Preservation and improvement of the landscape is a crucial part of the environment protection and thus the only way of achieving Sustainable Development.

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Exploring Design Principles of Bioclimatic Architecture and Double Skin Facades as A Convincing Tool for Energy Saving

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Abstract

Different climates of different regions do not provide the required appropriate climatic conditions to ensure thermal comfort all year long. The goal to be pursued is to achieve the best interaction between climate, building and user behaviour.

Bioclimatic buildings exploit climate in order to offer their occupants the most appropriate comfortable conditions. Especially, variations in hours of sunshine, in temperature, and rainfall of a particular climate signify establishing various strategies according to seasonal differences of particular region. In winter time assembling most of solar gain, and protecting the users from the cold (heating) are important. In summer; occupants/users need more protection from the sun (cooling). Thus, bioclimatic buildings reside in tune with these natural rhythms through consulting the most of natural lighting.

This paper is aimed to enable architects to rediscover the principles of bioclimatic architecture and the modern technical and architectural means to achieve them. The study persuades adjusting the Double Skin Façades (DSF) design as the disciplined approach of ensuring the major strategies of Bioclimatic Architecture. Apparently, the study seeks three delineated bioclimatic approach *daylight*, *thermal comfort* and *natural ventilation* in DSF systems. The study views the DFS systems as the potential inclination for bioclimatic architecture ecological principles. On this basis, a connection between Bioclimatic Architecture and DFS systems are asserted and moderated within a generalized task.

Keywords: bioclimatic architecture, double-skin facades, thermal comfort, heating, natural ventilation, day lighting

1. Introduction

Decades, the energy consumption came to the agenda as an alerting paradigm of major global concern. In view this fact; the many researches have accomplished a novel interest in the field of ecological studies in order to provide enhancing approaches and strategies. The building construction sector has been notified as the major fact on energy consuming. Their operational energy is commonly supplied in the form of electricity, which is engendered from fossil fuels. Overall, studies reported that buildings' energy use constitutes about one third of the global final energy use (G. B. Hanna, 2013). On this basis; sustainability spirit in architecture engaged with the manifestation of "*more efficient energy use*", where an allied relationship through the external and internal environment is adjusted to be asserted. This realm significantly influenced and correlated awareness on the selection of construction type and material use in architectural design, especially façade enterprises. In the explicit of sustainability beyond architecture has imposed various approaches in various scales of illuminating the ecological responsive allocation.

Fascinatingly to address the main paradigm of efficient energy use in design; the bioclimatic architecture appears as the grounded approach that signifies the major spirits (natural ventilation, heating, cooling and lighting) of efficient energy use in building design. Following "*efficient energy use*" aim of the sustainability in architectural design; the bioclimatic architecture demonstrates a responsive endorsement on indicating efficient way of energy use as a cognitive tool for design. In view of this fact; its principles particularly reside along with a natural dynamic interaction between user, their built environment and the outdoor climatic conditions. However, the determination of bioclimatic architecture can be adjusted either in vernacular buildings, or contemporary buildings without any style or era

distinction. In other words; any type of building belonging any time dilemma might be classified as bioclimatic. In order to call a building as bioclimatic architecture; the ecological dimension of the building significantly must met with energy efficiency perspective as naturally achieving the way ventilation, heating, cooling and lighting Olgyay V. (1953), Aronin JE. (1953), Arens E et al. (1981), Lima A. (1995), Singh MK, Mahapatra S, Atreya S. (2010).

In recent; a significant interests has growth in Double Skin Façade (DSF) design and its usage due to its pragmatic benefits on energy conservation contributing to the energy efficiency goal of sustainability (N. Safer, M. Woloszyn, J. J. Roux, and F. Kuznik, 2005). In recent demarcation DSF is resided in the definition of multi layer skin construction of contemporary architecture where an external skin adjoined to an internal skin through an intermediate space of airflow (J. Zhou and Y. Chen, 2010). In significant; the efficient energy use ideology is resembled in DSF with evacuating the solar radiation absorb upon a glazing envelope, which enhances continuous ventilation within the building. As a consequence; DSF impulses a minimized energy consumption use amongst accomplished cooling and heating (Z. Yılmaz and F. Çetintaş, 2005). However, its implementation is accompanied by significant challenges due to the complexity of the thermal and airflow phenomena that is involved in its behavior where adaptability is magnified in different climatic conditions (M. A. Shameri, M. A. Alghoul, K. Sopian, M. F. M. Zain, and O. Elayeb, 2011).

This paper investigates pragmatic deliberations of DSF for bioclimatic architecture as one of the most appropriate resided approaches of contemporary design. Thus, the study aims to fragment the DSF key parameters as a matching convincing tool for the design principles of bioclimatic architecture. The key parameters of DSF are demarcated within the framework of the study as *daylight*, *thermal comfort* and *natural ventilation*. The rationalized similarities between DSF and Bioclimatic Architecture are aimed to be met within a collective

perspective. The questioned key primitives of energy efficiency in two correlated approaches are drawn to illuminate a utilized scheme as a convincing tool for design of contemporary era and sustainability.

2. Incorporating Bioclimatic Architecture and DSF Principles

2.1 Bioclimatic Architecture

Bioclimatic Architecture imposes evolving climate responsive implantation in architecture through the use of appropriate project strategies considering the climatic differences of each place, in order to better improvement of the thermal comfort conditions for the occupants (Lamberts, 2006). Based on the global demarcation of international policy- Kyoto Protocol on sustainability; the bioclimatic architecture is identified as the income for reduction of energy use and other environmental impacts in order to obtain sustainability as an outcome within the challenging decade of climate change (Hyde and Rostvik, 2008). In deed; the approach provides an advantage on climate to control the heat transfer process through the right application of design elements and building technology (Goulart and Pitta, 1994; ERG, 1999 op cit). The energy save has mainly promoted with the ensured comfort conditions for occupants/users into building. Extensively in spirit; passive low energy techniques are persuaded for generating environmentally interactive, efficient and contented to human comfort standards (Yeang, 1996). On this basis the bioclimatic architecture principles are developed on representing energy efficient strategies, while the applicability is modified based on the environmental characteristics of the region and building type (Maciel, 2007).

Various researches are intended to prospect the principles of bioclimatic architecture (Machaira et al, 2012). With all of these perspectives, EDP, Axarli & Teli and Lambertin have made the most comprehensive approach to bioclimatic architecture approach.

Listed below are different set of principles as outlined by previous researchers such as Lamberts (2006) and Axarli & Teli (2008) EDP Energy (2011) (Table 1). According to the set

of principles, similarities and dissimilarities can be observed. According to comparing the various principles thermal comfort and natural lighting are the most dominant feature for bioclimatic architecture.

Table 1. Different set of principles as outlined, Lamberts (2006) and Axarli & Teli (2008) EDP Energy (2011)

According to Lamberts	<ol style="list-style-type: none"> 1. Building thermal performance. 2. Day lighting. 3. Heating and passive solar cooling. 4. Natural ventilation. 5. Thermal comfort. 6. Adequate shading.
According to Axarli & Teli	<ol style="list-style-type: none"> 1. Achievement of thermal comfort. 2. Improvement of visual comfort. 3. Creation of acoustic comfort. 4. Improvement of air quality. 5. Improvement of building's energy behavior.
According to EDP Energy	<ol style="list-style-type: none"> 1. Microclimate improvement. 2. Systems and passive cooling techniques. 3. Exploitation of solar energy. 4. Thermal protection of buildings and protection through shading. 5. Natural lighting. 6. Acoustic protection.

2.2 Double Skin Façade (DSF)

DSF can be defined as a traditional single façade doubled inside or outside amongst a secondary airflow break- glazed façade. In other words; The DSF is a system consisting of two glass skins placed in such a way that air flows within an intermediate cavity. The attribution of imposing a skin ideology is illuminative and spirited with the accomplished airflow cavity. A ventilated cavity - having a width, which can range from several centimeters to several meters - is positioned between these two skins. Though the heat extraction, the solar shading devices are placed inside the cavity (Poirazis 2004). Besides the automated

equipment-shading devices; motorized openings or fans, are also frequently preferred to be integrated into the façade. The main difference between a ventilated double façade and an airtight multiple glazing lies in the intentional and probably controlled ventilation of the cavity of the double façade, with or without integrating a shading device in the cavity separating the glazing (BBRI, 2004). In significant, pair of glass called- skins is separated upon a validated air space/ corridor. The main layer of glass imposes the insulation, while the air space/corridor between the layers of glass implements insulation against temperature extremes, winds, and sound. Sun-shading devices are often located between the two skins. All elements can be arranged differently into numbers of permutations and combinations of both solid and diaphanous membranes (Harrison, Meyer-Boake, 2003). Extensively, ventilation of the cavity can be natural, fan supported or mechanical. Apart from the type of the ventilation inside the cavity, the origin and destination of the air can differ depending mostly on climatic conditions, use, location, occupational hours of the building and the HVAC strategy.

2.2.1The Components of DSF and Passive Design

The DSF incorporates the passive design strategies of natural ventilation and solar heat gain into the fabric of the contemporary building. These are the key components of the DSF regarding to energy efficiency and human comfort that certain types of double skin façades are controlled. These key primitives are daylight, thermal comfort and natural ventilation (Boake, T. M., Bes, B., & Arch, M., 2003).

Solar Heat Gain

In DSFs; the control of solar heat gain is obtained through the use of shading devices (typically horizontal blinds) contained within the air cavity, where the cavity also demonstrates the ability to absorb some of the incoming solar radiation. In significant; the external shading devices claim efficiently reducing the solar heat in highly glazed buildings. Moreover; horizontal blinds allow getting the specific advantages for daylighting.

There are various configurations of horizontal blind shading devices. They can either be fixed elements or, typically, operable units that are either controlled through the occupant or sensors within the building. However; in each type the air cavity space has the ability to draw off some of the initial solar radiation. Convection currents carry the heated air upwards and extracts to the exterior through the venting arrangement at the top of the cavity.

“A double-skin façade reduces heat losses because the reduced speed of the air flow and the increased temperature of the air in the cavity lowers the rate of heat transfer on the surface of the glass. This has the effect of maintaining higher surface temperatures on the inside of the glass, which in turn means that the space close to the window can be better utilized as a result of increased thermal comfort conditions” (Compagno, 1995)

Consequently; the buffer zone allows for increased use of the perimeter zone of the space that typically requires heating or cooling mechanisms against the exposed glazing. Also, with the use of improved solar heat transmission values for glazing the absorption and reflection of heat can be controlled to minimize solar heat gain. This can be accomplished through the use of what is referred to as ‘spectrally selective glazing’;

Spectral Selectivity refers to the ability of a glazing material to respond differently to different wavelengths of solar energy – in other words, to admit visible light while rejecting unwanted invisible infrared heat. Newer products on the market have achieved this characteristic, permitting much clearer glass than previously available for solar control glazing. A glazing with a relatively high visible transmittance and a low solar heat gain coefficient indicates that a glazing is selective. Spectrally selective glazing use special absorbing tints or coatings, and are typically either neutral in color or have a blue or blue/green appearance. An ideal spectrally selective glazing admits only the part of the sun’s energy that is useful for daylighting (O’Connor, Jennifer with: Lee, E., Rubinstein,F., Selkowitz,S.,1997).

Natural Ventilation

Natural ventilation allows cooling and ventilating the space through the use of passive ventilating methods. The passive use of air currents plays a significant contribution on reducing the energy consumption of the building. Within this process; the exterior glazing of the double skin demonstrates a layer of air subsequent to the exterior wall of the building that is not affected by high velocity wind. This buffer zone as a key component to the double skin façade is typically the area admission by the occupants/users for natural ventilation. In some instances; the use of operable windows in the exterior glazing skin is also used for natural ventilation.

“The reduction of wind pressure by the addition of the extra pane of glass means that the windows can be opened even in the uppermost floors of a high-rise building. Natural ventilation of offices by fresh air is much more acceptable to the building’s users and it has the additional benefits of reducing investment in air handling systems and also reducing energy consumption.” (Compagno, 1995, p. 94)

On this basis; a typical strategy of the double skin façade is to compartmentalize the buffer zone into separate regions with air supplied by grilles or vents at each level or individual zone. This compartmentalization disregards the impact of noise, sound, smoke and heat transfer from one section, level or room to the next area. The use of vents or grilles allows the control of incoming air by reducing air velocity, protecting from rain and reducing noise transmission from the exterior. Such control allows occupant access to the natural ventilation in constructions. “Most effective ways to reduce building services energy consumption is to exploit natural means and depend less on mechanical techniques” (Farmer, Graham and Guy, Simon, 2003). Extensively; the air cavity space and integrated solar shading devices control the solar heat gains that would typically require the use of mechanical means of air conditioning and air extraction.

Daylighting

Daylighting is important in two ways; first it reduces the amount of artificial lighting required, and secondly the quality of light from daylight is preferential to artificial lighting. The double skin façade with its increased glazing coverage improves the access to daylighting in the space. The increased daylighting component of the completely glazed façade initiates excessive glare and heat at certain times of the day. These increases require advance actions in design to struggle their negative effects. Solar shading devices are designed into the air cavity space to decrease solar heat gain through the glazing and reduce the amount of glare to bring forth by the increased access to daylight.

3. Findings

The indoor environment is always under the intense of to be controlled for providing the users needs by the delivery of different building services such as heating, cooling, ventilation, and lighting. This can be explained from the traditional idea that meeting occupant needs on comfort and energy savings could be met by the formation of a static, *ultimate* thermal environment. Resembling the ultimate thermal environment adjustment as the major gizmo; the connections on *daylight*, *thermal comfort* and *natural ventilation* strategies of Bioclimatic Architecture and DSF Design are utilized in below Table 2.

Table 2. Daylight, Thermal Comfort and Natural Ventilation Strategies of Bioclimatic Architecture and DSF Systems.

		Bioclimatic Architecture	DSF systems
Daylight Strategies	Shading	<ul style="list-style-type: none"> • Canopies • Overhangs • Reflectors 	<ul style="list-style-type: none"> • Fixed/Movable Shading Devices contained in air cavity. • Reflectors
	Capturing	<ul style="list-style-type: none"> • Glass window surfaces • Exterior reflections 	<ul style="list-style-type: none"> • Transparent Surfaces
	Penetration	<ul style="list-style-type: none"> • Windows 	<ul style="list-style-type: none"> • Glazed exterior and interior

		<ul style="list-style-type: none"> • Shadings 	skin layers
	<i>Distribution</i>	<ul style="list-style-type: none"> • Windows • Reflectors • Interior surfaces 	<ul style="list-style-type: none"> • Windows • Reflectors • Interior surfaces
	<i>Controlling</i>	<ul style="list-style-type: none"> • Adjustable blinds 	<ul style="list-style-type: none"> • Adjustable venetian blinds
Thermal Comfort Strategies	<i>Heat Capturing</i>	<ul style="list-style-type: none"> • Orientation of the building. • Nature of surfaces and the materials used. • Topography of the site. • Glazed surfaces for direct heat gain. 	<ul style="list-style-type: none"> • Orientation of the DSF. • Glazed surfaces for direct heat gain. • Transmitting diffused solar radiation by glazed layers
	<i>Storage</i>	<ul style="list-style-type: none"> • Selecting materials according to their capacity to accumulate heat. 	<ul style="list-style-type: none"> • Absorptive double glazing
	<i>Retention</i>	<ul style="list-style-type: none"> • Dividing building into different spaces to create distinct temperature zones. 	<ul style="list-style-type: none"> • Compartmenting the buffer zone (air cavity) into separated regions with air supplied by grills or vents.
	<i>Distribution</i>	<ul style="list-style-type: none"> • Thermo circulation of the air. • Powered ventilation system. 	<ul style="list-style-type: none"> • Thermo circulation of the air through air cavity.
Natural Ventilation Strategies	<i>Shading</i>	<ul style="list-style-type: none"> • Permanent/mobile screens • Sufficient insulation • Reflective surfaces 	<ul style="list-style-type: none"> • Shading devices contained in the air cavity.
	<i>Dissipating excess heat</i>	<ul style="list-style-type: none"> • Outlets (chimney effect) 	<ul style="list-style-type: none"> • Air cavity • Outlets / inlets (stack effect and chimney effect)
	<i>Cooling the structure</i>	<ul style="list-style-type: none"> • Increasing the air speed of air circulation (venturi effect, wind towers) • Water features • Plants • Underground ducting. 	<ul style="list-style-type: none"> • Increasing the air speed of air circulation (venturi effect, wind towers) • Air vents • Manually operable windows on interior

Throughout reading the indicated findings from the listed Table 2; the following issues are more extensively and preciously conducted in explanation.

The **daylight strategy** intents to improve how natural light is captured and allowed to penetrate a space, and to improve how it is then diffused and focused. Controlling light to avoid visual discomfort must also be considered. The intelligent use of daylight allows the reduction of electricity consumption for lighting.

- Shading and Control: Excessive daylight penetration can cause visual discomfort. This can be controlled by architectural features like canopies, overhangs and reflectors in Bioclimatic Architecture, and with fixed or movable shading devices which contained in air cavity or exterior layer of DSF systems.
- Capturing: Windows into spaces convey a certain amount of daylight. This can be available in Bioclimatic Architecture with designing required size of windows and reflective surfaces on the ground such as, water elements or paving and also fully glazed transparent surfaces may contribute to capturing more light in DSF systems.
- Penetration: The way daylight penetrates into spaces depending on the position, orientation, angle, size and type of glazing which are necessary circumstances for Bioclimatic Architecture, but DSF systems can occur penetration of daylight by fully glazed exterior of interior layer.
- Distribution: Daylight can be diffused by an appropriate type of glazing usage or by reflectors that allow light for penetration, both in Bioclimatic Architecture and DSF systems.

The *thermal comfort strategy* is a response predominantly to winter comfort: capturing the heat from solar radiation, storing it in the mass of the structure.

- Heat capturing: Capturing heat in Bioclimatic Architecture comprises of storing solar energy and converting into heat. The solar radiation received by a structure depends on climate together with the orientation of the building, the nature of its surfaces and the materials used, on the topography of the site and glazed surfaces. In DSF systems, orientation of DSF, directs heat gain and transmits diffused solar radiation through glazed layers that can capture heat.
- Storage: Heat storage can be accomplished with materials among accumulating

heat capacity and absorptive double-glazing for DSF systems.

- Retention: Retention is the air-tightness of the building's skin together with the insulation properties of its walls that reduce heat loss in Bioclimatic Architecture; dividing a structure into different spaces for creating a distinct temperature zones. Same idea can be used in DSF systems by compartmenting the air cavity into separated regions with air supplied by grills or vents.
- Distribution: Distribution means conveying the air to the spaces. Air (heat) can be distributed with the thermo-circulation of the air (rising movement of warm air). This can be achieved through the air cavity that DSF systems contain where raised air must also be regulated according to the spatial needs and usage that Bioclimatic Architecture claims.

The ***natural ventilation strategy*** is a response to the requirements for summer comfort: shading from solar radiation, dissipating excess heat and cooling down naturally.

- Shading: Bioclimatic Architecture essentially sets the external shading screens, which could be permanent or mobile. In DSF systems; shading devices generally arise in the air cavity for creating fully glazed façade without any additional architectural features. In addition to this; sufficient insulation should be used to prevent accumulation of heat.
- Dissipating Excess Heat: Dissipating of excess heat can be achieved through natural ventilation by using outlets, where temperature differences create a chimney effect in Bioclimatic Architecture. Likewise; DSF systems can achieve dissipating of excess heat for creating stack and chimney effect through the air cavity by using air inlets and outlets.
- Cooling the Structure: Cooling in Bioclimatic Architecture and DSF systems can be easily achieved by natural means. Common solution to ensure ventilation is

to increase the speed of air circulation by venturi effect or wind towers created with buffer zone (air cavity). DSF systems also comprise operable windows, which located in the internal layer of the skin and air inlets, both on external and internal layers. In addition to these; some natural features can be used for cooling such as water features, plants and underground ducting, etc. in Bioclimatic Architecture.

4. Conclusion

Bioclimatic Architecture promotes valid major strategies to be considered as a major framework leading the ecological approaches in building industry. The general framework of Bioclimatic Architecture significantly estimates the grounds on understanding sustainability and its ecological implementations in building industry. Bioclimatic Architecture principles and strategies emphasize the pragmatic need for an amalgamated and universal approach on implementing sustainability in building projects. The challenge for the designers is to bring different bioclimatic architecture principles together with contemporary ways. The main challenge with highly glazed buildings lies especially in their ability to respond and acclimatize rapidly to the external environment according to occupants' requirements throughout the year. This is feasible by means of high-tech systems to control temperature, light and ventilation. According to the findings, an excessive correspondence has been comprehended between DSF systems and Bioclimatic Architecture strategies. Reducing heat demand, providing view through highly glazed surface, controlling solar heat gain, allowing natural ventilation with provided thermal insulation barrier, reducing artificial lighting to improve occupants comfort are all appropriate to be achieved in DSF systems. Consequently; DSF systems of contemporary architecture can be illuminated as the equivalent trend of Bioclimatic Architecture that adjusts its fundamental ecological strategies on *daylight, thermal comfort* and *natural ventilation*.

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The Role of Advance Composite material In Contemporary Buildings

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Abstract

Composite materials have been used from the earliest times, from wood, which is a naturally occurring composite of lignin and cellulose, through straw reinforced clay bricks to reinforced concrete. In the 20th century, a new breed of composite materials was developed using polymer matrices with high performance reinforcement fibres. The great effect and uncompromising properties of advance composite materials has enabled the emergence of composites cut across all fields of application and all areas of work, just to mention a few aeronautic engineering, automobile engineering, and medicine, military and building construction. Therefore, with emphasis on building construction, advance composite material has played a vital role in today's contemporary building construction method, by presenting its self as an alternative building construction material, its application has made the contemporary building construction much more flexible and achievable, compare to traditional building materials and its methods of construction. It further offers the building construction industry the technical know-how of having new possibilities of design styles, shapes and forms. Therefore, advance composite material proves it's self to be a better and a new alternative building construction material that remains construction friendly and flexible based on its properties. This study therefore tends to provide an overview on advance composite material, its application as well as its role in today's contemporary building.

Keywords: contemporary building, composite material, straw reinforced clay bricks, building construction

1. Introduction

The human race has contributed tremendously to the improvement and processing of elementary building materials, they have become the reference point to mark the early stages of mankind discovery, invention and development, such as Stone Age, Bronze Age, Iron Age, etc. However the beginning of the recent hundred years positioned building materials to become more multifunctional and as well required the optimization of different properties. The evolution and concept of building materials has also been driven toward composite materials whereby two or more different material parts are being joined together to provide a better combination of properties (Wegst et al. 2015). However, the rapid growth in technological development of the 21st century played a great role in the emergence of advanced composite materials and its construction methods. It has also presented its self to be more dynamic, and as well made contemporary buildings to be more attractive and unimaginable, therefore based on some of the outstanding attributes advance composite material portray, the use and application of traditional building material and its construction method tends to decline with time in the nearest future (Karbhari, 1998). Advanced composite material has therefore presented its self with a much greater value and sustainability; the impact of these materials has also made contemporary buildings and their various design type embrace a much more dynamic and flexible system of construction.

Building Materials can be described as the embodiment of a building or a structure, and its production accounts for 30-50% consumption of raw materials worldwide (Tagnit-hamou and Soliman, 2018). The early discovery of building materials cannot be undermining rather it can be registered as one which has gone through a unique and extraordinary historic path of discovery,

starting from the early civilization of the cave men who had to source material like wood, stones strands to create shelter that can stand as a form of protection from the harshness of the weather and harmful element of the environment of stay.

Ever since then man have never remained seldom in the search for possible innovative means to create materials that can go in hand with it environment, though the 19th century remains a remarkable era that can be remembered for it industrialization and the expansion of modern construction technological development which majorly had a great influence on building materials and its method of construction (Zabihi, 2010). Though the acceleration in advancement in technology of the past and much more innovative ideas today has lead in the creation of building materials that are gradually coming to the lam light. Today advance composite material can be regarded as one of the product of effective technological development of the 21st century (Ljungberg, 2007). These innovative building materials tend to play a great role in contemporary buildings, in terms of environmental friendliness and sustainability and as well tend to bridge the gap between already existing traditional building materials.

2. Materials and Methods

This research employed the case study method for identifying various buildings across the world that have employed the instrumentality of environment friendly materials for construction and composition. The sources of the identified buildings are the internet and other archival materials which considers the use of sustainable construction materials for the purpose of their composition. A checklist was also prepared for the purpose of obtaining up-to-date information about the selected buildings and also prepare a basic appraisal and evaluation critierial for the purpose of determining the extent of sustainability of the identified buildings.

3. Discussions

The awakening of 21st century paved way to vast technological advancement. However, these technological advancements majorly cut across the construction industry, by influencing its building material types as well as its methods of construction. This advancement further brought about a dynamic change in the building industry, by therefore producing innovative building materials (advance composite material) that offer unique properties as well as wide variety of functions, and structural performance qualities that are sustainable and environmentally friendly, and are as well very much impossible to archive with normal traditional building materials (Akadiri et al., 2012)

in terms of it:

- New aesthetic possibilities and ability to mould complex fluid and create design of different forms, shapes and styles
- Being able to Provide special integrated surface finishes and effects
- Being able to provide significant savings in weight usually up to 15%
- Being able to ensure superior durability with degradation through life
- Being able to provide Rapid installation and cost on site
- Being able to Unlock the possibilities of architectural design
- To ensure Temperature and chemical resistance
- To ensure Flex performance
- To ensure Dimensional stability.

With the above mentioned qualities, architect, designers and engineers tend to play a vital role with the use and application of contemporary building material. They are therefore exposed with the challenges of new idea, as well as new knowledge and understanding of the nature of these new

material, such as their physical and chemical properties, their structural properties, their characteristics in fire, their interaction with other material as well as their anticipated durability for any given situation, cost, maintenance requirement and potential for recycling and other environmental issues such as embodied energy. However, it also further relates to its impact in terms of health and safety, as well as its multiplicity towards aesthetic properties.

Advanced composite materials as a contemporary material are a mixture of two or more materials to form a composite material. It is classified as an advanced composite, because they are determined by unusually high strength fibers with high stiffness or modulus of elasticity characteristic compared to other materials or composite, such as fiberglass and concrete. Advanced composite systems are divided into two basic types, thermosets and thermoplastics. Thermosets are by far the predominant type of composite in use today while Thermosets are subdivided into several resin systems including epoxies, phenolic, polyurethanes, and polyimides. These, epoxy systems currently dominate the advanced composite industry today.

The first inception of advanced composite materials can be traced back to the past 50 years with a wide range of demanding applications. However, one of its very first commercial application was noted shortly after the Second World War, with a USA Company named Mine Hunters, which introduced advanced composites into military vehicles, as well as opened doors to the multiplicity of a much more advanced composite material that are now applicable in different forms and functions in today's modern world. Advanced composite materials are now the common material for high performance super yachts, large wind turbine blades, modern aircraft, and sports and leisure equipment including ski's, snowboards and surfboards. However, they are also being widely used in construction, because they tend to offer significant weight savings and their ability to form complex shape, give architects greater freedom in design. Nguyen, Mendis, Ngo, Tran, & Nguyen,

(2013), noted that the applications of advance composite material has witnessed and reflected a great shift in the construction industry through series of research and project carried out since the 1990s. However, its market share distribution has risen more than 25%, therefore projecting the construction industry as the second largest field in the application of advance composite, See Fig.1.

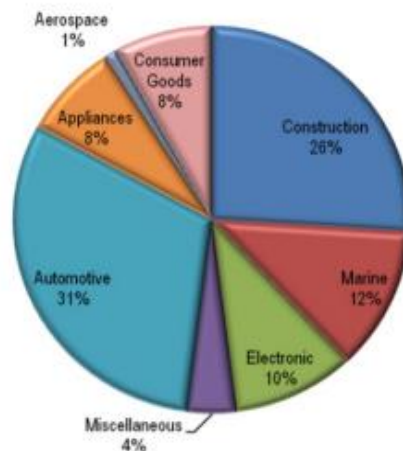


Fig.1: Shows a chart showing the differential scale in the application advance composite material (Nguyen, Mendis, Ngo, Tran, & Nguyen, 2013).

An example of such is exhibited in Heydar Aliyev Center designed by Zaha Hadid Architects. The building which is a contemporary building characterized with a complex geometry, it also represent a wide contrast from traditional building materials, because some of its major construction material used were advance composite material in form of Glass Fibre Reinforced Concrete (GFRC) and Glass Fibre Reinforced Polyester (GFRP), they were chosen as ideal cladding materials, because they allow for powerful plasticity in building design while responding to very different functional demands related to a variety of situations, see Fig 2



Fig.2: The representation of Heydar Aliyev Center Azaebarjan designed with advance composite material.

Designing with advance composite materials opens up a wide range of design possibilities, it can also optimize the performance of a structure by the modification of the building blocks of the materials. The chemistry of the resins can as well be modified to produce materials with specific characteristics for specified use.

3.1 Characteristics of advance composite material

Nguyen, Mendis, Ngo, Tran, & Nguyen, 2013, described Advance Composite materials, to possess high advantages in strength, stiffness, low density, as well as manufacturing flexibility; therefore, their potential in replacing traditional building materials (such as concrete, aluminum and steel) in building construction has become attractive. Advance composite materials are not only limited to building material alone, rather their use and application also have a broad and proven application in design flexibility as well as dramatic shapes, styles and forms in architectural aesthetics, interior finishes and landscaping design etc. one of The biggest characteristics of modern day advance composite materials are the fact that they are light in nature but also very strong to stand the taste of time. They are also innovatively driven by the choice or specification of an appropriate combination of matrix and reinforcement materials. It can therefore be made to exactly meet the specified requirements of any particular application. However, based on its outstanding attribute,

advance composite materials tend to play a vital role in taking construction, design, aesthetic and remodeling forward in this contemporary era. Therefore, with recent technological advancement, advance composite materials are now designed to respond with various stimuli which are changed significantly into predictable manner in response to the environment .

3.2 Aesthetics possibilities with advance composite material

Aesthetic problem due to complexity in design and architectonics has been notable in the construction industry, as a result of the low level of technology involved in traditional building material and its method of construction. Architects, designers and engineers show great interest in the use of advance composite materials in the formation and composition of contemporary buildings, to advance composite material for the ability to allow cost effective realization of unique shapes, styles and forms as well as flexible aesthetics, while accommodating architectural designs and needs. The long-term durability, weathering resistance, and the exceptional mechanical properties have recently suggested the adoption of advance composite material for building façade systems in an increasing number of buildings worldwide (Berardi & Dembsey, 2015).

However contemporary buildings and structures built from advance composite materials has revealed and proven its flexibility by allowing all forms, shape and style of aesthetics to be achievable with high durability and tensile strength. Nonetheless Designs with advance composite materials are easily archived in time and safety. Advance composite materials are innovative candidates to be used in contemporary building façade and aesthetic systems because they offer excellent performance and cost effectiveness in aesthetic and complex designs.

With the benefits of high strength and stiffness, low density, and highly flexible shaping, advance composite material become potential candidates in the replace of traditional building materials (such as aluminum and steel) in civil applications. For example, advance composite materials

contribute up to 50–70% weight reduction as an alternative to traditional metal-based materials. In addition, the manufacturing flexibility of advance composite material products is well-suited with the demands of architects and engineers in designing complex building structures such as the façade systems while maintaining mechanical properties and durability. Therefore, it can be noted that one of the major roles advanced composite material play in contemporary buildings are the possibility of new aesthetic. However this can be considerably high due to the vast use of advance composite materials in the twenty-first century buildings and structures. Since the introduction of advance composite material in buildings, it has paved way for some many fabricators to produce composite materials from recycled and renewable materials in other to create building elements for buildings facades and the general aesthetics of buildings and its environment.

Composite materials, such as Glass fiber reinforced polymers (GFRPs), carbon fiber reinforce polymers (CFRPs), possess the advantages of high strength, stiffness, low density, and flexibility; therefore, their potential in replacing traditional materials (such as concrete, aluminum and wood) in building aesthetics and facade has become an interesting and attractive one in the building industry today. See below Fig.3, Fig.4 and Fig.5

- The use of sandwich Glass fiber and epoxy resin combine with a lightweight foam core that is use for the finishing of the facade of the Harman High speed Rail station in Medina.



Fig.3: The representation of the Haramain high-speed rail station.
(www.burohappold.com.)

- The use of Glass fiber reinforces concrete columns of greater surface finishing and aesthetic compare to concrete and more timeserving in construction.



Fig.4: Show the representation of columns constructed with composite of glass and steel.
(www.strombergarchitectural.com)

- The use of Glass fiber reinforced polymer to create the design of a museum with great surface finishing, and a façade of free flow of form without column support.



Fig.5: Illustrate the aesthetic possibility of FRP on the city museum façade with free flow of form without column supports.

3.3 The influence of advanced composite material in existing buildings and structures

Advance Composites materials are one of the most widely used materials today, because of their innovative and sustainable adaptability to different environmental and structural condition. It also allows for the combination with other materials, so as to serve specific purposes and exhibit desirable properties in existing buildings and structure. Therefore, it uses and application in buildings and structures they are selected carefully based on it intended required purpose for the repair of damaged elements in buildings or structural elements, so as to help prevent futuristic occurrence of failure of any kind in the long run use of the building or structure. However, the use and application of advance composite materials in existing buildings are to enable performance quality, structural stability and a functional structure that can stand the taste of time.

Advanced composite material like fibre reinforced polymer are proven technology used for upgrading and strengthening of concrete, masonry, timber as well as steel structure. Generally advance composite materials have exceptionally high strength, yet they remain very light and easy to work with. it application has cut across all areas of construction ranging from increase in capacity of existing buildings, bridges, seismically upgrading structure, correcting design or construction

error and allowing for further modification or change in use. Fig.6 & 7 shows below some of the application of fibre reinforced polymer and some of its advantages



Fig. 6: shows repair of concrete beams with ACM.



Fig. 7: shows the repair of concrete column with ACM.

Some of the advantages of fibre reinforced composite are:

- Economy and durability
- Ease of application
- Extremely high tensile strength
- Outstanding fatigue behavior
- Absolute resistance to corrosion
- Ability to upgrade structure while in use
- upgrade possibilities even with limited access

A rhetorical studies conducted by (T. Keller, 2001) has proven that Fibre-reinforced polymers (FRP) have found increased application in bridge and building construction in recent years. This is predominantly due to the advantageous properties of these materials, such as low self-weight, high strength, free formability and substantial resistance to corrosion and fatigue. Chiewanichakorn & Toranzo, 2011, also pointed out that a comprehensive study on *Seismic* retrofitting of st. Joseph Hospital revealed the use and application of advanced composite materials for the enhancement of column, slab, wall *and* beam elements. It also further depict the practical use and application of advance composite material in archiving certain structural standards as assigned by the united states government, see below fig.8, fig.9.



Fig.7: depict the use of advance composite in the healing of concrete spall on wall (Chiewanichakorn & Toranzo, 2011).

The application of advance composite material enabled protection against concrete spalling and as well as reduced the possibility of body injury. Basically the use of advanced composite material can contain any form of damage to the concrete that could occur during a seismic event.



Fig.8: Depict the use of advance composite in the healing of concrete spall on wall (Chiewanichakorn & Toranzo, 2011).

Columns are retrofitted with advance composite material. Advance composite wraps are applied in circular direction to supplement the transverse steel reinforcement and to as well increase the shear capacity of the columns and to provide plastic hinge confinement.

3.4 Advanced composite material as an innovative and sustainable building material for the feature

Advance composite materials are currently revolutionizing architecture and design. Their applications in the field of construction have allowed the progressive replacement of traditional materials and many barriers that designers used to find when implementing projects with a futuristic design have disappeared. Up until now, advance composite materials have been more commonly used in repairs, secondary structures and huge self-supporting structures, such as domes. However, it's innovative drive open door for architects and engineers to develop more complex works which will satisfy the creativity of some designers and architects. It also offers the desire to challenge the established certain canons when designing buildings and unique works, These which are only possible with composite materials, since we take advantage of the combination of the low weight of these materials and their ability to be molded in such complex shapes (Isabel&Soler, 2016).

4. Conclusion

The emergence of composite materials in the building industry came as a result of certain limitation and factors over traditional building material. However based on the versatility of advance composite materials, a wide range of construction development has been achieved ever since its inception in to the building industry. The use and application of Advance composite material enables broad and proven application in contemporary building, it flexibility in design also enables great achievement in complex geometric shapes, styles, and forms as well as a much more flexible method of construction

Design complexity can be resolved with the ability of advance composites materials. However it further plays a very unique role in the repairing of existing buildings and structure due to its unique characteristics over traditional building materials with high flexibility characteristics. There is a great possibility of achieving new aesthetics in construction and in repair of old buildings.

Advance composite materials tend to offers a very wide range of applications, properties and advantages in present day building technology which are far impossible with traditional building materials such as new aesthetic possibilities, abilities to mould complex fluid and creative form which integrate special surface finishes and effect, significant saving in weight usually up to 15%, superior durability with degradation through life cost on site and less degradation, flex performance, dimensional stability, rapid installation as well as unlocking the possibilities of architectural design. Therefore, composite material can be assessed as a new intervention in the modern day building industry with so many credits against traditional building material.

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Impact of A Community Place in Regards to Sustainable Design towards Decreasing Social Crime

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Abstract

Human settlements have constantly provided to accommodate the wellbeing, security and the prosperity of their residents regarding plan and closeness of area to water, sustenance and other crucial assets. Safety and security have been critical issues all through history, from early ancient period to medieval and present day urban areas. In light of the populace development and quick urbanization that propels everywhere throughout the world, crime has turned out to be a standout amongst the most genuine social issues. Actually, governments and diverse specialists are attempting to vanquish this marvel by contributing a colossal measure of trade as invasive measures. Regardless, this issue is as yet uncertain as crime rates far and wide continue heightening. Dealing with and diminishing the pessimistic impacts of crime on human life will provoke more conspicuous controls and further welcome more enthusiasm of both the general population and the Community. This exploration will talk about crime and economical design concerning man and its condition with a view to decreasing the effect it has on man and nature. Designers and other design experts should mull over the encompassing condition keeping in mind the end goal to lessen. The design of structures and the game plan public offices and other outside spaces can influence the chance of crime and the level of dread of crime.

Keyword: crime, urban community, sustainable design

1. Introduction

Crime is considered to be understood as being destructive to human and its surrounding and a lot ought to be done to handle this. (Hillier, 2005) defined a sustainable community as safe, perceives itself to be safe and is considered by others to be safe. However, both sustainability and security are two important factors to be considered during the design process. Sometimes these two elements complement each other. In light of these considerations, mitigating crime and fear of crime may improve the quality of human life (Schneider & Kitchen, 2007) which is a basic human need. Safety and security have always been major human needs throughout history.

Sustainable design has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainability presents the urgent need for radical change in man's thinking and behavior, so much so that it is termed the 'global revolution .. Sustainability is a common and a contemporary goal of many urban development policies in various countries (Chan & Lee, 2006). Sustainable development includes extensive discussions on the various levels and activities, including an international scale, regional, provincial, city, neighborhood and building scale. According to existing researches neighborhoods are the main places where people feel the lack of safety and insecurity in these areas (e.g. Abdi, 2012). An urban community place can be thought to be brimming with consumption of energy, waste creating and heat producing activities. This can be caused by high populace focus, industrialization forms, and vehicular activity clog and development operations. As per (Mabogunje, 2011), numerous nations are moving towards having 40 to 50 % of their populace living in urban communities. The high populace thickness in the city

makes challenges in the parts of urban housing quality and quantity, financial and infrastructural improvement, environmental quality and in addition energy request.

2. Crime and social problem

Crime has been characterized in the Oxford English Dictionary (1989) as a demonstration deserving of law, as being illegal by statute or damaging to general society welfare; a malevolent or harmful act; an offense, a transgression, particularly of a grave character (Abdul Mohit and Elsayahli Hannan, 2010) Therefore, it is essential to consider elective choices to take care of the current issues. There is most likely that crime is impacted by an assortment of elements, for example, monetary, social, and administrative and also physical components. In the interim, the commitment of the manufactured condition towards the diminishment of crime has gotten impressive consideration over the most recent four decades.

The omnipresent issues of crime and the dread of crime keep on representing endemic issues for post-modern urban social orders. In the UK, for instance, crime has expanded all things considered by 5.1% every year since 1918 (Home Office, 1999). Despite a noteworthy descending pattern in the UK, since 1995 (Home Office, 2010), and the variety of unpleasant designs in the UK, the USA and Australia, the issue of crime remains a noteworthy worry for governments, the police, especially the counteractive action of offenses. Researching the urban community stage, where (and when) crime is found, can along these lines contribute much to our current information and comprehension of crime and aid the creation and support of more secure, energetic and more sustainability urban community. Indeed, there is a growing body of research That links urban sustainability with crime (Du Plessis, 1999; Cozens, 2002) It is increasingly recognized that a sustainable community is one that is both safe and perceived by its residents to be safe from crime.

Upgrading an urban community infested with crime using sustainable design have different reactions in different neighborhood. Figure 1 illustrates how people in crime infested places react to a new environment, mentally, socially and physically. Firstly from the physical and mental point of view there is a reduction in stress level, control in stress level, secondly from the aspect of mental health and social activity there are loads of issues such as low self-esteem or self-confidence and thirdly is the aspect of the Physical and social activity here there is a feeling of safety and a breath of positive life.

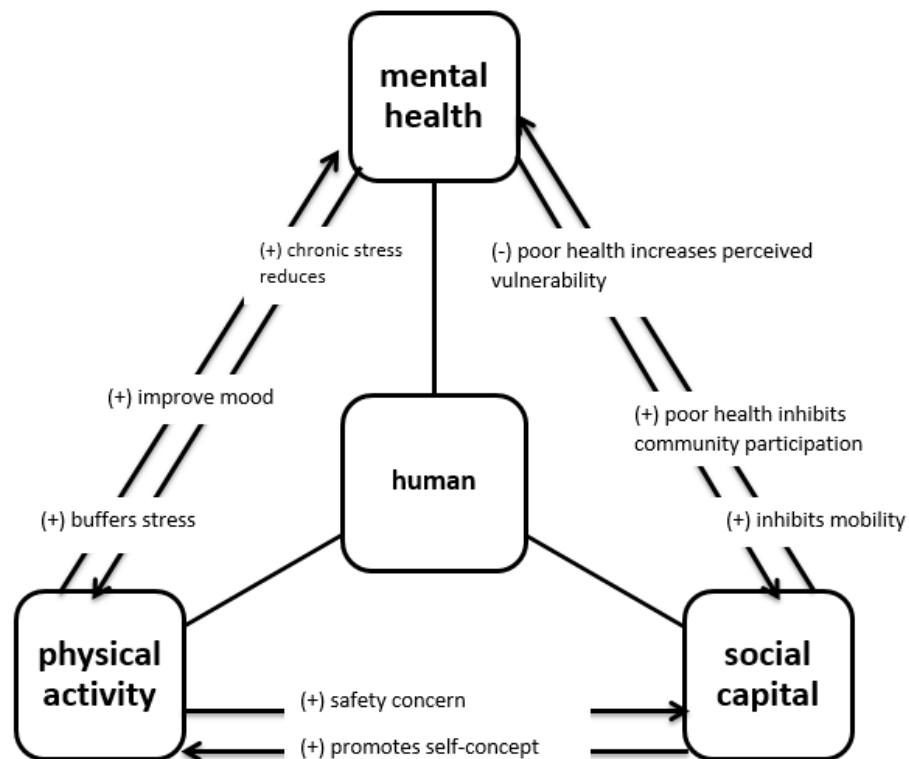


Figure 1: Reaction of upgrading an urban community infested with crime using sustainable design (designed by author).

3. An insight on Sustainable design on reducing crime rate

Sustainable design is awareness for substantial development which has come to stay, all over the world today architects, engineers and developers are generally searching for approaches to mirror their new ideas of building and particularly to design. In today's world building professionals take diverse examples that incorporate either a superior design, coordinated design, sustainable design or green building. A sustainable venture is designed, assembled, remodeled, worked on or reused in an environmental and asset proficient way (Ortiz, 2010).

To a vast degree sustainable design has appeared as a response to unravelling the clear negligence for our natural and social environment and one type of sustainable design is building reuse where the exemplified vitality of the first structure is kept in place, sustainable development is an advancement that addresses the issues (such as crime) of the present without trading off the capacity of future generation to address their own issues (world bonus on condition and improvement, 1987). It is comprehended that the prerequisite of sustainable design comes in various ways, for example, the worry for the neighborhood, the experience of happenings in the area and the necessities.

The thought is to have a neighborhood that is assembled shrewdly and wisely with a specific end goal to utilize a low measure of non-sustainable power source, create little contamination and waste, and has zero crime rate, while then again it enhances and improves the wellbeing, security and welfare of the general population who live and work in a specific neighborhood.

Crime has a tendency to dynamically degrade and influences the neighborhood adversely which thus makes major problem that includes lack of open space for social interaction. Sustainable design approach in present-day time has turned into a basic mission in the redesign of the weakened

neighborhood, keeping in mind the end goal to distinguish the root cause of criminal activities and find sufficient solutions with the guide of the sustainable design approach.

4. Crime infested neighborhood and its impact on the community

A Crime infested neighborhood is a fabled place that negatively impacts its surrounding and its inhabitants which eventually leave little or no space for growth of all sorts. A new kind of built environment with higher prospects should always be considered, which will directly affect the people who live in such environment. The problems with Crime infested neighborhoods include external and internal factors, the external factors include corruption and unemployment in which corruption portrays the economic instability while unemployment shows the level of people that are productively active by means of the job being provided thereby showing that those that are unemployed end up becoming a burden to the society. The internal factor is divided into four, Firstly over population this shows where the population is more than the available infrastructure and amenities thereby putting pressure on the infrastructure, Secondly illiteracy this shows the level of education, experience and exposure, therefore people aim for a better life but with a high level of illiteracy there is no aspiration for a better life, thirdly family structure it is popularly said that charity begins at home so therefore the structure of a family on how it runs and perceived by everybody is as important as having a stable society that aims for the best for themselves and others around, also the ability to have a good family plan in order to avoid a very high fertility rate, and finally we have recreational center (it is said that all work and no play make Jack a dull boy) this helps to provide a balance in the sense that having open parks, playing ground and other social centers creates a relaxed and welcoming atmosphere. All this if not properly combated will result in low or lack of safety and security of lives and property which can lead to total breakdown of

law and order, it also results to low or lack of social life, this is vital to the balance of human life in order to have a happier life.



Figure 2. Slum areas that can breed criminal activities in Brazil

Source by (<http://thecityfix.com/blog/sao-paulo-brazil-master-plan-prioritizes-sustainable-urban-development-people-oriented-mobility-public-participation-maria-fernanda-cavalcanti/>)

It is challenging enough to characterize what a Crime infested neighborhood is, but it identifies with an extensive array about the wellbeing and quality of life. Looking at urban renewal, this term is by and large used to depict a living domain involving the physical, social and economic measurement (Nieboer, 2005). In managing a Crime infested neighborhood, we can't abstain from considering nearby group communities. A few European urban regions are encountering neighborhood issues, as brought up by European-based analysts, post-war neighborhoods are physically falling apart. Various urban areas in Europe are encountering rotting forms with resemblances in factors prompting decay. A few neighborhoods are no more appealing living conditions and have lost their intensity on the city level. Structures were arranged in view of the idea of optimistic housing, which means open, well-spaced, well lighted and well-ventilated area while having a wide green area. Be that as it may, the huge accessibility of green is frequently seen by inhabitants as a positive factor.



Figure 3: Slum area transformed into a fully sustainable community place in Brazil
Source by (<http://thecityfix.com/blog/sao-paulo-brazil-master-plan-prioritizes-sustainable-urban-development-people-oriented-mobility-public-participation-maria-fernanda-cavalcanti/>)

The effect of neighbourhood attributes on individuals' mental change fluctuates noticeably, depending on individuals' circumstance and behavior (Cutrona et al., 2000). A few people with especially strong identities can adapt effectively, even in unsafe and crime-infested neighbourhoods. Nonetheless, other individuals are very susceptible to depression when they live in the unfriendly environment. It might be that living in an impeded and disorderly neighborhood hinders positive thinking and replaces it with misery and negative attitude. Because of the absence of successful administration and misappropriation issues, the general nature of the neighborhood is dynamically diminishing, and a few side effects of this decline include physical disintegration and crime which in the most exceedingly terrible circumstances joins with disruptive conduct vandalism. Since organizations and institutions regularly need appropriate control, inhabitants don't feel safe in their own place and social connection gets affected (Calzolaretti, 2011; Carini et al., 1978). Notwithstanding, managing neighbourhood issues in a coordinated way, in this manner, considering social, physical and economic viewpoints isn't new. Initially, endeavors can be found around two decades back as actualized by governments and key performers to react to the expanding multifaceted nature of urban issues. Just when those activities demonstrated

achievement, they swung to be regulated at higher political levels. It appears that in the mid-80s, United Kingdom, France and the Netherlands were the primary European nations actualizing incorporated urban strategies.

The physical rot of neighbourhoods is related with social conditions, for example, illness risk, poor mental wellness, and the dread of crime (Cohen, 2000). Actually, the "Chicago School" of Sociology firmly accentuated the effect of neighbourhood physical rot on health medical issues (Faris & Dunham, 1939; Park & Burgess, 1925). One examination found that a neighbourhood record measuring the quality of houses, deserted cars, spray painting, crime, and state-funded school decay clarified a greater amount of the difference in gonorrhoea rates than did a destitution list measuring salary, joblessness, and low education (Cohen et al., 2000). Neighborhood qualities impact the likelihood that individuals will shape ties with each other at the point when private turnover is high, individuals are more averse to frame connections. So also, individuals don't tend to shape connections when they live in neighborhoods high in social issue, since they mistrust their neighbors (Hill et al., 2005) Relationship disturbance may have a few distinct outcomes applicable to despondency, including lower levels of casual social control, insufficient social help, and poor family role execution. The term sustainability has turned out to be well known in policy situated research as a statement of what open policy should accomplish. The idea of sustainability was initially instituted in forestry, where it implies that the forest should not be harvested beyond what it yields (Wilderer, 2007) the word Nachhaltigkeit (the German expression for sustainability) was first utilized with this importance in 1713 (Wilderer).

5. Conclusion

It is fine to say that sustainable design plays a major role in drastically reducing crime rate, Looking at the situation at hand crime infested neighborhoods are usually neglected and usually

not given much attention because it contributes in defacing and devaluing the community area. Thus more attention should be devoted in reviving a neighborhood that is obsoletely deteriorated and crime infested because if it is improved upon it would add immense value to the neighborhood and environment at large.

In a clear view of thing it has been seen that there has always been an increase in the population of a certain class of people in crime infested area such as those seeking shelter, seeking a hideout and seeking a base for criminal activities. On the other hand it has become a global issue that is constantly deliberated upon in developing countries, shown by the continues effort of the global community to provide a more sustainable environment and way of leaving. It is also known that more people are constantly migrating from rural areas to urban area with nothing in their pocket and eventually settling in an urban crime infested and deteriorated neighborhood because it is probably cheap, free or easy to access.

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The Substrate and Urban Transformation. Rome: The Formative Process of the Pompeo Theater Area

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Abstract

The city is an organism that has been transformed through continuous modifications of its form. In these transformations we can find traces that remain and organize the successive urban aggregates over time. The case that will be proposed is the one of the urban fabric formed in the area of Pompeo's theater, in the Renaissance district of Rome. Through Saverio Muratori's studies on the urban history of Rome and the new archaeological discoveries, the formation of residential building on the remains of the ancient building until its specialization was analyzed. The role of the substratum, evident in this case study, shows how spontaneous architecture attests to the great forms of the past, and reuses them in every era, transforming and reinterpreting them. In this way the city is so eternal reuse of its forms, its paths and its materials.

Keyword: urban morphology, Rome, historical cities, urban organism, substratum.

1. Introduction

The research focuses on the study of the historical city and its evolutionary and formative processes through the act of transformation of the existing. Starting from the assumption that "the single work has meaning only if generated and read in the great flow of the cities's transformations and territory, as an ongoing energy that modifies the pre-existing"¹ shows how the formal and constructive characteristics of an ancient organism remain in organization

¹ G. Strappa, *L'Architettura come Processo: il mondo plastico murario in divenire*, Franco Angeli, Roma 2014.

of the city and help in the hierarchization of the elements. According to Saverio Muratori it's possible to find, through the reading of historical textiles, two large organic categories of shapes: the elementary forms, modular and rhythmic, and the accentuating and cohesive forms². The first are characterized by residential construction that specializes in the base cell through a work of addition, recast and synthesis, transforming itself into a supportive organism and transmitting this process cyclically to the subsequent building organisms. The latter, object of the study, are represented by the ancient public monumental buildings such as theaters and amphitheatres. These in urban history appear as catalysing elements of paths and building fabrics; they present themselves as the pivot of urban transformation from the late ancient age to the medieval, arriving to our days more or less explicit and legible in urban plots depending on their political-economic role and their characteristics cohesive with the context.

Here we don't want to propose a philological reconstruction of the original ancient building but through an analysis of the sources and reliefs available to us in the archaeological field we want to show the concrete persistence of their shape and the permanence of the physical elements of the structure. We want to show how the ancient substratum is a guiding element that can perimeter our choices within the urban organism so as not to get lost in the sea of possibilism.

2 S. Muratori ed altri, *Studi per una operante storia urbana di Roma*, C.N.R., Roma 1963.

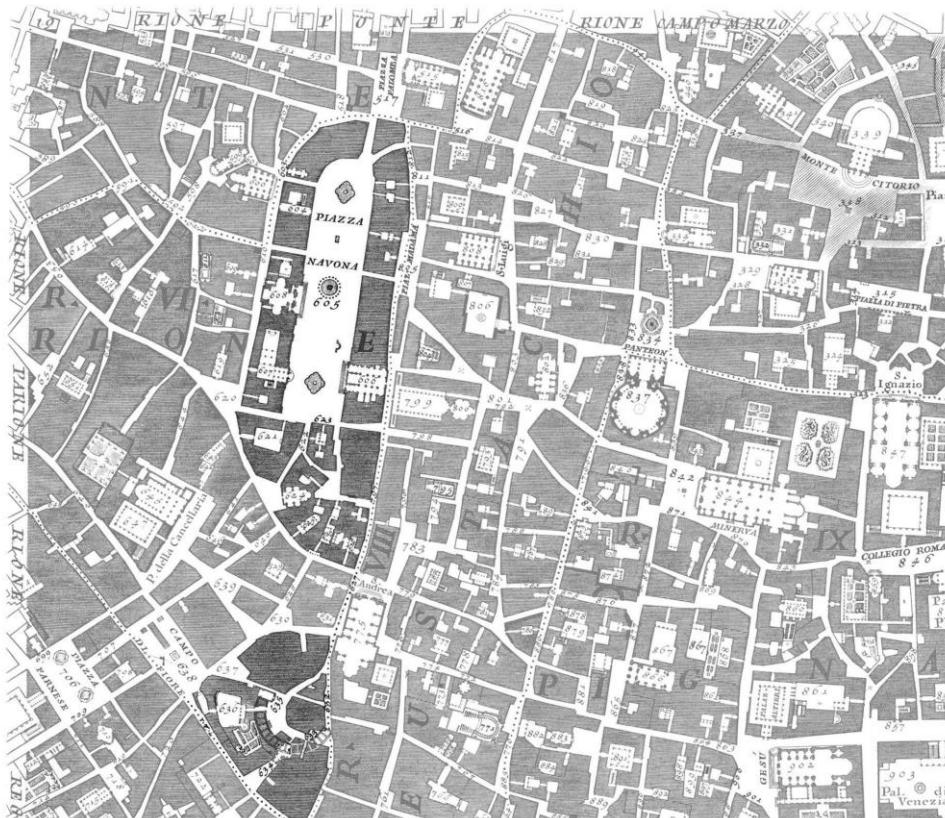


Figure 1. From the plan of Nolli of 1748 it is evident the permanence of the shape of the ancient buildings in the modern city and their relationship with the paths

2. The role of the Substrate and the Renaissance district in Rome

To understand the "formative" character of the sub-stratum in the events of the urban organism it's possible to start from a statement by Luigi Pareyson: "Art could never arise if the whole spiritual life didn't already prepare it with its common format. This is why art has to be sought in a sphere in which that format is able to acquire a determined and distinct character, with its own specific and irrepressible autonomy³. "The Roman Southern "Campo Marzio", now called as the Renaissance district , is a virtuous example, in many cases an unicum, of a special antique fabric that hasn't lost its organic character overtime, and of the Roman building events, thanks to the presence of monumental buildings that have maintained "an irrepressible autonomy" through their circular shapes. The area was urbanized in late Republican age under Pompeo Magno, after a long reclamation work due to the continuous

³ L. Pareyson, *Estetica. Teoria della formatività*, Bompiani, 2002.

flooding of the Tiber that had transformed the site into a marshland, *Palus Caprae*. The Roman general began the monumentalization of the area in 55 BC, probably driven by the desire to exploit and monetize his possessions in the area, with the construction of the theater which then took its name. Numerous monumental complexes followed throughout the imperial age, giving rise to a special building district for play and religious purposes. Among these complexes are important for this study, in addition to the theater of Pompeo, the stadium of Domitiano and his Odeon, the theater of Balbo, that of Marcello and the *quadriportici* present in the area. These were connected, through a tangible relationship to a series of paths that are still partly recognizable in the current topography.

The transition between late ancient and middle ages, very often obscure and neglected in urban morphology studies due to the difficulty of the information available, is instead fundamental to understand how this fabric of special buildings has continued to live through the conservation of its plant. Marcello Marocco and Luigia Zoli, in a critical paper⁴ on the morphology of the Renaissance district, show the factors that have contributed to the formation and modification of this urban sector. They articulate the study in five essential points:

- 1) reconfirms the elements such as walls, bridges, streets and monuments that characterized the ancient structure;
- 2) presence of catalyst elements of successive building transformations such as basilicas, villas, hortus and domus cultae;
- 3) creation of a system of tensions capable of guiding the reconstitution of urban morphology according to certain directions;

⁴ M. Marocco, L. Zoli, *Il "Quartiere del Rinascimento". Tipologia edilizia e morfologia urbana*, Studi Romani, Gennaio 1983.

4) the great polarities (centers of life): Campidoglio, Mausoleum of Hadrian (later Castel Sant'Angelo) and the Vatican;

5) the type of land use that in the Middle Ages gravitates around the residential nuclei that are both secular and religious;

Through these categories it's possible to summarize the transition from the ancient monumental city to the medieval one in the bend of the Tiber, which takes place through continuous interstitial developments responding to a need for continuity of the urban jersey. Unlike the other medieval centers that gravitated around an original nucleus where political and religious powers resided. Rome has no real center on which to gravitate and this has involved an isotropic character of the urban tissues, a strong resistance to change. This isotropy, however, is due to the area of the Western and Southern Campo Marzio in the presence of large monumental structures that possess the original quality of organically linking the transformations into a single resistant organism, formally autonomous, but participating in the continuity of the medieval and then modern city. Also Morocco-Zoli state: "The intrinsic relationship that binds the new city to the old one, through the use of ruins as a substratum, is a structural law that conditions the development of the city already in the Middle Ages. This phenomenon is due to the permanence, in the new organism, of certain grandiose cuts, such as the emptiness of Piazza Navona and the long straight via del Corso. "

The special ancient building enters the formative dynamics of the medieval city by welcoming the prerogative of its plant in commercial and residential base cells that, through the phenomenon of recast, specialize again. A continuous life cycle characterizes this part of the Campo Marzio and the circular plant buildings of the Mediterranean area; it's the physical and not just typological reuse of the existing key for these stratified tissues. Gian Luigi and Mattia Maffei, continuing the research of Gianfranco Caniggia on basic construction, face the reading of the special building in which they assert that the inverse relationship, or the de-specialization treated here, must be studied on the reverse: "What it was an internal path - the horizontal distribution - reacquires the value of a real external path - that is, of the road - as well as the elementary aggregated cells, in a serial or non-serial way, summarize the typological role they had in basic construction⁵".

5 Gian Luigi Maffei, Mattia Maffei, *Lettura dell'Edilizia Speciale*, pag. 50, ALINEA, Firenze, 2011.

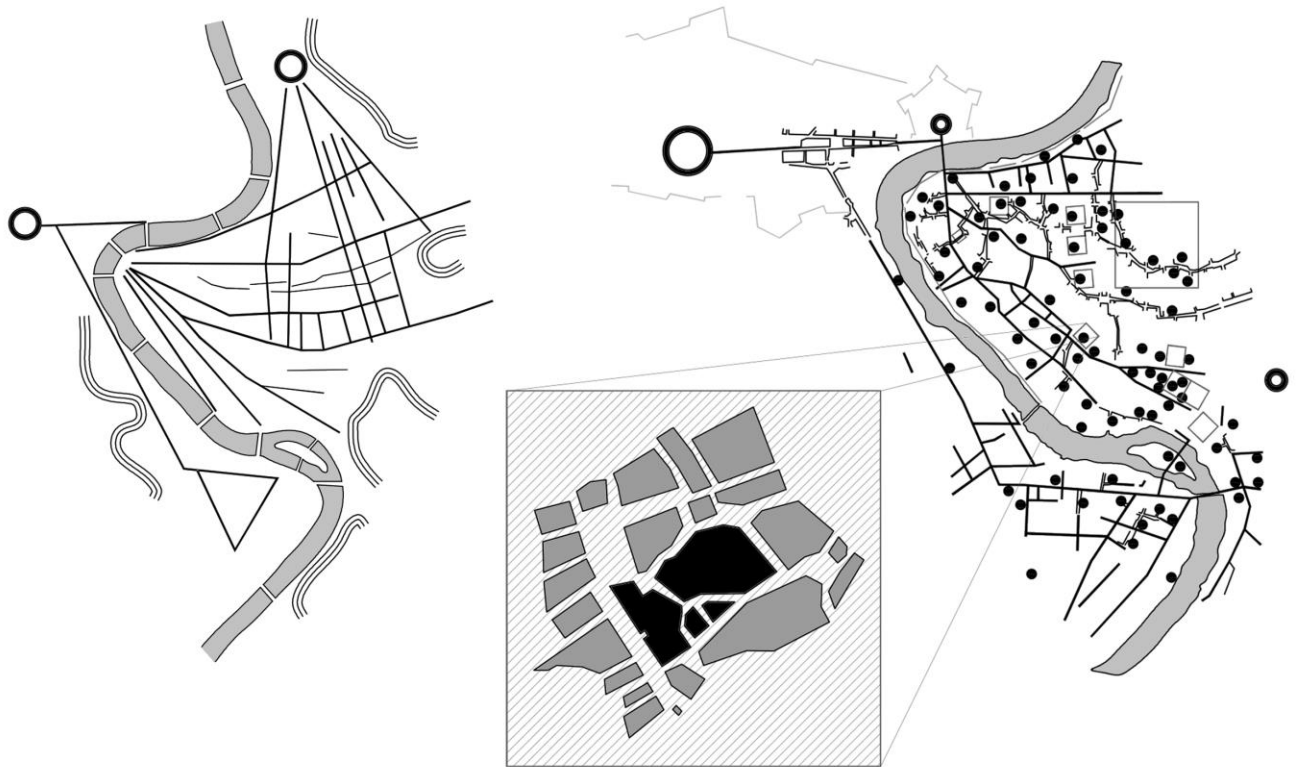


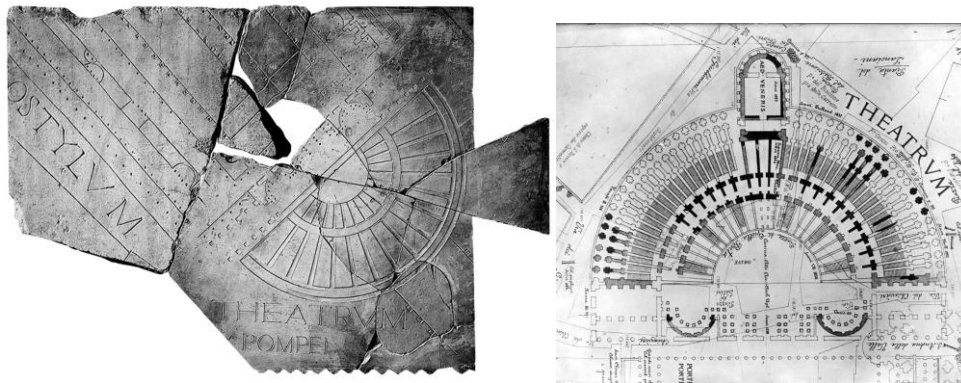
Figure 2. In the first scheme we can see how the polarities of the Vatican and Piazza del Popolo influenced the orientation of the routes.

In the second scheme we can see how the Roman routes, in black, persist and orient the medieval fabric of the city. The medieval paths are grafted onto the ancient ones and they grant the new churches, schematized in circles, with the ancient traces. The Roman monumental complexes, black squares, become catalysing elements of the new religious buildings. In the zoom the study area is synthesized through a schematization of the Bufalini's map; 1551.

3. The Pompey theater and the factors of permanence

In the study of a fabric deriving from an ancient substratum, it is necessary to make use of the contribution of the archaeologists for the survey of the existing remains, their identification in the current organism and the reconstruction of the original artefact. The case study of the monumental area of the theater of Pompeo becomes emblematic in the identification and reading of the phases of the training process. From this derives the modern fabric between Piazza Campo de 'Fiori and Largo di Torre Argentina. The shape of the theater is now

perfectly recognizable both planimetrically and along its outer perimeter along the Via dei Chiavari (which partly occupies the ancient scene), the streets of Paradiso, the Biscione and the Via dei Giubbonari up to Piazza Campo de ' Flowers. Its shape is even more evident along the Grottapinta road that follows the internal curve of the cavea. Thus we identify the factors of permanence that induce the reading to start from the most obvious parameter: the city of today. The study of urban morphology is a backward operation in time; we do not start from the ancient topography but we must read the fabric like a text leafing through it layer by layer.



Figures 3 - 4. The *Forma Urbis* gives us only an approximation of the form of the theater of Pompey. The Victorious Venus temple does not appear in the drawing. In the relief and plan of the Lanciani, the presence and permanence of the temple in the block appears evident.

Among the key themes of the study there is the question of fruition: in these buildings for the purpose of play, usability evolves according to historical epochs, always restoring new meanings to the forms in a continuous process of organic renewal; biological. A generation of enlightened archaeologists, attentive to this theme of urban morphology, is that of the '70s represented by Anna Maria Capoferro Cencetti, who in his essay "Variations in the time of the functional identity of a monument: the theater of Pompeo" reminds us the importance of matter / material through the names given to this theater by atky writers: lapideum and marmoreum. *Theatrum lapideum* and *marmoreum* because it was the first stable theater in

masonry of Rome, then called magnum because despite the rise of nearby theaters it remained the theater par excellence of Rome where the most important events were to be held. The history of theater and of the Roman and Hellenic theatrical stage typology has long been consolidated in both the archaeological and architectural academic environment, but it is important to remember the news for which, given the prohibition to build a masonry building Rome availed itself of the construction of a temple dedicated to the victorious Venus in axis with the cavea; this expedient justified the presence of the steps as a great staircase of access to the temple used for the celebrations of the cult.

The news on the theater inform us that this was restored numerous times up to 510 AD. By Septimius Severus and in use until the eighth century.

4. The Middle Ages and the formative process

When the oral tradition took the place of the written one, the places were equivocated and the new points of reference of the topography replaced the old ones. Ancient Rome entered the dimension of the fantastic and was transformed into itself; only toponymy in many cases allowed the memory and transmissibility of places and its artifacts. In the Einsiedeln itinerary of the second half of the 8th century, mention is made of both the Theatrum of Pompeo in its monumental structure and other buildings in the area within the pilgrim route. It is not possible to know the exact moment when there was the first de-specialization of the complex and the occupation of the ruins with the settlement of the type of the terraced house. Surely we can imagine the occupation from the ninth century of its arches by proto-housing and commercial units: the crypates. This spontaneous occupation of the great Roman structures justifies the passage of the population of the population from over 1 million inhabitants to less than 20,000 and the consequent abandonment of linear and modular residential fabrics in favor of cohesive structures that allowed, besides a structural solidarity, also a use in terms of

defense of the territory⁶ exploiting, as in the case of the Domitian stadium, the interior of the structure as a pertinent area dedicated to cultivation. Maffei makes explicit this process linking it to the overturning of the paths and the maximization of the use of space: "The theater of Pompeo in Rome regains as an external path, in addition to the one around it, the internal one of the " fauces ", between cavea and scene , and it doubles with the formation of an intermediate fabric, in the place of the orchestra, thus obtaining a double front in the use of the cavea. Another example is the structuring of the sixteenth-century Piazza Navona, also in Rome, which takes the place of the free space inside the stadium of Domitian. This area was previously used as a part of the medieval terraced houses that had been located in the modular perimeter structures of the stadium, transforming the bays of the ancient arches. An equal transformation undergoes the more contained amphitheater of Lucca, while in Florence the internal area of the amphitheater is built with the introduction of two restructuring paths that crosswise cut the original special building ". An important factor for the reconstruction of the training process is the presence of the sacred buildings in this area. In 1186, in the Bull of Urban III, the small church of Santa Maria in Cripta Pincta is already mentioned and probably takes its name from the paintings in the cryptae of the theater of Pompeo. Even more ancient is the church of Santa Barbara (X - XI century)⁷ and its dating at this time is possible thanks to an epigraph of the period on the wall to the left of the entrance⁸. This church shows the characteristics of adaptation of the artefact to the ancient structures: in a

6 The medieval turreted rome will then be focused on a constellation of residential and defensive housing aggregates arising on the major arteries of city traffic. The most common example is the fortress of the Pierleoni, then Palazzo Savelli and Orsini on the ruins of the theater of Marcello.

7 Some authors date it also to the Constantinian age but it is to be excluded because the last restorations of the theater turn out to be of the VI century.

8 In this epigraph reads the renunciation of all rights by Giovanni di Roizo and his wife on the pertinences of the building and on the church itself. We can imagine that among the appurtenances there were parts of the theater for residential and commercial use that were rented or used as marble quarries.

plan of 1601 we can see how the ancient plan of the church followed the wedges of the amphitheater, while in another of 16779 it was possible to reconstruct the role of via di Grottapinta as a master path due to the presence of a staircase that marked the original entrance to the building from the old cavea.

In the Mirabilia the area of the theater of Pompeo is identified with the term *Templum* probably because the part best preserved and still perceptible in its original form had to be that of the Temple of Venus Vincitrice that will be recurring element and urban land-mark in the history of this part of the fabric and that recurs with different names in the Orsini Archive documents. The history of the Orsini property is partly the history of the theater of Pompeo and through the writings it is possible to reconstruct it synthetically: in 1150 the first nucleus of the stronghold with the transfer of Trullum, between 1242 and 1268 the Orsini bought from their relatives of Monte Giordano all rights to the *Arpacasa* that can be identified with the temple of Venus. In fact, there is talk of a *Camera Magna*¹⁰, probably the temple cell reused and transformed into a tower to defend the fortress built through the recast of the purchased particles. Between 1290 and 1296 the Orsini bought other portions of the area, and other residential and commercial properties both on Via dei Giubbonari, adjacent to Santa Barbara. With the purchase of properties between Via di Grottapinta, Piazza dei Satiri, Via dei Giubbonari, Piazza Campo de 'Fiori and the Biscione, the layout of the area is definitively configured. This fact was of primary importance for the family as it was possible to control the Valeria street, one of the main accesses for southern Italy and the Kingdom of Naples. This strategy of occupation and fortification was implemented by all the great Roman families in the strategic points of the city. The theater of Marcello transformed into a fortress

9 Archive of the Vicariate of Rome, Compagnia dei Librai, tome 43, pag. 133.

10 We speak of the Arpa house and of a Camera Magna in the testament of Matteo Orso Orsini of 1279. The Camera Magna is identifiable with the cell of the temple.

was in fact a point of control of the passage of goods and pilgrims between the two banks of the Tiber.

The perimeter of the fabric that arose between the structures of the Roman monument offers us an important example of the phenomenon of the sliding of the front. This phenomenon, common to many urban fabrics arising, or not, from a substratum material, derives from the presence of an impassable limit: the perimental walls of Palazzo Orsini. On the front, between the Campo de 'Fiori and Via dei Giubbonari, new base cells were set up, destined to the shop until a fifth street was redefined on the new present route. Not being able to grow in height the monocells multiplied horizontally approaching each other until saturating the space redefining a new limit.

Between the 14th and 15th centuries, the two blocks stand in the orchestra area, while in 1634 a fire burned three shops near the church of Santa Barbara¹¹; this event allowed the redefinition of the space that was transformed into a square that elegantly follows the orientation of the rays of the ancient theater.

¹¹ The news of the fire "nella strada de'Gipponari "is handed down to us by the Diario del Gigli, 1660-1672.

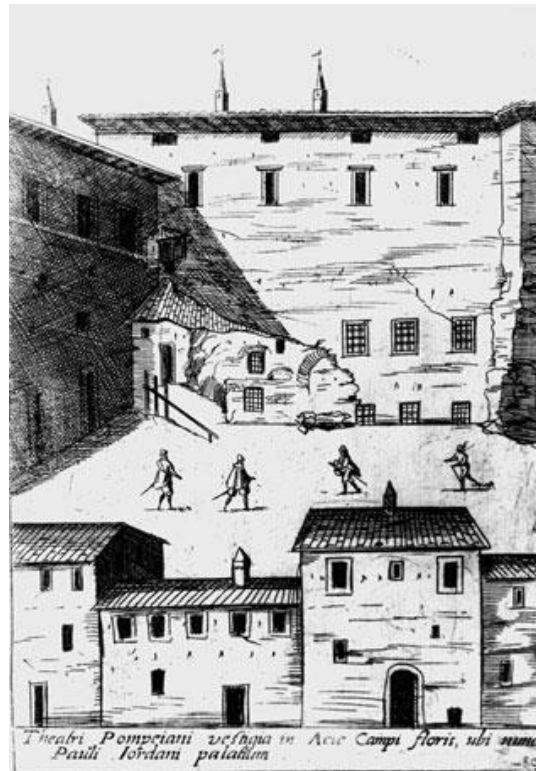


Figure 5. In this drawing by Giuseppe Maggi of 1615 we can see how the Orsini palace area appeared and how the building was born from the ancient substratum. The Roman remains of the arches on the ground floor are evident.

5. Survey methodology for a substrate architecture

Capoferro Cencetti offers us a three-point verification for the study of the transformations and the recognizability of these urban catalyst elements. This survey methodology is an excellent starting point for the study of today's historical centers because it allows to perimeter the field of research; the points proposed by the scholar are:

- 1) the recognition of visible findings;
- 2) structural relief and identification of evolutionary processes through iconographic and archival documentation;
- 3) the analysis of the existing relationship between form, structural subdivision and use;

The first point is to support urban morphology to concretely materialize the research carried out. These are tangible proofs of the transformation of the architectural organism. In the case study of the theater of Pompeo, the reconnaissance of visible artifacts is documented by

Colini, 1937, but it is now possible to make use of further surveys published in 2013¹² showing the findings on the cadastral parcels of via del Biscione 78, Piazza del Paradiso 67 - 69 and piazza del Pallaro 10 - 11. From the reliefs the reuse of the ancient walls is evident both as the foundation of the successive edificazioni, and as vertical structural elements.

The second point proposed is the survey of the blocks in order to reconstruct the training process and its phases. The Muratorian relief of the ground floors, even if with some approximations, has provided us with the demonstration of how the archaeological substratum has conditioned the fabric not only at the level of the lower floors but also at the upper levels as evidenced by the study of the Orsini palace floor plans.

The third point tries to overcome the merely technical and constructive aspect, whose highlight risks debasing the real meaning of the monument by tracing it back to what it once represented and relegating it to a symbol of a precise period. We must consider the actual relationship between the community and the architectural themes that express this same idea of community. Its shape has allowed it not to undergo variations over time such as to mark its decline and its end. Circular, elliptic and, more generally, shapes characterized by an external curve-like and closed surface with convergent rays in one or two internal points, are more opposed to variations and accretions than others. In addition to the wraparound shape, the modular structure of the wedges is important. The pitch of the arches is such that it can be exploited for the settlement of terraced houses and with the overturning of the modules it is possible to saturate the various wedges.

However, if the theater of Pompeo welcomes a basic building fabric, albeit with different variations, this does not happen in the palace specialization: the Orsini building can not develop in harmony with the new demands of the Roman Renaissance palace. The building is

12 Soprintendenza archeologica di Roma, *Roma. Archeologia nel centro, II La "città murata"*, De Luca Editore, 2013.

strongly asymmetrical and totally different from its contemporaries and a commentator of the time describes it as a negative tone stating that it has a malfatta lodge and the outer walls try to take "façade form" but without success. Undoubtedly this problem is due not only to the shape of the ancient substratum but also to the lack of a figure that could interpret this process; what instead happened magnificently in Palazzo Massimo at the columns.



Figure 6. In the reliefs of the ground floors of the area it is possible to see how the walls and the spaces are conditioned by the Roman structure. The substratum is evident and conditions the successive transformations.

6. Conclusions

We must not dwell on the monument as an object but also in the contemporary era understand the evolutionary and formative process. This allows us to face the problems of our historical centers not only in terms of conservation of the existing but above all to imagine a continuation of this process that can lead to a further transformation of the existing. Historical

textiles can emerge from monumentalization in order to return to participate in the transformation of the city without being crystallized in a single historical period. In every phase of the evolution of the city are in fact contained all those past but also the image of those that will be in the future.

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Computer and traditional tools in design activity: Experimental study on students of architecture

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Abstract

The worldwide emergence of computer tools in the field of architecture has evolved along with the great advance in digital technologies, extending to the whole process of the project. A fact that we cannot generalize in Algeria: students and teachers hesitate to adopt these tools in architectural projects. Some prefer "traditional tools" (paper/pencil) especially in the early stages of design.

This paper presents the results of an experimental study aiming to know how and when the student of architecture uses computer tools during the design of his projects and how the used tools affect the method and the quality of design. The study is based on an exercise with a group of volunteer students from the Master of Architecture. At the end of the exercise, they filled-in a questionnaire to learn their opinions and choices.

The design outcomes were collected at the end of the experiment (texts, papers and digital files), and they were presented in a unified way and printed out before being distributed to the jury composed of teachers from the same department. During the experiment, observations were collected and annotated using an observation matrix. Based on this matrix, the design activity of each student was segmented and graphically presented via timelines. The latter showed difference between students regarding timing and order of the use of tools (computer tools and pencil). It was proved that most of them used both tools. The results of the evaluation

show that the design and quality of the project did not rely on the tool. More specifically, the students' projects were not significantly affected by the adoption of computer tools.

Keyword: Architecture; Computer tools; Stages of the conceptual design; Design attitude; Observation; Experimentation.

1. Introduction

The use of digital in architecture has become widespread all over the world at educational and professional spheres. This tool which was once considered simply a means of drawing becomes a tool aiding in the design. However, students and practicing architects in Algeria do not share the same attitudes towards the use of such tool, even if the adoption of the computer in their projects is taking firm ground.

This paper explores the integration of the computer tools in students' architectural projects. It deals with the design process studied and analyzed through the experimental study, in an attempt to distinguish when and how the tool is integrated in the architectural design process. Many research works have been carried out to investigate architectural design and have been focused on the sequence of the design process on the basis of protocol analysis. This method going back to 1960s along the introspection method used in psychology, is highly appreciated by researchers in their study of the designer's approach (Arrouf, 2012). Only the principle of segmentation of the design activity is taken from this method in the present work. This principle is adapted here by taking up this activity first on timelines before their segmentation into sessions or sequences.

This study is inspired by works already done in this respect like the research of Bilda and Demirkan (2003) that aiming to understand the designers' cognitive processes by comparing digital and traditional media. Another work of Blida and Gero (2005) questioned the need to use external representations in the early phases of design. The paper of Visser and Détienne (2005) dealt with the behavior of three architects working in collaboration during a meeting for

a project design. A similar work by Zhu et al. (2007) dealt with design quality (creativity, adaptability) of a final product achieved by using different tools: one sub-group was requested to carry out their project using CAD tools within a CAD laboratory. The second sub-group carried out the project using traditional tools within a traditional workshop.

However, our exercise, that was carried out in one of the faculty of architecture and urbanism's workshops, tried to ensure the usual work conditions for students allowing them to choose their working tools. The exercise highlights the design phase by observing how students make use of the computer, on one hand, and at what time they use it, at the other hand. In other words, the study lies in the extraction of key moments in the designer's activity; that is to determine the exact time or the exact phase during which the student resorts to the use of the computer. The focus is on the tools and not on the design process itself.

2. Methodology

To better understand the introduction of the computer tools in the design process and their possible impact on the design quality of projects, an exercise was designed and administered to a sample of volunteers who favorably answered a call for volunteers displayed at the department of architecture (workplace). In addition to the display, the call was also diffused through the students' group on Facebook. Contact with participating students was made possible through emails.

Data collection method differs from a study to another. For the work of Zhu et al., students had 8 hours of work during which they were requested to record the progress of each step by safeguarding a copy of their drawings or digital files. These students were interviewed at the end of the experiment. The work done by Leclercq et al. (2007) consisted of observations of five professional architects using a screen tablet with an electronic pen. Results of this investigation were interpreted on the basis of an audio and a video record. Cameras were also used in the work of Blida & Gero (2005) and of Visser & Détienne (2005).

However, in the current study, and in order to put students at ease, the record of progress is made through observation and photo taking. Data collected through observation is completed by questionnaires administered to participants.

The experimental study is made up of a design exercise made by volunteer students for whom an appropriate space work was ensured (Figure 1). The design problem to be solved has been prepared to offer students more freedom and it consists of a project with few constraints. The choice concerning feasibility: content and student's level was made in collaboration with some teachers at the department. Some of them were participated in the evaluation of students' outcomes in this exercise.

The proposed variants are as follows:

- 1st variant : individual dwelling ;
- 2nd variant : rest area and motorway service;
- 3rd variant: automobile show room.

Participants received the content of the exercise and the different variants in hard and digital copy (CD) before starting the exercise (stage 2 in Table 1). The form of the output was not specified, but according to the documentation offered to the participants, it has been indicated that the output consisted on any document justifying their project in the form they are used to. The explanations given to students stipulate that the design work could be stopped once the product is sufficiently communicable.

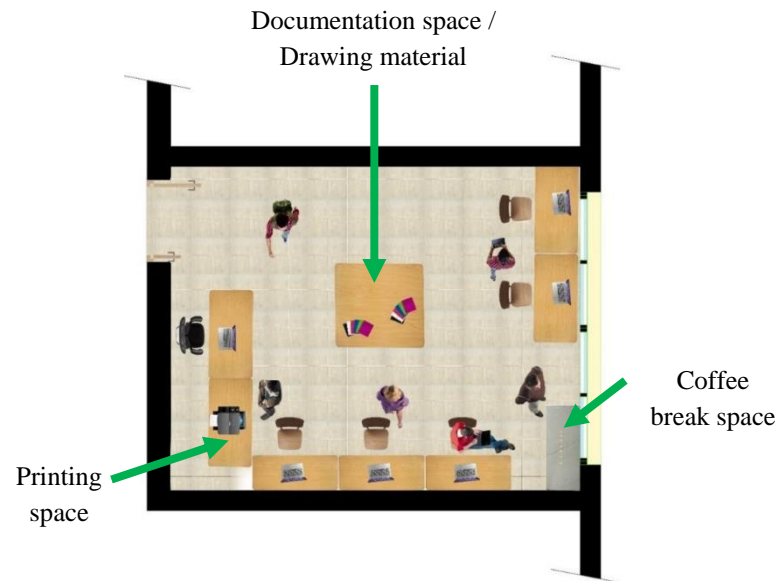


Figure 1. Plan view of the workshop devoted to the experimentation.

The experiment is made up of six steps as explained in the following table:

Table 1. Experimental steps.

Step	Objectives	Supports	Average duration	Observations
1	Presenting the research context and the exercise objectives	Verbal	10 min	
2	Explaining variants : - The design problem to be solved ; - Checking comprehension	A file delivered individually to students: programs, sites ... (paper and CD)	15 min	
3	Explaining questionnaires administered to students	Printed questionnaires	10 min	To be taken back at the end of the exercise
4	Explaining the task: observation, notes and photos taking, while ensuring students are at ease	Verbal	10 min	
5	Exercise	Laptops, paper, tracing paper, felt-pens, pencils, color pencils, magazines, electronic and paper documentations	In average : 4 hours and 38 minutes	Lunch break at 12h.00 or 12h.30 + Coffee break as fits the student
6	Taking back the documentations, the digital files and the questionnaires; Thanking the participants		20 min	

3. Results

3.1 The observation

The objective being to collect information through the observation of the students' working attitudes, an observation grid had been devised in advance, adjusted and filled on the spot in a chronological order. Time consumed, working manner, supports used and duration of the different phases form the data of this grid. Note taking was done according to a timing variance of 10 to 15 minutes (maximum) depending on the context. In parallel with students working, photos have been taken (Figure 2).



Figure 2. Photos of the exercise.

For each student, a timeline was drawn to represent the student's activity. Axes, thus, represent graphically progress in time of the design activity (in a chronological order) and are made up of a sequence of tasks each defined in terms of its beginning, end, and the support used in its execution. It is important to note that the process is made up of a nonlinear combination of steps (switching back, moving back and forth, for example), but our choice is made on the linear in relation to time.

Some remarks emerge following a first reading of the timelines:

- All the suggested variants were equally dealt;
- The students did not have the same attitude towards the work; each student had his own preferences, except one student (S4) who worked with computer tools for the whole

process. All the rest of the students started working on paper / tracing paper with a pencil ;

- The software used were: SketchUp, AutoCad and Google Earth (Google SketchUp). SketchUp is the one preferred by most students for the volume. As for AutoCad, it was reserved for spatial repartitions and finalization of the drawing before submitting it;
- 4 students out of 9 (working with a computer) used AutoCad alone and did not produce 3D drawings (Example of S10) or made hand volumetric (Example of S3, S7 and S9) ;
- 5 students out of 9 (working with a computer) used AutoCad and SketchUp and produced 2D and 3D drawings (with the help of softwares) ;
- The flowcharts were drawn by hand only on a white paper or a tracing paper ;
- The design is made in two-dimensions:
 - For the whole process, as for example S10 ;
 - The volume comes at the end of the process, whether it is produced with a software (S2) or by hand (S3, S7);
 - S9 : a draft volume (a basic one)
- A back and forth work between 2D and 3D is observed in :
 - S4 ;
 - S5 and S8: 3D hand sketches developed with a software.

3.2 Analysis of the design activity

The reported activity of each student on timeline was segmented into sequences or sessions according to the used tool; each change in tools mark the beginning of a new sequence. Table 2 sums up these sessions with a more detailed temporal division to quantify the hourly volume related to:

- Working with computer ;
- Working with the pencil on a tracing or white paper ;

- Readings: this session covers all what is related to available documentation on student's own laptops or internet search of documents and images;
- Others: covers all useful tasks such as digitization of the site (for students' preferring a vectorial plan), volume of the site, printing, text typing, ...

Time allotted for each session was quantified as well as milestone tasks were identified on these axes aiming to locate –with relation to the design activity- at which time:

- The first recourse to the computer was done ;
- The first lines were drawn out on white/tracing paper.

This information is summed up in the same table, which specifies the time and the percentage of the elapsed time.

Two cases are reported:

- The work of the student who came for the work without bringing her laptop (S6) was not taken into consideration in this part;
- The student S7 had a technical problem with AutoCad and decided to continue working on paper. The quantification of this work is presented in the table below but not taken into account when calculating the averages.

Table 2. Segmentation of the design activity into sessions and the design activity milestones.

Wor k	Varian t choice	First lines on paper	Session (s) of work with pencil/pape r (min, %)	First recourse to compute r	Session (s) of work on compute r (min, %)	Reading s (min, %)	Others (min, %)	Total working time		Project chosen
S1	at 10h.00	at 10h.55 : after 55min	80	at 12h.10: after 2h10min	145	55	40	320	5h and 20mi n	Rest area and motorway service
		17,19 %	25,00%	40,63%	45,31%	17,19%	12,50 %	100%		
S2	at 10h.00	at 10h.55 : after 55min	65	at 13h.00: after 2h30min	110	30	55	260	4h and 20mi n	Individual dwelling

		21,15 %	25,00%	57,69%	42,31%	11,54%	21,15 %	100%	
S3	at 10h.00	at 10h.25 : after 25min	125	at 13h.20: after 2h50min	55	5	35	220	3h and 40min
		11,36 %	56,82%	77,27%	25,00%	2,27%	15,91 %	100%	
S4	at 10h.00	None	0	at 10h.35: after 35min	270	10	35	315	5h and 15min
		-	0%	11,11%	85,71%	3,17%	11,11 %	100%	Rest area and motorway service
S5	at 10h.10	at 10h.50 : after 40min	35	at 12h.45: after 2h05min	180	50	25	290	4h and 50min
		13,79 %	12,07%	43,10%	62,07%	17,24%	8,62%	100%	Automobile showroom
S7	at 10h.10	at 10h.10 : after 0min	150	at 12h.45: after 2h05min	75	40	0	265	4h and 25min
		0%	56,60%	47,17%	28,30%	15,09%	0%	100%	Rest area and motorway service
S8	at 10h.10	at 10h.10 : after 0min	70	at 11h.20: after 1h10min	190	0	15	275	4h and 35min
		0%	25,45%	25,45%	69,09%	0%	5,45%	100%	Automobile showroom
S9	at 10h.10	at 10h.40 : after 30min	125	at 13h.10: after 2h30min	125	30	10	290	4h and 50min
		10,34 %	43,10%	51,72%	43,10%	10,34%	3,45%	100%	
S10	at 10h.10	at 10h.10 : after 0min	80	at 12h.45: after 2h05min	170	10	40	300	5h
		0%	26,67%	41,67%	56,67%	3,33%	13,33 %	100%	Individual dwelling

RQ. In order to facilitate the reading and comparison of data, the minimal and the maximal values are identified in two different colours for each column.

The following points are remarked on the basis of the table:

- Total time of the exercise (without taking into consideration the lunch break, breaks for personal reasons, and the student S6) ranges between « 3h and 40min » and « 5h and 20min » with an average equal to 4h and 42min ;

- Sessions :
 - The total of sessions allotted for the work with the computer took between 25% and 85,71% of the total time of the exercise, with an average equal to 52,40% ;
 - The total of sessions allotted for the work done with the pencil took between 0% and 56,82% of the total time of the exercise, with an average equal to 26,57% ;
 - Readings took between 0% and 17,24% of the total time of the exercise, with an average equal to 8,51% ;
 - The other tasks « Others » took between 3,45% and 21,15% of the total time of the exercise, with an average equal to 12,52% ;
- The milestone tasks:
 - With the exception of the work S4, the rest of the participants resorted to the work by hand, using the pencil before moving to the computer ;
 - The time taken to move to the pencil varies between 0min (valid for the 3 variants) and 55min from starting up the activity, with an average percentage equal to 9,23% of the total time for the exercise ;
 - The participants resorted to the computer after a time varying between « 35min » and « 2h and 50min » from starting up the exercise, with an average percentage of 43,98% of the total time allotted for the exercise.

4. Discussion

4.1 Design attitudes

For the entire project design phase, the participants have adopted the following work attitudes:

- Use of paper/pencil only : A1 ;
- Use of Computer tool only: A2 ;
- Use of pencil at the beginning of the project and computer tool at the end : A3 ;

- Back and forth between the pencil and the computer, but always ending with the computer: A4.

4.1.1 Attitude A1: « Paper architecture »

This attitude called « *paper architecture* » (Porada, 2001-2002), is based on a handwork on white/tracing paper. Proponents of this attitude are convinced that hand drawing is an architect's traditional talent. Coordination between the hand and the brain seems the ideal for the detection of problems and the simulation of solutions.

The work of S6 was totally done adopting this working attitude, although the student divided her work into two phases: the « *phase 1* »: 2D and 3D hand sketches with text, then comes the « *phase 2* » which—according to her— concerns « *the development of interior spaces (the plans) and the free hand drawings (moving to the scale) which will be made with the computer* ». According to her own explanation, her “reel/usual” attitude can be classified in A3.

4.1.2 Attitude A2: « Computer for the whole process »

In our experiment, we have noted just one participant adopting this attitude: S4 (rest area and motorway service). The participant did not draw any line on the paper and did not print any drawing. He resorted to the computer after 11,11% of the exercise time had elapsed, taking thus the highest percentage of the session of work on computer with 85, 71%.

4.1.3 Attitude A3: « Computer tool = drawing table »

This attitude is that of the participants using the computer after having formulated a clear idea of what they wanted to do, as the example of the works of S2, S3, S5 and S8. These participants decided everything on the paper before using the computer for one time: in **one session**. In these cases, the computer is considered as a drawing table or “*a modern drawing table*” (Guena, 2010) for the projects conceived in a traditional way, giving, therefore, a clear separation between the two sessions (the first devoted to pencil and the second to the computer tool).

The first recourse of participants to the computer comes after consuming half of the time (percentages vary between 25,45% and 77,27%, with an average of 50,88%). This attitude is very noticeable for S3 (individual dwelling) who resorted to the computer after using more than 2/3 of the exercise time (77,27%). This is confirmed (for this participant) by the considerable amount of time allotted to the work with the pencil and the paper which is equal to 56,82% (the highest percentage of participants), whereas the work with the computer received 25,00% (the lowest percentage of participants). Among participants adopting this attitude, this was the only case for which the paper session has exceeded the computer one (the S7 is not taken into consideration).

It is noteworthy that even if the participants start with the pencil /paper, the session devoted to the work with the computer represents a higher percentage than the one devoted to the work with the paper. Among the four participants adopting this attitude (A3), the amount of time used in the work with the computer ranges between 25,00% and 69,09% with an average equal to 49,62%. However, the amount of time used in the work with the pencil/paper ranges between 12,07% and 56,82% with an average equal to 29,84%.

The work of S7 can be classified in A3, up to the technical problem that occurred after consuming 75,47% of the time allotted for the exercise.

The attitude A3 is, thus, the most adopted by the participants in this experiment.

4.1.4 Attitude A4: « The back-and-forth »

The participants adopting this attitude: S1, S9 and S10 work on the paper until they reach a better definition of their project, at this time they shift to the computer, then shift back to pencil/paper. This back-and-forth movement is generally marked by the printing of plans. It is important to note that even if some participants had printed once, they placed the tracing paper many times, like the work of S10 (individual dwelling). This work reflects at best the back-

and-forth movements where working sessions with the computer and those with the paper were multiplied.

It is to be noted that for the participants adopting a back and forth attitude, the total amount of time devoted for sessions related to the work with the computer is the highest. It ranges between 43,10% and 56,67%, with an average equal to 48,36%. The lowest percentage (43,10%) is that attributed to S9. This work represents an identical amount of time concerning working sessions with the computer and those with the paper/pencil. This participant resorted to the computer after using half of the time: 51,72%. The other two participants opting for this attitude represent almost identical percentages: 40,63% and 41,67%.

This experimental study shows that the great majority of participants conveyed attitudes mixing between the work with the pencil and the use of the computer.

4.2 Stages of design

The architectural design is one of the most critical phases in the project process. The most important ideas emerge during this phase and continue to be developed and revised till the end of the process. According to Lebahar (1983), this phase itself is divided into two steps: ***design and production***. The first step corresponds to the creative part of the process through the search of forms and the problem solving, while the second step corresponds to give a form to the project. These two stages (times) are also called: conceptualization and instrumentalization by Bourbonnais (2014).

According to the observation of the design activity, we may conclude that with the exception of the work of S4 (using the computer for the whole process), the participants used the computer tool for the production stage, even if they were adopting attitudes shifting between the two tools (Table 3). The pencil is used for the first stage: « conception/conceptualization », which is the stage of ideation that generally addresses “poorly defined” problems (Quintrand et al. 1985). Free hand sketch, that considered as “a *projection of thought*” (Leclerq et al. 2007)

seems to be ideal in order to respond to the blurred and abstract aspect of this stage. As a result, the computer was discarded for the second stage “production / instrumentalization”.

Table 3. Working attitude and stage of the computer use.

Work	Working attitude	The stage at which the computer is used	Observations
S1	A4	Production / Instrumentalization	
S2	A3	Production / Instrumentalization	
S3	A3	Production / Instrumentalization	
S4	A2	Conception / Conceptualisation + Production / Instrumentalization	
S5	A3	Production / Instrumentalization	
S6	Non identified	Production / Instrumentalization	A participant who came without her laptop and expressed her desire to take part in the experiment
S7	Non identified	Production / Instrumentalization	A technical problem with AutoCad which occurred after consuming 75,47% of the time devoted for the exercise
S8	A3	Production / Instrumentalization	
S9	A4	Production / Instrumentalization	
S10	A4	Production / Instrumentalization	

4.3 The evaluation: Computer tools vs architectural quality

The evaluation of the design quality was ensured by an examination board made up of teachers from the same department, who have experience in teaching workshop. The works done by the participants were first treated in order to unify their products and prepare printing in the same format. The unified printing in A3 format was given to the examination board with a text explaining the general context of the exercise and the evaluation grid. Criteria that constitute the latter were set in collaboration with some teachers evaluators. A working session was devoted for each member of the examination board to explain the exercise, its objectives and the evaluation mode. The evaluating teachers were free to add any further comments.

The examination board has evaluated the architectural quality of the works on the basis of the product: A3 papers given in the absence of the designer as the drawing means to be an instrument of research and clarification of ideas and a tool for representation the conceptual idea.

In order to facilitate the reading and the interpretation of the results, the appreciations of the teachers were converted into a 1 to 5 scale. The evaluation results are shown in Figure 3.

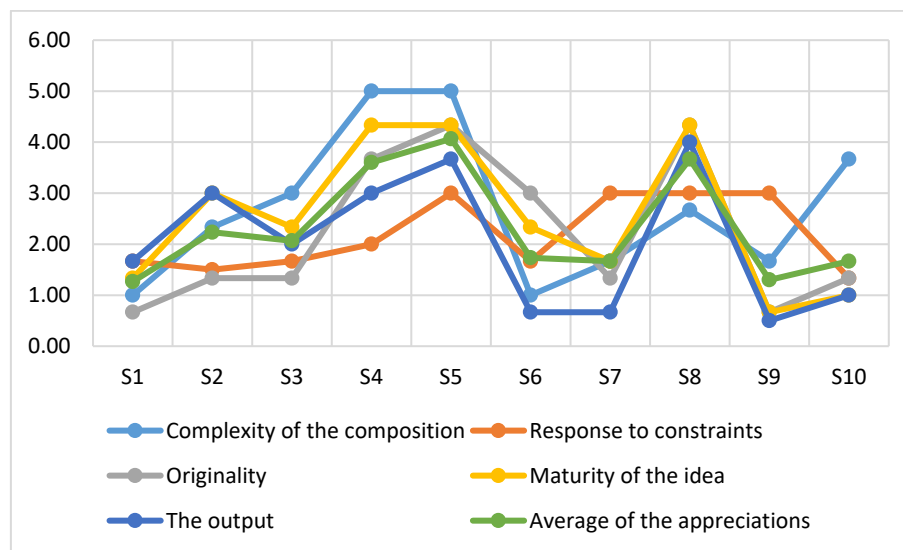


Figure 3. Evaluation of the participants' works by the members of the examination board

The average of the appreciations attributed to each work was calculated and ranked in [Figure 4](#) presenting two graphics (left: a ranking according to participants' order, right: according to best works)

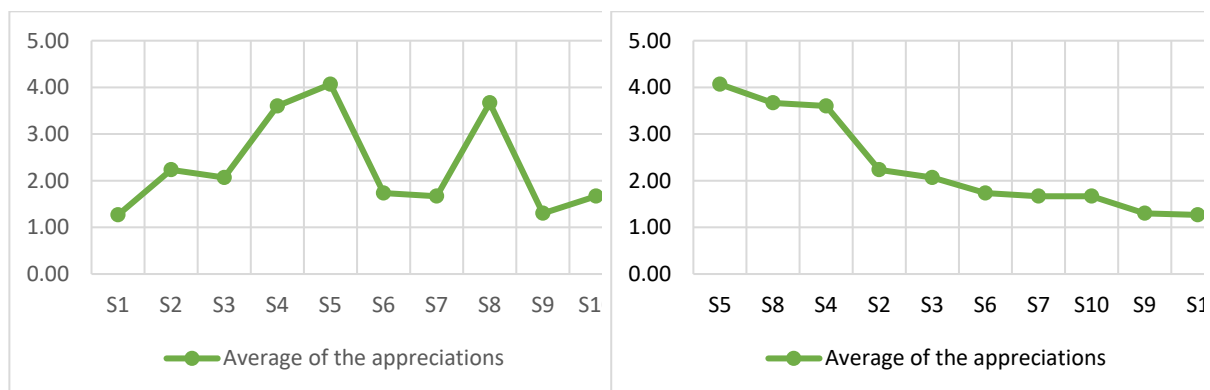


Figure 4. Global appreciation and ranking of works

The projects that convinced the most the members of the examination board are in order: S5, then S8 and S4 (which have nearly the same averages).

The characteristics of these three first works are resumed in the table 4, they:

- Has the highest percentages in terms of sessions of work on computer. They are in the following order : S4, S8, S5 ;
- Reflect at best the back-and-forth work between 2D and 3D ;
- Present a use of both software: AutoCad for 2D and SketchUp for 3D.

Tableau 4. Characteristics of the best works.

Work	Variant	Work attitude	First lines on paper (after consuming ... of the exercise time)	First recourse to computer (after consuming ... of the exercise time)	Session (s) of work with pencil/paper	Session (s) of work on computer	Stage of the use of computer tools
S5	Automobile show-room	A3	13,79%	43,10%	12,07%	62,07%	Instrumentalization
S8	Automobile show-room	A3	0%	25,45%	25,45%	69,09%	Instrumentalization
S4	Rest area and motorway service	A2	/	11,11%	/	85,71%	Conceptualization and instrumentalization

It appears –in our humble opinion- that these three works are those reflecting a better use of the tools: the use of the computer alone or of both tools. We may conclude that according to the evaluation made by the jury, the architectural quality does not depend on a specific tool but rather on **the intelligent use** of the tool(s) chosen.

5. Conclusion

The experimental study was an opportunity to closely verify the students' design attitudes and the use of the computer during the design stage. The results of this study show that the majority

of the participants mixed between the use of the computer and the use of the pencil/paper (using both tools), following two major attitudes:

- The computer is kept to the end to digitalize the plans already done on paper in a traditional way, creating thus a clear separation between the two uses. In this attitude, the computer is an alternative to the drawing table and has the objective of digitalizing the plans produced in a traditional way;
- A permanent work back and forth between the two tools. Sometimes the students make use of a printed paper output to work and improve the project handly and /or bring modifications before opting for the final solution.

We have noted that for the majority of the students using both tools, whatever the attitude they adopt, the computer is reserved for the second stage of design. The use of traditional tools known as « *analogue* » or « *manual* » (Dortaa et al., 2008) are preferred for ideation, whereas the computer tools are devoted to the production stage: “*CAAD tools are viewed as production tools rather than as another design tool*” (Zhu et al., 2007).

Up to the current work, the computer tools are considered as a graphic medium similarly to the results of the work of Zhu et al., 2007. We are currently living the same situation, although our students are attracted by the technology and do their best to be up-to-date with software and training. This study confirms that architecture students of Constantine prefer varied choices as regards the design tools, but the majority stick to traditional methods as they start with a free hand sketching, preferring its abstract aspect. In 1985, Quintrand explained that the problem is in the tool, and it is only the second time of the design that can accommodate the computer. Leclerq et al. (2007) presented that the computer tool is not made for the design phase. Bourbonnais (2014) confirmed that it is not enough developed to assist the architect in the design.

The evaluation of participants' works brought to light other factors among which the use of computer appears to be not a priority. Other research works have already proved that there is no clear difference in the quality of works produced in the traditional way and those produced with the help of CAAD (Zhu, 2007). We deduce from this evaluation that an intelligent use of the chosen tool is necessary and a wrong comprehension of the tool limit the quality of the product (the architectural project). This brings us to the question about the mastery of the chosen tool.

However, in our universities, the computer tool (as we have not yet reached the stage of digital technologies) is not used to help in the design. It has not taken its real place and its use is not pushed to the great potential of simulation

Acknowledgment

We would like to express our sincere gratitude to the students who volunteered in the experiment.

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The phenomenon of mobility, a development challenge for the city of Algiers

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Abstract:

Urban displacements are a major challenge for the economic and social development of the city and are a sign of quality of life. They are defined by less congestion, less pollution, congestion and urban sprawl.

In Algeria, the new urban policies are seen as the beginning of a positive transformation of the city's situation, which degradation seems to have origin in a lack of coordination between planning, the deregulation of the transport sector and the urban planning of cities. Therefore, it is necessary to develop a transportation policy based on a logic of sustainable development of the urban area where the optimization of mobility is required.

In Algiers, transport and urban planning have been the subject of many debates that have shown that the city suffers from several problems, in terms of transport, mobility, traffic and parking. This makes it a perfect example of a city affected by urban sprawl generating a series of other problems that come together to cause an imbalance in the layout of spaces.

In attempting to address these problems in order, the first would be the increase in the various displacements due to the metropolisation and centralization of human activities. These displacements are not only in continuous increase but are experiencing a real imbalance where the quantity dominates on the quality, which leads to a remarkable saturation of the transport networks, and thus to a dense traffic notably during the peak hours.

The purpose of this article is to demonstrate the importance of developing the most adequate operating policies for the various modes of transport that are the most appropriate in the

capital city of Algiers, and to implement an investment program in the management of mobility in order to transform the city.

Keywords: Transportation; urban mobility; urban planning; management.

1. Introduction

There can be no territories without connection, nor a city without system of transportation (KAUFMANN, YVES FRRARI, DOMINIQUE JOYE, & FRITZ , 2003) . Transport is a necessary condition for performing daily activities, however to satisfy these needs, a number of transportations is accomplished every day by individuals who leave their homes to go to different destinations, moving is a concept that improves over time through the multiplication of transportation motives leading to various forms of transport (Korkaz, 2013). This generated the need of concentration and convergence that gave birth to cities, where the reflection on the city became very tied to the reflection on transport “... the transport networks in a city, are just like the skeleton and the circulatory system at the same time. In short, they constitute the main conditions for a city functioning” (Merlin).

In Algeria, with the acceleration of urbanization «As of January 1, 2016, the total resident population in Algeria reached 40.4 million inhabitants»¹, transport has become a key sector for the economic and social development of the country. These recent years, traditional transport policies have an interest towards the demand for the private car, and have focused on assessing the role of urban transport and its contribution to urban integration and improvement of the quality of life in cities. Automobile-oriented development of city of Algiers with 1,254,553 cars 26.07% ² of the national car fleet brought with it several problems in terms of transport, mobility, circulation and parking, as well as other problems

¹ (n.d.). Retrieved April 2018, from National Statistical Office: <http://www.ons.dz/>

²(n.d.). Retrieved 2018, from National Statistical Office: <http://www.ons.dz/repartition-du-parc-automobile,211.html>

related to pollution and urban sprawl. This is why the Algerian authorities take this term into consideration in the strategies for the implementation of the National Spatial Use Planning Scheme (NSPS) 2025. The studies for drawing up the four Master Plans for Urban Development Metropolitan Areas (MPDMA) Algiers, Oran, Annaba and Constantine, below the following objectives: setting off a major transport infrastructures, large structural facilities, and general orientations for protecting and enhancing the environment³.

The objective of this research is to demonstrate the importance of developing the operating policies of the various modes of transport most adequate in the Capital of Algiers, through the analysis of the different processes of transport planning and mobility management.

2. Methodology of research

This analytical research has allowed us to identify the major questions related to the problem of urban transport and its relation with the modernization and metropolisation of Algiers so that we can identify and understand the procedures and methods to follow, taking into account coordination between transportation and planning. Then, to better develop our research, we opted for a reading of the legislative framework for urban transport and urbanism documents dealing with the issue of mobility to arrive later in the presentation of the city of Algiers, type and mode of transport in the capital (case of study) and follow the strategies for modernization. Finally, we have the results of our analytical research that have demonstrated the absence of coordination between transport and urban planning and the inconsistency found in certain legislative and regulatory texts.

³ (n.d.). *The implementation of the National Spatial Planning Scheme NSPS 2025*.

3. Theoretical background

3.1. Urban policy and transport:

According to (Merlin), the transport policy is "*the set of guidelines determined by public authorities*". The transport policy is the result of a process of regulation and control of transport reserves, to facilitate the efficient operation of economic, social and political aspects of a country (mobility of people and goods) to the lowest social cost and with total security.

The transport policy in Algeria has experienced several levels since independence, which the table below summarizes:

Table 1. Periods of transport policy in Algeria

The 1962-1967 period the Monopoly of the National Transport Office	
Legislative texts and regulations	Objective
- Order 67-130 of July 22, 1967	- Organization of terrestrial transport within the self-management of transport
- Article 16	- Creation of municipal organism of urban public transport in cities
- Article 22	- Organization and supervision of transport institutions inherited from the colonial period and coordination between public sector properties
<i>Source: Official Journal N 63 relating to Law 67-130</i>	
The period from 1967 to 1988 Expropriation of the State on the terrestrial transports	
Legislative texts and regulations	Objective
Order 71-73 du 17 November 1971	- Absence of monopoly private sector of SNTV although the existence of a legal framework that allows this activity.
<i>Source : Official Journal N 97 relating to the order 71-73</i>	
Decree 81-375 of December 26, 1981	- The attribution of the municipality and the Town Office - Absence of the private sector
<i>Source : Official Journal N 52 relating to decree 81-375</i>	
Decree 83-306 of 07 may 1983	- Ending the centralization and distribution of public company passenger in: TVC center, TVO West. TVSO South West. TVO East and TVSE South-East.
<i>Source : Official Journal N 19 relating to decree 83-306</i>	
Interministerial Order 20 May 1987	Integration of the private sector in the transport sector
<i>Source : Official Journal N 21 relating to the Interministerial Order</i>	
The period from 1988-2001: opening of the road transport market	
Legislative texts and regulations	Objective

Executive Order 88-01 of January 12, 1988	<ul style="list-style-type: none"> - Canceling of the state and a strong emergence of the private sector - Abandonment of institutions by the State - Improving the efficiency and productivity of commercial institutions
<i>Source : Official Journal N 02 relating to the Executive Order 88-01</i>	
Law 88-17 of May 10, 1988	- Private sector development
<i>Source : Official Journal N 19 relating to the Executive Order 88-17</i>	
Executive Decree N 90-381 of 24 November 1990	- Improved profitability and efficiency of institutions to make them more productive in accordance with the commercial code
<i>Source : Official Journal N 51 relating to the Executive Order 90-381</i>	
Executive Decree N 91-195 of 01 June 1991	- Fix the general conditions for the exercise of terrestrial transport activities within the framework of Law N 88-17 of May 10, 1988, Mentioned above.
<i>Source : Official Journal N 27 relating to the Executive Order 91-195</i>	
The period from 2001 to 2012	
Legislative texts and regulations	Objectives
Executive Decree N 03-261 of July 23, 2003	<ul style="list-style-type: none"> - Composition, allocation and operation of the National terrestrial Transport Council, the Interministerial Technical Committee for the Transport of Dangerous Material and the Administrative Penalties Commission of Wilaya (Province) <p><i>Source: Official Journal N46</i></p>
Executive Decree N 04-416 of December 20, 2004	<ul style="list-style-type: none"> - Determination of the procedures for drawing up and implementing terrestrial transport plans for people <p><i>Source: Official Journal N 62</i></p>
Executive Decree N 09-89 of February 17, 2009	<ul style="list-style-type: none"> - Determination of the operating methods of the account of special assignment N 302-125 entitled: special fund for the development of public transport <p><i>Source : Official Journal N°12</i></p>
Executive Decree n10-91 Law N 11-09 of June 5, 2001 amending and supplementing Law N 01-13 of August 7, 2001	<ul style="list-style-type: none"> - Orientation and organization of terrestrial transport; public transport, own transport, operation, combined intermodal transport, vehicle, rail transport, guide transport of persons, road transport of persons and goods.
Executive Decree N 12-109 of March 06, 2012	<ul style="list-style-type: none"> - Organization of the functioning and missions of the urban transport organizing authority. - Adoption of A.O.T.U of certain Wilaya (province) <p><i>Source: Official Journal N 15 relating to Executive Decree 12-109</i></p>
Executive Decree N 12-190 of April 25, 2012	<ul style="list-style-type: none"> - Creation of the authorities organizing urban transport of some Wilaya (province) including Algiers, Oran, Constantine, Annaba, Setif, Batna, Sidi bel abbots, Mostaganem, and Ouargla. <p><i>Source : Official Journal N 25 relating to Executive Decree 12-190</i></p>
Executive Decree N 12-230 of May 24, 2012	<p>Regulation of taxi transportation in 03 forms:</p> <ul style="list-style-type: none"> - Individual taxi services - Urban Collective Tax Services - Non Urban Collective Taxi Services <p><i>Source : Official Journal N 33 relating to Executive Decree 12-230</i></p>

Source: (Official Journal, n.d.)
(Author treatment)

3.2. The institutional organization of transport

Table 2. Synthesis of transport organizations and these responsibilities

Institutional organization of transport		Responsibilities
Organization or under guardianship	Office Town and regional institutions	
- MCET ; Ministry of Civil Engineering and Transport (<i>French: MTPT ministère des transports et des travaux publics</i>)		Transport policy
- MCET ; Ministry of Civil Engineering and Transport (<i>Fr: MTPT</i>) - DTT ; direction of terrestrial transport	- DWT ; Direction of (province Transport (<i>Fr: Direction des transports des wilayas DTW</i>)	Organization of public transport
- DTT ; direction of terrestrial transport	- DWT ; Direction of province Transport (<i>Fr: DTW</i>)	Regulation of terrestrial transport
- MCET ; Ministry of Civil Engineering and Transport (<i>Fr: MTPT</i>)	- DCET ; Direction of Civil Engineering (<i>Fr: Direction des travaux publics DTP</i>)	National and Regional Road network: Construction and Maintenance
	- DCET ; Direction of Civil Engineering (<i>Fr: DTP</i>) - Establishment of Maintenance of Road and Sanitation of the province of Algiers (<i>Fr: ASROUT</i>)	Urban roads. Construction and maintenance.
	- DWT ; Direction of province Transport (<i>Fr: DTW</i>)	Transportation authorizations, driver's license, driving school
- DUTRT ; Direction of urban transport and road traffic (<i>Fr : direction des transports urbain et de la circulation routière DTUCR</i>) - UTSO ; Urban Transport Studies Office (<i>Fr : Bureau Des Etudes des transports urbains BETUR</i>)	- DWT ; Direction of province Transport (<i>Fr: DTW</i>)	Transport study
- DUTRT ; Direction of urban transport and road traffic (<i>Fr: DTUCR</i>)	TMUTC Traffic Management and Urban Transport Company (EGCTU) Policy	Traffic Management
- DUTRT ; Direction of urban transport and road traffic (<i>Fr: DTUCR</i>) - NPSF ; National Pension and Social Security Fund (<i>Fr : Caisse nationale de retraite et de prévoyance sociale CNRPS</i>) - NTCE ; National technical control establishment (<i>Fr: Etablissement National de Contrôle Technique Automobile ENACTA</i>) - GENDARMERIE	- Committee of Traffic and Road Safety - Police	Road safety
- MHU Ministry of Housing and Urban Planning (<i>Fr: Ministère d'Habitat et d'Urbanisme MHU</i>)	- DCUP Direction of Construction and Urban Planning (<i>Fr : Direction d'urbanisme et de</i>	Urban planning

- NCSARUP National Center for Studies and Applied Research in Urban Planning (<i>Fr: Centre National d'Etudes et de Recherche appliquée en Urbanisme CNERU</i>)	<i>construction DUC</i> - URBANIS	
- AUSPTE Algiers Urban and Suburban Public Transport Establishment (<i>Fr : Établissement public de transport urbain et suburbain d'Alger ETUSA</i>) - TRANSUB	- Private operators - Collectives taxis	Exploitation of urban public transport
- EMA Algiers Metro company		Realization of the Algiers metro
- DTCT Direction of Trams and Cable Transport (<i>Fr: DPTTC</i>)		Realization of the tramway of Algiers
- NRTC National Railway Transport Company (<i>Fr: SNTF</i>)		Electrification of suburbs trains
- AUSPTE Algiers Urban and Suburban Public Transport Establishment (<i>Fr: ETUSA</i>) - DTCT Direction of Trams and Cable Transport (<i>Fr: DPTTC</i>)		Cable
- AUSPTE Algiers Urban and Suburban Public Transport Establishment (<i>Fr: ETUSA</i>)	- DWT Direction of province Transport (<i>Fr: DTW</i>) - Private operators	Specialized transportation
	- DWT Direction of province Transport (<i>Fr: DTW</i>) - Private operators	Taxis

Source: Study of the urban transport plan and the traffic plan of the agglomeration of Algiers
(Update author 2018)

3.3. Planning in the transport sector

Law N 01-20 of 12/12/2001, relating to the planning and sustainable development of the territory defined the items and origins of the national planning policy and sustainable development via orientations, instruments of national policy and implementation of the national development plan of the territory, these instruments and tools form the interface of this policy, the following table summarizes the planning instruments in Algeria.

Table 3. Urban and Regional Planning System in Algeria

Laws	The law of Spatial Planning	The law of planning and urban planning	Town Office Code	Communal code
instruments	- NSPS - MPDMA	- MPUP - POG	- TODP	- MDP
Objectives	- Regional balance - Inter-sectoral and inter-regional coordination. - Optimization resources.	- Orientation of the development - Rationalization of the use of ground	- Development of the province (Wilaya).	- Development of the municipality.
Contents	- Schema - Orientation	- Development - Regulation. - Graphic document	- Vocation and function of the province (Wilaya).	- Vocation and function of the municipality
The criteria	- Sectoral policies (hydraulics, transport and tourism) - Resources, natural human	- Opposability to third party - Population social economy - Urban composition - Architecture.	- General directions of the NSPS, the RSPS and the law on the development	- General directions of the NSPS, the RSPS and the TODP.
The scales	National Regional	Communal	province (Wilaya)	Communal
Elaboration	- Structures responsible for territorial planning.	- province (Wilaya) - Wali (APW) - Urban planning ministers - local communities	- assembled province (Wilaya) people. - Wali.	- assembled communal people
Approval	- Council of Ministers	- province (Wilaya) - Wali - Urban planning ministers - local communities	- assembled province (Wilaya) people. - Wali.	assembled communal people
Management	- Sector	Communal	- province (Wilaya)	Communal

Source: (BAOUNI, Malfunctions urban planning and urban transport in Algerian cities)

3.4. Existing laws and regulations in Algeria

The laws and regulations in Algeria are reviewed at the General Secretariat of the Government, before they were proposed for discussion and adoption, and according to this

the participation of the Ministry of Relations with Parliament should be noted, whose one of its missions is precisely to study and make a contribution to the projects initiated texts by other sectors.

Table 4. Existing Legislative and Regulatory Texts in Algeria

Legislative text	Definition
Order	Enacted by the President of the Republic between the two parliamentary sessions of the spring and autumn. In most of the cases, this order, once the parliamentary session opens, passed by the parliament with its two chambers, and is approved in the form of "law".
Law	"The law in the formal sense is the law voted by the parliament and enacted by the president of the republic". The proposed legislation, to be admissible, are filed by twenty (20) deputies. The draft laws presented by the cabinet after consulting the Council of State then submitted by the first Minister on the National Popular office of the assembly.
Presidential Decree	According to the article 77 of the presidential, decree N 96-438 the presidential decree is signed by the president of the republic on the report of the Secretary concerned by the device.
Legislative Decree	This disposal has been put in place precisely during the period of application of the platform national consensus on the transitional period, and this, following the judgment of electoral process in 1922 regarding legislative decree specifies how enactment of this type of text.
Executive Decree	Was signed by the chef of the government before the constitutional revision of November 2008 and is signed by the first minister after the revision of the constitution and this, on report of the minister concerned after approval of the president of the republic.
Decree	This disposal has been abandoned for some years before, there has been promulgation of texts by decree signed either by the President of the Republic or the first Minister.
Interministeril Instruction	Instruction concerning a particular domain, with interference from several different sectors, to be published in the Official Journal, and to be signed Jointly by two or more ministers.
Ministerial Instruction	Instruction concerning a particular domain, with the intervention of a single sector to be published in the official journal, which must be signed by the minister concerned.
Stopped	Being signed by several different levels of competence under: - Minister - Two or more ministers - Wali - President of the Municipal People's Assembly.

Source: (BENAMARA , Municipal territory in Algeria between urban development and legal texts, case study; municipality of Corso, 2012).

3.5 The report transport / town planning and town planning / Transport

The relation between transport and town planning is a transitive relation. This gives some explanation by the impact of the decentring of equipments on the transport. More the poles of the various activities are far, more the distances traveled are long which involves an increase

of car traffic on one hand. On the other hand, the location of jobs on the urban periphery and the development of automobile use often affect the rate of customers of public transport. As a result, the state of the road traffic gets worse every day.

4. Case Study "The City of Algiers"

The accelerated urbanization that knew the capital during this last decade provoked a series of problems that require an urban management of the space, the equipments, the structures and the functions today. This management requires the upgrade of the planning instruments to master the city and reach the purpose of the modernization and the metropolisation of the capital.

Among these problems; transportation that requires a comprehensive study. Following this, we tried to understand and target the problems of the articulation between urban planning and the transport system in Algiers.

4.1. Presentation of Algiers

Algiers, capital of the country occupying a strategic position in the Mediterranean Rim and the gate of the African continent which gives it an important economic and political influences.

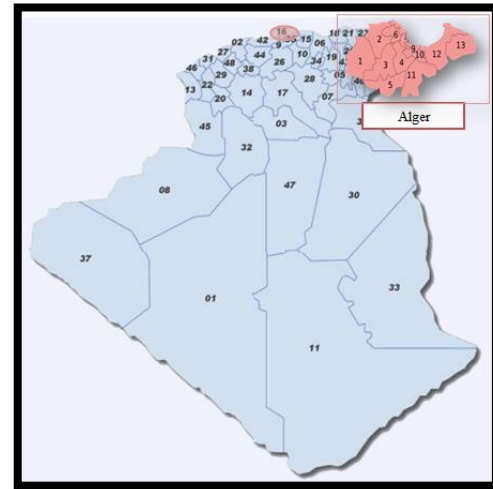
Considered to be the most populous province (Wilaya) of Algeria with 2,988,1604 inhabitants and a density of 3,691 inhabitants / km² cover an area of 804.74 km², it is the smallest Algerian Wilayas. It is composed of thirteen "13" dairas, each comprising several communes, for a total of fifty-seven municipalities.

⁴ (NOS, 2008)

The Wilaya of Algiers is located in Algiers in northern Algeria, it is bounded:

- North, by the Mediterranean Sea;
- East, by Boumerdès Town Office;
- West, by Tipaza Town Office;
- South, by Blida Town Office.

Carte 1. Situation of Wilaya of ALGIERS
(treatment author)

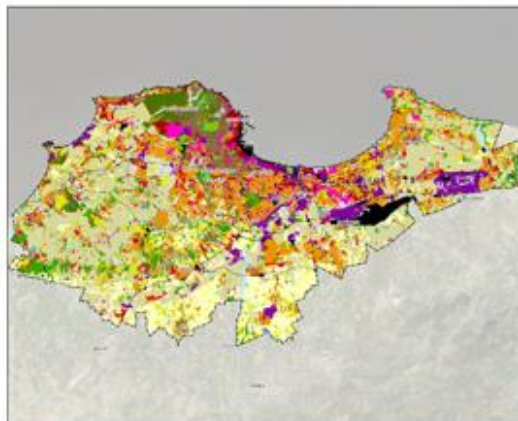


Source: Google Image

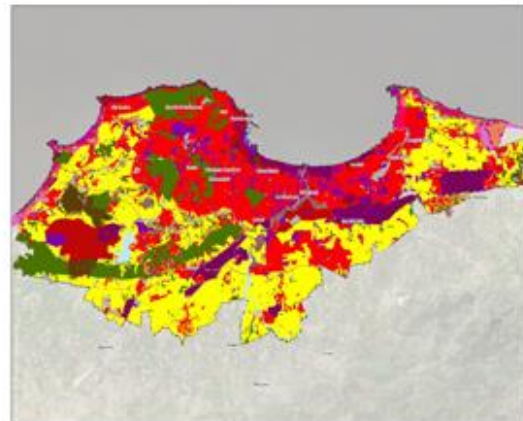
- **Geographical situation**
- **Evolution of the population**

The population is the intervening variable in any projections, also considered as a source of tension and imbalance of any territorial organizational policy.

Figure 1. Evolution of the population.



Population en 2012



population prévu en 2030

Source: TSO EGIS

4.2 Urban transport network in Algiers

Transport is considered a motive movement (work, purchase, leisure ... etc.) of a person made for a certain reason, between an origin and a destination, using one or more modes of

transport, according to a route and for a specific duration (MINISTRY OF TRANSPORT OF QUEBEC). Among the modes of transport and the means of transport in Algiers, we quote:

▪ **Road transport**

Either individual (on foot, by vehicle, or by motorcycle) or common (bus, taxi,). The network consists of an entanglement of several lines spreading on different axes; they collect a number of vehicles that exceed 143,000 vehicles⁵.

- **NH** National Highway: 542 Km
- **OTR** office town Roads: 660 Km
- **LR** Local roads: 794 Km
- Construction of 1,250 engineering structures (new construction, rehabilitation and maintenance) and 37 hoppers.

Traffic at the two most important roads in the country, **NH 4** and **NH 5** between Oran and Constantine, passing through Algiers, is very important, ranging from 12,000 to 25,000 vehicles per hour depending on the section. At the approach of the Wilaya of Algiers, traffic easily reaches 50,000 vehicles per hour. This saturation will require a great development in the railway suburbs. (CHELLA , 2014)

Carte 2. Road transport network in Algiers



Source: Road Operations and Maintenance Branch

⁵ (NOS, 2008)

▪ **Rail transport**

The capital Algiers is connected to the national rail transport network by lines that run along the city to other Wilaya through a network comprising (tracks, stations, tunnels and bridges).

▪ **Air transport**

Algiers has air transport services which includes a national and international airport whose characteristics are classified in the following table:

Table 5. Characteristics of Algiers Airport

Aerodrome	Taxiway			Strops			Parking			Main Track			Secondary Track		
	Nbre	Long	Larg.	Nbre	Long	Larg.	Nbre/Poste	Long	Larg.	Orient	Long	Larg.	Orient	Long	Larg.
Algiers/ Houari Boumédiénne	2	35 00	25	3	257, 5	25	32	625	95	05/2 3	350 0	60	09/2 7	350 0	45
		23 50			257, 5			285	380						
					257, 5										

Source: (ASMP) 2005-2025

▪ **Maritime transport**

The port of Algiers gives it the advantage of a gateway to Africa and makes the city a crossing point for human flows and goods traded on the world market, we quote:

- 03 headlights
- 01 commercial port
- 03 fishing ports

4.3. Future of transport infrastructure in Algiers

The modernization of the capital Algiers requires the creation of infrastructure networks and hubs to better structure the city, and although the city has an important infrastructure, it

remains insufficient comparing to the rampant urbanization that know the capital. To this end, several projects planned for the year 2025 according to the strategic plan of Algiers, that refers to the lengthening of traffic congestion during rush hours, the facilitation of parking in the heart of the city. Among these projects; *six road infrastructure projects, five local road projects, three interchanges, three new bus stations, eight multi-storey car parks and three car parks, two gondolas and the completion of the metro and tram.* (OUAZEN, 2012)

4.4. Urban planning instruments and transport in the city of Algiers

Table 6. Urban Planning Instruments and Transportation in the City of Algiers (Author Processing)

STRATEGIC OBJECTIVES					THE PRIORITY THEME CROSSED
NSPS (the National Spatial Planning Scheme)	TERRITORIAL				Transport system and sustainable mobility

Source: (NSPS)2025
(Author Treatment)

5. Results

Through the analysis of the various instruments of the planning and the situation of the transport sector in the city of Algiers, some deficiencies and shortcomings were observed , especially the inconsistency and the non-coordination between these two sectors (Planning and transport), for these reasons we have established some sources of malfunction:

- The chronological non-respect of different instruments of urban planning elaboration, and the absence of the complementary relation between the different urban planning instruments, that is shown through the absence of coordination and control between these different instruments.
- Marginalization of the transport sector in the planning instruments on which programming instruments are based for, this is marked by; the absence of a long-term vision that includes the issue of transport with all these dimensions, the incompetence of actors and companies to manage the transport and planning policy and finally the non-respect of the orientations proposed by urban policy.

Consistent legislative and regulatory framework

Despite the rich content of the existing legislative framework, the absence of a strategy of coordination of the transport and planning imposes dysfunctions of the city.

- The texts relating to planning and urban planning indicate that the mission of urban plans is essentially limited to urban planning aspects while the dimension of urban transport is completely failed. In addition, Law 90.29 on planning and urban planning did not emphasize the procedure for implementing coordination of planning and transport.
- The 2001 law on the orientation and organization of terrestrial transport imposes in its articles 40-41-42-43 the obligation to integrate transport planes into documents.

6. Discussion

Planning a type of transport requires a very deep analysis of many factors including space, time, money, quality of service and the nuisance it generates (noise, pollution, congestion ...). Through this analysis, we've reached to a synthesis that would allow us to operationalize the coordination urban planning and urban transport for a harmonious development of the city of Algiers.

- Think about checking, controlling and restoring the legislative framework that affects the planning and transport sector to ensure better coordination between the two sectors, control of urban sprawl and modal shift towards public transport.
- Articulate between the fields and scales of planning (spatial planning, urban plan and transport plan)
- Deepen the communication between the public authorities, and to create an interface of local debate within the agglomerations (governance).
- Reform and improve legislation and regulations, while facilitating its reading and its application, and involve its importance in the field of urban planning and construction, particularly in the training curriculum of the architect, engineer, and the administrator.
- Make a comprehensive review of legislation and regulations related to urban planning and transportation to distinguish existing inconsistencies.
- Integration of the concept of mobility in MPUP/POG urban planning documents
- The programming of the various projects at central and local level, with a view to ensuring better harmonization and coordination between the different actors.

7. Conclusion

If the situation of transport and mobility networks in the city of Algiers nowadays may reveal to us something, it would be the standpoint towards the implementation of a better management of transport, which reveals the question of the coordination between transport

and urban planning instruments, which we have emphasized in our article. And this, in order to guarantee a more favorable quality of life. "The art of developing cities today depends on the ability to control flows and circulations, to organize the mobility of people and goods" (Wachter, 2003). Therefore to better understand and regulate these problems raised by transport, the institutions, administrations and local authorities who are responsible for managing cities, should consider establishing an urban transport plan that will constitute an integral part of the urban master plan and which will be covered by the challenge of providing a perfect coherence with urban development plans. Despite the setting up of the legislative and regulatory framework, and the efforts of direction that have been made for the benefit of transport in the city, the imbalance of the urban framework and the inefficiency of the transport, would be nothing comparing to what the fact of dysfunction between urban planning and urban transport can generate, which is in fact due to the weak managerial capacity and the insufficiency of the actors concerned by this fact and who are in charge of the establishment of the various instruments as well as by the phase shift that occurred during the development of these.

Abréviations

MCET Ministry of Civil Engineering and Transport

MHU Ministry of Housing and Urbanism

DWT Direction of province (Wilaya) Transport

DCE Directions of Civil Engineering

U.T.O.A Urban transport organizing authority

NSPS National Spatial Planning Scheme

RSPS Regional Spatial Planning Scheme

MPDMA Master Plan for the Development of Metropolitan Areas

ASMP Airport Sector Master Plan

TODP Town Office Development Plan

MP Master Plan

MPUP Master Plan of Urban Planning

POG Plan of Occupation of ground

MDP Municipality Development Plan

UTP Urban Travel Plan

GCPH General Census of Population and Housing

NH National Highway.

OTR office town Roads

LR Local roads
PT Public Transport.
PTC Passenger Transport Center
PTW West Passenger Transportation
PTSO South West passenger transportation
PTSE Passenger Transport South East
OJ Official Journal
TSO Technical Study Office
ASROUT Establishment of Maintenance of Road and Sanitation of the office town of Algiers
DUTRT Direction of urban transport and road traffic (DTUCR)
UTSO Urban Transport Studies Office (BETUR)
TMUTC Traffic Management and Urban Transport Company (EGCTU)
NPSF National Pension and Social Security Fund (CNRPS)
NTCE National technical control establishment (ENACTA)
NCSARUP National Center for Studies and Applied Research in Urban Planning (CNERU)
DUPCH Direction of Urban Planning, Construction and Housing (DUCH)
AUSPTE Algiers Urban and Suburban Public Transport Establishment (ETUSA)
EMA Algiers Metro Company
DTCT Direction of Trams and Cable Transport (DPTTC)
NRTC National Railway Transport Company (SNTF)
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Managing a Project as Part of an Urban Renewal Program: The Case of Development of the BARDO Area for the Construction of an Urban Park CONSTANTINE, ALGERIA

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Abstract

Today, urban renewal appears as a new and indispensable practice of sustainable urban planning. with a dual objective, to work on the aged and disadvantaged sectors of the city, while meeting the requirements of space saving management, it evokes an urban, social and economic ambition of city re-evaluation through global projects; Each project is distinguished by its unique characteristics and related activities. These projects must respect the deadlines, the defined budget and the prescribed specifications.

Therefore, to carry out such projects, city stakeholders should use the project management body to ensure the effective and efficient implementation of the urban renewal approach. This approach will allow project managers to respond to the project requirements with its issues and complexities, taking into account the needs and expectations of different stakeholders.

In this context of perception, the city of Constantine is the subject since many years of several studies and perspectives of development, metropolisation and modernization, to improve the city image and the quality of life of its inhabitants. The international event of "Constantine Capital of Arab Culture 2015" was the opportunity to go through major projects, playing a founding role in the urban renewal of the city.

In this research we will focus on the Bardo urban park, which takes part in a series of interdependent projects with strategic and operational dimensions of project management

distributed among several parties, emphasizing on how to manage the urban park project that is part of an urban renewal program for Bardo.

Through this example we envisage to evaluate the importance of both project management and the program management in a global managerial urban approach.

Keywords:urban renewal;project management; program management; Bardo. 7

1. Introduction

Over the past decade, cities around the world have embraced, with renewed interest, urbanism as a concept for creating sustainable environments. To do this, city leaders also recognize the need to conserve resources.

Today, urban renewal appears as a new practice of planning, with a dual objective, to work on the aged and disadvantaged sectors of the city, while meeting the requirements of space saving management, it evokes an ambition urban, social and economic revaluation of the city through global projects; Each project is distinguished by its unique characteristics and related activities. These projects must respect the deadlines, the defined budget and the prescribed specifications.

Therefore, to carry out such projects, city stakeholders should use the project management body to ensure the effective and efficient implementation of the urban renewal approach. This approach will allow project managers to respond to project requirements with issues and complexity, taking into account the needs and expectations of different stakeholders.

In this context of perception, the city of Constantine is the subject in recent years of several studies and perspectives of development, metropolisation and modernization; to improve the image of this city and the quality of life of its inhabitants. With the event of "Constantine Capital of Arab Culture 2015" the city has taken the breath with the opportunities that it is granted through major projects, which play a founding role in the urban renewal of the city. The urban park development project of Bardo, which is part of a set of interdependent

projects with strategic and operational dimensions of project management distributed among several parties.

2. Project management and program management

We are all brought to realize projects, We make every effort to achieve the product or service requested in the time and budget allocated.

But studies show that, for various reasons, several projects do not achieve their objectives. However, following simple rules of common sense, drawing on the tools of project or program management, increases its chances to succeed.

2.1 The project in project management :

a project is a unique process that consists of a set of coordinated and controlled activities, with start and end dates, undertaken to achieve a goal that meets specific requirements, including time and cost constraints. and resources (ISO 10006)

So any project, whether big or small, professional or even private, are similar in that they orient their action according to three predefined factors: the desired result (quality), the period of realization (delay) and the cost is the constraints that the project is subjected to.

2.1.1 Causes of failure and conditions for success of a project:

Table 1.Causes of failure and conditions for success of a project

	Failure	Success
Objectives	Not well defined, no communication	Clear, shared, Consistent with the missions
Phases of the project	utopian	Control, realism
Resources, Constraints	Underestimated, Mistakenly Analyzed	taking into account the environment
Direction	Direction is not motivated	Poster and shows its involvement
Project team	- Roles not defined, not competent -Strategies of opposing powers - Absence of cohesion	- Delegation clear, autonomous, choice of members - Culture, training, communication -Multidisciplinary, motivated
Management relationship	Orientation to production	Contractualize, negotiate
Management of the project	Management failure	Choosing the projectmanager
Evaluation	Unsuitable criteria	functionality

Many projects do not achieve their objectives because of lack of project management despite simple techniques, tools and methods of project management can increase the chance of success .

2.1.2 Project management

The term project management approach is most frequently used as a set of principles and guidelines that define how specific project is managed (Iivari, Hirschheim & Klein, 2000; Introna & Whitley, 1997). The almost similar meaning has a term project management framework, which represents operative set of rules, processes, methods and templates to be used during the project lifecycle (Introna & Whitley, 1997; Office of Government Commerce, 2002; Project Management Institute, 2008)

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management is accomplished through the appropriate application and integration of the project management processes identified for the project. Project management enables organizations to execute project effectively and efficiently.

Effective project management helps individuals, groups, and public and private organizations to:

- Meet business objectives;
- Satisfy stakeholder expectations;
- Be more predictable;
- Increase chances of success;
- Deliver the right products at the right time;
- Resolve problems and issues
- Respond to risks in a timely manner

- Optimize the use of organizational resources
- Identify, recover, or terminate failing projects
- Manage constraints (e.g., scope, quality, schedule, costs, resources)
- Balance the influence of constraints on the project (e.g., increased scope may increase cost or schedule)
- Manage change in a better manner.

Poorly managed projects or the absence of project management may result in:

- Missed deadlines
- Cost overruns
- Poor quality
- Rework
- Uncontrolled expansion of the project,
- Loss of reputation for the organization,
- Unsatisfied stakeholders
- Failure in achieving the objectives for which the project was undertaken.

Projects are a key way to create value and benefits in organizations. In today's business environment, organizational leaders need to be able to manage with tighter budgets, shorter timelines, scarcity of resources, and rapidly changing technology.

The business environment is dynamic with an accelerating rate of change. To remain competitive in the world economy, companies are embracing project management to consistently deliver business value.

2. 2 Multi-project management:

Multi-project management has become the mode of operation for several large industrial companies developing parallel projects and medium-sized companies with technological

know-how. It requires a consolidation of subprojects or grouping of business activities, dependencies between projects and the inevitable sharing of resources.

2.2.1 Multi-project management technique:

There are several techniques in multi-project management, the common factor of which is resource sharing. , we will support our work on the master / subproject project technique

Master Project / Subproject:

This technique links a phase, activity, task, or milestone of the master project with a task or set of tasks from another project. there is a unifying project bringing together several ancillary projects that require consolidation necessary for the development of a macro-planninggiving an overview.

The operation of this technique is similar to that of a program divided into several projects related to each other in dynamics.(HenriGoergesMinyem 2007)

2.3 Program management

Program management is concerned with the construction of a group of related projects falling under the auspices of a program. The program management process scales the key program has a tool for making decisions throughout the program cycle based on benchmarks, performance metrics, established procedures, and the program aims. In order to find better solutions for many aspects of a program, including planning and scheduling, distribution of resources labor and staff, optimizing the procurement process and minimizing costs while achieving the program objectives. (Ali .D. Haider 2016)

2.3.1 Program Success Factors

What makes some program managers consistently successful and others consistently marginal or average, Before we dive into this question, let's detail what characterizes a successful program. The

key factors are:

- Stability of operations and operations becoming more efficient
 - A proper, strategically identified balance between operations and development/new projects
 - Projects delivered on time and on budget
 - Clear lines of accountability
 - Stable, well-understood budget process
 - Professional growth of program personnel
 - Clear, well-understood project management and decision processes
 - Clear objectives for success
 - Happy stakeholders
 - Constant alignment with the strategic or organizational vision
- All of the above are a subset or result of the culture the program manager must develop. A positive, supportive, structured culture makes programs self-regulating and success automatic.

The program manager is, in essence, an icon. As the icon, he or she serves as the focal point for the entire program, and others imitate

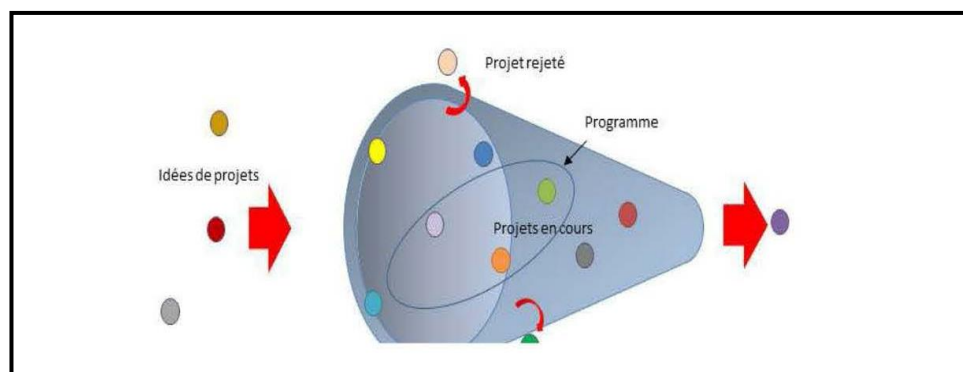


Figure 1: Project selection(le grand livre de la gestion de projet)

2.3.2 Strategies Are Designed to Ensure Organizational Discipline

The program manager needs to have a strategy for instilling discipline throughout the organization. Two overriding factors are involved in any kind of organizational discipline: (1) compliance of everyone in the organization because of the desire to please the leadership, and (2) compliance because of the fear of pain (negative repercussions).

Creating the kind of culture in which the organization has a desire to please the leadership hinges on relationship building. The strategies that provide pain when there is a lack of discipline in the

organization are also required. Both approaches are required to maximize success, because all people are not alike. In any organization you'll have a percentage of people who will test the boundaries,

and crossing some of these boundaries should lead to negative consequences for those who do so. Pain is often the most effective motivator for instilling discipline. For example, if someone willfully or callously violates a safety rule, punishment is in order. An organization left to its own actions in the absence of leadership (personal or process) will not have any discipline and will be doomed to failure.

Many paths lead to program success. The key is having the discipline to stick to the path. While the mentoring process and the status process contribute to discipline, the program manager acting

with integrity contributes to discipline even more so. Realize that discipline is best when it is self-regulating. Therefore, having a certain amount of pride in yourself and in the organization is a

powerful way to instill discipline in others. Instilling pride within an organization is absolutely necessary. (James T. Brown 2008)

2.4 Comparative Overview of Programs and Projects

Table 1. Comparative Overview of Programs and Projects(Pmbok 6th edition)

	Projects	Programmes
Definition	A project is a temporary endeavor undertaken to create a unique product, service, or result.	A program is a group of related projects, subsidiary programs, and program activities that are managed in a coordinated manner to obtain benefits not available from managing them individually
Scope	Projects have defined objectives. Scope is progressively elaborated throughout the project life cycle.	Programs have a scope that encompasses the scopes of its program components. Programs produce benefits to an organization by ensuring that the outputs and outcomes of program components are delivered in a coordinated and complementary manner.
Change	Project managers expect change and implement processes to keep change managed and controlled.	Programs are managed in a manner that accepts and adapts to change as necessary to optimize the delivery of benefits as the program's components deliver outcomes and/or outputs
Planning	Project managers progressively elaborate high-level information into detailed plans throughout the project life cycle.	Programs are managed using high-level plans that track the interdependencies and progress of program components. Program plans are also used to guide planning at the component level
Management	Project managers manage the project team to meet the project objectives	Programs are managed by program managers who ensure that program benefits are delivered as expected, by coordinating the activities of a program's components.
Monitoring	Project managers monitor and control the work of producing the products, services, or results that the project was undertaken to produce.	Program managers monitor the progress of program components to ensure the overall goals, schedules, budget, and benefits of the program will be met.
Success	Success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction	A program's success is measured by the program's ability to deliver its intended benefits to an organization, and by the program's efficiency and effectiveness in delivering those benefits.

Project or program management is essential for better project management, among them urban renewal projects, throughout the project phases as soon as the need for intervention on the project to its implementation applying knowledge, skills, tools and techniques, first to anticipate, anticipate, act and control and secondly to correct and make the necessary decisions; identify the causes of the drifts between the realized and the expected; identify new points of intervention and redefine processes as necessary.

3. Urban Renewal

The purpose of urban renewal is to improve specific areas of a city that are poorly developed or underdeveloped. These areas can have old deteriorated buildings and bad streets and utilities or the areas can lack streets and utilities altogether. Urban renewal provides the following tools:

First it allows for the use of tax increment financing (explained below) to finance improvement projects.

Second, it allows for special powers to buy and assemble sites for development or redevelopment, if that is desired.

And third, it allows for special flexibility in working with private parties to complete development projects. For a municipality to use urban renewal it must establish an urban renewal agency and it must adopt an urban renewal plan (Tashman Johnson LLC, April, 2005) .

3.1 The bardo urban park project in the context of urban renewal in Constantine

On the occasion of the designation of Constantine Capital of Arab Culture 2015, the local authorities decided to build an urban park within the Bardo area. After the eradication of slums. The operation was registered under the program of accompaniment of the event. the project consists in enhancing the heart of the city in a cultural and leisure area. The latter consists of three lots: "roads and various networks", "building and equipment" and "landscaping and green areas" which covers an area of 65 ha. The urban park of Bardo aims to improve the image of the city, through a cultural and tourist pole

Successive external changes caused by the park project's adjoining projects, such as the reclamation project for the wadirhummel, which divides the park into two parts (the right bank and the left bank) causing a change in the initial state of the soil.

Direction of water resources plans to make a waterfall on the left bank of the wadi at the bottom of the gardens of the olive trees. The realization of this cascade encroaches on one of the thematic gardens programmed in the urban park of bardo, thus hindering the interventions on this part of the project.

the salahbey viaduct works caused very significant deformations that affected the site and its morphology, thus modifying the initial study carried out by the study office (joint Algerian-Italian SFC joint consortium), subject of contract with the grouping companies responsible for the construction of the urban park, thus changing the nature of the soil.

It is also planned the construction of a drainage tunnel to ensure the safety of the work of salahbey and its stabilization in the right bank that will occupy a large area of the park project and it will have an impact on the wadirhummel, the modification of the plans and the location of the theater caused by the next works of the drainage tunnel.

the urban park, which offers access and continuity for the tourists' path, the wastewater discharged from the old town prevents the work of the educational farm and the sidirached bridge which influences the landscape view of the bardo zone, all these projects have an impact on the progress of the project . (environment direction 2017)

the change of the lots during the realization of the project of the urban park the problem of the

landslide caused an ambiguity of the deliverables, a blatant overtaking in the cost, delay and in the risks that will arise and influence on the final quality of the park, these transformation have caused a terrible management and anarchy in the entirety of the project , from this observation, various questions arise about the best way to manage this project

3.1.3 The presentation of the project of the urban park of BardoContantine



Figure 2 : location of the bardo district in relation to the city center (google earth)

3.1.2 The potentialities of the site:

"The Bardo site offers considerable land and landscape potential. Located along the Rhumel, in the continuity of the Medina and against the low Coudiat, Bardo aims to decongest the center, reconcile the city with its Wadi, a founding and structuring element, and renew the urban landscape along the streets. shores in a perspective of reorientation of urban development towards the South-East and to pick up urban fragments by a new coherent structure. "(Badia BELABED-SAHRAOUI, January 2009)

The area of the Bardo has characteristics of great interest because of the context in which it is and the spatial configuration of the natural system to which it belongs.

3.1.3 The topography

According to the geotechnical sketch of this pos one could bring out the following areas:

- The first zone covers almost all the terrain are Mio-Pliocene continental terrains. They are clays, and silts sometimes terraincailloux high slope between 15% -25% and sometimes exceeds 25%.

- The second zone, which represents Priabonian clays, with a slope of between 15% and 25%

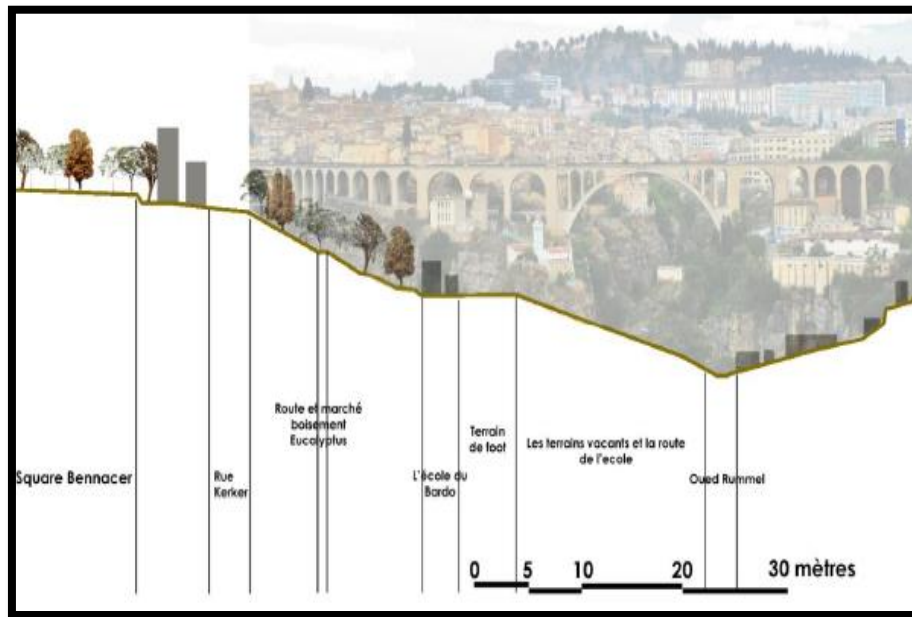


Figure 3: Schematic cut on the site of the Bardo (*Skillshare un Espace de sauvegarde du Savoir-faire par R. Fritah*)

3.1.4 Consistency of the work of realization:

Lot n ° 01: VRD including earthworks, roads, sanitation, AEP.

Lot n ° 02: Building and equipment including open air theater, trade building, parking, Bardo house, educational farm, service and maintenance building.

Lot n ° 03: Landscaping and planting including 07 thematic gardens (Botanical, nurseries, irrigation, lighting, development of thematic areas.)

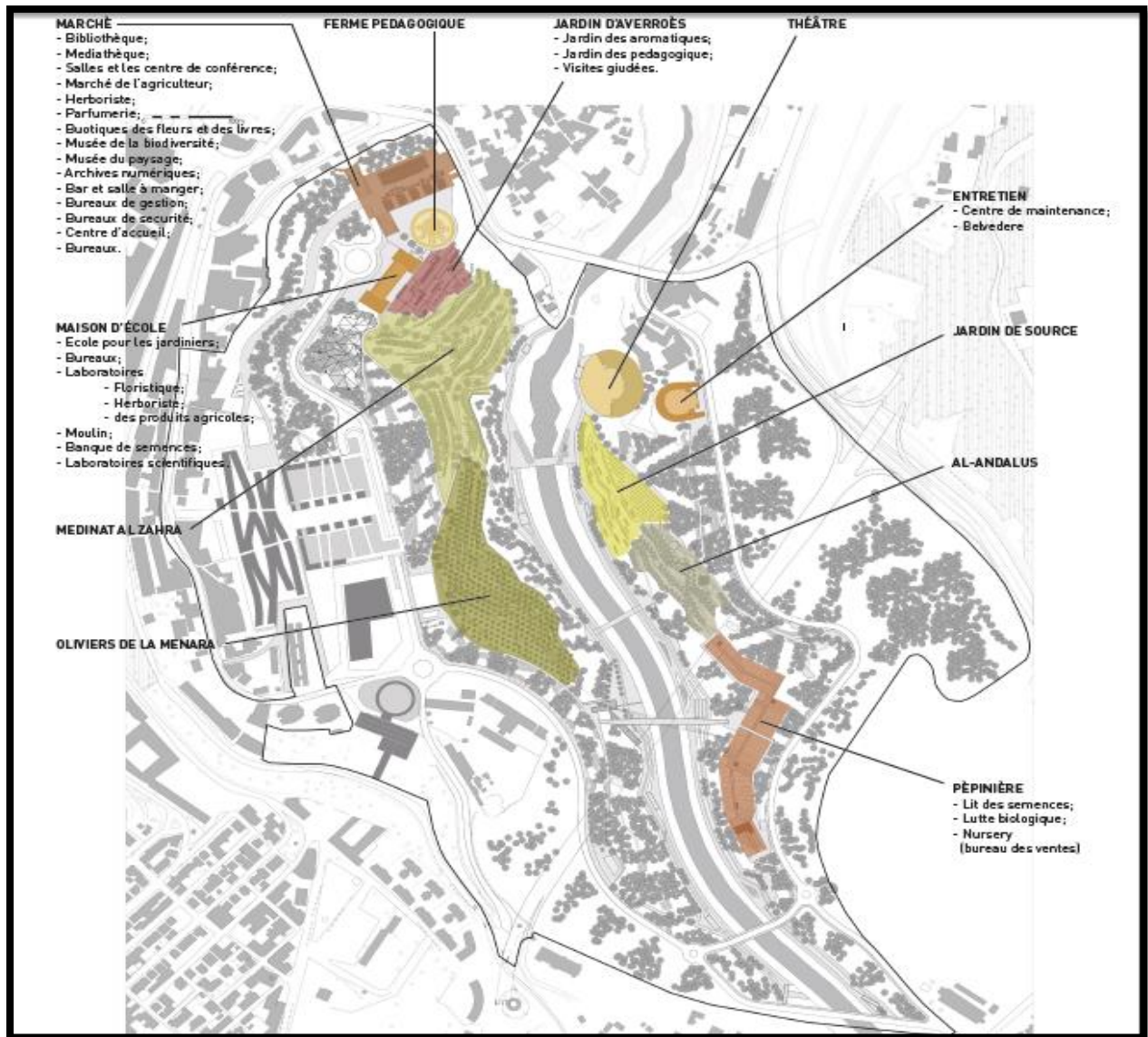


Figure4 : presentation of lots of urban park bardo (Study and monitoring of the BARDO Urban Park of Constantinemission 1)

All work scheduled on the right bank of the project site is suspended until the completion of the work of the Public Works Department which consists of the realization of a drainage gallery SalehBey Viaduct.

3.1.5 Progress of the work of realization

Table 2 . the Progression of the work of realization (urban park Bardo)

Lot number	Designation of work	Physical rate	Constraints
<u>Lot n ° 01:</u> <u>VRD</u>	Highways	90%	Soil movement requiring a slip study.
	Sanitation	90%	
	Drinking water supply	100%	
	Lighting	75%	
<u>Lot 02:</u> <u>Building and equipment</u>	House of the bardo	95%	
	Ferme pédagogique	95%	
	Educationalfarm	0%	Very unstable terrain requiring the realization of a stability wall
	Open theater	5%	- Change of the original place planned on the right bank. - New study at CLC level for approval.
<u>Lot n ° 03:</u> <u>landscaping and planting</u>	Olive treesEL MANARA	70 %	Sliding caused by the calibration work of OuedRhumel
	Madinat EL ZAHRA	45%	
	Jardin D' AVERROE	45%	
	Garden of water	0%	Work subordinated to the completion of the OuedRhumel Calibration works which encroaches on the Park site.
	Garden of SOURCES	0%	Works subordinate to the completion of the works of realization of a drainage gallery for the stability and safety of SalehBey viaduct.
	EL ANDALOUS Garden	0%	
	Alignment trees	0%	
	Nursery	0%	- Change of the site on the left bank. - The initial site is occupied by the viaduct drainage gallery works. - The new site is still occupied by the equipment of the company ANDRADE in charge of the work of the SalehBey Viaduct.

3.1.6 The management of the interfaces of the five projects adjoining the urban park

The process of the management of interfaces applies to internal and external interfaces, we opted for this process because its importance lies in the fact that it ensures a good coordination between the different projects realized in the zone of bardo, moreover it the

elimination of the negative impacts resulting from the interaction between these same projects.

The application of this process must be started from the initialization stage of the projects to the exploitation phase through the study and implementation phases.

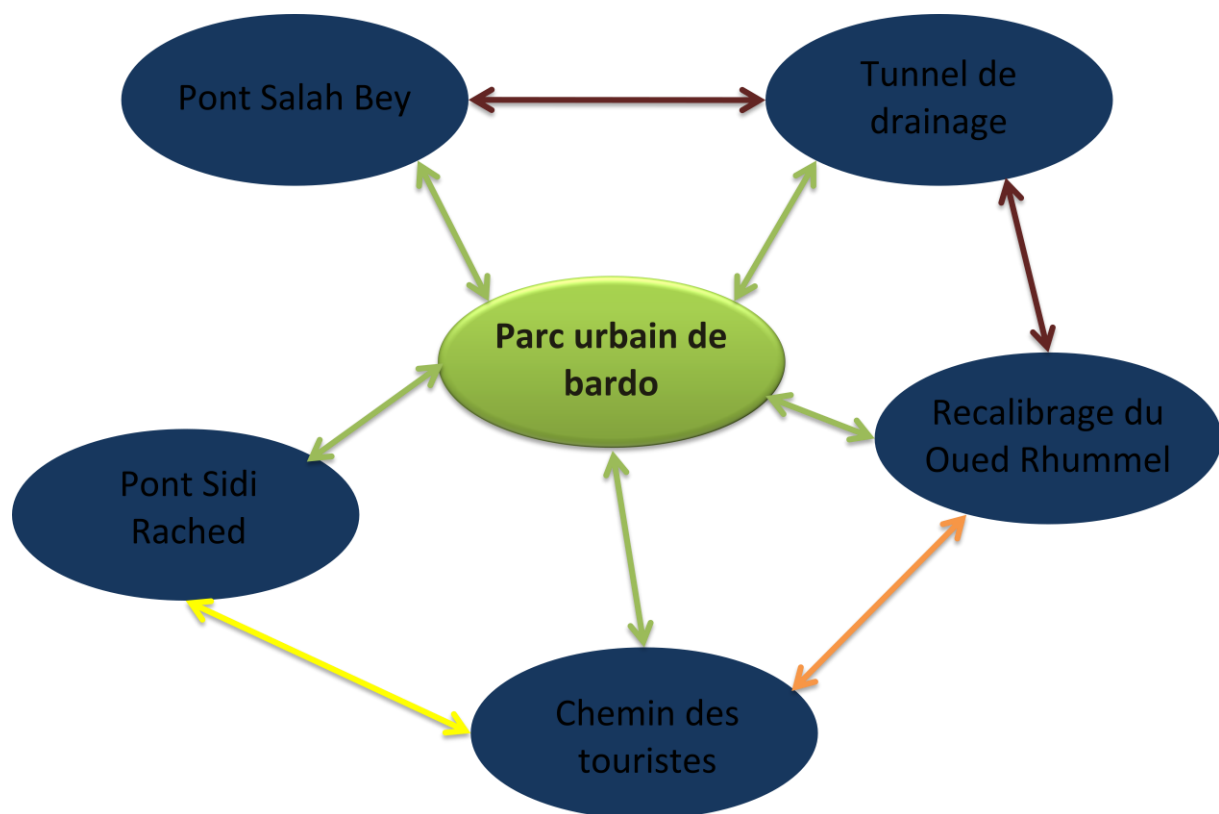


Figure 5: Interfaces between Urban Park Joint Projects (author treatment)

- ◀▶ interface between the Urban Park project and other projects
- ◀▶ interface between the drainage tunnel project with the two projects recalibrating the OuedRhummel and Salah Bey Bridge
- ◀▶ interface between the projects of the path of the tourists and recalibration of Oued
- ◀▶ interface between the projects of the path of the tourists and the bridge SidiRached

All the problems encountered can not be solved. It is above all a problem of governance and someone with enough political power must take the responsibility to review, with techniques, the upstream management of the project. When upstream there has been no preparation, we find ourselves confronted with inextricable situations.

4. Proposal and recommendation

Given the state of progress of the project, we have limited ourselves to recommendations and solutions, starting from the audit at the internal (project) and external (program), to resolve the situation it is necessary to alert the sponsors by explaining:

it is a problem of governance and consideration of all projects as one and the same program.

-In the projects of realization of the programs of urban development, it is essential to integrate a cell of coordination, control and scheduling in each project which will be charged with its mission, the works this last one will be headed by an urban OPC which will manage the complete program.

- to make the authorities aware that the preliminary studies, the diagnoses and the consultation have a

delay and a cost that some elected officials are reluctant to pay, but the absence of these studies and debate around projects have a deadline and an even greater cost than at the time of their

realization or / and during the life of the work in its environment.

-It is necessary for an experienced program director to completely review the project plan and subproject plans. This one will have to accompany the project managers well and to be very supported by the sponsors (the state) and the sponsors.

-It takes a pilot on the plane, supported by the right people with enough power to punish the subcontractors

5. Conclusion

The urban park of Bardo is an ambitious project that aims to promote a natural site in the heart of the city of Constantine. on the occasion of the event of Constantine capital of the Arab culture 2015 the project had the opportunity of its realization.

However, this project has experienced several changes and disturbances at the internal level (change of lots, change of plans, respective stoppages of work, a deformation of the morphology of the land, many endorsements ...), at the external level (the projects adjoining the urban park have impeded the progress of the work and which have occupied the field of the perimeter of the project) these obstacles are due mainly to a lack of planning upstream of the project, the absence of programmatic studies and its mismanagement on the one hand, and on the other hand, the existence of external interfaces with other joint projects that are managed independently at the strategic level as well as at the operational level. All these problems are caused by the absence of a city contract and the problem of governance which has engendered problems of coordination.

Indeed the success of these projects, including the project of realization of the urban park of bardo, requires an efficient and effective management by the actors who carry them like a unified and coherent whole in the form of a program by applying a management approach program that integrates project management processes .

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Planning, management and strategies for the light rail transit Case of the tramway of Constantine Algeria

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Abstract

Railway transport is an attractive choice for any heavily traveled corridor, as it is the mode of urban travel which could best move people consistent with the local requirements. When the requirements of passenger travel in a major city are served by rail transport on a regular basis, the service is referred to as rail transit. The Light Rail Transit (LRT) systems are being used increasingly in urban areas all over the world as a mode of rail based public transport. It can be developed in stages from a modern tramway that shares its right-of-way with other traffic to a rapid transit system operating on its own exclusive.

In Algeria, the decongestion of cities necessarily involves the establishment of public transport that meets the standards of quality, hygiene, comfort and safety, emphasized, particularly in Constantine. Since "the launch of a large urban project is considered as one of the tools for the implementation of metropolises planning and developing strategies, the Project for the Modernization of Constantine PMMC as the majority of large urban projects throughout the world, is constituted of several structuring ambitious projects which all have the same objective like tramway.

The Constantine tramway project is a structuring project for the city, it aims to connect the city center and the suburban Zouaghi agglomeration by a fast and ecological means of transport, the project has experienced several obstacles, due to constraints, on the deadlines of achievements were made; these modifications have an impact on all other aspects of the project (costs, quality

...). In this framework of perception we plan to shed light on the strategy, planning, and management of the tramway project at the scale of the city.

Keywords: transport; tramway; management; Constantine.

1. Introduction

Constantine is a historical regional metropolis which beams for several centuries on the Eastern part of Algerian. This attribute or quality is based on several elements which made it sacred with time and events.

Whether it is in history, in geography, in culture, in imagination, it is a place, a city, which got a national and international recognition.

endowed with a viable economic substrate because being a central pole of regional socioeconomic dynamics, being crossroad of different exchanges in the region, the city remains a big centre with regional radiance.

So the new dimension which the city must acquire will allow it to reinforce and to sit definitely its underground status.

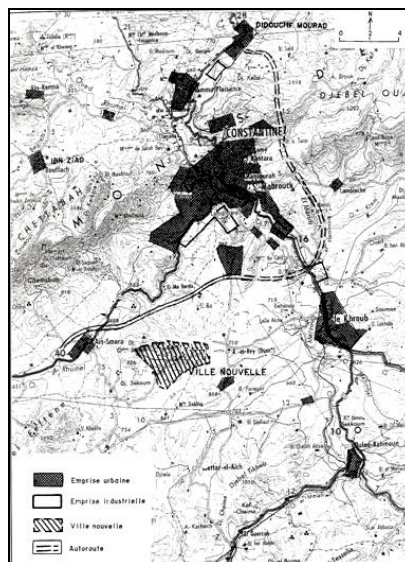


Figure 1. map of Constantine.

And this is distinctly compatible with the new political vision of the country in urbanization, in organisation and in management of cities since they raise that an interest rebound in this domain with the promulgation of several laws and texts among which some recently.

as a result , the metropolis becomes a fundamental element on which can be founded an appropriate and individual politics. This perspective once, it is the dimension of the métropolisation that will intervene to mark the beginning of a new epoch of territorial building. There is, a process there demanding at the same time continuity and breaks. It is in this vision and this logic that if registered student Constantine.

2. Strategies of planning of the Metropolis of Constantine « PMMC »

It registers in the present situation who is characterised by a preoccupation more hired by the State in comparison with the questions of the city.

Indeed if it is supposed that generalised, speeded up and widely unverified urbanization cannot be indefinitely perpetuated it is then necessary to create new frames, new instruments and mechanisms that can better promote actions undertaken for year 2000. In already approved efforts and to come (building of accommodation attenuating crisis, set up of equipment and facilities) metropolises have to benefit from a respect, from a particular treatment in reply to their waitings.

2.1 The PMMC

In reality it is from a sum of voluntarist actions among which some were already hired that will be conceived and formulated the underground Plan of modernisation. It is therefore a reflexion, a study that tries to give a legibility to different founding plans, a coherence of group on the territorial plan of the metropolis, an active and ambitious pronunciation between different domains and sectors. The culmination of this large and deep firm is New Constantine.

2.1.1 The planning of New Constantine « the objectives of PMMC »

They are numerous and they take various forms:

- It is the revaluation of the picture and of the face of the city by its embellishment.
- It is modernisation by the presence of contemporary equipment
- It is urban improvement by renewal, rehabilitation,
- It is the promotion of local potentialities by creation,
- It is the development process by the promotion of the investment,
- It is the reduction of internal difference in the metropolis which will lead to a better social cohesion)
- It is an answer to waitings and to requests of the local population

These big plans which will transform the metropolis completely have to assure its regional radiance but also hang it up worldwide that is to say include it into the worldwide network of metropolises. This dimension is necessary and vital because we are on time of opening and globalisation.

2 .1.2Tthe principles of PMMC

The principles which are going to govern this plan enunciate so:

- It is a shared, participative town planning, because he takes into consideration waitings of the local population, he links foreign partners; he is subjected to intellectual and decision-making debate.
- It is a plan which aims to be managed as part of good governance because of presence and of real participation of the different actors.
- It is a plan endowed with a big largeness, wingspan: its action will procreate a deep mutation of the metropolis and he will come true gradually, progressively.
- It is a plan which has a double coherence: the first one is internal which is at the level of the metropolis and of its underground Algeria.

2.2 The Transport and communication facilities

Communications, (motorised and pedestrianized) circulation and transport in Constantine's urban aerie and especially in city of Constantine are worth being considered:

- as revealing faithful and incontestable of any situation of crisis when she happens.
- as elements favoured on which could take support an action on the city with a view to improving his structure, his functioning and his environment because they have important founding effects.

The official report of reality by each and every one, studies made by administrations, research departments such INGEROP lead all to the same result: the city of Constantine arrived at the ultimate borders of its possibilities in circulation and transport term.

the fall of ratio, the number of inhabitants / vehicle put into circulation for whole Algeria and therefore for the Wilaya de Constantine and more still for Constantine's urban aerie or everything lets to think that, seen its economic possibilities, the increase among vehicles will be a little higher. Indeed, for the wilaya of Constantine, this ratio which was 1 vehicle / 7.82 inhabitants in 2005 is going to pass/6.49 inhabitants to 1 vehicle in 2010 then in 1 vehicle / 4.59 inhabitants in 2015.

This quick evolution of the situation marked by quick increase among vehicles indicates from a deadlock situation and situation of medium-term saturation if a strong action is not undertaken to avoid it.

But problem put down by this saturation exceeds the simple contained report / containing and returns forcing in an analysis of this situation of crisis given that it is the result of a complex combination:

- Of factors recovering from the site and from the geographical position of the city of Constantine.
- Of factors raising nature and characteristics of the building and voierie of the city.
- Of factors recovering spatio deployment - functional of the city of Constantine, of its urban aerie, different centralités and from its hyper-centres (Medina, Bab El Oued, Koudiat)
- Of factors releasing from characteristics of displacements of population (places of departure, of arrival, routes, time, sense.).

-Of factors raising quantity and quality of transport offer in a situation governed by limiting factors listed before in the city of Constantine and in its urban aerie.

-Factors raising the offer of means of transport

Besides traffic problems, any merged reasons, by considering the intimate report between the problems of circulation and the problems of transport, transport offer supposed to meet needs of displacement is worth being arrested qualitatively and quantitatively with a view to analysing what poses problem and to think about adapted solutions.

The only objective elements of analysis of the transport in the city of Constantine and in its urban aerie those are expressly produced by the society **INGEROP**, which in its report diagnosis 2004 (Mission 4) as part of the study of feasibility of the tram brought to light:

- a network of voeries very cramped in the borders of its possibilities
- a network of rail and waterways networks dominated by radial ways, orientated to the centre of the city
- a high traffic exceeding the strict frame of displacements domicile / job
- the circulation towards and in the hyper - centre generally blocked at the hours of tops and some time during all day
- Absences of traffic lights regulating the circulation in important crossings
- the vehicles which circulate in the city of Constantine and in its urban aerie are divided as follows and for year 2004

Light car: 69 %

Taxi: 18 %

87 % of VL

Public transport: 8 %

Heavyweights: 5 %

The circulation is principally dominated by the light cars

- The transported population and by type of transport divided as follows:

By light Car: 42 %

By Taxi: 17 %

57 % by public transport

By Bus: 40 %

By Heavyweights: 1 %

Both variables A (vehicles circulating in the urban aerie) and B (number of persons transported by type of vehicle) show us that the total number of light cars (individual + taxi) constitute 87 % totals of vehicles to transport only only 59 % passengers, while the public transport which represents only 8 % traffics transports 40 % passengers.

This situation of public transport is assured by 88 transport lines among which 49 lines serve Constantine's urban aerie exclusively.

-- Transport 80 % of lines converge on Constantine's centre

-- the railway participates only with 3 % passengers in senses Zighoud Youssef - El Khroub

This analysis summary but nevertheless sufficient of the situation of the circulation and of the transport in Constantine's urban aerie, suggests solutions in the dimension and in adequacy with types of put down problems. She orientates us to solutions which break radically with current situation.

- Adopt a system of transport of mass which will transport until 70 % populations without augmenting the mass of the transport vehicles and reducing appeal to the particular vehicles. - The solutions of the train, of the tram, coupled or not in the network of bus are worth being envisaged in order to transport the population better in a new space shape, while relieving the car traffic, in a situation dominated by a cramped voerie and to give him a transport with a level of allowable comfort.

- Open new ways even if these require important technical prowess and to answer challenges put down by an uneven site.

Think of a device of circulation and of transport and of voirie which would act on staggering in surface of the hyper centre and that of this fact would diminish the pressure of the car traffic on him.

- Regulate in a final way the passage of the population from a bank to other one of Rummel. Up to now only 3 bridges and footbridge allow this passage. A lot of the car traffic assures its passage of is in West of the city by the Boulevard of Soummam which is in process of saturation itself. This deserves the installation of new road Equipment (bridges) (Cherrad, S.D. et al., 2007).

The rail transport, the tram, the cable: the beginning of solutions in the problems of circulation and of transport in the city of Constantine and in its urban aerie.(Cherrad, S.D. et al., 2007).

3. The case study: « the management of the extension of the first tramline in constantine

3.1. Project presentation

Constantine, one of the most ancient cities of the world, is an important city in Mediterranean history. The third the most important city of Algeria, of its ancient name Cirta, capital of Numidie, has for the 17 centuries the name of the emperor Constantine Ier which rebuilt it in 313. Constantine is known as the «city of bridges», the «city of the eagles», but also the «city of the malouf». A city of culture and tradition in a privileged natural place.

The Transport Ministry, through the Firm Underground of Algiers, develops the plan of Constantine's tram aware of its transcendence, as founding element capable not only of transforming physically the city and its means of mobility and of transport, but also the mind of the region by causing a dynamics of future.

In a perspective of future, the public transport which would give the tram will link up the cities of the Wilaya de Constante (Constantine, Zouaghi, Ali-Mendjeli and Khroub), totaling a million persons and contributing to the transformation of the historical city of Constantine into a roofless museum and a cultural reference to international ladder.

Former study detailed plan, the monitoring and the control of jobs of realisation of the extension of the first tramline of constantine was entrusted to the grouping idom-tec4 (leader: idom). The plan is developed as a job of group there, conceived with and for the citizens of constantine. Plans are accomplished conducted by ema with many working workshops including all disciplines having taken place as well in algiers as in constantine, as well as several piloting committees supported in the wilaya de constantine and chaired by wali. The own minister de transport followed personally, in some key occasions, the development of plan.

Plan has as objective the execution of the Market which fixed conditions and modalities of realisation of jobs of extension of the Constantine's first tramline which stretches over a commercial length of **10,3 km**, in accordance with the technical prescripts linked in addition to Market.

In accordance with the article 14 of the Presidential decree n°10-236 of October 07th, 2010 carrying regulation of public works contracts, changed and supplemented, the Market is :

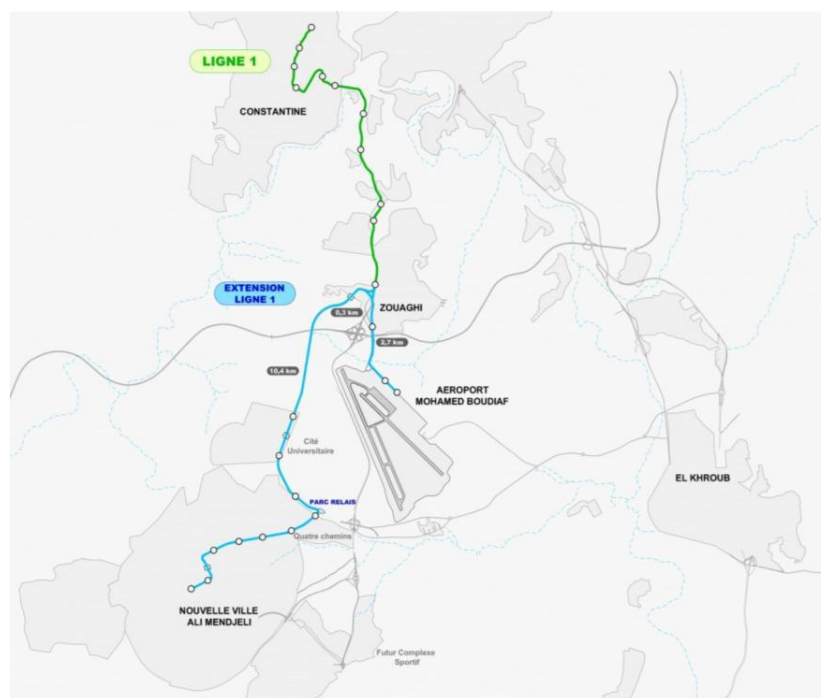


Figure2. Elements of the Extension of the line 1 of Constantine's Tram. (Alstom, 2017)

-The extension of the first line is formed by both following plans: APD EXTENSION ZOUAGHI - Airport (zone of including Remisage) ; APD EXTENSION ZOUAGHI - Ali Mendjeli

Even if both plans mentioned above constitute two very distinct APD, they both sum up conceived in the same mind of a network of group, which takes into consideration possible extensions and future modes of working, as well as their signification in the economic, social and cultural transformation which they entrain.

In this plan, they describe studies which constitute extension towards the Airport and Ali Mendjeli. Documents the component concern all the accomplished analyses, define the necessary preparatory work, list the founding elements of extension and describe their implementation, display insertion and development considered principles, offer lists of equipment and of equipments to be installed, and give a quantitative estimate and a prediction of realisation planning.

The line of extension between the station of the city Zouaghi and Ali-Mendjeli stretches over a linear about 10,5 km, while the length of the strap leading towards the international airport Mohamed-Boudiaf is in the order of 2,7 km, according to the study of detailed draught performed by a Spanish grouping, according to the same source which added that the line Zouaghi-Ali Mendjeli envisages a stopover within the university Constantine-3.

The sum of the submission carried on the opinion of interim attribution of the market comes to more than 34,7 thousand million dinars, has still pointed out the manager of wilaya of Transport who also reminded that the first operational line of the tram since July, 2013 between the stadium Benabdelmalek-Ramdane (city centre) and the station Zouaghi-Slimane on a 8,1 km distance, will later be reinforced by a second line of extension going from Ali Mendjeli up to the city of El Khroub(Cherrad, S.D. et al., 2007).

3.2. Choice of the position of Flat Form on the way

The deck can be:

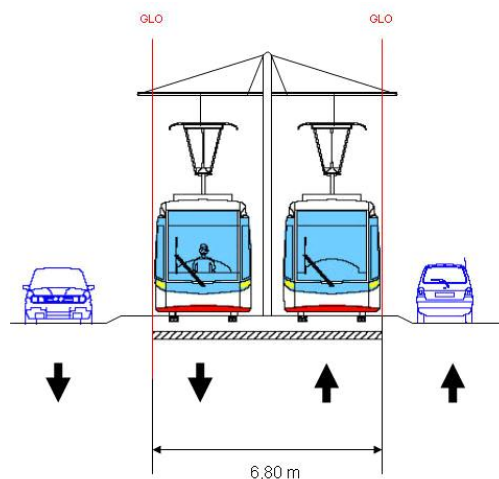
- bidirectionnelle: both senses of circulation of the tram occupy the same deck abreast and stations are common.
- unidirectional: a deck by circulation sense(Wilaya de Constantine, l'année).

Two modes of insertion are considered for the positioning of the bidirectionnelle deck on an existent rail and waterways network: central insertion (Figure 3) or lateral insertion (figure 4)

In central insertion, the limit size of obstacle (GLO) in right alignment with obstacle border is taken in 6,80m by considering oars of 2,65 m of open sea with central support of catenary

Central insertion reinforces visual impact and marks distinctly the urban landscape notably by a hold of important deck. That is why it will be chosen on broad avenues. She allows not to bother lateral accesses or accesses bordering the street.

In lateral insertion, the limit size of obstacle in right alignment with lateral posts or clash in facade is taken in 6,40m. To it is added the breadth of separators according to different types of clean site chosen and establishment of the LAKE posts if necessary.



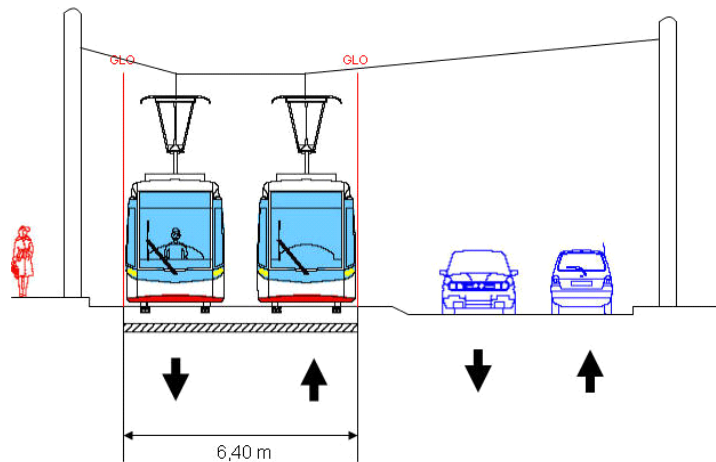


Figure 3. Central insertion of tramway. **Figure 4.** Lateral insertion of tramway.

3.3The Dealers

The actors of plan and their membership entities are identified this day and their general organisation is defined below in figure 5. The general organisation of operation is based on a structure at 3 levels: work workmanship, the workmanship of acting work, the Holder. The main interfaces between the actors of operation are described in flowchart.

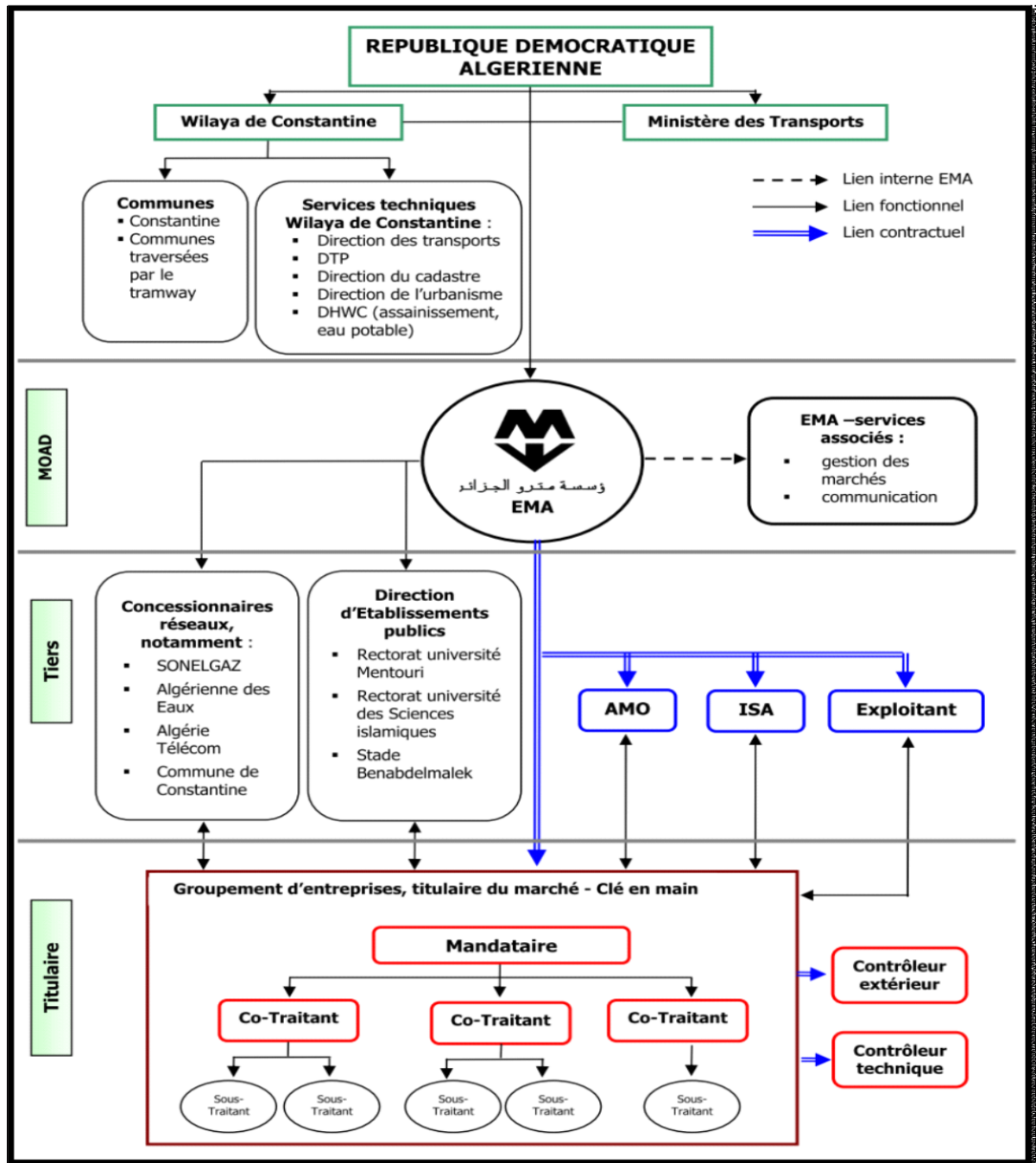


Figure 5. The stakeholders of the project tramway of Constantine.

3.3.1 Other stakeholders in realisation

As part of his benefits, the Cocontracting party will have to define interfaces with the different stakeholders of operation and assure the coordination of his benefits: studies, jobs, trials, etc. with these parts.

The third parts are identified in the Diagramme manager quality of the present Market. They will notably identify:

- The different helpers of Contractant service (MOE, Certificateur Indépendant of the Security of
- the System Tram, etc.).
- The supplier of the equipment rolling CITAL.
- The concessionaires of networks notably ONA, HYDRAULIC, ADE, TELECOMMUNICATIONS ALGERIA and SONELGAZ Distribution and others.
- The control Societies.
- Future farmer:

At the very least, during the period of trials, of walk with white and of training of the future farmer, the Cocontracting party will have to assure a daily coordination with the future farmer, with periodic penalty payment during the not worked hours.

- SONELGAZ and other concessionaires:

Interfaces with SONELGAZ DISTRIBUTION are limited to the supply of the power supply for public lighting except lighting of stations.

The concessionaires will be able to be solicited during jobs in case of discovery of networks not identified before.

- Other external dealers The Cocontracting party will also have to assure the coordination linked to the organisation of the construction site with the actors
- main of the city:
 - The residents, dealers, ...
 - The technical services of the wilaya and of the different villages,
 - The police,

- The firemen and help services,
- The direction of state-owned companies in correlation with the tram.

3.4 Basic benefits

The Tram system to be accomplished is constituted of group of subsystems described below.

Except for the supply and the maintenance of the movable equipments, the Cocontracting party promises to accomplish

Jobs according to the cutting up of lots defined below:

Broken down, in **six (6) Lots**:

- **LOT HAS:** Management of plan and overheads
- **LOT B:** Prior and supplementary Studies
- **LOT C:** Facilities and Urban development
- **LOT D:** Transport system
- **LOT FR:** Extension of Remisage
- **LOT G:** Additional Equipment of the Line 1

every LOT is broken down into functional Groups and functional Subgroups.

3.5 Operational Organisation of the Grouping

For the execution of plan, the grouping is organised in operational entity

GROUPE MANAGEMENT there loads Walk with realisation of Pilot

GROUPE there charges with Piloting and with coordination,

the under Grouping system, or responsible for the lot system,

the under Grouping Engineering Civil or responsible for the lot Facilities,

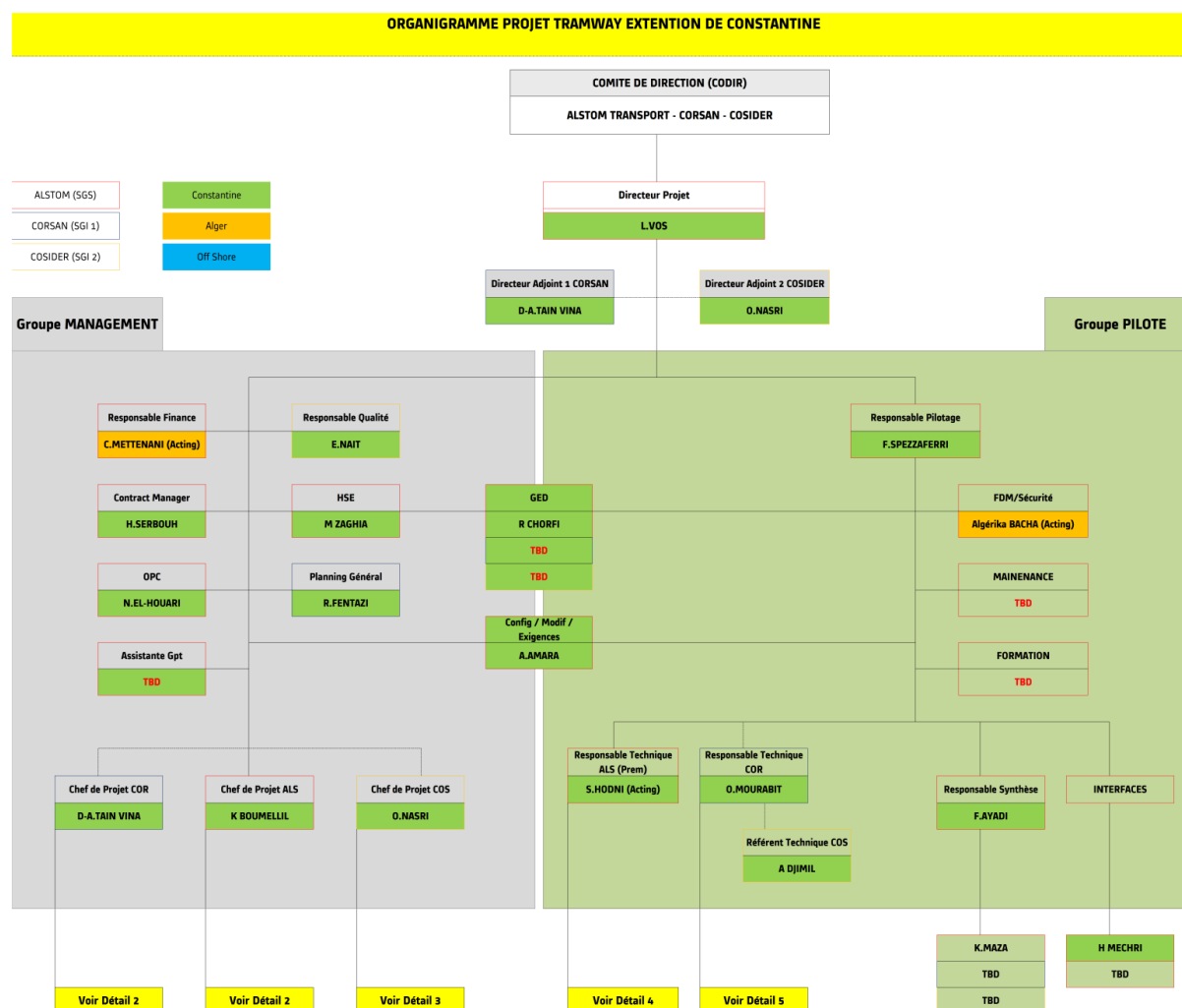


Figure 6.The organisation of the grouping.

3.6 Management process plan used in the extension of tramway Constantine

3.6.1 Management of Communication

☐ Language

The official language used for communication with the Client E.M.A, the members of the grouping or the representative of the maitre of acting work is **French**.

☐ Communication with the client

The Project manager of the Grouping and his two Assistants are the only interlocutors with Maitre of the Delegated Work EMA or with his representative.

For practical modalities (for working meeting behaviour or transmission of documents for information), other communications can be adopted provided that the Project manager of the grouping and the project manager of Maitre of Œuvre are informed and addressees of copies relating to treated subjects.

✓ Adresse provisoire du maître de l'ouvrage délégué,	
EMA	Sis 170 B, rue Hassiba Ben Bouali Alger,
✓ Adresse provisoire du maître d'œuvre,	
Groupeement IDOM/TEC4	Base de vie Zouaghi, Route de l'aéroport 25021 Constantine
✓ Adresse du groupeement,	
Groupeement Alstom/Corsan/Cosider	B.P 64, Cité des frères FERRAD, Zouaghi Constantine

☐ **Communication with others :**

The official communication with the externals defines itself through the direction of the plan of the grouping, mainly for the tax and lawful aspects. For practical modalities, other communications can be adopted provided that the project manager du Maitre de l' Œuvre are informed and addressees of copies relating to treated subjects.

☐ **Planning of meetings**

The objectives of any meetings are to favour communication and decision-making with the intention of making develop plan. A meeting planning is worked out according to waitings and approved by the different parts

-External meetings:

Table 1. Identification of External Meetings

	Intitulé	Fréquence	Participants	Objectifs	Résultats
1	Réunion de coordination « Pilotage »	Hebdomadaire	SGP SGS SGI	Suivi d'avancement des études	Procès-verbal minute de réunion
2	Réunions techniques et spécifiques	A la demande d'une des parties	SGP SGS SGI	Pour appliquer des techniques spécifiques et urgentes ou des décisions de coordination	Procès-verbal minute de réunion
3	Réunion d'interface	Hebdomadaire	SGP SGS SGI	Suivi d'avancement des résolutions des interfaces entre groupement	Procès-verbal minute de réunion
4	Réunion de synthèse	Hebdomadaire	SGP SGS SGI	Suivi d'avancement des études de synthèse et résolution des conflits entre groupement	Procès-verbal minute de réunion
5	Réunion de configuration + FMO	Hebdomadaire	SGP SGS SGI	Suivi d'avancement des FMO et la gestion de configuration projet ainsi que les exigences contractuelles et normatives	Procès-verbal minute de réunion

- Internal meetings

Table 2. Identification of Internal Meetings

	Intitulé	Fréquence	Participants	Objectifs	Résultats
1	Réunion hebdomadaire	hebdomadaire	MOE et MOA CDF ALS COR COS	suivi d'avancement des études et clarifications des performances selon le contrat	Procès-verbal minute de réunion
2	Réunions techniques et spécifiques	A la demande d'une des parties	MOE et MOA CDF ALS COR COS	Pour appliquer des techniques spécifiques et urgentes ou des décisions de coordination	Procès-verbal minute de réunion
3	Réunions d'interfaces externes	A la demande d'une des parties	MOE et MOA CDF ALS COR COS	Pour appliquer des techniques spécifiques et urgentes ou des décisions de coordination	Procès-verbal minute de réunion
4	Réunion d'avancement système générale	Mensuelle	MOE et MOA CDF ALS COR COS	suivi d'avancement des études système et performances selon le contrat suivi d'avancement des études FDMS et performances selon le contrat	Procès-verbal minute de réunion
5	Réunion d'avancement spécifique FDMS	À en convenir avec la MOE et MOA de sa périodicité	MOE et MOA CDF ALS COR COS	suivi d'avancement des études FDMS et performances selon le contrat	Procès-verbal minute de réunion

3.6.2 Quality management

The quality management is more in detail described in plan insurance quality under ref: ETC1-00-A-PAQ.CDF-PR-0001 and software plan quality under ref: ETC1-00-A-PQL.CDF-PR-0001.

Politics Quality: The system quality is the whole organizational structure, responsibilities, procedures, of go about things and of resources to implement the management of quality. The system quality of plan is based on requirements of model «norm ISO 9001 for the insurance of quality in design, development, production, installations and benefits associates», he will have to meet requirements of the Market and its annex 1 «general management specifications» and additional 2 «Diagramme of quality manager».

The grouping is responsible for conception, for realisation and for service of the line. A system quality will be set up under the supervision of the representative quality. He will identify needs in term of material quality (organizational structure, common procedures) to assure a maitrise of requirements of the Contract. The material of the system quality of the Plan of Constantine's Tram contains the following documents:

- ☐ ☐ The guiding diagramme quality,
- ☐ ☐ Material additional quality of the partners, suppliers and of the subcontractors,
- ☐ ☐ The organisation management of plan,
- ☐ ☐ The specific procedures of plan (conception and execution): ALS, HORN, COS
- ☐ ☐ The plans of examination and of controls,
- ☐ ☐ The procedures of reception of installations,
- ☐ ☐ recording quality.

The system quality takes care of all contractual aspects of the Market of Constantine's tram and to show that the grouping has a whole responsibility in:

- ☐ ☐ Approval of plans, of procedures and of methods with EMA, if necessary,

- □ Conception, of manufacture, execution and reception of jobs,
- □ Control of the quality of jobs in accordance with norms, with specifications and with building plans,
- □ Of detection of corrective not compliances and of action launching,
- □ to prove by recording of all that was above-mentioned plan and in procedures complies in,
- □ to lead audits to determine pertinence and effectiveness of the system and that the system is set up well

3.6.3 Process of risk management

The risk management linked to a plan defines itself by an iterative cycle composed of 4 activities, linked to the plan management:

Identification of risks

The Representative for the Management of Risks makes sure of the identification of risks of plan. This list is got or further to different identification meetings at the level of the Group of Piloting and Coordination including the representatives for Sub-groupings or further to annual appraisals or exchanges with the different members of Plan, until all the activities of plan are covered.

Besides, this first task is supplemented by risks identified at the level of every Subgroup. The leaders of Subgroups communicate to the representative for the Management of Risks list of risks identified with their level impact of which has a range on plan. These risks are validated during the magazines of risks at the level of the Grouping and included into the total list of risks Grouping.

Then during the holding of plan and notably during the changes of stages of plan, the list of risks is updated by proving the pertinence of risks beforehand identified and by the recording of new risks. The identification of risks also includes for every risk:

- □ the identification of probable reasons and consequences,
- □ the determination of information characterising this risk (the domain concerned by risk, type of risk, the stage in which the actions of treatment of risk must be accomplished).

This information allows to classify risks and make easier their recognition and the subsequent analyses. This information is defined of a way planed between the Representative for the Management of Risks, the Direction of Plan and other dealers. They are recorded in the register of risks of the Plan, kept up to date by the owner of risk, through chips of risk.

The identification of risks can make risks with the aid of families following:

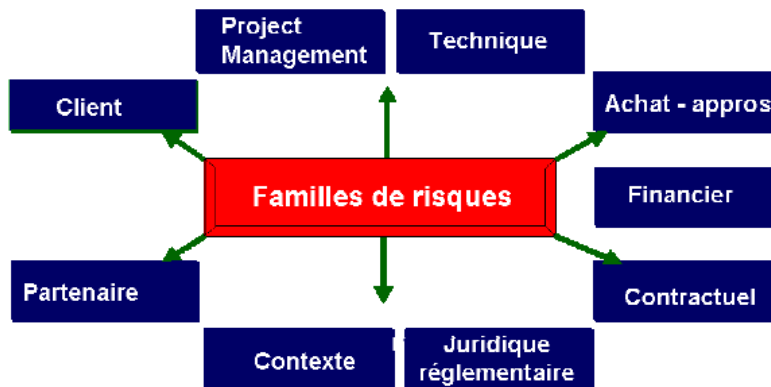


Figure 7. Flowchart of the families of risks.

➤ Analysis and valuation of risks:

It is necessary to estimate the repercussions which risks can cause to plan to be able to act prioritairement on the highest risks. Repercussions are assessed at the same time in terms of impacts and of likelihood of appearance of risk.

Impact is the measure of consequences of risk. The impact of a risk shows itself to best by the following aspects:

- □ Quality / performances: deterioration of the level of a performance envisaged of the product.
- □ Cost: additional cost for plan in comparison with the envisaged budget.

□ □ Delay: sliding of delay in comparison with fixed dates.

Appearance likelihood expresses the degree of possibility of demonstration of a risk.

A detailed analysis of risks is accomplished under the supervision of the Owner of risk to teach as precisely as possible each of risks, their reasons, their consequences and their case likelihood.

The valuation of risks perhaps accomplished in a qualitative or quantitative way:

3.6.4 Management of delays

The management of Planning makes sure of the monitoring of methods and the procedures defined by the Grouping which allow the monitoring of progress of Plan with a view to making sure of the accomplishment of all stages of Plan.

The management of planning will set out to accomplish planning and monitoring of all the stains allowing the execution of the present contract within the limits of Milestones imposed by this one and recalled below.

Table 3. Summary Picture of contractual milestones

Milestones	Date	Description
J1	To + 2 m	Delivery of the following documents: procedures of magazine of the System Tram, Plan of Management of Quality and PAQ, Procedure of management of nonconformities and of modifications, Plan of Management of Material (GED), projected List of the documents of Security, Plan portrays monthly reports of progress and planning, projected list of all technical documents, the projected list of the documents of security (LPDS).
J1b	To + 1 m	Mobilisation on site of the personnel necessary for the starting of the activities of the Pilot and of the research department
J2	To + 5 m	Delivery of the following documents: Specifications of interfaces, planning railway, preliminary Plan FDM by subsystem, Plan of preliminary Service, general Directives for groups and functional subgroups in tools and spare parts, procedure of management of supplies, procedure of management of transport and of shops, plan of management of shape.
J3	To + 10 m	At the end of general studies of execution (basic principles); delivery of the following documents: Plan of Training, list of spare parts and of tools for the Firm Edge.
J4	To + 12 m	At the end of the validation of general studies of execution (basic principles)
J5	To + 22 m	Fine earthwork VRD

J6	To + 14 m	Delivery of the Justificatory File of Security (DSJ)
J7	To + 27 m	At the end of jobs civil engineering structures
J8	To + 29 m	Delivery of the following documents: Plan of interim reception, Trial plan of the System Tram and trial procedures, File of security system (DSS) according to regulation, service Files
J9	To + 30 m	At the end of jobs of the Lot C and of SGF D1
J10	To + 32 m	At the end jobs of the Lot D
J11	To + 33 m	Bet LAKE under high pressure
J12	To + 32 m	Delivery of the following documents: File of demonstration of the respect for objectives FMD, procedure of lifting of reservations, procedure of management of guarantees, File of Security System (DSS)
French television = J13	To +35 m	Interim and delayed reception of following documents: Final File of Security, final Plan FDM and Synthesis FDM File, Material of Works carried out, Technical Material Farmer

□□A partial delay, DP1, relating to the interim reception of the Extension of Remisage is defined to T0 + 12 Months.

□□A partial delay, DP2, relating to the reception of the additional equipment of the line 1, is defined to T0 + 12 Months.

Planning of studies and of execution

The planning of studies and of execution is the result of the strengthening of all the working programmes of every dealer: ALS, HORN, COS and CDF. He is subjected to the Maitre d' Œuvre for approval.

representative OPC (scheduling, piloting and coordination) is charging up of production and monitoring of all plannings, as well as of production of the reports of progress. He is permanent member of the team of Piloting and Coordination which assures the planning of internal benefits the Market and its interfaces, and the interlocutor of the EMA for what is that concern aspects planning.

Guiding planning is got by regrouping or filtration of the activities of detailed plannings.

The plannings of details are organised by nature of activities: studies dress rehearsal, study of details, purchases and manufacture, deliveries, installation, brought into service, material,

training, spare parts and specific tools. At level Grouping, will be established and transmitted to the representative of the MOE the following elements:

- ☐ ☐ The general Planning of Plan,
- ☐ ☐ planning Railway,
- ☐ ☐ The detailed planning of Plan

The effort of planning of the management of costs takes place early in the planning of plan, and sets up the frame in which will be carried out the processes of management of costs, so that these processes are efficient and co-ordinated.

3.6.5 Management of human resources

The management of human resources is made at the level of every member of the Grouping and in accordance with rules in force within their firms.

It is to note that considering the internal rules of every firm at level security of the persons, specific pressures will be able to be imposed: caretaking, call to police force, ban to work at night ...

Human resources, administrative procedures and instructions specific for Plan are worked out and implemented by the manager du Projet in collaboration with structure RH of every under grouping (COS, HORN and ALS) according to recruitment plan.

The management of human resources of plan is within the province of the Project manager in term of:

- ☐ ☐ Definition of necessary profiles for the good of resource,
- ☐ ☐ Selection of the members of the staff and control of their skills if they were allowable,
- ☐ ☐ Identification of supplementary refinement,
- ☐ ☐ Management of the personnel during the extension of Plan

On the basis of the expression of the needs of the Project manager, a recruitment plan is drawn up to meet needs in personnel local and deported.

Following posts are currently defined:

Table 4.Names of attribution of posts

Post	Name	Place
Manager of Plan (Leader)	Laurent Vos	Constantine
Project manager Corsan and assistant leader	Jose Enrique da Silva Figueredo	Constantine
Project manager Cosider and assistant leader	Othmane Nasri	Constantine
Pilot	Nabil Souilah	Constantine
Representative OPC	Mohamed Nabil El Houari	Constantine
Project manager Alstom	Cedric Ben - Ali	Constantine
Representative Risk	Laurent Vos	Constantine
Representative Quality	Esma Nait Abd Errahmane	Constantine
Representative Hygiene, Security and Environment	Massinissa Zaghia	Constantine
Manager of Studies system	Jalil Yahia	Constantine
Manager of Studies civil engineering CORSAN	Oscar Mourabit	Constantine
Manager of Studies civil engineering COSIDER	Hamza Bouttout	Constantine
Administrator of interfaces	Samir Chelgoum	Constantine
Representative Shape	Amira Amara	Constantine
Representative management material	Rofia Chorfi	Constantine
Representative management contract	Hamid Serbouh	Constantine
Representative administration and finances	Chakib Metennani (Acting)	Algiers

3.6.6 Management of Interfaces

From answer stage on the appeal of offer the grouping sets up a process of management of interfaces which will be applied throughout the life of Plan.

Process of management of interfaces

The management of interfaces leans on following processes:

- Identification of interfaces: results on one hand from the analysis of the existent and on the other hand of the need specifications coming from studies system.

- Resolution of interfaces: system of the Transport System applies to the detailed conception of any new interface decided generally during the stages of studies.
- Implementation of interfaces: the installation of interfaces during the stages of building of subsystems and of those of external entities in the Transport System applies to manufacture and.
- Evolutions of interfaces: applies to evolutions of already defined interfaces.
- Validation of interfaces: applies to the validation of interfaces during the stages of test and of validation of interfaces between subsystems / external entities and systems.

The diagramme below present process according to the stages of realisation of plan:

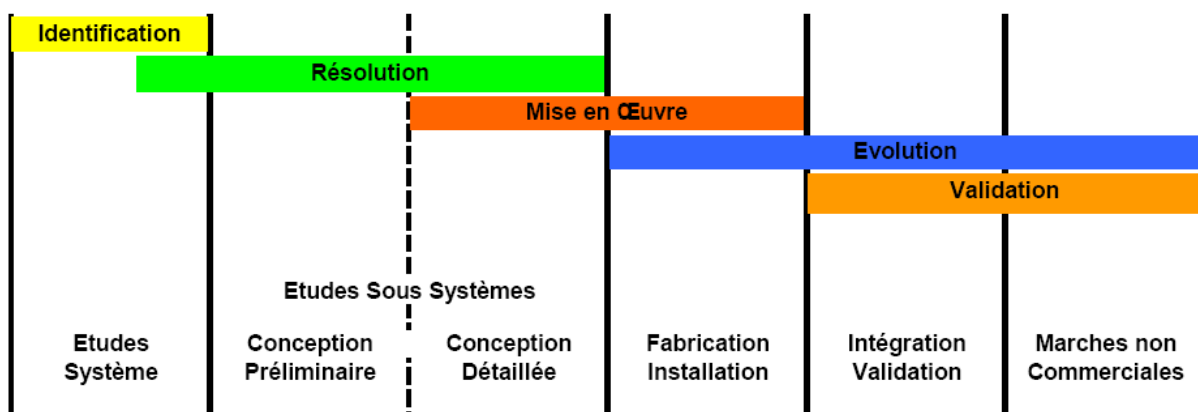


Figure 8. Process of Management of Interfaces.

3.6.7 Process of management of modification

The main aim of this procedure is to assure identification, monitoring and the fence of requests of modifications as part of the plan of the extension of the Constantine's first tramline.

-The objectives of this process are:

- ☐ To make sure of the formalisation of the decision-making process of evolutions of plan in stage of conception and a clear management of evolutions of the market in realisation stage.

☐ To be sure that any modifications of conception are correctly justified, assessed in cost terms and delays, and in keeping with planning and process established.

☐ To be sure that all necessary actors participate in evolution, approval and adaptation of modification;

-Use:

This document is applicable for any entities implicated in the plan of the Extension of the Constantine's first tramline (groupement de la réalisation de l'extension du tramway de Constantine,)

4.Conclusion

However that the grouping applies the approche manageriale for the realisation of the plan of the extension of constantine's tram but he suffers from a delay, swelling of the coc and which re-collides on quality. Of this fact it is necessary to think serieusement has the amelioration of plan process with methodes who admits it.

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Urban rights and sustainability in Latin-America. First steps towards urban justice operationalization.

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Abstract

The following research is based on the affirmation that urban sustainability in developing regions, such as Latin America, is an impossible goal to be totally achieved, due to the circumstances of poverty, informality (slums), corruption, violence, among others that exist there. Therefore, the urban sustainability in the cities of this region has to be reached through survival efforts that seek to balance the existing inequalities (urban justice).

So, the first step to take is to detect and measure those inequalities, in order to be able to take actions to eradicate or decrease them. To do that, urban rights were chosen to be used as measuring tools for those urban injustices. The research presents five priority urban rights contextualized to the Latin-American spatiality, called the Latin-American urban rights (right to a living place, right to the public space, right to alterity, right to mobility and accessibility, and right to good government practices and public policies), that were obtained after analyzing urban and social characteristics in different cities such as Santiago, Chile, Salvador de Bahía, Brazil, and Monterrey, México.

Finally, a first proposal of operationalization of the Latin-American urban rights is presented, which was applied to a case study in the city of Monterrey, México, in order to prove the efficiency of the model.

Keyword: Urban sustainability, urban justice, Latin-American urban rights.

1. Introduction

This paper states that although sustainability is a concept that initially seeks to achieve a common welfare status, this hasn't been able to be achieved due to several reasons, so it is proposed to make a critical review and a re-definition of that concept, in order to obtain more tangible tools that allow us to move forward urban justice in the contemporary city.

The "traditional" concept of sustainable development that has predominated in the political, academic and cultural discourses from the past two decades has been the one of a balance between the economic, social and environmental areas that guarantees the resources of present and future generations.

It is a concept born from the different crisis provoked by the industrial revolution in the XIX and XX centuries, which produced changes and consequences that have generated more negative issues than benefits to the contemporary society, such as environmental depredation, social inequalities and poverty exacerbation, uncontrolled urbanizations, social and urban fragmentation, excessive water and energy consumption, among others.

But over time, the disenchantment has been constant, especially in the Latin-American region, where the expectations of sustainable development haven't been fulfilled in their contemporary cities, which are dynamic, flexible, effective, versatile and global, but are also places of violence, poverty and injustice, with an evident polarization of wealth and power, generating new urban crisis, and a need for staking out a re-thinking of the whole sustainability concept.

The sustainable development concept mentioned above, hasn't accomplished its proposed expectations, because its trialectics of an economical-social-environmental balance has created a "global sustainability" concept, with big generalizations that are applied as a unique "recipe" to any urban problem without taking into account the particular contexts of each city. And that

general concept has lost sight of the interactions and simultaneities that are produced when its three elements crisscross each other, leaving open a lot of possibilities and problems to attend.

Therefore, that global concept of sustainability is an impossible goal to achieve given the mentioned urban circumstances. Different authors in the last years have suggested that the idea of urban sustainability as has been presented, is a utopia (Ruano, 2000) for different reasons, being one of them, that, because the general concept of sustainability refers to a state of balance, in which its economic, social and environmental elements remain stable, it is impossible to apply it to any city environment, which is anything but stable, static and balanced, due to its dynamic, changing, hybrid, and unstable nature.

That is why the efforts to achieve sustainability in the contemporary city don't have to be directed to balance their elements, but to shorten the distance between them, trying to adjust the spatial injustices presented in each specific context.

Another aspect to establish is that, in order to shorten that distance between the economic, social and environmental aspects of sustainability, it is necessary to complement its traditional approaches, which are mostly thought in quantitative terms, that is, the sustainability levels are measured in numeric units (poverty index, CO₂ tons in the atmosphere, deforested hectares, gross domestic product, population census, etc.), which is good and useful, but it needs a qualitative counterpart that can analyze and measure the people and their daily life processes, as well as the aspects of their culture, identity, and the spatial manifestations generated in their different urban geographies.

That is why, it is proposed, that contemporary urban sustainability has to be measured also in spatial units, justice units, and urban rights that allow us to monitor the relationship between people

and their built environments, and with that, help to increase dignity and spatial justice in those environments, contributing to achieve “feasible levels of sustainability”.

When the contemporary sustainability concept ceases to be only “global”, and can have a “local” complement that contextualizes it into the different cities’ spatialities, and in the moment when the sustainable analysis opens its trialectics (economical-social-environmental) and includes justice and considers it as a qualitative counterpart, then, we could talk about a “feasible” and “achievable” sustainability.

2. A proposal for an updated urban sustainability concept

To redefine the idea of sustainability, to a more updated concept, and transform it into an operable concept, that can be useful for urban issues interventions, the first step is to “spatialize” it, in the same way as Edward Soja did it with the concept of justice (Soja, 2010), that is, to generate a consciousness that the geographies in which we live in, can be changed and reconfigured, and with that new consciousness, to “land” the concept from the abstract, to a more specific contexts of the contemporary urban life, giving it different scales (local, regional, national, global), which will allow us to explore strategies to move towards fairer geographies.

The new concept of sustainability has to have the first name “urban”, so that, when we talk about urban sustainability, we will be talking about a spatialized sustainability, not of a concept that belongs to ecology, economy, or sociology.

As a next step in the proposal of this new concept, we must take into account that cities in the world coexist in a division between the cities of the “North”, which act as the global centers from which the power and dominant discourses are exercised, also known as first-world cities; and the cities of the “South”, that are the megacities of the Global Periphery, the third-world, subordinated to the Global North discourses (Roy, 2009; 2011).

So, in the same way that the urban discourses cannot be the same in the Global North than in the Global South, the sustainability discourses and strategies developed in the Global North can't be the same as the ones developed in the Global South. Fernando Gaja (2005) raises about that, that the sustainability challenges in the Global North have to do with making cities attractive, sustainable, integrated, and solidary. But in the Global South, the challenges of sustainability have to do with stopping and controlling the growth of the cities, to guarantee dignified living conditions, such as the access to basic goods and services, or re-qualify the urban environment, because the urban hypertrophy process they experiment, is aggravated due to the absence and non-compliance of urban and economic planning, which has as a consequence, one of the main urban characteristics of these regions: the informal city.

Thus, for the development of urban sustainability as an applicable concept to the cities of the Global South, it is necessary that along with the traditional urban planning strategies, different strategies and survival efforts are also built from the context of informality and the "border" thinking, with all its elements and spatial components, because the urban sustainability cannot exclude the segregation processes produced in those cities' environments, and must include the fragments and different geographies that compose them.

There are authors like Páez and Alexis (2007), that propose that the concept of sustainability opens its trialectics and includes the element of public institutions that propitiate the needed legal framework to face the urban challenges in an integral way, thinking in transdisciplinary terms, in a proactive way that takes action and seeks solutions, rather than analyze problems without making decisions.

In the other hand, Larraín (2002), declares that excluding the political dimensions of the sustainability triad, has been decisive for its failure, and enunciates that a sustainable society does

have to satisfy the needs of present and future generations, but also has to equally distribute the resources, impose growing limits, and above all, deepen in the democracy concept in order to achieve a social and environmental equity.

This way, urban sustainability has to be proposed also as a more open and transdisciplinary concept, that takes into account the multiple dimensions that act in it. When talking about urban sustainability in the XXI century, it is imperative to include the complex realities that each city presents and that makes them unique, because they derive from their own historical, temporal and spatial context.

The next step is to exemplify how the proposed urban sustainability concept can be flexible and focus in different and more specific contexts, that is, inside the Global South, in spite that there are some characteristics and values in common with the Global North, the realities and circumstances are not the same in Latin-America that in India, Africa, or the Pacific Asia. So, to re-think of an operational urban sustainability concept, it is necessary to consider the local aspects of each region. For example, Latin-America is one of the most urbanized zones of the planet: three of four people of this region live in cities, and it is estimated that almost 44% of the urban population of the region lives in informal areas. Therefore, the increasing informality, even in economical recovering circumstances of some countries, is a central subject in the Latin-American agenda because of its implications in the quality of life of the people that live in these areas, the dysfunctions that it generates in the entire urban society, the environmental commitments that entails, and the urban management problems that provokes (Viana, 2007).

And it is not that there have never been efforts to combat complex phenomena such as Latin-American informality, but most of those efforts have a deep background of political and economic convenience interests, that generate isolated and sectorial interventions (construction of social

housing, rehabilitation of deteriorated urban centers, occupation of vacant land and properties, investment in infrastructure and urban services, among others), without a real integration into the broader urban context of the daily life of the inhabitants of the informal city (Fernandes and Smolka, 2004).

This helps to reaffirm the hypothesis that Latin American urban sustainability will be possible only from survival efforts in this context of changes and economic and social processes experienced by this region.

3. An overview of the Latin-American spatiality

The analysis of Latin-American spatiality through cities like Monterrey, México, Santiago, Chile, or Salvador de Bahía, Brazil, made in previous researches (Gómez, 2015; Gómez and Arantes, 2015; Gómez and Arantes, 2016), and the urban-architectural manifestations found there, reinforces what we already know about the region: that due to the economic globalization, the inappropriate release policies and the privatization schemes lacking regulation, among others, are provoking social and urban re-configurations in the Latin-American cities, increasing the contrasts between their “first” and “third” world structures, between the “formal” and “informal” realities that coexist, juxtapose, and mix simultaneously. And, as can be observed in the performed analysis, those contrasts translate into spatial injustices, in some cases, related to security, in others with accessibility and transport, with exclusion and social segregation, poverty, informality, or others. That is why as it has been said before, urban sustainability, especially in the cities of the Global Periphery, have to fight to shorten the distance between those injustices through different strategies.

The researches and analysis performed in the Latin-American cities mentioned before, using different strategies like direct observation, tours through different areas, and a set of interviews with the inhabitants of those areas, allowed to obtain more accurate information regarding some processes of their citizen's daily life. The obtained data and the urban-architectural manifestations found in the analysis, has helped to recognize some particular "habitats" that coexist in the Latin-American city, which are not the only ones, and obviously they take part of a larger urban scale, but were selected as representative for the purposes of this research. These habitats serve to make a more specific and detailed overview, and then, to sketch out a set of urban characteristics that will help in the urban sustainability concept contextualization. The mentioned habitats are the following:

The informal habitat: It refers to the informal settlements, or low-income formal settlements, marginal zones, with an illegal status. They are zones with high levels of poverty, unemployment, crime and socio-spatial exclusion. It is the forgotten city, the inexistent city for the traditional planning and public policies. In some cases, they are in the periphery of the city, and in some others, they are in central areas surrounded by "planned" settlements of medium or high class. They are zones that are stigmatized as areas to avoid by the rest of the citizens.



Figure 1 & 2. Contrast between formal and informal housing in Santiago, Chile (Gómez, 2015).

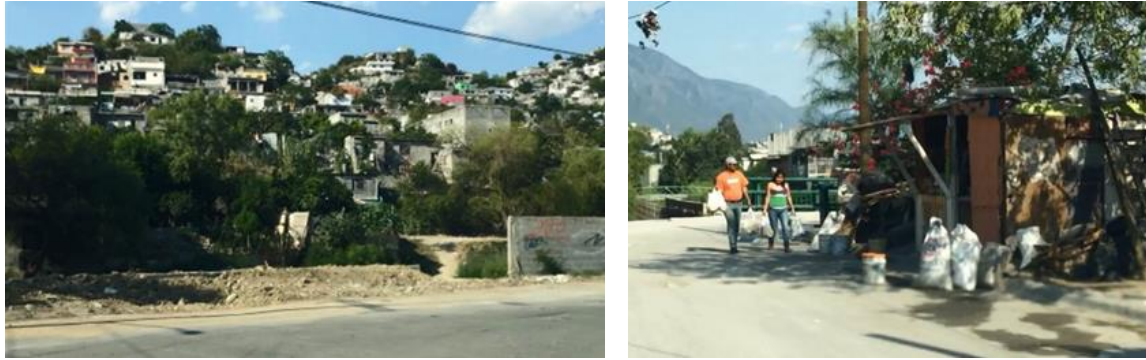


Figure 3 & 4. Informal settlements in Monterrey, Mexico (Gómez, 2015).

The habitat of fear: It refers to the settlements (horizontal and vertical) planned under the capital of fear and paranoia, that is, with urban-architectural elements that seek protection and self-segregation from its immediate exterior context, with high walls and perimeter fences, access booths with security guards, surveillance cameras, electrified meshes, among other security devices. That culture of fear is not only observed in developments of recent creation, but also in older settlements, which, following the trend, modify their existing structure, closing streets with doors and bars, or by building the elements mentioned before.



Figure 5 & 6. Access booths and surveillance devices in Monterrey, Mexico (Gómez y Arantes, 2015).



Figure 7. Self-segregation manifestation in Santiago, Chile (Gómez, 2015).



Figure 8 & 9. Access booth and surveillance devices in Salvador de Bahía, Brazil (Gómez y Arantes, 2016. Gómez y Arantes, 2015).

The formal-traditional habitat: It refers to settlements that are a little older in the city, whose urban structure and architectural design does not present the characteristics of the habitat of fear. These are settlements usually of medium class, with open streets and public spaces, consolidated and interconnected with the rest of the city (XX century urban planning), in relatively central or accessible locations within the city.



Figure 10 & 11. Formal-traditional habitat in Santiago, Chile (Gómez, 2015).



Figure 12 & 13. Formal-traditional habitat in Monterrey, Mexico (Gómez, 2015).

The global city habitat: It refers to the urban-architectural elements that function as urban “amusement parks” for the tourist and the global postmodern citizen that also lives in the Latin-American city. It is the habitat that has the shopping mall as a substitute for the traditional public space, which functions as a node that detonates urbanization of its immediate context. It is the urbanization based in commercial buildings of all sizes, hotels, museums, big office and services complexes designed with modern and avant-garde styles, to give the image of a first-world architecture.



Figure 14 & 15. Global city habitat in Monterrey, Mexico (Gómez, 2015).

Finally, the set of urban characteristics proposed after a more thorough analysis of these habitats is the one that follows:

Latin-American spatiality characteristics

- Informality/urban poverty
- “Border” spatiality: a contrast between first and third world structure
- Hyper-hybridization
- Urban-architectonic manifestations of exclusion and spatial segregation, especially between the “planned” and “not planned” areas.
- Urban vulnerability to natural disasters
- A government weakness regarding the urban planning decision making, and facing the real estate market forces
- Violence, insecurity and war against drug trafficking
- Corruption and a lack of transparency in all government levels
- A very strong urban imaginary of fear and insecurity in every sector of the population
- Deficient or non-existent transport and urban mobility systems

- Little or no regulation regarding environmental impact issues (water management, energy consumption, atmospheric pollution, among others)

This obtained information serves to verify that the Latin-American city is a “border” territory, where we find urban-architectonic elements product of capitalism and globalization combined with elements like informal settlements and urban peripheries.

All of the above contributes to form an image of the contemporary Latin-American city as a city of contrasts between different but simultaneous realities, a city that is not a first world city, nor a third world city, a city in which the limits between formal and informal structures juxtapose, a city that can no longer be planned under the traditional way, or from approaches generated in the Global North. That is why, the Latin-American city needs to contextualize concepts like urban sustainability and justice into more achievable goals, and into efforts of social and spatial fight and survival according to its real context.

4. The Latin-American Urban Rights (LAUR)

Therefore, the proposed unit to evaluate the urban justice/injustice conditions in the Latin-American city is the “urban right”. That unit is derived from the concept of “right to the city” coined by Lefebvre and its re-definitions and updates made by several authors like Edward Soja (2010) or David Harvey (2012).

In order to be able to operationalize the “urban right” as an evaluation strategy, it was decided to start from the reinterpretation made by Jordi Borja (2013), in which he states that the right to the city is a democratic response that integrates the rights of the citizens and the urban criteria that makes them possible, and that is conditioned by the physical and political forms of urban development, stating that, in order to materialize the right to the city into citizen demands, it has to be linked to a critique of the current urban dynamics.

Borja also recognizes that as long as the current urban and political criteria are not replaced by those of competitiveness, social cohesion, sustainability, democracy, participation, and a strong will to reduce social inequities, every effort will only be a good intention. That is why, he proposes a fight for the urban rights as a strategy to give the first steps towards the mentioned changes.

He proposes, then, a catalogue of 21 urban rights to contribute to an urban and political renovation, and to carry out a democratic battle for justice in the cities that legitimate the local demands, and the existing territorial practices, which are listed below:

Right to housing and place, to the public space, to beauty, to collective identity, to mobility and accessibility, to centrality, to the marginal city legitimating, to have a metropolitan government, to political innovation, to information technologies access, to the city as a shelter, to government protection, to justice and security, to illegality, to employment and salary, to environmental quality, to intimacy and difference, to a same-citizen status, to international organizations participation, to transversal information access, and to international associations and governments networks.

This catalogue of urban rights is an important base to re-think the contemporary city in terms of democracy and justice as the qualitative complement of sustainability previously mentioned, establishing this way, a first overview of the various factors that need to be addressed. However, if we want to apply those urban rights to the spatiality of the Latin-American city, they feel incomplete, or a little un-contextualized, because they were stated from an “occidental” and “Spaniard” point of view, due to the cultural and formative contexts of the author.

Therefore, it was decided that a more specific analysis of those rights had to be done, in order to be able to contextualize them, by grouping their intentions and essence, and complementing them

with the Latin-American urban characteristics mentioned before, with the purpose of obtaining the "*Latin-American Urban Rights*" (*LAUR*) that can be used as a more appropriate evaluation tool.

From that contextualization process, it was concluded that the fight for justice in the Latin-American city can be approachable through five general urban rights, that are not the only ones, but they can be the most priority to advance towards a Latin-American urban sustainability to the extent that strategies that involve them are developed:

LAUR 1. Right to a living place: It is not just the right to a shelter or protection, but a right that covers all the basic services needed for a healthy and worthy habitability, with a full freedom of choice their residence place. It's the right to housing with beauty and quality public spaces nearby. Also, that housing has to contribute to strengthen the feeling of community and collective identity. It has to be accessible or connected to the rest of the city, physically and virtually, and has to guarantee security and tranquility through strategies that seek justice and fight crime. Finally, that housing and its urban environments have to be committed to cause the less possible environmental impact.

LAUR 2. Right to public space: It is a right to the free access to quality public spaces, spaces that help to articulate all of the urban fragments of the city, beautiful, democratic and worthy spaces that also recognize and include the existing spaces in the informal and marginal areas of the city. Spaces that strengthen the feeling of community, belonging and identity, spaces that are safe and that allow a connection not only physical between the people, but also virtual through the free access to the cyberspace and the information technologies. The public space has to be designed and intervened taking into account the best practices for diminishing the environmental impact.

LAUR 3. Right to alterity: Is the right to be recognized as a true citizen. The democratic city must be thought in matters of alterity, that is, including the "other". Its discourses and strategies must

accept the difference, multiculturalism, heterogeneity and simultaneity. In the extent that the informal city stops being excluded, and all the citizens are recognized as equal without distinguishing race, beliefs, sexual orientation, gender, migrant situation, social class, etc., the city will move towards urban justice and democracy. It is also about give the same guarantees to everybody regarding security, justice, accessibility, infrastructure and quality of life, and include them in the public policies, giving them voice and decision power over their own urban reality.

LAUR 4. Right to mobility and accessibility: It has the objective of balancing the existing inequalities regarding the access to different transport alternatives in the city, without making one more privileged than the other. It is the right to move and transit freely in the city in the most sustainable and worthy possible way, a right that the city is not planned and designed only for the private vehicles only, but to have multiple and consolidated options for urban mobility, designed to make the citizen's life easier in their daily life activities, diminishing the environmental impact. Accessibility also has to do with stopping the excessive urban sprawl, and strengthen urban nodes/districts to create mixed centralities accessible to every person. Likewise, it has to do with making a city for vulnerable people like elderly or disabled. This right also seeks to guarantee connectivity, permeability, and mobility infrastructure in an inclusive public space that allows virtual free access to the cyberspace and the information technologies. The citizen also has to have freedom of organization and network creation in any level or scale, and has to have access to the government information (transparency).

LAUR 5. Right to good government practices and public policies: Every citizen has the right to their rulers to be in continuous updating regarding practices, government systems, public policies, citizen participation mechanisms, among others, which must be focused into including the demands of the different social movements, civil associations, academics, etc. It is the right to be

considered by the authorities as a first-level citizen, and a right to the government to innovate and update its laws and management instruments according to the realities of the contemporary Latin-American city. A government that has the flexibility of exercise authority with a metropolitan reach beyond the municipal borders, that seeks justice, security and protection of every citizen. A government that is transparent in its actions and movements, without corruption and that not put up actions against the common welfare, but instead, builds associations between the public, the private and the citizens in local and global levels, pledging to watch over the environmental quality in the city.

It's important to note that these five Latin-American urban rights are written in a utopic structure or ideal scenarios of democracy and inclusion, but we have to be aware that achieving a full and complete justice is an impossible and overwhelming task due to the current complexities and the socioeconomic and political conditions, so these rights are not viewed as a set of goals to accomplish in a hundred per cent, but instead, as instruments of evaluation of the urban justice/injustice in the different fragments of the city, and as a guide that point us a direction to follow in the course to a more feasible urban sustainability.

5. Operationalization example in Monterrey, Mexico

According to Anaya (2008), the main issue regarding rights operationalization is that people usually go from enunciating the right to the operationalization process, without making a previous clear and solid definition of the right's content, that is, establishing what does that right implies and what it means. So that, in order to make a more successful operationalization of an element as subjective as a right, it is necessary to establish with detail and clarity its content, identify its components, select a certain number of indicators, and finally, define the measuring technique of each one of them.

With that in mind, an example of the operationalization process of one of the five Latin-American urban rights is going to be presented, establishing its content and elements to measure. The selected right is the right to public space, and from the definition of the right established before, a set of nine elements that compose it is generated:

Right to public space content:

1. Free and safe accessibility to the public space
2. Accessibility, permeability/connection with the city
3. Beauty/Design/quality urban image
4. Maintenance and quality conditions of the public space
5. Strengthen of communitarian identity
6. Security
7. Design and construction with low environmental impact strategies
8. Public space status (formal or informal)
9. Accessibility/connectivity to the cyberspace

And with those 9 elements, turned into indicators, a measuring chart can be created, assigning values from 1 to 5 to measure them, based in the observations, tours and interviews made in the public space that is being measured:

Table 1. Measuring chart example

	LAUR 2. RIGHT TO PUBLIC SPACE	1	2	3	4	5
1	Free and safe accessibility to the public space					
2	Accessibility, permeability/connection with the city					
3	Beauty/Design/quality urban image					
4	Maintenance and quality conditions of the public space					
5	Strengthen of communitarian identity					
6	Security					
7	Design and construction with low environmental impact strategies					
8	Public space status (formal or informal)					
9	Accessibility/connectivity to the cyberspace					

In those 1 to 5 values, 1 is the lowest range value, and is assigned when the evaluated component is nonexistent or is really bad; and 5 is the highest range value, and is assigned when the evaluated component is perceived as consolidated, existent, or really good. For example, if in the “security” component, the interviewed people perceive that their public space is not completely insecure, but neither has a fully consolidated security, a number 3 value would be assigned to it. Obviously, the assigned values are going to vary depending on the perception of the interviewed people, but as it has been explained, this measuring allows us to have a first overview of the evaluated space.

5.1 Measuring example

In the city of Monterrey, Mexico, it has been observed that informal and segregated settlements lack of parks or sports facilities with quality, beauty and accessibility. For that reason, the inhabitants improvise their public space in wasteland, in private land that hasn’t been developed, or at the sides of streams and urban rivers. This is an example from the neighborhood called colonia alfareros, in which the inhabitants use a non-developed land as a football court:

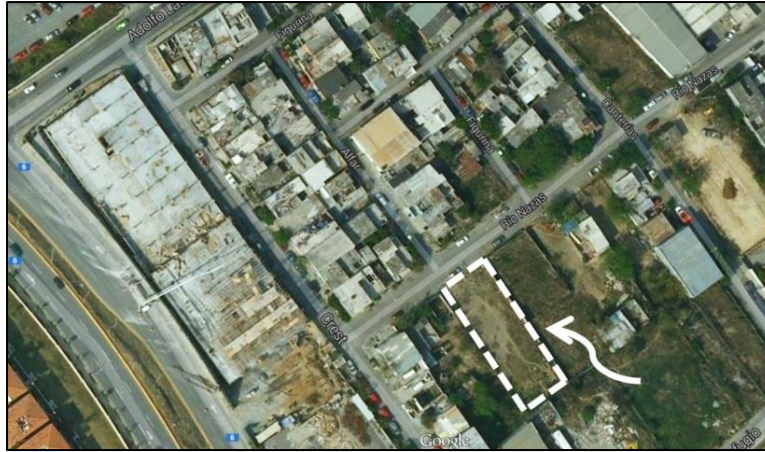


Figure 16. Aerial view of the analyzed space (Google & author digital manipulation, 2017).



Figure 17. Inhabitants improvising a football court in the non-developed land (Gómez, 2017).

This shows us that there is an important necessity of these kind of spaces, but by being an informal settlement, those spaces are not planned by the authorities, and people has to find their own way to create and use them, turning them into active and functional places.

Now, executing the measuring according to the observations and interviews, we proceed to fill in the measuring chart as follows:

Table 2. Measuring chart filled out

	LAUR 2. RIGHT TO PUBLIC SPACE	1	2	3	4	5
1	Free and safe accessibility to the public space					
2	Accessibility, permeability/connection with the city					
3	Beauty/Design/quality urban image					
4	Maintenance and quality conditions of the public space					
5	Strengthen of communitarian identity					
6	Security					
7	Design and construction with low environmental impact strategies					
8	Public space status (formal or informal)					
9	Accessibility/connectivity to the cyberspace					

And with this first overview, we can acknowledge that, in order to consider this space a fair and sustainable space, basically, actions and strategies are needed in all of the components, because there is no component measured in the values 4 or 5. Only the components of accessibility, communitarian identity and security are ranked with the value number 3.

With this guide, a set of punctual urban strategies or public policies, oriented to balance those detected inequalities, can start to be developed and established, so that the public space could have a more feasible sustainability.

6. Conclusions

As specific conclusions, we can mention the following:

Due to the complexity of the contemporary cities, to reach a totally spatially balanced society is impossible, so it is important to work on efforts and actions that help to balance specific mismatches in the analyzed urban fragments.

Traditional intervention strategies seek to solve already produced injustices, instead of intervene and change the processes that produce those injustices, that's why is important to comprehend those processes first, in order to change them and produce different results.

The traditional concept of sustainability, has a discourse that is global and universalist, and its rigid trialectics (economical-social-environmental) and intervention strategies are abstract and hard to

contextualize to the different local environments. Therefore, the proposed concept of urban sustainability has to be a flexible concept, open and transdisciplinary that takes into account the concept of justice and urban rights as a qualitative counterpart that measures people's daily life processes in justice units.

The "urban right" is established as the justice measuring unit, and from its analysis and contextualization process, a set of five Latin-American urban rights were proposed as the more priority to face the issues of the Latin-American spatiality, and an example of how they can be operationalized was presented.

Finally it is important to mention, that this is not a finished research. The operationalization steps are currently being evaluated and taken into practice in others examples. This document only presents a first approach to the subject.

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Catching Up With BIM: A Curriculum Re-Design Strategy

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Abstract

BIM has been discussed widely for enabling collaboration in AEC professions. Its widespread benefits from efficiency to sustainability in design and construction converted it into a primary tool in most AEC education institutions in the last decade. However, Turkey, like a part of the central Europe, remains hesitant in this concern. The majority of schools of architecture have conventional curricula based on fragmented areas of expertise studied separately with disconnected contents, teaching methods, and requirements. This separation not only prevents the students from building links between different contents of sustainable design, but also increases their work load while decreasing their creative potential. Regarding the necessity for collaboration in the growing complexity of built environments, underdeveloped skills in building links between fragmented data bases is eventually becoming a serious problem.

After scrutinizing the fragmented curricula of the schools of architecture in Turkey, in comparison with the integral examples from around the globe, the potentiality of a BIM based transformation is going to be discussed. In order to build a strategy to redesign a curriculum of integration, apparent obstacles and potentials are going to be evaluated, with example cases for the use of BIM as a medium to include environmental and structural information in the design solutions from the second and third year students of architecture at Başkent University. This study is expected to demonstrate how provoking the skill to employ BIM can be to integrate creative educational experience in architecture, at the center of which remains the design studio. The discussion concludes by suggesting pathways to catch up with the growing gap

between the global evolutions of interdisciplinary and integral design thinking through the use of BIM in AEC education.

Keywords: Architecture, Engineering, and Construction (AEC) disciplines, Building Information Modelling (BIM), integration in education, curriculum development, collaboration

1. Introduction

There is a consensus that BIM and its adoption provided a shift in AEC professions (Azhar et al., 2015), which would yield to the transformation of the higher education of AEC disciplines (Briscoe, 2016; Scheer2014; Barison and Santos, 2010; Deutsch, 2017). According to Scheer (2014) the transformation by BIM would lead to a redefinition of an architects' role in the creation of buildings. This redefinition requires the academia to reevaluate the profession and its education continuously. The requirement for the interconnection between the academia and the profession is even stronger today.

Because there is not enough research on the industrial requirements or on the educational opportunities or limitations in Turkey, the need for a study on adapting the architectural curricula to BIM based integration has two motives. The first motive is educational, which is on the opportunity provided for achieving an integrated learning environment, in line with the constructivist educational theory (Jonassen, 1999). And the second motive is industrial, where the construction sector deals with large scale and complex projects and constitutes a leading role in the national economy. The big number of ongoing and future large scale projects of high complexity also require minimized errors in design and construction projects to be delivered in very limited times, without taking project based economic risks.

Although it is known that the requirement for BIM experience is increasing, the number of research studies on the spread of BIM among professionals in Turkey is quite small. However, there is a growing need for a BIM based architectural education, which is the consequence of

the professional requirement for highly complex building and construction process designs and control. One feature of this overall transformation is the multi-disciplinary working environment, where each profession can work on the same BIM model, separately but interdependently. Therefore, the problem of adapting architectural education to prepare graduates ready for a BIM based professional practice is not only about learning to use the BIM software limited with a single disciplines conventional practices.

There are two major research questions that this study deals with:

- How can the existing condition of architectural education in Turkey be transformed to prepare for a BIM based practice of building design and construction regarding the existing possibilities and limitations?
- Is it enough to deal with the problem from the potentials and limitations of the existing conditions or is it a paradigm shift that is required in the overall understanding of architectural education?

The discussion is based on the potential of BIM as a medium for resynthesizing architectural knowledge as a comprehensive whole for an integrated learning environment in the educational settings.

2. Recent approaches to BIM in higher education of AEC disciplines

As Azhar et al. (2015) put it, the practical implementation of the BIM tools started in the mid-2000s the technology of which is based on the technique of object-oriented parametric modelling. The authors explain what parametric is, with its feature that when a change is made in an object results in necessary changes in other objects, with which it has previously defined relationships. (Azhar et al., 2015). It is this feature of BIM that made it a central concern in AEC professions, which resulted in increasing number of schools that started to implement BIM into their curricula. In order to understand the current trends in this implementation, many

researchers continue conducting surveys regarding the educational realm (Barison and Santos, 2010; 2012; Adbirad and Dossick, 2016; Becerik-Gerber et al., 2011; Joannides et al., 2012). As Adbirad and Dossick (2016) state, the transition of education under the BIM influence occurred mostly as the transition of CAD teaching courses to BIM teaching courses until 2010. According to the authors, after 2010, the process of integrating BIM into core courses begun, shaping the curricula with regards to the industry participants' and academics' views on BIM. As the author state, most recently two major themes have emerged. One of them is related with the cross disciplinary collaboration and the realization of these practices in the educational curricula. The other one is based on the in-depth analysis of innovative pedagogical strategies (Adbirad and Dossick, 2016).

Based on the general conception that sees BIM as an instrument of a paradigm shift in architectural practice and education, Barison and Santos (2010) focus on how the universities around the world deal with the introduction and/or integration of BIM into their curricula. As the authors put it, by 2010 the integration of BIM into AEC curricula had reached a range of eight categories, as depicted by the authors, some of which occur together in some programs: "Digital Graphic Representation (DGR); Workshop, Design Studio; BIM Course; Building Technology; Construction Management; Thesis Project and Internship."

Becerik-Gerber et al. (2011) have also made a survey across the US schools of higher education of AEC disciplines in 2009, which depicted that an overall 56% of all programs in their survey had offered BIM courses, which had started earlier in the schools of architecture. It was in that survey that the authors depicted that almost all of the programs which had not yet included BIM in their curricula were planning to incorporate BIM into them within a year or two.

It is interesting that Becerik-Gerber et al.'s (2011) study depicts that in 2009, in many architecture programs, BIM was assumed to hinder creativity. The article does not give a specific reason for this belief but what the authors state by quoting from Denzer and Hedges

(2008) is important, which indicates that the biggest challenge for design instructors is the new teaching methods required with BIM. This might mean that it is not BIM that hinders creativity, but the current educational methods require a transformation to fulfil a creative insight to be achieved via BIM. These methods are mostly about employing BIM as a teaching tool to demonstrate the course content (eg. construction detailing) on the BIM model. According to Morton (2012), BIM has a creative potential starting from the early conceptual design and academia has to fulfil it.

3. The predominating role of collaborative design in BIM implementation

With the feature of object oriented parametric modelling (Azhar et al., 2015), BIM supports the concept of Integrated Project Delivery (IPD), which means collaborative building design and construction practices. As he states, it requires the multiuser access to the BIM model to integrate multidisciplinary information in the same model (Azhar et al., 2015, 24). This is interoperability of a BIM software referring to its ability to provide working media and feedback to all of the stakeholders of the project through a single BIM model. This feature brings the opportunity of collaborative design, in which the design task is divided into parallel sub tasks that can be progressed simultaneously. Division of labor is the sharing of problems into the sub problems of different professional databases. That the task is not completely separated which is the essence of collaborative work, instantaneous feedback and test outcomes can be utilized for faster and flawless problem solutions. As Kozar (2010) explains the direct interaction of collaborators is different than cooperation where different parts of a problem are solved separately and then brought together. In line with this state Azhar et al.:

“BIM represents a new paradigm within AEC, one that encourages integration of the roles of all stakeholders on a project. This integration has brought greater efficiency and harmony among players who all too often in the past saw themselves as adversaries.” (Azhar et al., 2015, P.25)

According to Kymmell (2008), The relation between the complexity of a real life architectural design problem and BIM based design process should be included within the educational curricula. He regards collaboration as the fundamental principle to the whole BIM process and asserts that “learning collaboratively is excellent preparation for the psychological mind set necessary to work with the BIM process.” As he underlines it, team building and processing is not a natural skill, it has to be developed (Kymmell, 2008). If the students do not acquire the experience of team working in collaborative design project solutions during their educations, they will not actually fulfill the required BIM skills even if they have learned how to use a BIM software in an advanced level.

Deutsch (2011) also underlines the importance of knowing how to collaborate and integrate the design working process. He cites from Charles Hardy, the director of GSA Office of Projects Delivery, about his statement asserting that only 10% of BIM is technology, while the remaining 90% is “sociology”. He uses the terms “mindset” and “attitudes” for expressing the state of readiness for BIM implementation as the ultimate necessity (Deutsch, 2011). As Becerik-Gerber et al. (2011) assert, the problem of collaboration and IPD is not only the problem of the schools of architecture. As a result of the literature review that they have conducted they state that today’s engineering graduates are also required to have developed team-working and multidisciplinary collaboration skills. Moreover, the authors have depicted that the rate of multidisciplinary collaboration was lower than expected (Becerik-Gerber et al., 2011).

4. The relation of educational transformations with the industrial requirements

Azhar et al. (2015) assert that BIM is a revolutionary tool for AEC industry. Likewise, Briscoe (2016) regards BIM as a source of inspiration that is potential to change how architecture is perceived and practiced. According to him, it was when CAD dominated representation in architecture that information became fragmented (Briscoe, 2016). According to Scheer (2014),

the separation of design and construction that dates back to Alberti in Renaissance, has come to an end with the replacement of drawing by simulation provided via BIM. What he means by this merging of design and construction is involving the construction and technical data at the early stages of conceptual architectural design. This might even include, as Leon et al. (2015) exemplify, the inclusion of other disciplines as consultants or design team members at the conceptual design phase. This depiction of merge after a long break since renaissance is worth attention as it also means that in architectural education this integration is also inescapable and is going to become fundamental.

Collaboration is an ultimate part of IPD and the concept of integration requires as much attention. Briscoe (2016) points to a different facet of collaboration, which is not real collaboration but requires attention for the integrative role that it takes. As he states, the case of downloading BIM objects from the manufacturers' object designs, which is now possible with the shared BIM content, makes it possible to host another designers' highly detailed and informed system design in the definitive BIM environment. As he puts it: "This exchange suggests a culture of collaboration, so to speak, in borrowing information from the workflows, opinions, and values of others (Briscoe, 2016)."

According to Scheer (2014), simulation is replacing representation, by which he means the tools for thinking for design solutions have been exposed to a shift by the adoption of BIM and computational design in the AEC industry. When taken from the educational perspective, it is important to understand that adopting BIM especially for constructional and structural information based courses at least partially for the beginning is essential.

As Deutsch (2017) asserts, it is not only the tools but also the current state of the design community that leads the convergence in building design, fabrication, and construction. By convergence he means two or more things evolving together into one. He expands this concept of integration with its three features: simultaneity of the real time decisions, superintegration

of collaboration practices, and convergence of attitudes – approaches in building design and construction. He expresses the shift in architecture with this new converging nature of the profession (Deutsch, 2017). Convergence as he discusses it, implies the change in the way that architecture is practiced and how architects are educated. In line with Kocatürk and Kiviniemi (2013) Deutsch also argue that this is a process of transformation which requires the reappraisal of architecture.

There seems to be a one way relation in between the industry and academia, which results in AEC education responding the expertise requirements of the industry. Looking from this perspective, academia in general remains short in catching up with the required developments in industry. The reason for this is that academia is assumed passive in generating knowledge on the problem of integration in building and design construction processes. Regarding this misconception, Becerik-Gerber et al. (2011) argue that AEC education must take the leading role in the shaping of industrial requirements rather than trying to answer the arising industrial requirements.

5. The current condition in Turkey: integration of BIM in the curricula

It has been almost a decade now since Becerik-Gerber et al. (2011) completed their survey across US, the results of which were given above, and in contrast with it still there is not a significant rise in the number of studies on the reflections of BIM integration in the higher education of AEC disciplines in Turkey. Türkyılmaz's (2016) article is an example for BIM integration in architectural education, which explains the objective of the BIM course of a university in İstanbul, Turkey as the consistent production of the complete set of building representations and documentation. The author expresses the capabilities brought by BIM without including the multidisciplinary collaboration feature. Nor does he explain the practical and cognitive outcomes of the integrating function of BIM.

However, this single example should not mean that there is a dominating ignorance for the integrating role of BIM in Turkey. Indeed, Türkyılmaz's discussion is limited with the individual design practice of a single discipline, because of the current state of the educational curricula. Being aware of the potentials and requirements of BIM integration, Meterelliyoğlu & Özener (2017) argue that the use of BIM in education should not be limited with drawing, production and visualization and that the predominating potential of BIM on integrated design should be considered as a pedagogical input that can transform education. Based on this motive, the authors have analyzed the existing curriculum of a school for its early stages of architectural education to understand the adaptability of BIM based pedagogy, and it included understanding the convention of the courses on building systems and construction detailing. This is an example of what to do when BIM integration is late in architecture education.

6. The reasons for delay in integrating the curricula

To explain the problems of architectural education, Barison and Santos (2010) cite Fien and Winfree (2012) for their depiction that higher education of the AEC profession has been slow in adapting to technological expectations of the industry. As expressed earlier, one reason could be the attitude of academia on misleading its role and merely trying to catch up with the requirements of industry. This indicates a lack of academics that understand the inevitable transformation caused by the new paradigm of IPD and the collaborative nature of building design caused by it. Regarding this, Mandhar and Mandhar (2013) criticize the way schools of architecture uptake BIM technology for the general misunderstanding of its overall application. They put forward two possible reasons for this problem: the first is the lack of competent staff to teach BIM thinking and the second is the indecisiveness between teaching a software or the technology and process behind it. As the authors state, the implementation of BIM "...can only be achieved with a coordinated effort between teachers, the school, senior management and the university, as pedagogical changes for integrating BIM will need departmental or even inter-

departmental restructuring to ensure that it is well integrated within the curriculum and is taught effectively by staff who have specialist knowledge and a background in the subject area (Mandhar and Mandhar, 2013).”

As an example of a slow transformation towards the BIM methodology, Boeykens, et al. (2013) express the case of Belgium as not being able to convert the methodology from mono-disciplinarity to cross-disciplinarity. They argue with reference to and in line with Lockley (from the NBS Building Information Report (Anon, 2011, p.20+21), that the educational institutions have a big role in the transformation towards a BIM based education, which would include learning the mind for cross disciplinary collaboration.

In their systematic literature review, Adbirad and Dossick (2016) indicate that the research articles by the authors who focus on the future of BIM based education in AEC courses were advocating that solely mastering BIM software in a BIM course “is not effective for long-term BIM implementation.” But the BIM software skills are desired by the industry professionals as developed in the university education. The authors argue that BIM instructors should cover both (Adbirad and Dossick, 2016).

As Barison and Santos (2010) cite from Taylor et al. (2007), BIM has the potential to take place throughout the program, which would mean at every level and for many differentiated content. This is where the integrating role of BIM is coming from. However, the research that Becerik-Gerber et al. (2011) conducted in 2009 revealed that BIM was mostly used in design visualization and constructability activities. The most common reason for not having integrated BIM in the curriculum is the lack of the required teaching staff.

Kymmell (2008), puts forward another requirement for BIM integration. In his “recipe for successful learning” of BIM, he gives the example of BIM curriculum at California State University, Chico as a developed one. Based on the evidence he gives from that example, he asserts that success in learning to use the potentials of BIM requires motivation and full-

heartedness (Kymmell, 2008). This may include the projected learning outcomes be reevaluated for a meaningful integration based on shared objectives where the courses meet at a comprehensive meaning within the students' overall educational experiences. The expected learning outcomes of integrated education would include self-competency resulting from knowing where to find what is looked for and knowing what is missing, knowing how to consult and using a simulation medium to test the proposals.

Another reason behind being late in transition is little or no teamwork or collaboration. However, the opportunities brought by BIM would also have merits for improving architecture students' creative skills. In a previous study, the positive feedback of structuring the design process of ill-defined problems was discussed (Açıkgöz, 2015). The idea that team working needs a structured process for interactive and uninterrupted communication among the team members to fulfill the opportunities provided with teamwork was supported with the findings of a case study. The findings of that study could also be supportive for asserting that the nature of architectural knowledge is demanding collaborative work for the development of competency through creative act.

7. The risks of fragmented curricula:

Learning in architecture is a personal task (Acikgoz, 2010). It includes students' personal educational experiences, developing their personal libraries; content libraries, portfolios, lecture notes and the like. A student has a set of information and products that belongs to his educational experiences most of which reflect the content of his/her learning. When this is the case, the fragmentation of educational experience provides the students with exhausting and time consuming challenges to start the technical research for each project from scratch and complete the process mostly without fulfilling the minimum requirements for technical issues.

Türkyılmaz (2016) states that BIM is only used for the design studio practices in architectural education. In line with that, in the course that he explains, the IFC format has a specific place in the curriculum (Türkyılmaz, 2016), but its merits for BIM based multidisciplinary collaboration during the design and construction processes is missing. This indicates the extents to which fragmented curriculum may lead the opportunities provided by the BIM tools towards a misdirection. Deutsch (2011) seems to ask the right question regarding the current curricula about BIM and integrated design: “What, in the learning process, needs to be unlearned?” According to the author, the problem of implementing BIM in education is not about learning software, but about becoming familiar with the collaborative process and the concept of integrated design (Deutsch, 2011).

In order to understand the span of the problem caused by the fragmentation of the content of architectural design, it is necessary to understand the content of student experiences in their educational settings. A comprehensive content analysis was not made for this study, but to draw general perspective, personal experiences as an educator, and a former student of architecture in Turkey, who has experiences of study and work in three different schools of architecture, can be used to pose the question about the problem of disintegrated education. For example, the following picture of student experience is worth of attention.

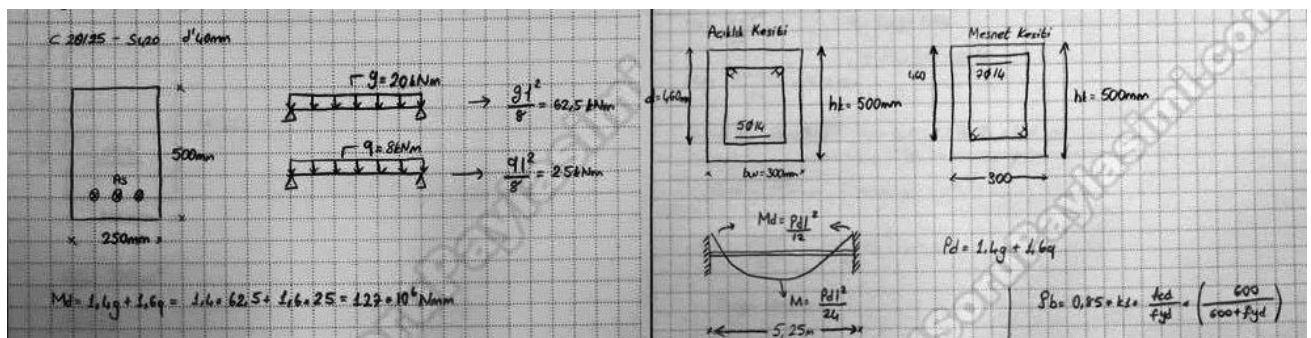


Figure 1. Portions of typical answer sheets of the reinforced concrete elements' section calculations and moment diagram (Source: sorupaylasimi.com)

The third year students of architecture in their course on “structural design in architecture”, make the sectional calculations required to understand the dimensions and steel reinforcement, due to the forces acting on a single reinforced concrete element in a written exam (Figure 1). In the same week, they take critics for the solution of a concept design that does not have a structural support system yet for their design studio course. This is the educational realm experienced as a student, and observed as an instructor of 15 years which has not altered a little in this period, and which is the literal outcome of the problem of disintegrated curriculum. A similar picture can be drawn for the courses on energy efficiency, architectural history, material and construction systems, and even for city planning courses. This is a problem of not acquiring the experience of integrating knowledge, which not only endangers fulfilling the changing requirements of AEC professions. Regarding Kocatürk and Kiviniemi’s (2013) argument on how architecture should contribute to the development of BIM thinking, it is possible to think that it also threatens the disciplinary existence of architecture as a profession.

7. Displaying potential for integration through samples of student works

The research method of the study is based on sampling the 3rd and 5th semester student works for displaying their potential for an integrated curriculum design. The 2017-2018 Fall semester was the first semester that the students of the Department of Architecture at Başkent University were introduced with a BIM course in the curriculum which was converted from a former CAD course. It is important to state that none of the students from the 2nd or 3rd year had a previous experience in any BIM software before taking the courses. Fortunately, there were different courses for these two different grades that focused on CAD based representation and modelling. Therefore this semester could be the semester of implementing BIM into the curriculum of the department from scratch.

Figure 2 displays three examples of the works of the fifth semester students, who were 75 in total number. The works are the outputs of the final examination of the BIM course that lasted

for 90 minutes in total, in which the students were asked to design a mass model of a high-rise building with a base, convert it to a BIM project and submit in an A0 size designed sheet in pdf format including renders, elevations and plans. 90 minutes is a very short time to prepare and submit a conceptual output when compared with the traditional design and representation media or CAD. The outcomes were mostly valuable because they displayed the speed of working with BIM, which is going to become a fundamental requirement especially in multidisciplinary collaboration.

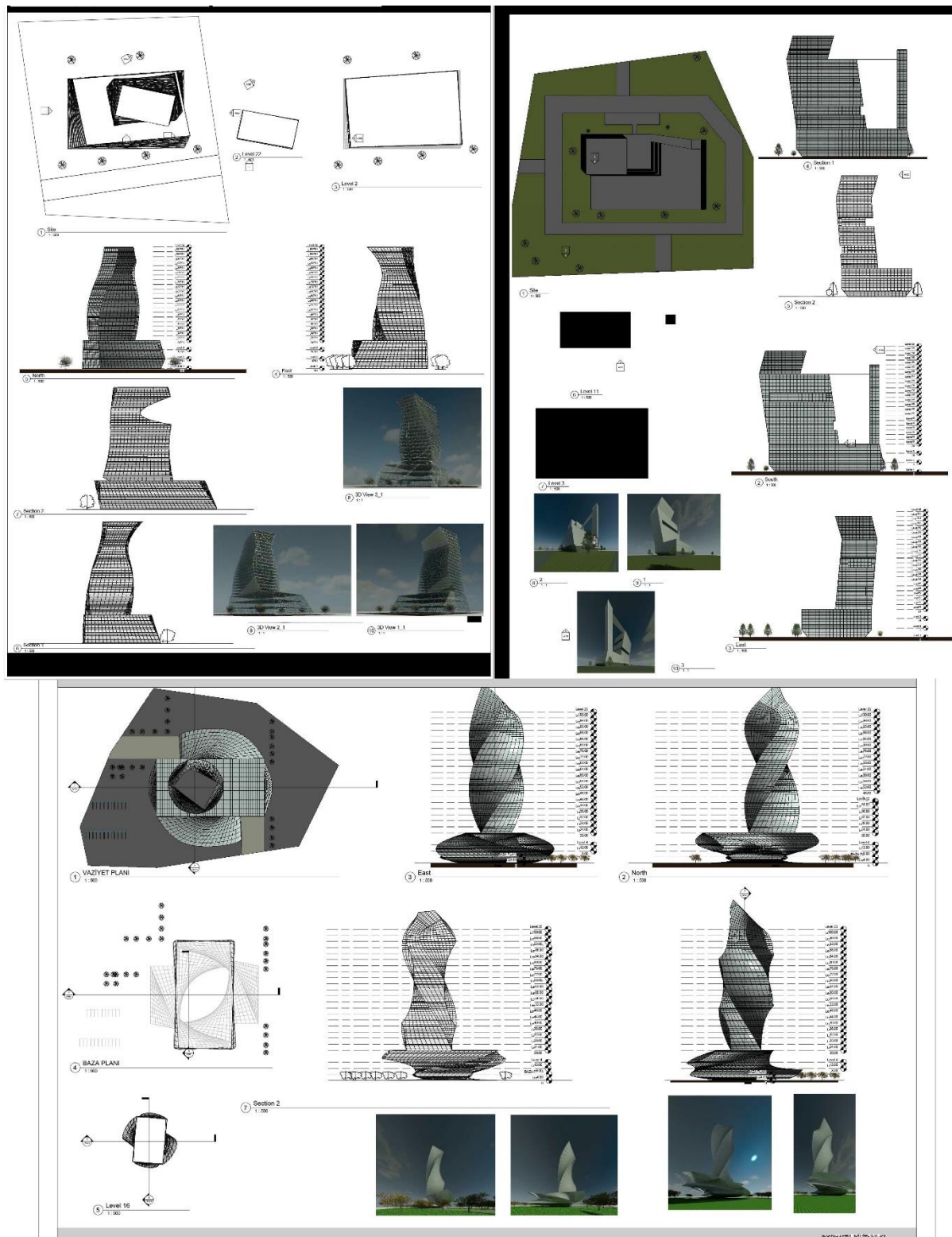


Figure 2: Three of the total 75 5th semester students' final exams' presentations

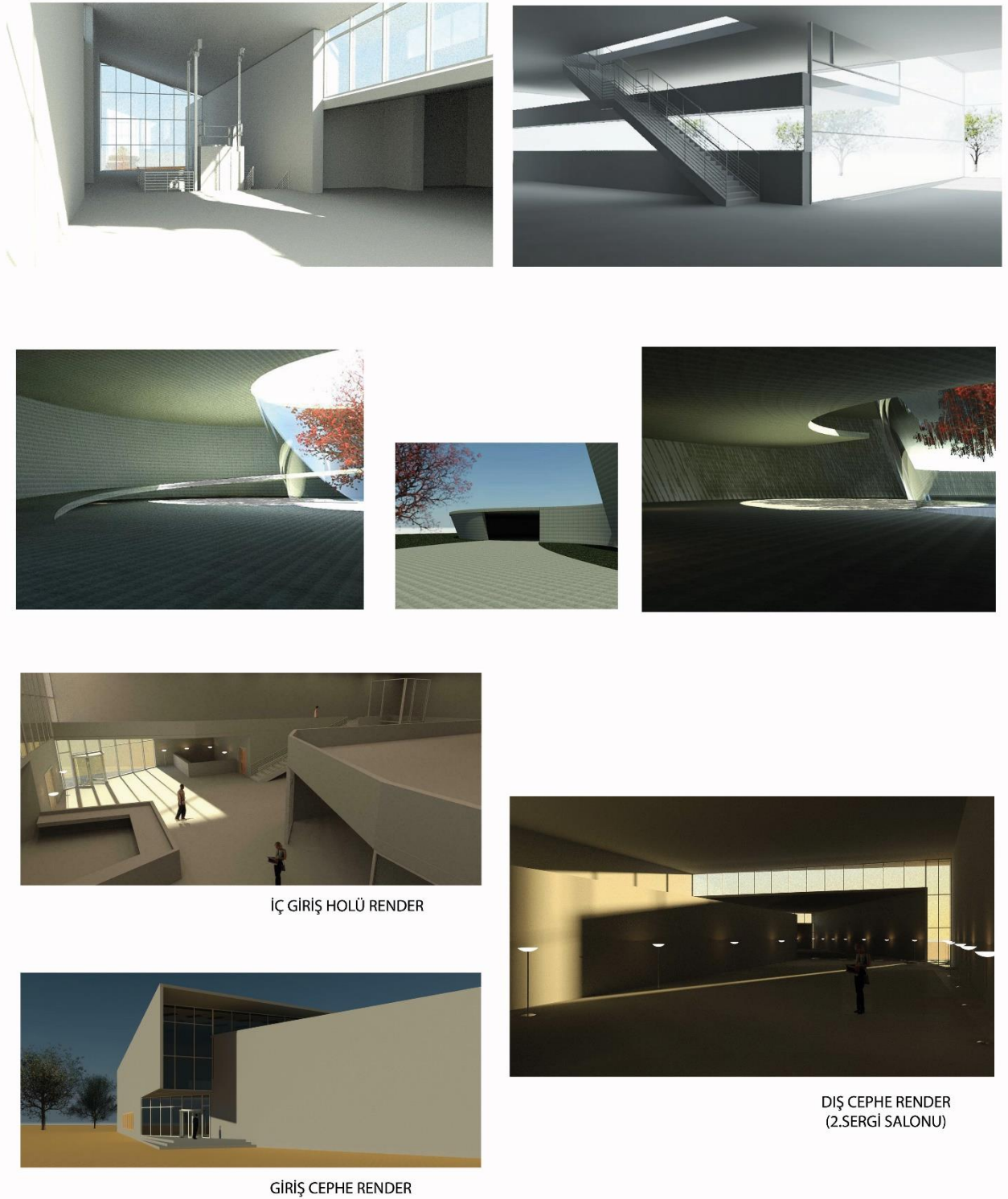


Figure 3: Sample BIM model renders given to express the solar conditions of the 3rd semester students' final design studio projects.

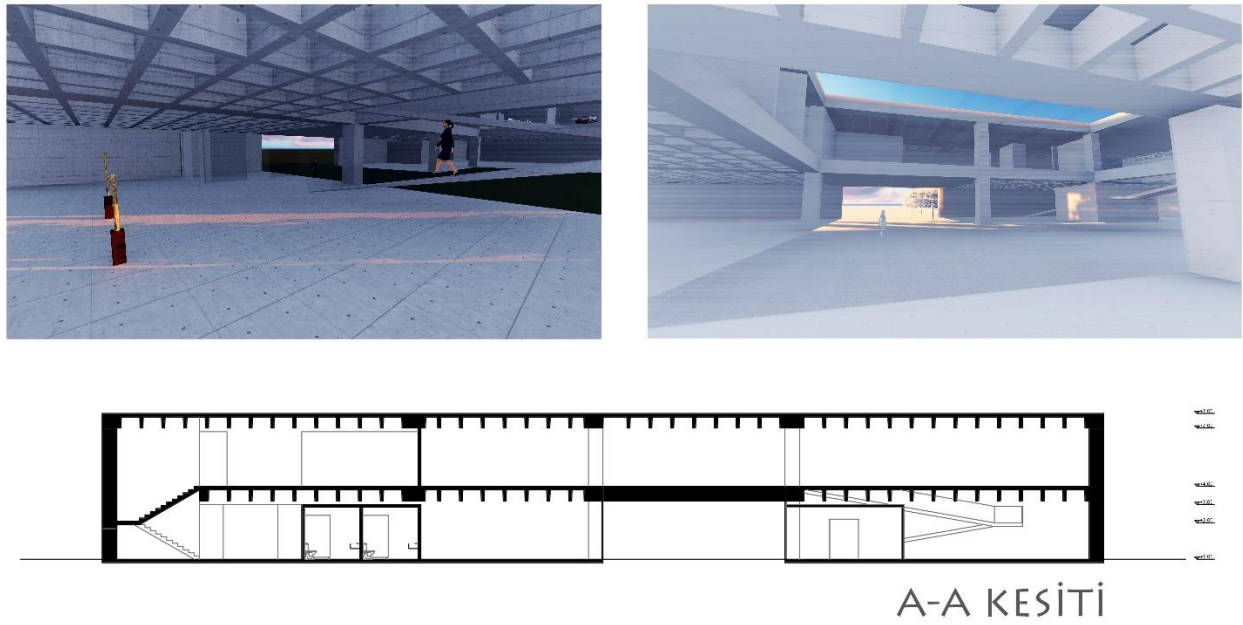


Figure 4: Sample BIM integration in the design studio of 3rd semester students.

In their 3rd semester, the students of architecture take a must course on basic construction principles and solution methods of structural systems including reinforced concrete. In figure 4 a student has integrated her structural design knowledge into her design studio experience through the use of BIM.

The given examples from Başkent University Department of Architecture display the consequences of implementing a BIM course into curriculum. It is evident that the students are enthusiastic about integrating their knowledge base in the design studio, which has been regarded as the core of architectural education for a long time. It is important to note that there was not a specific requirement for this integration by the instructors of the department. The question is what would happen after a fully integrated curriculum in architecture after managing to solve the limitations mentioned above could be overcome.

8. Conclusion:

Being late in adopting the required transformations in AEC education has many disadvantages in terms of catching up with the developed and progressed merits of integrated building design

and construction in education and in practice. However, it also has an advantage, which is being able to reach the researches on schools of architecture that have overcome the obstacles of teaching BIM.

One of the most important findings that should be kept in mind is the depiction that academia should take the leading role in determining the development of BIM based integration from industry (Becerik-Gerber et al., 2011). This requires in Adbirad and Dossick's (2016) words, the in-depth analysis of innovative pedagogical strategies to get prepared for coming to the grounds of studying the cross disciplinary collaboration and the realization of its practices in the educational curricula.

Being a BIM instructor of five years' experience, it is possible for the author to argue that the long-term BIM implementation cannot be possible without being competent with a BIM software at least at the intermediate level, however, the objective to acquire the software skill may have limitations of its own, like feeling limited with the previously reached solutions of the software. Therefore, there should be a practice based instruction on the BIM software, but understanding the BIM thinking is necessary if the students are expected to use BIM as a design tool for creative processes in their own design work. This means that they have to be explorative for differing potentials, opportunities and limitations of the tools that they are using in order not to be controlled by what the tools can do.

However, in order to answer the need for collaborative design experience in monodisciplinary and interdisciplinary educational settings, the curricula should be examined for the existing material to adopt accordingly. For example, As Azhar et al. (2015) put it, BIM provides sustainable design analysis at the pre stages of the design, which is as they put it, the most critical phase for decisions on sustainability features (Azhar et al., 2015, 22).

This is important regarding Becerik-Gerber et al.'s (2011) study which examines the sustainability based courses with their integrating feature, having a relevant solution base to be

converted to BIM based courses. The sustainability and sustainable construction courses also have an interdisciplinary span of content.

A BIM based curriculum requires a structured process of collaborative design study. But where this collaboration starts and how the team working experience can be a part of an integrative curriculum are the questions that need to be answered. It is however apparent that BIM can be used as a tool for architectural curriculum to transform from the system of fragmented content to an integrated education.

The integration requires experience; students' experiences must be the base to integrate different content. But is this experience only building a BIM model, or building it collectively in the design studio? Kymmell's (2008) recipe for successful learning would not work if the students are more motivated in the design studio than in the courses of other fragmented content.

According to Deutsch (2017) the result of convergence in AEC professions must be more than only increased efficiency, it also leads us to a future where the boundaries between AEC professions are mostly blurred or disappeared. Therefore, assuming the completion of the catch-up with BIM implementation in education and even the state of leading the AEC professions, it would be reasonable to get prepared for redefining the AEC disciplines including architecture and questioning their fragmentation too.

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Keeping the Pulse of Heritage Awareness in Ankara: Two Historic Sites, Two Interventions

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Abstract

How heritage is preserved and transmitted to future is heavily dependent on the responsible awareness of its local society. Transformations in a historic urban landscape (HUL) are intervening into its collective memory, affecting its social sustainability and resilience. This paper considers two of these cases from the historic district of Ankara, namely Hacıbayram Square and Hergelen Square, to see whether the demographic changes in the society has a similar consequence on the public awareness of the historicity and heritage values of their sites. The first case, which is a cult site of heritage, history, and religion, was previously studied. This paper explains the study for the second case, Hergelen (İtfaiye) Square with a more recent historical significance, and interprets the outcomes of the two studies tieh their differing and common aspects. Hergelen Square has been exposed to a series of demolitions, two of which are the foci of this work: the Bank of Municipalities building, a heritage monument from the early republican era of Turkey, and Otto Herbert Hajek's sculpture. The questionnaire outcomes of both independent surveys demonstrated that as the educational level of the participants decreased the admiration for the transformative interventions increased. However, being identified with different priorities and functions, the case of Hergelen Square, when considered with its past and former intervertions that it has been exhausted to, implicated further insights about the problem of integrity of the HUL of Ankara.

Keywords: the Historic Urban Landscape (HUL) approach, community values, social sustainability, social resilience, cultural integrity

1. Introduction

The idea that cultural heritage should be considered within the complete landscape that it constitutes a part of has been generating a series of implementations around the Globe. It is the awakening that admits conservation of cultural objects in isolation has a destructive effect for cultural and urban integrity (Turner and Tomer, 2013). Integrity is a key concept which is used to explain the conditions where things are meaningful for those who see, appreciate, and live with them (Ripp and Rodwell, 2016). This appears to be the reasoning behind the HUL approach in which the responsible awareness of the people living in that specific cultural landscape. This study explores the question why and how the interrupted urban integrity can be dangerous for the heritage objects in a cultural landscape on the example of Ankara.

This study explores Ankara's historic integrity through the final intervention applied in the Hergelen Square through the framework of the HUL approach, and considers its survey outcomes together with a previous survey on the public perception of the heritage value of another historic site in the same district. These two sites have been subject to similar scales of interventions recently that represent a greater scale of transformation together. Given the HUL based role of local communities on urban preservation of a city's historic integrity, this study is based on the research question that asks whether the social awareness of and responsibility for cultural heritage preservation in the Historic Urban Landscape (HUL) of Ankara is affected by major transformative interventions in its historic sites. An indicator for this affection is the responses of the public to these interventions.

On a search for how these interventions are conceived by the public, it is possible to come across with the declarations of academics or institutions representing the experts of urban planning and/or architecture as reactions against the illegality of these interventions, their

effects and consequences. On the contrary, a majority of the public press and declarations of local authorities have a completely different discourse about the way they comprehend the transformed environments. Therefore, the polarity in-between these two opposing perceptions makes it necessary to research on the actual comprehension of the public for the causes and effects of these interventions. The public has a shared memory of these sites under transformation embracing their pasts, ongoing transformative interventions that they were subject to and these two opposing perceptions on these interventions. Hence, the current perception of the public may provide an insight about how these interventions might change the way HULs are conceived by the local public.

The questions that arise from this need are threefold. The first asks whether the residents of Ankara valued a former intervention in Hergelen Square as a part of their cultural perception for the city. The second question asks what consequences the former disintegrated solutions have for today's citizens. And the third one asks whether a comparison of the outcomes of the independent surveys on the public perception of the historicity of two different parts of the HUL of Ankara display a common indication about the effects of interventions in the public awareness for cultural heritage.

In order to achieve the required answers, a public survey on the Hergelen (İtfaiye) Square in Ankara was applied based on its shared memory among Ankara's residents and their conceptions about the recent transformations. The results of the survey were considered together with a previous study on the cult historic site of Hacıbayram Square and the public perception of the recent transformations applied on it.

2. The problem of interrupted urban integrity

Problem of interrupted urban integrity is expressed by Ripp and Rodwell (2016) as the condition of destroyed systemic properties, where the system is divided into isolated objects or concepts. This isolation is a result of leaving the responsibility of having a perception for

heritage protection to a very limited community of experts. It also means the dissolution of the links between heritage objects and the contexts that renders them as meaningful parts of an integrated whole. As Ripp and Rodwell (2016) suggest, urban heritage is meaningful by way of its interaction with people and people may not assume responsibility on individual objects of heritage like buildings which do not have a meaningful integration with today's communities. Inversely, when an object is a meaningful part of the urban landscape, this responsibility reveals public action. As Myolland and Grahn (2012) put it, when the objects of a cultural landscape are not formally listed as heritage, preservation of cultural heritage is often handled by the voluntary actions of the local communities.

The role of public on heritage protection is connected with the meaningful integration of the heritage with its community. According to Harvey (2001) heritage is the long term development of its society and it is a societies relationship with its past that determines the focus of what to research on its heritage (Harvey, 2001, p.320). It is explained with the value system of a community, where heritage is the object of which. Especially for today, urban communities are not stable, nor can their value systems be. This has reflections with the cities that the communities interact, and as Bandarin and van Oers (2012) explain the natural change in a city can be through its adaptation to the evolution of social structures and needs which also determine the limits of acceptable change. According to them, the historic city expresses social values that keep the "collective identity and memory, helping to maintain a sense of continuity" (Bandarin and van Oers, 2012).

Van Oers (2010) asserts that the significance attained to cultural heritage is open to change with the diverging multiplicity of the societies, which makes it necessary for the societies to make progressive redefinitions of their value systems, if what they value needs to be protected. The urban disintegration could also be a consequence of the challenges in the global, regional or local scales like demographic changes within the society resulting from migration (Ripp and

Rodwell, 2016). As Bandarin and van Oers, (2012) state, in the 20th century, urban community was diversified with the addition of multiple communities, which resulted in a reinterpretation of the values of the historic city. Regarding the management of urban conservation, the authors suggest that, which values to preserve for the integrity of urban landscape should be decided through the collaboration of the communities of users and experts (Bandarin and van Oers, 2012; 68). According to Ripp and Rodwell (2016) the share of responsibility for heritage protection among the experts and local community should be maintained by moderators who follow the changes in what the community values.

3. The HUL approach and community engagement

This is a view shift in the understanding of urban conservation, which also includes the conservation of architectural heritage as part of a complete cultural landscape, predominantly including the active participation of the community for explicating and reinterpreting their transforming value systems. It is the Historic Urban Landscape (HUL) approach, which appears as the most recent form of understanding that has emerged on the perceived need for an urban management, which is truly integrated with the preservation issues (Turner and Tomer, 2013). Accordign to Zeayter and Mansour (2017, 12) the HUL approach is capable of providing awareness of the public for taking part in the management of urban conservation plans. Taylor suggests (2016) that the HUL paradigm is an approach, through which we can see cities as the reflectors of the values and belief systems of their communities.

The HUL approach is based on two important achievements in the definition of the relationship of historicity with the city, by the international community of conservation. One of the origins of the discussion was the decisions adopted by the UNESCO World Heritage Committee in 2003 and the other one which proceeded the approach further was the Vienna Memorandum in 2005 (Bandarin and van Oers, 2012). According to Ripp and Rodwell (2016) the first signs of the HUL approach dates back to the 1975 Council of Europe Euroean Charter which was when

the integrated conservation came into agenda together with the recognition that architectural heritage should be considered in urban and regional planning. Basically, it is a change in the way conservation is conceived not in isolation with the “objects of the monuments”, but together with the “subjects of the living cities” (Turner and Tomer, 2013).

The goal of the HUL approach has been discussed as achieving sustainable urban environments (Bandarin and van Oers, 2012), but according to Ripp and Rodwell (2016), recently there is a greater emphasis on urban resilience. The authors describe the “systems approach” in which, problems are viewed as parts of a single overall system and not in isolation. As they explain, compared to the sustainability approach, resilience is more complex, more dynamic and requires being flexible to change without leaving the overall system and it can also empower communities (Ripp and Rodwell, 2016).

The HUL identifies the community of an urban cultural landscape as the primary stakeholder and states that their engagement in the management of urban heritage is crucial as they will be affected by that management (Bandarin and van Oers, 2012, 155). As Taylor (2016, 474) states, in the HUL approach, the concern is particularly based on understanding the role of people who live in and experience the urban places, which results in its definition as taking part in the discussions on heritage and participate in the planning and management of the process. On summing up the discussion on how urban heritage should be managed, as one of the five goals of the HUL approach, Bandarin and van Oers (2012, 193) express: “The reinforcement and the empowerment of local communities in identifying and taking part in the preservation of heritage values within an open and democratic process.” As (Turner and Tomer, 2013) express, one important aspect of the definition for the HUL approach is the adoption of historic cities as a layered structure of a diversity of cultural expressions. Regarding the problem of the multiplicity of values which may have conflicting consequences, this diversity may be a

consequence of a divergent society as that of Ankara, in which people from very different backgrounds need their representation to generate values for the cultural landscape.

4. Disintegration in Hergelen Square

Hergelen square has a disconnected memory resulting from different interventions taking place in time. Currently it has a disintegrated character interrupted by the traces and/or effects of these interventions. Before explaining and discussing the results of the survey carried out in order to understand the community's value system and how they conceive the integrity of the site, this section of the article focuses on its definers and discusses the reasons behind their failure in defining it.

Hergelen Square has a special place in the urban memory of Ankara, which is visible in the novels the stories of which are taking place in Ankara like Oğuz Atay's *The Disconnected* (2017) (*Tutunamayanlar*), where you can read that the name of the square was Opera Square back then. The reason for this is that its place was designed in the Jansen Plan of Ankara (1935) for an opera building that has never been built (Fig.1).



Figure 1: Partial view from the Jansen Plan (1932), taken from Sözen, M. (1984).

The square was defined especially with the eastern entrance of the Gençlik Park, planned as a significant cultural spot on the Atatürk Boulevard, the main north-south axis of the city which is connecting the historic citadel on the north end and presidents mansion on the south end. On that main axis, the eastern boundary of the huge urban park was defined with the exhibition hall, which is currently the opera building, facing the headquarters of the Bank of Municipalities on the opposite side of the boulevard, right next to the place that was formerly called Opera Square and lately called Hergelen Square. As Yılmaz (2006) states, the Exhibition Hall, represented the achievements of the new Republic, which means that the gate of the Gençlik Park on the right side of the exhibition hall had a specific importance. On the East end of the square there is the registered Gazi Highschool building designed by Ernts Egli and completed in 1936. Since then, the square has been subject to several interventions and changes in terms of the social values attained on it. For example, Atay, in his aforementioned novel, displays the picture of degeneration and shallowness of the square as a “disgusting” representative of the country (Gülsoy, 2009). Therefore before looking at the current conceptions of the community about the square, it is important to understand the progress that it has been up to.

5. Former discussions about the site with its surrounding definers:

5.1 Gençlik (Youth) Park:

As mentioned above the park was a part of the Ankara City Plan by Jansen, and its construction has started in 1938. At the beginning, a noteworthy portion of the public was not ready for the civilization level of the Republic (Yılmaz, 2006), that was represented with the clean and neat condition of the park. This might have been the beginning of the conflict between different portions of the society, which was going to reach at its peaks in the following times. As Yılmaz (2006) puts it, after major changes in the economy politics of Turkey in 1950's, migration from rural to urban areas accelerated. The increase of the rates of migration to Ankara from the rural

settlements occurred simultaneously with the rest of the World, which brought a different value system with itself (Bandarin and van Oers, 2012). In this period, the park has become a center of amusement and recreation, which in the second half of 1980's hosted the peak point of conflict arisen from the encounter of the old users of Gençlik Park and those who have migrated to Ankara before having experienced a mid-class modernization process (Yılmaz, 2006). Not being able deal with the challenge brought by conflicting value systems of the divergent society, resulted with the abandonment on the spaces where that conflict occurs. Bandarin and van Oers's (2012) express the function of city for its society: "In the experience of the majority of modern humans, cities represent the context of daily life and activity." After 1990's until 2008 the park was left as a neglected space, which also neglected what it stood for: the importance of daily social life (Fig.2).



Figure 2: Google Earth images of the park and Hergelen square in 2002 (above) and (2017) below.

5.2 Bank of Municipalities:

The Bank of Municipalities founded to provide financial support and management to municipalities (Güler, 1996) had a significant role on the establishment of the new modern cities of the country. The Design principles of the building require attention for the intention to be an integral part of the new environment that was going to be a long lasting representative of the strength and values of the new republic. It was a competition project won by a modernist proposal by the architect Seyfi Arkan in 1935 from out of 18 proposals (Acar, et al., 2017), one of which belonged to Martin Elsaesser (Aslanoğlu, 1986). According to Aslanoğlu, with the Mendelsohn inspired dynamism of continuous lines through semi-cylindrical forms of entrances or corners, Arkan designed his buildings with complete detailing of interiors, gardens, and furniture. Given in Acar et al.'s (2017) article on the demolition of the Bank of Municipalities Building, Arkan's expressions on the reasoning behind the design decisions for a plain and simple building was that the focus of the environment should have been kept on the opera building which was to be built soon. As mentioned earlier, this site spared to a future opera project would become the Hergelen Square later.

Since the first rumors about the danger for its demolition for the ongoing construction on the Hergelen Square, until the day that it was demolished, it's historic, cultural, social, heritage, and memory values were being presented and discussed by the specialists and experts, in the social media and other media that these specialists and experts could reach (eg. Cengizkan, 2015). However, these reactions did not take much place in the public press until the day that the building was demolished.

5.3 Hergelen Square and Hajek's sculpture:

In 1986 a project competition for Ulus Historical Centre was organized and the competition winners Raci Bademli and his team's proposal for the site included a public square and a statue to be built in front of Egli's Gazi high school. The site that was saved for an opera building in

Jansen's plan was used by several low rise buildings, until the Ulus rehabilitation plan by Bademli was accepted. Concordant with the HUL approach that foresees an integrated cultural landscape, in his article on the design of the square, he expresses the necessity of community participation in the preparation phases of urban development projects (Bademli, 1993). In the same article he expresses the story of the decision and creation phases of the sculpture by Herbert von Hajek, in front of the Gazi High School facing the square that extends toward the train station axis through Gençlik Park, to function as a connector of the ancient past of Ankara represented by the historic citadel with that day's Ankara (Fig.3). Regarding the design of Hergelen Square, the intention behind the renovation plan was a complete axis along the train station, Gençlik Park, Hergelen Square, Hajek's Sculpture, architect Ernst Egli's High School Building, and the citadel (Bademli, 1993).

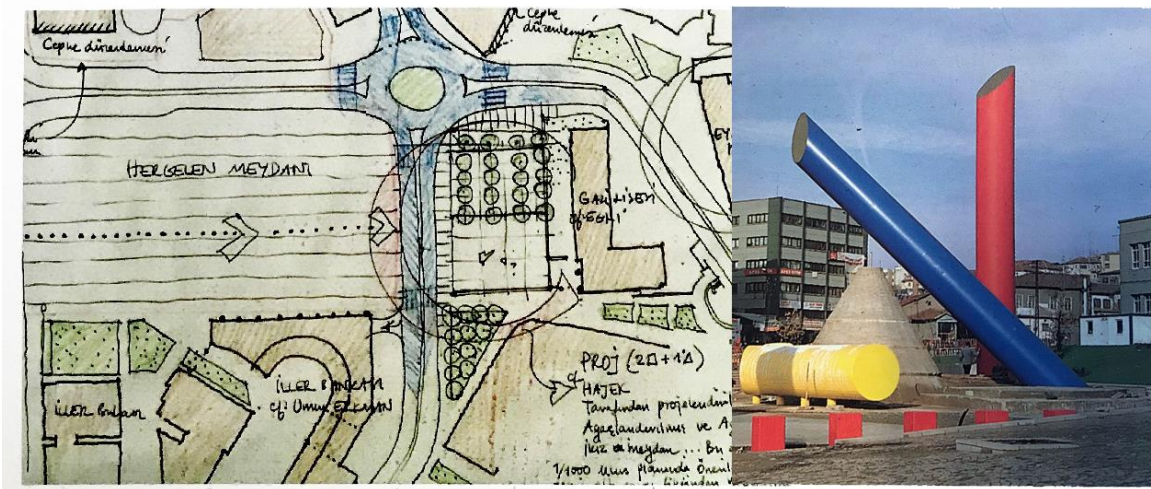


Figure 3: The plan sketch of the Rehabilitation Plan by Raci Bademli and his team and Hajek's sculpture after completion (Bademli, 1993).

The square was used as car park for decades while the sculpture neighbored an informal market where the second hand goods were sold. This is why Hajek's sculpture could not be a part of an urban integrity. The car park and the market interrupted what that has been planned in the renovation plan by Bademli and his team, and the case with the abandoned years of the Gençlik Park is not any different.

6. The intervention in the Square

Today there stands a Mosque on the square, which looks like the mosques of the 15th century Ottoman Empire, for which Hajek's sculpture and the registered building of the Bank of Municipalities, two cultural entities that intended to build cultural integration, were demolished (Fig.4, Fig.5, Fig.6). The construction of the mosque started in 2013 and completed in 2017. The buildings around the site were demolished so that the visibility of the mosque would not be interrupted.

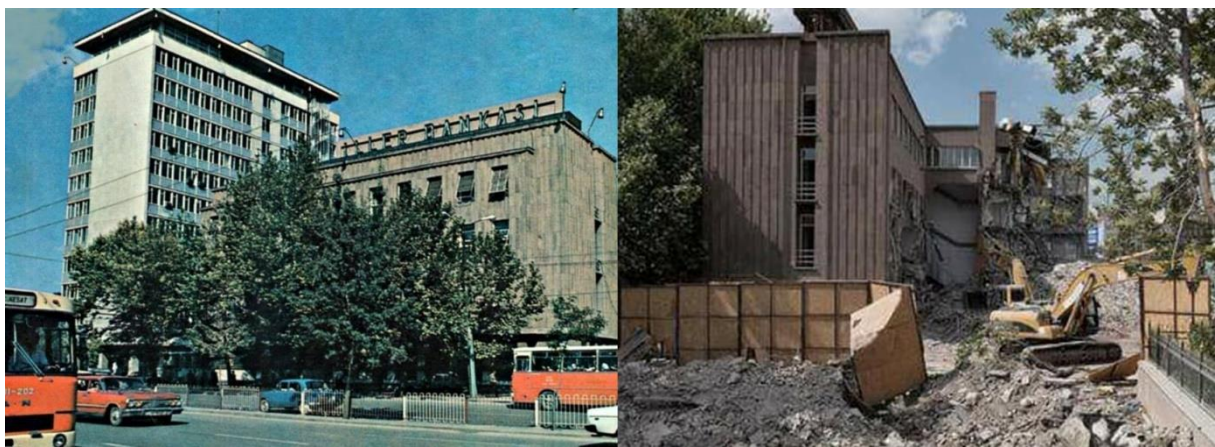


Figure 4: The Bank of Municipalities building in 1970's (Sözen, 1984) and in June 17th of 2017 (Interpress)



Figure 5: Google Earth images of the Hergelen square including the places of the Bank of Municipalities and Hajek's sculpture in 2007 (above) and in (2017) below.

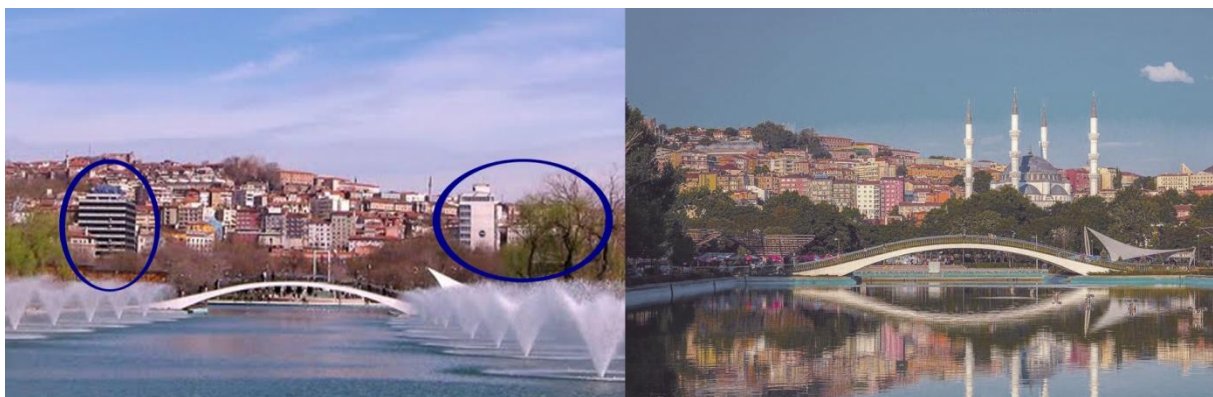


Figure 6: Views of the Hergelen Square from Gençlik Park in 2013 (on the left, the marks indicate the demolished Tika and Bank of Municipalities Buildings) and in 2017 (on the right, the new mosque has been built).

The changes in the view from Gençlik Park, which is a part of the axis that expands to the citadel, displays the scale of the intervention in Hergelen Square (Fig.7). The following part focuses on the aforementioned questions regarding the Square and its interrupted integrity.

7. Methodology and Discussion

There are three questions that constituted the focus of this research, which are:

- Do the residents of Ankara value a former intervention in Hergelen Square as a part of their cultural perception for the city?
- What consequences do the former disintegrated solutions have for today's citizens?
- Does a comparison of the outcomes of the independent surveys on the public perception of the historicity of two different parts of the HUL of Ankara display a common indication about the effects of interventions in the public awareness for cultural heritage?

The study group was people who have been residing in Ankara in the past or in present. An online questionnaire was prepared and distributed through the social media tools. A total of 138 participants completed the questionnaire, and among the questions a Cronbach's Alpha level of 0,794 could be achieved through the test of the questionnaire's reliability statistics. Although the homogeneity levels are in acceptable rates, because the asymptotic significance (2-tailed) distribution values of the rates of importance attained on the surrounding definers of Hergelen Square and the educational levels of the participants in the One-Sample Kolmogorov-Smirnov test were lower than 0,05, non-parametric methods were used to analyze the data gathered from the questionnaire.

One important output that was necessary for the study is the relation between the rate of admiration of the interventions and the educational level of the participants. In the previous study on Hacıbayram Square, regarding the effect on the historic site and disintegration, a similar intervention was the subject of discussion and the outputs of the same question was significantly meaningful while there was a strong negative correlation between the rate of

admiration and educational level of the participants. Below is the table displaying the results of the nonparametric (spearman) correlation test (Table 1).

Table 1. Spearman's Correlation between the educational level and the rate of admiring the final interventions among the participants.

Correlations		Edu.level	Rate_of_admiring_the_renovation
Spearman's rho	edulevel	Correlation Coefficient	1,000
		Sig. (2-tailed)	-,266**
		N	,002
	rate_of_admiring_the_renovation	Correlation Coefficient	138
		Sig. (2-tailed)	138
		N	138

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation coefficient value on this table, which is -0,266, indicates that there is a negative correlation between the rate of admiration and educational level of the participants, which is a similar result with the survey carried out for the Hacıbayram Square. This negative correlation is significant at the 0,01 level. This test does not indicate a cause effect relationship between the two variables, however, it is possible to interpret this result that the less educated people are less questioning than the educated; or the less educated do not feel represented by the experts who constantly object to the actions taken by the government on reshaping the built environment, as the experts too are well educated people. In order to achieve a healthier outcome, the effects of other variables on the rate of admiring the last intervention should be considered. When the same test was run with the control variable of 'age interval', the correlation coefficient increased to -0,236, which indicated that age of the participants has an effect in the way they think about the intervention. Similarly, with a correlation coefficient value of -0,285, the control variable 'visiting frequency of Hergelen Square' proved to be effective for the rate of admiration of the final intervention.

In Hacıbayram square the most significant output was the admiration of the public for the intervention on the site. The reason is that the site has a cult character that is mostly defined by its heritage value rather than the definition or design motive behind the intervention. In the case of Hergelen square however, the heritage monuments are representing an urban integrity that has been planned to be based on a shared value system from scratch. Therefore people's appreciation of these monuments as parts of a cultural integrity also requires a major attention. Therefore, another required output is for the relation between the educational level and the average importance given to the former definers of the square, three of which were included in this study, namely Gençlik Park, Bank of Municipalities' building, and Hajek's sculpture. The table below displays the results of this spearman correlation.

Table 2. Spearman's Correlation between the educational level and the average importance given to the definers of Hergelen Square among the participants.

Correlations			Edu.level	Avr. importance given to square's definers
Spearman's rho	Edu. level	Correlation Coefficient	1,000	,183*
		Sig. (2-tailed)	.	,032
		N	138	138
	Avr. importance given to square's definers	Correlation Coefficient	,183*	1,000
		Sig. (2-tailed)	,032	.
		N	138	138

*, Correlation is significant at the 0.05 level (2-tailed).

The correlation coefficient value on this table, which is 0,183 indicates that there is a positive correlation between the educational level of the participants and the average importance they give to the square's definers. The positive correlation is significant at the 0,05 level. Similar to the test above, this test does not indicate a cause effect relationship between the two variables, however, this result could be interpreted in a similar way with the previous outcome that the less educated people care less about the integrity of the cultural landscape than the educated.

Another question that needs to be answered was whether there is a difference in-between the values attained for the Bank of Municipalities Building and Hajek's sculpture. The answer to this question could be interpreted to answer the first aforementioned research question. The former intervention is the rehabilitation plan of Bademli and his team, and its unachieved goal for an integrated cultural landscape.

Table 3. Paired Samples Statistics among the participants thought on the demolitions of the Bank of Municipalities Building and Hajek's sculpture

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 thought_on_the_demolition_of_ the BM_building	4,43	138	1,208	,103
thought_on_the_demolition_of_Hajek's sculpture	4,13	138	1,158	,099

The Paired Samples Statistics table indicates that with the N value that is equal for both questions, all the participants have evaluated the demolitions of both The Bank of Municipalities' building and Hajek's sculpture.

Table 4. Paired Samples Correlation among the participants thought on the demolitions of the Bank of Municipalities Building and Hajek's sculpture

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 thought_on_the_demolition_of_ the BM_building thought_on_the_demolition_of_Hajek's sculpture	138	,538	,000

In the significance column of the Paired Samples Correlations, the value is 0,000, which is smaller than 0,01. This means that the participants' thoughts on the demolition of the Bank of

Municipalities' building is significantly different than that of the demolition of the sculpture at the $p < 0,01$ level.

Table 5. Paired Samples test among the participants thought on the demolitions of the Bank of Municipalities Building and Hajek's sculpture

Paired Samples Test									
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	thought_on_the_demo lition_of_the BM_building thought_on_the_demo lition_of_the_sculptur e	,304	1,137	,097	,113	,496	3,144	137	,002

When the t-test results and the mean values are evaluated together, it is understood that the demolition of the Bank of Municipalities Building was found more negative than the demolition of Hajek's sculpture. This outcome indicates that the value attained for the Bank of Municipalities is greater than the value attained for the sculpture. When considered from the perspective of the HUL approach, the Bank of Municipalities Building had a greater rate of integration with the cultural landscape. Indeed the descriptive outcome of the question regarding the demolition of the building indicates that the mean value of the 1(positive)-5(negative) scale is 4,43, which means that there is a significant disapproval of the demolition, and that the building was highly valued by the public. The mean value of the outcomes for the sculpture is 4,14, which also indicates a disapproval for the demolition of the sculpture as well.

8. Conclusion

Regarding the connection between the two sites of the same HUL of Ankara, the survey on the final intervention on Hacıbayram Square did not present an outcome regarding the changing value system of the communities, nor did its discussion could fit with the HUL approach to understand the parts of the urban fabric primarily for their integrative role. The reason for this

is that both the heritage value and the religious meaning of the site constitute its dominating characteristics. However, considering these two interventions together is meaningful for understanding the common between the two interventions, and their rates of acceptance by the public. In both, the admiration rate increased while the educational level decreased, and the interventions of both were applied by the same authorities. Therefore, it is possible to say that there is consistency among the two studies regarding the relation between the educational level and the rate of admiring the interventions by the same authority.

The literature is reticent about the reasons behind the conversion of Hergelen Square into a parking space after the rehabilitation plan by Bademli and his team was applied, but it is not difficult to assume the political, economic, and primarily migration based social reasons behind this. One thing is for sure that the discontinuity between the area's past and present is a consequence of a will that benefits from that disconnection. That the sculpture or the square did not last until today, which is unfortunately ironic considering the last words of the article of Bademli (1993), is not necessarily because of the failure of the plan or its application on the site. The disconnection in Ankara's social and physical past and present is a normalized thing for its society.

This is not just an intervention in the physical environment. The normalization of such interventions by the local community is the consequence of an existing and previously founded problem of disconnected/interrupted/over-intervened past. The transformations happening due to other subjects' interventions have become expectable. Disapproval of the demolitions is clear, but the resistance remains passive. Regarding the results of the study, it is possible to say that for the last intervention, the rate of appreciation is very low, but the reaction against the intervention is limited with a very small portion of the public.

Being registered has not been enough to protect the Bank of Municipalities Building, and in the 17th of June in 2017 the registration was removed and the demolition begun irreversibly in

the same day. The explanation of the reasoning behind the removal of its registration was the loss of its structural durability and being severely exposed to corrosion. It is not possible to discuss here whether the technical reports, which were given as the reason behind the removal of the registration, reflected the truth about the buildings durability. However, it is possible to be highly skeptical about it, especially regarding the last three years of the life of the building. The story is well known by those who are interested and the presupposed reasoning behind the demolition is shared among those who feel sorry for its ending.

From the point of the HUL approach the demolition of the building of the Bank of Municipalities is not only a loss of a historic monument as a single building with historic significance. More predominantly, it is the loss of the urban integration that it provided to determine the comprehensive system of an urban historic area as it is expressed in the Vienna Memorandum of 2005 (Bandarin and van Oers, 2012). Unlike Hajek's sculpture, that had been blocked by the parking area and market for decades, the Bank of Municipalities building had not lost its role in maintaining that integration, which is apparently concordant with the reasoning behind Arkan's design decisions like modesty, continuity, relation with the boulevard on the ground floor scale. It was an ultimate example of consistency and success not only as a product of architecture but also for its 80 years' role of place-making. Together with Hajek's sculpture it was sacrificed to build a pseudo context that is completely disintegrated with the place's cultural value system.

Apart from that, the most important output that can be derived at the end of this study is that if the HUL approach was adopted, and if the public took a responsibly participant role in the decision making processes on informing those who are in charge about the acceptable limits of change, the condition could have been much different than today. There is no clue whether the integrating proposal of Bademli and his team would accompany the resilience of the community, as well as the sustainability of the cultural landscape. However, it is for sure for

today that the possibility of applying a similar approach with that of Bademli for achieving the integration of the cultural landscape of Hergelen Square is far less than it was in the past.

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Vernacular Architectural Preservation of Material and Spiritual Interconnected Cultural Heritage

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Abstract

Vernacular architecture presents sustainable minimum-impact structures harmonized with their context and inhabitants. Heritage preserved tangible and intangible in material forms, encrypted spiritual believes of humanity's life in dwellings' organization unveiling the details of our ancestors' life and world cultures' connectivity. Instigated by modern-world urbanization, sustainability and cultural diversity issues, the study is researching on cultures connectivity, corresponding to the scale and context of the global cityscape and attempting to synthesize vernacular heritage. The objective of this research is to study indigenous human congruent architectural examples and their relationship with intangible aspects of habitat. This paper will be adapting a qualitative method, by which it aims to study and observe various examples so as to analyze interconnections of Siberian Chums and Native-American Tipi, their design driving forces, settlement of the 2nd century BC- Arkaim and Japanese traditional architecture.

Keywords: Vernacular Architecture; Arkaim; Chum; Tipi.

1. Introduction

Vernacular architecture bears climate-efficient regional and time proven sustainable systems, the analysis of which can benefit locally oriented modern architecture. Through the study of various examples, one can notice the firm presence of spiritual aspects, religious or pagan believes as driving forces of dwellings' planning. Space will always remain to be very influential to the quality of human life that is based on intangible psychological aspects and

habitual traditions. Importance of vernacular architecture's preservation is indisputable, it absorbs to reflect culture and traditions performing as a living historical evidence. Thus analyzing extant vernacular architectural forms and venturing into their inner space organizations this study seeks to identify the unifying principle.

The case of Siberians and Native American inhabitants' architecture similarities is not a coincidence, it is another proof of cultures' links on a par with language analogies proposed by Edward Vajda and detailed DNA analysis held by the Centre for GeoGenetics. As two distantly evolving communities, Siberian including Nenets, Evenks, Navkhs, Yuits, Kereks and Native Americans or so-called Indians have same believes, shamanic background and therefore architectural analogies shown in Chums and Tipis.

Centralization of fire, noticed in Japanese architecture and so common for Zoroastrian architecture is seen in both of previously noted vernacular dwellings' examples as well as in another case of research, the Bronze Age settlement of Arkaim inhabited by Agni-worshipers. Studied in light of cultural connectivity through the intangible background of spaces design by first architects, its religious aspect may link it with present-day differentiated cultures and arise more research possibilities.

2. Siberian Chum – the life center of Nenets people

Siberia region of Russia has exceptional architectural treasures, carefully transferred to the modern world by the indigenous population of this region. The example of chums is referred to Middle Siberia inhabited by Nenets tribes, also noticed in the cultures of Hasova, Samoeds, Evenks, Navkhs and Uraks. Yamal peninsula, the place where Nenet people abide, is not an exception for the impetus of infrastructure in the 21st century.

Local research conducted by Boyarsky and Stolyarov (2000) shows that Yaman peninsula, and Vaigach Island in particular, was preserved and guarded by locals in the past because of its significance and sacred meaning. Moreover, as R. Jones, a member of S. Borrough's expedition

held in 1556, wrote: “wild Samoyeds live there, not allowing Russians to land”. (Boyarsky, Stolyarov, 2000, p. 30) However, inducing an economic interest nowadays, the region inhabited by Nenets is under the process of new development. With the construction of Obskaya-Bovanenkovo railway line, which is the northernmost in the world, Yamal Project has already impacted the local land ecosystem and the nomadic pace of Samoyedic life that was followed for centuries by disrupting their migration routes. Chance and Andreeva point on the problematic situation in the Russian North, saying that nowadays it is experiencing most dramatic environmental devastation that directs to the social disintegration. (N. A. Chance, E. N. Andreeva, 1995).

The harsh climate with long winters and seasonal winds, severe waterlogging, and isolation forced ethnic group to adhere to their centuries’ nomadic routine solely dependent on hunting and deer keeping. Same as centuries ago, today Chum remains the center of Nenets’ lives, both habitual and sacred. However, this example shows that a vernacular dwelling preserves much more than a material architectural form.

Detailed information was provided by the expedition of D. Andersons, in collaboration with the archaeological field research team of Dr. Viktor Vetrov of the Irkutsk State Pedagogical University and Baikal- Hokkaido Archaeology Project (BAP) and then documented by Andersons. The author states that Evenk’s cone-shaped dwelling is an example of “*how vernacular architecture reflected social structure*” (2, 2006). An influential work done by Shirokogoroff (1929) unveils details of the indigenous pace of life and the meaning behind its details, providing “*an early authoritative schematic of the structure of a conical lodge with its distinctive pattern of names, which in turn implied certain roles to men, women and to guests*”. (1929, pp. 255–256).

2.1. Spiritual understanding of the world behind the spatial organizations of the dwelling.

Same as in the previous century, modern chums bear the original vernacular exterior and interior spatial organization that have carried traditions, language and religion by the definite interdependence between form and function. Similarly as for inhabitants of North America or Canadian Plains, most aspects of Nenets' life are interlinked with shamanism and this belief is shared among most of the aboriginal cultures of Siberia.

In shamanism, the world differentiated into three partials: the sky, the land, and the underground are believed to be inhabited by human souls as well as by many other spirits, gods, protectors, and helpers that only shaman can reach to. For aboriginals of Siberia their self-eidolon was not differentiated from animals. It is important to mention that images of the world tree, the bear and the bird play a significant role in their life and folklore. (Mchedlov, et al., 2002)

Despite forced Christianization, Siberian aboriginals preserved their religious and cultural identity, animism, totemism and shamanism, thanks to the successive mode of life and continuous direct dependence from nature. Chum, the resultant of nomadic Nenets' life has always remained habitual and sacred central element. The dismountable dwelling's spatial arrangement goes in accordance with shamanic order, hierarchy of the clan and gives meaning to all the dwellings' elements.

Reindeers are the source of food, clothing and building materials, all necessities for Indigenous Siberians, Nenets in particular (Lissner, 1961). Constructed not without materials provided by deer, chum's conical structure with an inlet for the smoke (Sona) is covered by the sewed skins in the winter or with boiled bark, canvas and burlap in the summer. Dwelling's frame consists of approximately 40-50 sloping poles (Golovnev, 1995).

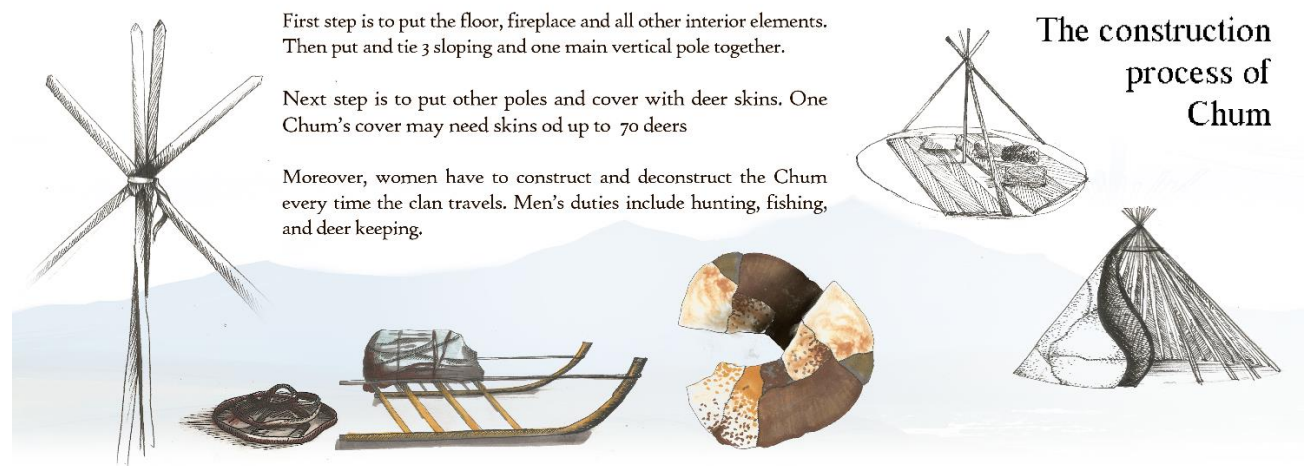


Figure 1. Construction process (Developed by Author).

The location of the chum is decided by man and the first act, placement of the metal fire sheet [Tumu] on the ground, by woman. Thus the hearth becomes the central, first and most significant element of the house. Golovnev wrote that *"Perhaps in this first movement, the idea of the 'hole' to the lower world coverage and the symbolism of the primary designation of the center and the history of the chum itself which was originally a "bonfire closed from the wind", are combined."* (1995, p. 212).



Figure 2. Woman installs ‘simzi’. (Dmitry Tkachuk, 2016).



Figure 3. Installment of suspended furnace. (Dmitry Tkachuk, 2016).

Central vertical sacred pole simzi handles seven ancestral spirits’ heads and tops with a Minley bird figure in the house of a Shaman. Many shamanistic rituals such as herb smudging involve the use of fire and simzi and are performed daily as well as on special occasions. The house is maintained solely by women, construction and deconstruction of the chum, combustible moss, bushes and firewood preparation, smudging is dependent on her. She can freely walk and touch everything in the house including sacred pole and maintain fire and men believe in her spiritual mighty power to give and take human life, to empower and disengage sacred meaning of the simzi pole. Man and women are understood as opposing elements that converge in the center, man’s place in chum (si-nyangi) is further from the entrance when woman’s (nie-nyangi) is closer. Geometrical spatial allocation goes along with the sacred meaning behind it. Thus, women’s space, protector from the evil, adjoins to the entrance doors and the opposing is considered as men’s. Moreover, it is a serene sacred space (si) where all everyday utensils and the casket with spiritual patrons’ figures are kept. (Golovnev, 1995)



Figure 4. Chum in winter (Kristen Richard, 2016).

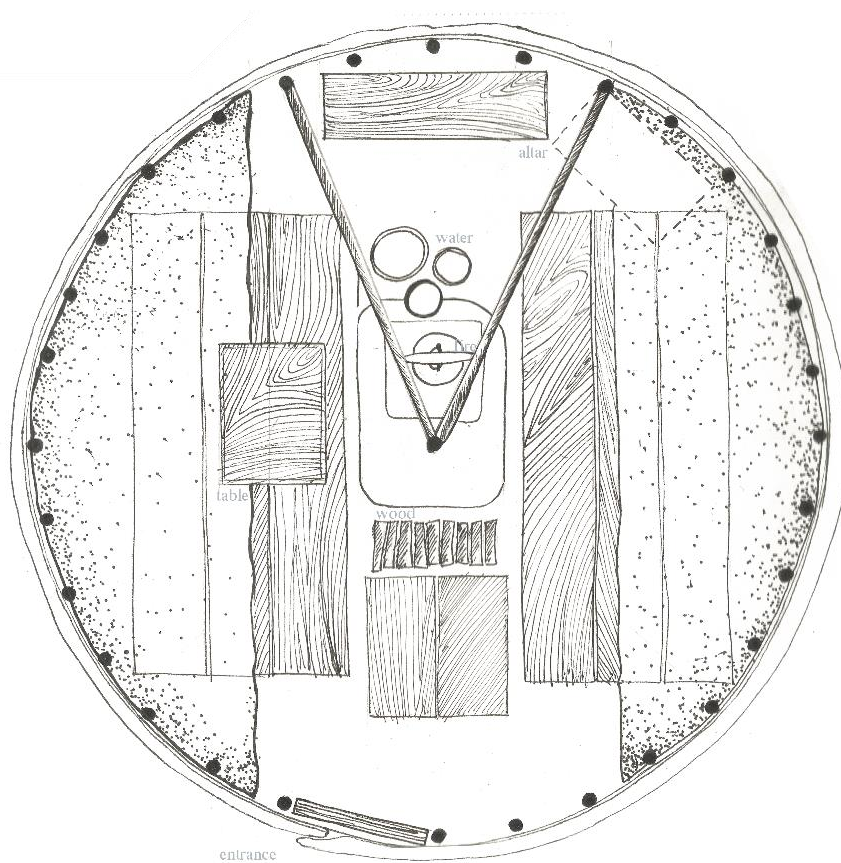


Figure 5. Interior plan of the Chum (Developed by Author).

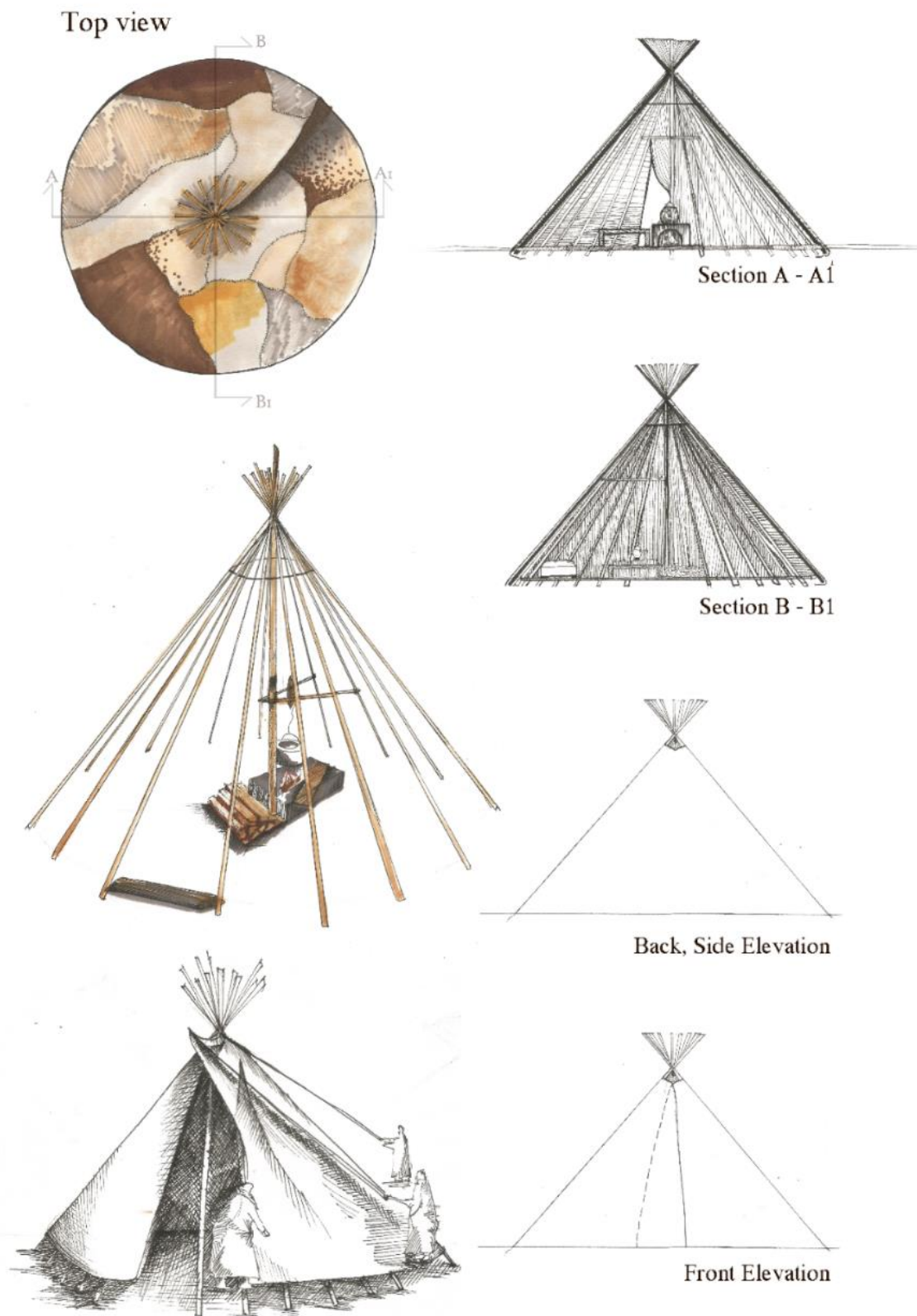


Figure 6. Elevations and sectional views; Chum illustrated during the construction process (Developed by Author).

Vernacular architecture is the result of peoples' adaptation, reflector of their culture, beliefs and traditions. Maximum affordable or free local sustainable materials and inherited techniques are used in the construction of these dwellings. Speaking about Nenets people's vernacular architecture, Chum is the only tangible object to absorb, conserve and afterwards reflect traditions and mindset of Samoyeds - Siberia inhabitants and nomadic nations in general. Their life is a rare example to bear authenticity in the modern globalized world. Moreover, thence providing pure cultural architectural evidence.

3. Tent-like architectural form links distant continents' cultures.

Chums as well as Native American Tipis, dwellings more than 6000 kilometers away, have striking similarities despite the distance. One can notice the connection between distant cultures of Siberian and America's first inhabitants through their vernacular architectural heritage. When studied more in detail and through the prism of equally important spheres of linguistics and genetics, too, it can serve as an evidence of cultures' connection.

The motivation and the leading force for most vernacular cultures remains to be the spiritual aspect of lives and thus every details of the indigenous dwelling becomes more than just a form but a conveyor of traces in some cases and the preserver of the heritage in others. Regarding architectural similarities, Siberian chum and Native American tipi are of circular shape, with fire as a main central element and shared spiritual background. Indigenous dwellings are both using poles to shape a cone structure and are covered with canvas or animal skins.

This segment of the study will present Siberian-Native American connectivity analysis alongside the synthesis of different perspectives to enrich their hypothetical relativity to one another from an architectural standpoint.

3.1. Dene-Yeniseian, a linguistic link between America and Siberia.

Due to the vital present-day debate apropos the origin of Native Americans, this paper suggests an alternative look upon their heritage comparison which is involving architecture. Some researchers are stating they have moved from West-Asia, and contemporary ones believe the wave of migration came from Siberia via north-eastern Alaskan bridge. A linguistic approach to this discussion, a hypothesis of Na-Dene (excluding Haida) and Yeniseian languages' connection was presented in Dene-Yeniseic Symposium held in Alaska in February, 2008 (Vajda, 2010). It included multiple notable linguistic researches and was reinforced by various more from spheres of archaeology, genetics and folklore. Na-Dene is one of the most studied and widely used indigenous languages of Americas. Yeniseian, however, is a vestigial linguistic family with only Ket remaining in scarce use. Nonetheless, I would propose this hypothesis to be applied on the Indigenous American and Central Siberian cultures' relationship. Siberian communities and nations can be differentiated into several groups when conducting linguistic, genetic, folklore and religious analysis. Thus, we can easily notice similarities in Samoyeds' or Nenets' and Kets' shared traditions, spiritual life background, worshipping animism, and vernacular dwellings projecting as a preeminent cultures' preservation object.

3.2. DNA analysis that unveil Native American ancestors.

Another biological perspective was recently proposed by the international group of researchers. Despite the fact that the accurate ancestor of Native Americans remains uncertain, the analysis led by the Centre for GeoGenetics, Natural History Museum of Denmark (University of

Copenhagen) links them with Siberian indigenous population. The group of scientists sampled a 24,000-year-old skeletal remain from the Upper Paleolithic site of Mal'ta in south-central Siberia at the Hermitage Museum (Saint Petersburg) in 2009; and the second sample from Afontova Gora-2 that is dating to about 17,000 years ago. Results revealed the direct connection to Siberia. The group of scientists led by Eske Willerslev “estimate that 14 to 38% of Native American ancestry may originate through gene flow from this ancient population” (Rasmussen, S., et al., 2014, 87). Both of these hypotheses remain debatable, however outcomes demonstrate how vernacular architecture in its original form can act as a culture bridge.

4. Indo-Aryan Settlement of Arkaim – Coexistence of Sacred and Material.

Arkaim is less studied and distant in time vernacular settlement that is embodying spiritual aspect of human life. It also became an architectural evidence to convey hereditary messages. Fire-centered space organization is referring to the fire-worshipping Indo-Aryan nature of the settlement with no doubt, creating a universal network of local architectural systems.

The ancient settlement is located in Trans-Ural Steppe, southern part of Chelyabinsk region of Russia. Arkaim and Petrovka (settlements) are rare examples of Sintashta vernacular architecture which existed in the 2nd century BC and is known for extensive copper and bronze metallurgy as well as for astronomically verified settlements' layouts. Some sources are dating it back to 8th-9th century BC (Khafizov, 2009).

It was a birthplace of numerous cultures where Indo-Aryans, Turks and Ugors coexisted in their beginnings. Arkaim's discovery is verily underappreciated in relation to other world renowned historical sites (Zdanovich, 2004). The area remains poorly studied and even the exact date of its origin is still unknown. In the traditional system of chronology sites date back to XVIII-XVI centuries BC, at the same time radiocarbon analysis indicates the XXI-XVIII centuries BC.

Moreover, in the past it was in the risk of deterioration. In 1987 archaeological expedition of Chelyabinsk State University, Ural branch of Russian Academy of Science, discovered more than 70 archaeological sites in the 21 square kilometers area of oval shaped Bolchekaraganskaya Valley, framed by the Ural Mountains. Findings are from various eras: temporary towns from Middle and New Stone Ages – Mesolithic and Neolithic to mounds and ritual fencings of Kimak and Kipchak tribes. However even with the obvious historical value, the area was meant to be flooded and serve as a water reservoir if not the will and efforts of Gennady Zdanovich that proofed the significance of the area and it was declared cultural reservation in 1991.

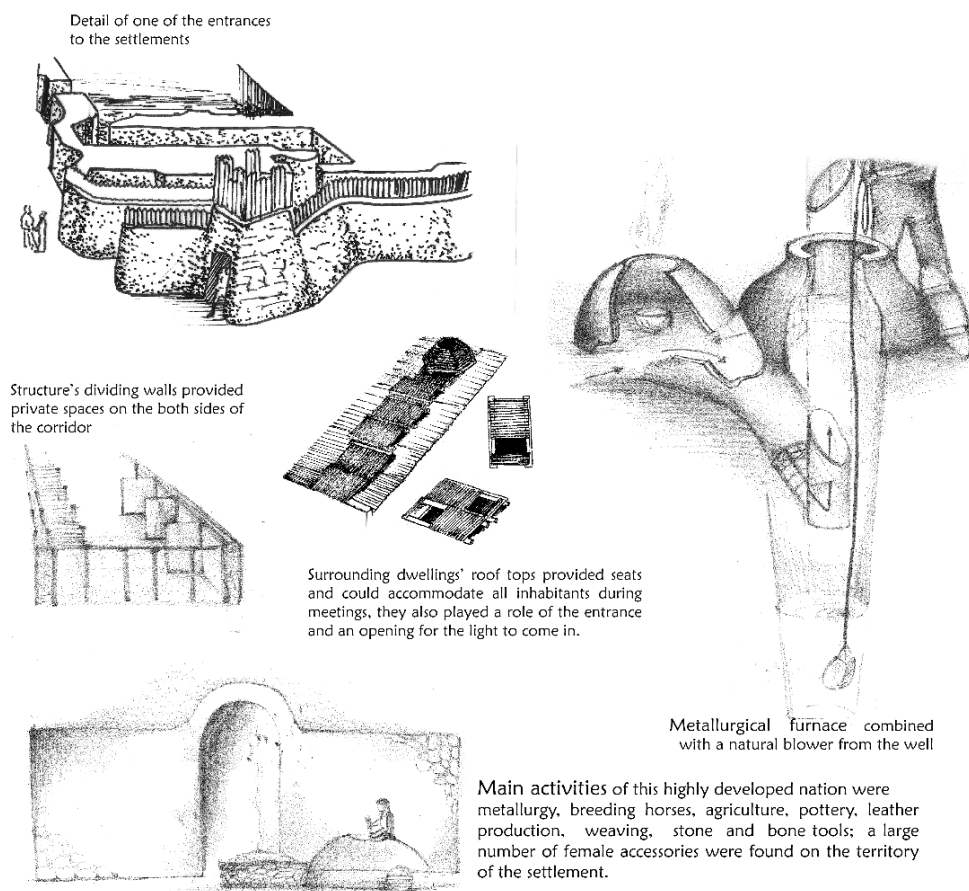


Figure 7. Illustrative details of the indigenous habitat (Developed by Author).

The deeper research of more settlements and cemeteries that refer to the same culture occurred in the late 1980s after the decipherment of aerial images by Batanina and Levite that indicated mounds' forms. Arkaim is an evidence in the architectural tangible form that shows the high development level of so-called "cities of the country", southern part of Chelyabinsk region of Russia that includes the settlement, numerous ancient mounds, necropolises and other archaeological finding. As seen on the case studies of all vernacular architecture examples presented in this research, this settlement unveils consciously planned space organization that bears idem centralized sacred relation to fire in a different scale.

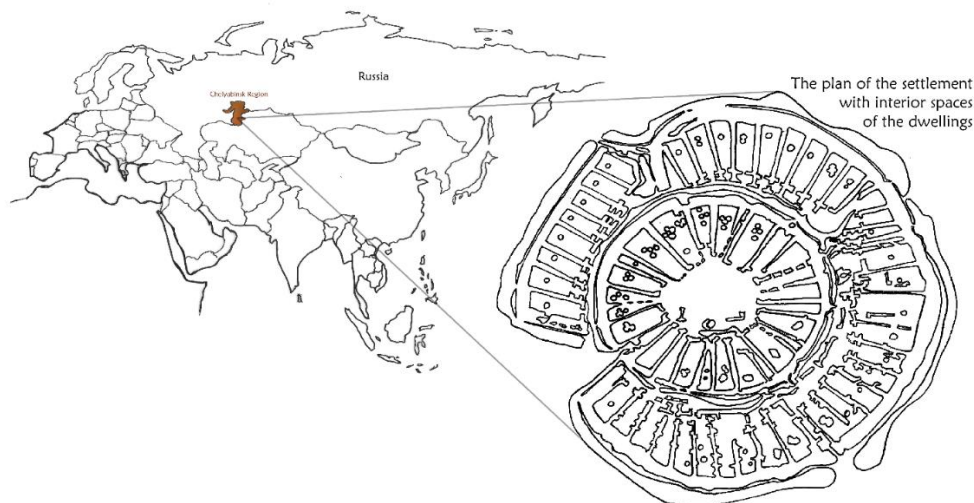


Figure 8. Location and the plan of the settlement with interior spaces of the dwellings (Developed by Author).

The circular settlement is 150 meters in diameter and covers 20,000 square meters area. Located on the confluence of two rivers in the elongated valley, surrounded by hills and ridges, its geometry objectifies the astronomical concept in its form. Houses follow the round shape forming two inner circles outlined by a moat and a wall. Plan's central rectangular square was used for sacral religious acts. Surrounding dwellings' roof tops provided seats and could accommodate all inhabitants during meetings and rituals. *"Evidently, the fire ritual played a major role here, considering that*

Zoroastrianism, the solar religion of fire-worshippers, arose in these places.” (Khafizov, 2009, p. 40).

66 trapezoidal shape dwellings were revealed inside the settlement using geophysical methods and archaeological excavations, and 20 of them underwent detailed analysis. The size of single residential building varied from width 110 to 180 square meters, 8.6 meters in width and 20 meters in length (Zdanovich et.al, 2009). Zdanovich also noted that two outer rings of fortifications were adapted for astronomical observations. Following ones were two dwelling circles and one street with sewerage. The second defensive wall consisted of a log-ground parts and wooden parapet and bypassed by a 2 meters deep moat. Fortifications were simultaneously main walls of the settlement; two neighboring sectors were divided by a wall in between. One Arkaim’s sector – could hold up to 40 - 60 people. Different family clans occupied private bedrooms separated by wooden partitions which were warmed up with the central oven – the hearth of the house. Typical dwellings had only two exits - one terrestrial, the other, from the opposite end, led by the stairs to the roof opening which let the light to come through. There were different areas in the house: almost all dwellings started with a small courtyard, with the stove in the corner and the pit connected with the storm sewerage. Then the corridor began with small rooms on both sides (Zdanovich, 2004).

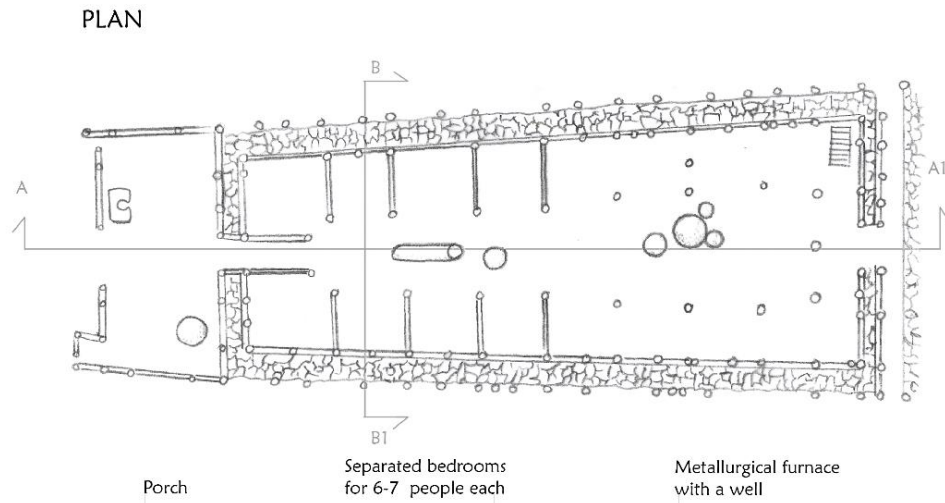


Figure 9. Plan of one single dwelling (Developed by Author).

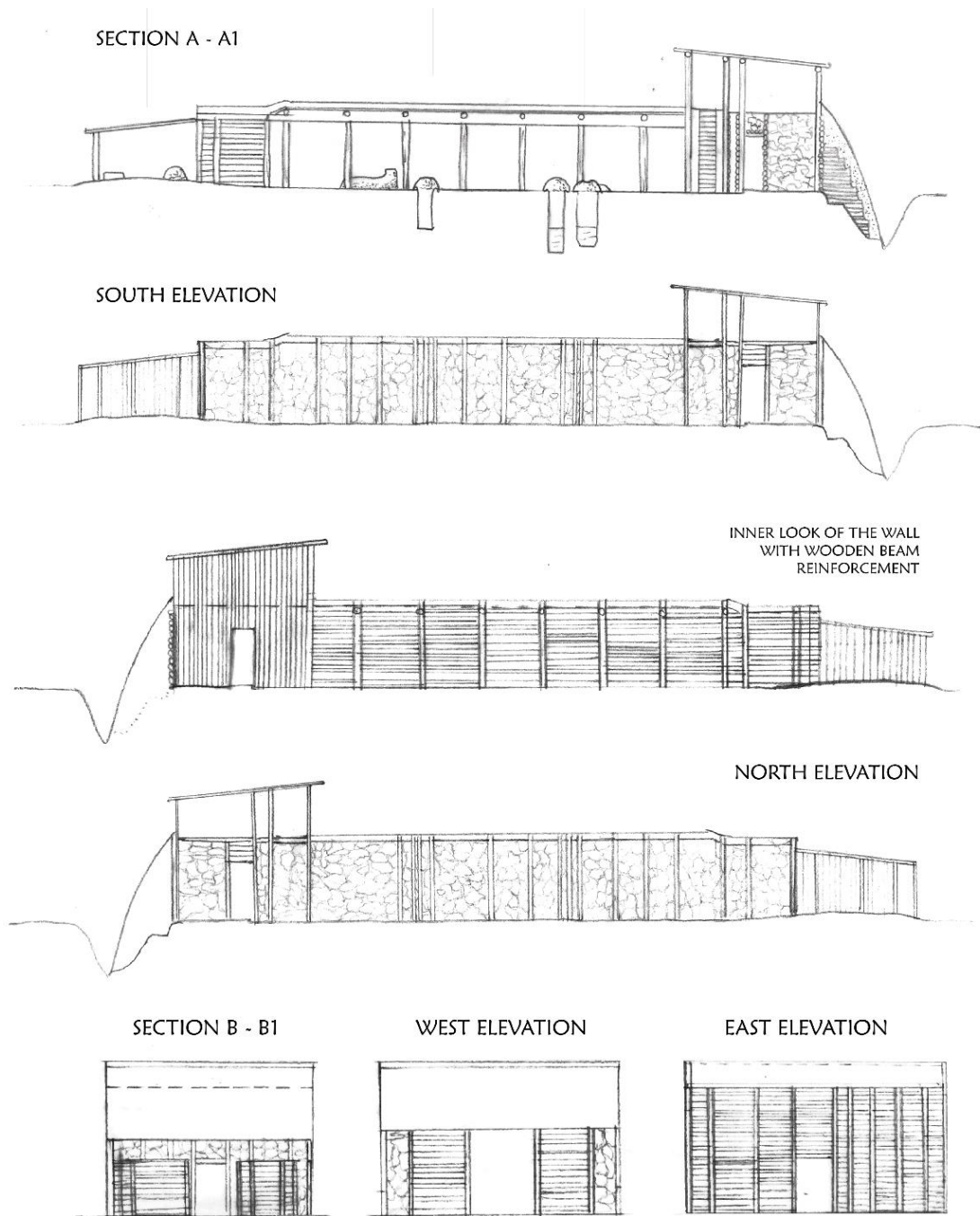


Figure 10. Elevations and Sections on Arkaim dwelling (Developed by Author).



Figure 11. Reconstruction of the dwelling in Arkaim Museum. (*Rinat Hayratdinov*).

Working area and general family gathering place occupied approximately one-third of the house. Architectural, domestic and hand-crafted findings are pointing on the fact that metallurgy was inhabitance's primary occupation along with leather, pottery stone and bone tools production, weaving, breeding horses and agriculture. There was a well-fridge (pit, cellar), metallurgical furnace combined with a natural blower for the well and stoves in every house. An altar with skulls and other bones of domestic animals was placed at the bottom of each fireplace.

House represented harmonized unity of earth, fire, air and water. Indoor comfort was achieved with both cold and hot spaces, potable and household water accessibility for everyday and ritual ceremonial needs. Dwelling accommodated spaces for sleeping, recreation, work and prayers. Each sector replicated the principles of the settlement structure, thus fireplace can be identified as the gathering space for a family or a community, in the scale of a single house or the settlement respectively. The whole city was concentrated around the central square, the heart of Sacred Arkaim. (Zdanovich, et.al, 2009). Arkaim settlement communicates the system of men and nature

symbiosis in unified arrangement of various elements, forms and structures. One can state that vernacular architectural representatives of Sintashta culture point on very developed nations' habitual and scientific level.

Spatial arrangement of Sintashta nation is referring to the one of Chums and Tipis. Centralization of fire is noticed in Arkaim in the dual form. Being the early origin of Zoroastrism, the settlement combined fire worshipping with animism. This element appears to intersect distant detached or relative cultures' vernacular dwelling spatial arrangements.

5. Japanese vernacular architecture and interior spatial arrangement.

5.1. Anthropological approach to the Japanese vernacular architectural differentiation.

Due to Japanese land' isolation, long standing attentiveness and care to national heritage, vernacular architecture was preserved and is treated with respect till today. Professor Jean Louis Armand de Quatrefages differentiated anthropologically juxtaposed races into four groups: (1) Almost entirely blended 'Negrito type', (2) 'Yellow element' with the well recognizable Chinese origin, (3) 'White Ainu element' and (4) 'White Indonesian element'. He noted that "yellow and white elements occasionally occur juxtaposed and not intermixed in any striking manner." (Mechnikov, 1881)

Bearing the same approach in mind, development of Japan may be differentiated into two periods, Pre-Buddhist and later mainland-influenced. The earlier one includes Jomon (10000 BCE-300 CE), Yayoi (300 BCE-300 CE) and partially Tomb Mound (300-710) periods. Flat-land buildings, heichi jukyo came from an earlier pre-ceramic period and can be of a circular or rectangular plan and be constructed using vertical and horizontal intertwined poles. Following Yayoi and Tomb Mound periods experienced Korean blending that influenced all spheres of life including architecture primarily with the expand of wet rice agriculture (Young M., Young D. T., 2012).

Dwellings could be grounded, flat or raised on poles. Details such as the interior spatial arrangement of Pre-Buddhist architecture examples remain obscure, however, clearly identified forms and construction methods retained their influence by this time.

5.2. Ainu huts, Indigenous Japanese dwellings.

Ainu people may be considered the aboriginal nation of Japanese archipelago. As recorded by the number of researchers and travelers (J. Batchelor, I. L. Bird, J. K. Goodrich) in the late 19th century, Ainu's huts are of a flat land construction with very minimal furnishing and the central elongated hearth. Similarly as in the previously discussed chum interior organization, Ainu's dwellings' hearth-sacred relationship follows the same algorithm in terms of physical and intangible. This fact is very surprising, however one can easily notice on plans (image 12-13) how repetitive is the sequence of entrance, fire (hearth) and the sacred. Goodrich wrote: *"A sacred window is left in the middle of the eastern wall, through which the sun-god is worshiped, and before this an inao is placed. ...the northern of the fireplace is sacred to the family"* (1888, p.499). So-called 'Inao', willow-shavings as the representations of gods occupy the essential part of the dwelling (Batchelor, 1892). Thus, following the same analogy, sacred parts of the dwelling are centralized hearth (place of fire) and further inner space, east window with 'inao'.

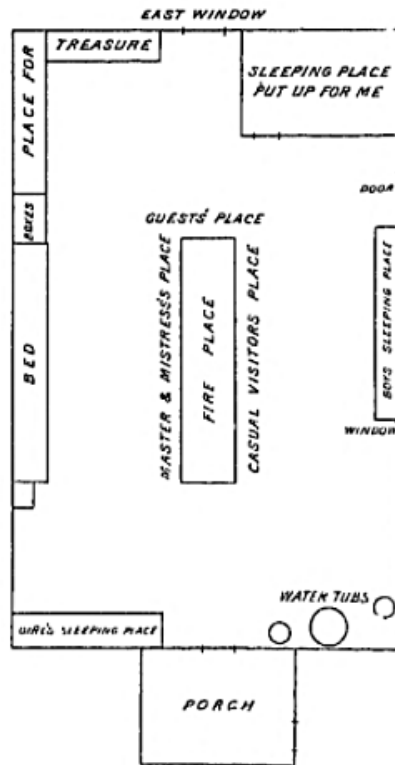


Figure 12. Plan of an Ainu Hut (From Batchelor, 1892, p.73).

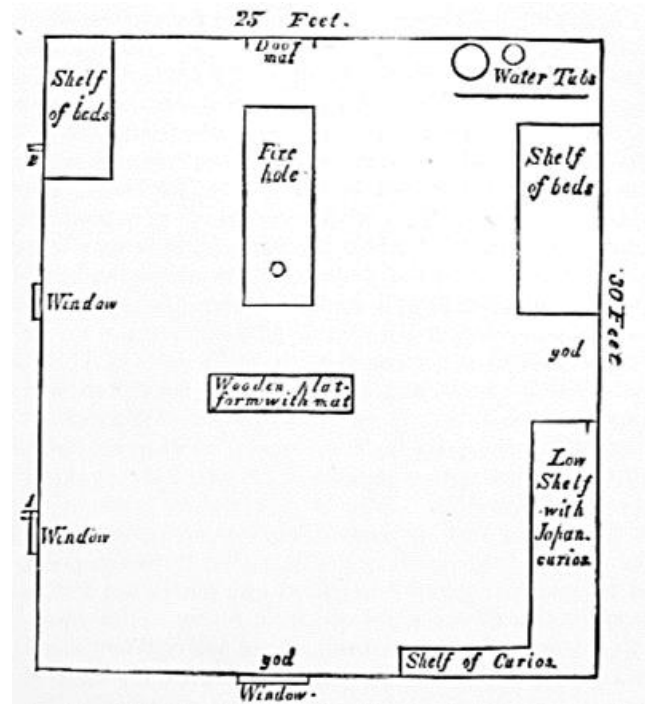


Figure 13. Plan of an Ainu House (From Goodrich, 1888, p.501).

5.3. Cha-no-yu, spiritual meaning in spatial organization of Japanese tearooms.

Cha-no-yu may be considered one of those traditional Japanese typologies that are prevalent in the modern life. Not always consciously taken into account, the background that stands behind habitual actions and planned spaces goes far back to Japanese spiritual origins.

Among eight varieties of tearooms' arrangements most common and original one is the 'four-and-a-half' mat where the middle 'ro' mat and a hearth are surrounded by four full tatami mats (Sadler, 2011).

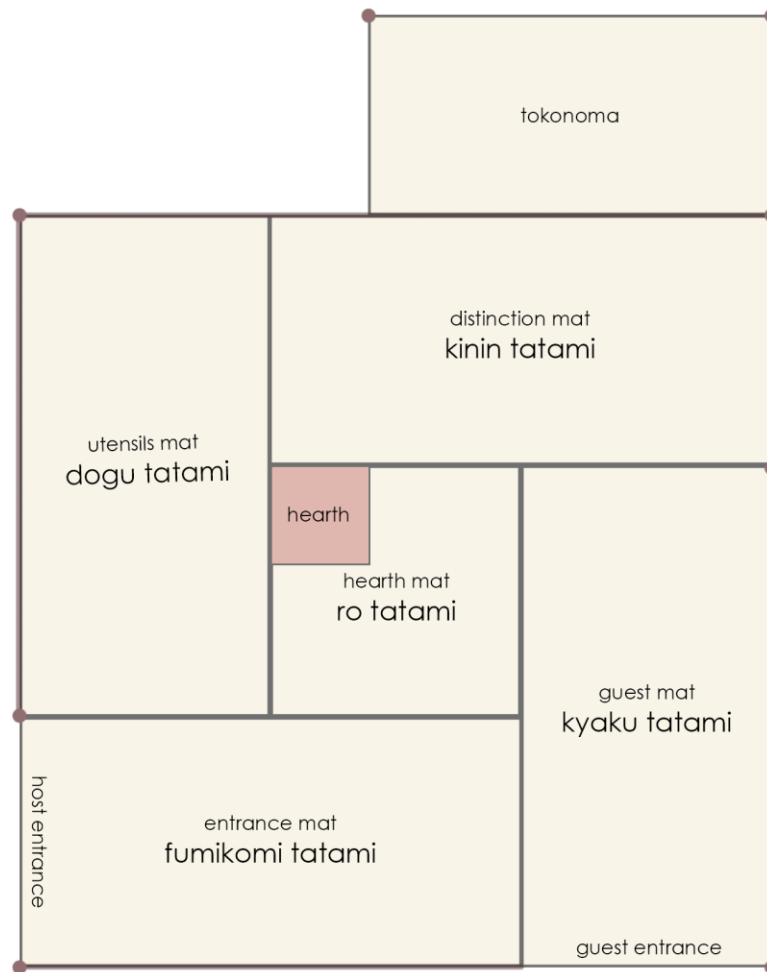


Figure 14. Four-and-a-half Tatami Tearoom arrangement (Developed by Author).

Centralized hearth algorithm, transferred to the common dwellings' plans found its place and meaning in the regular routine. *"The Japanese hearth is also normally in the dirt-floor kitchen, but in the middle of it, or sometimes at the center of tatami room"* (Sirvimaki, 2003, p.86). Black (2011) also presents how a typology of a tearoom with centralized hearth repeats in various building types, including so-called 'thatched minka' farmhouse or people's house and in some samurai residences. Moreover, the central tea table, commonly seen in later (Edo period) occurred typology, the 'machiya' (city house), can be considered as an evolved adaptation of the hearth (Black, 2011). However, *"Despite its centrality to Japanese cultural identity, Japanese Tea ritual*

or chanoyu has been treated superficially in the ethnographic literature” (Anderson, 1987, p. 475). Anderson studies The Way of Tea and the religious symbolism of its etiquette that unconsciously rebounds in daily tea ceremonies. He noted the strong presence of Shinto and Taoist beliefs in actions (1987). The final stage of the ceremony finds its place in the tea room of chashitsu (tea house).



Figure 15. Tea Ceremony, from the series Etiquette for Ladies (女礼式ノ内 茶之湯ノ図) (Yôshû Chikanobu, 1888)

And even the traditional house of modern times retains this important feature in its approximate form and meaning. Irori (sunken hearth) is named to be the focus of household life, place for communication and relaxation and to preserve hierarchal order of guests' seating placement.

6. Conclusion.

Recalling three principles of conservation, in the current context of vernacular heritage, introduced by Hosey, which include: '*reduce, reuse, recycle*', the fourth step comes as first, '*rethink*' (2012).

Following my considerations, modern strategy of vernacular architectural heritage should be rethought to be further improved. This paper aimed to find the unifying algorithm through several distant or relative indigenous dwellings' analysis. Detailed case study included Chums of Nenets from the Central Siberia, Tipis of indigenous Americans, Arkaim Settlement of the early Indo-Aryans, Ainu aboriginal dwellings and the Cha-no-yu traditional Japanese teahouse. Successfully, the proposed algorithm was noticed to be repetitive in all of those examples. In this regard, the unifying centralized fire spatial arrangement is also bearing same spiritual significance in its background. Thus, vernacular architecture in the modern universalized world could be introduced in new glocal, simultaneously global and local, perspective.

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A Comparative Analysis On User Satisfaction In Closed And Open Office Buildings: Case Study Of Some Selected Buildings In Abuja

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Abstract

Many organizations and industries around the world have their own preference of office type base on the nature of services to be rendered. Office building without employee's satisfaction can adversely affect their performances at their places of work. Open office is an office that has large open space with no partitionable walls but providing workstation for each employee within the open space while close office is the type with solid walls or frames as partitions with doors which open to each office. It is in the light of this that the design of office becomes imperative to both employers and architects. The aim of this study is to investigate user satisfaction and preferences in office buildings, in other to proffer appropriate design suggestion and recommendation that can be used when providing office to employees. A survey is adopted through the aid of administered questionnaire to respondents, and the results are therefore analysed using simple statistical tool. Findings from the study reveals users satisfaction and preference for open office layout, it further reveals efficiency in users productivity due to its effectiveness in communication, knowledge sharing, space saving, cost saving and flexibility in managerial activities. The study therefore creates a correlation between findings conducted by other researchers over the years concerning the provision of office for employees their preference and satisfaction for open office buildings.

Keywords: Office building; Open office; Close office; Users satisfaction; Users Preference.

Introduction

An office or office building, is represented as an office block and a business center. Office buildings are known with different forms, and are characterized as buildings that contains mainly designed spaces used for offices (Brookes & Kaplan, 1972). The primary purpose of an office is to provide a workplace and working environment primarily for administrative and managerial activities (Wineman, 1986). In the words of office design consultant and author Francis Duffy, "The office building is one of the great icons of the twentieth century. Office buildings and towers dominate the skylines of cities in every continent and are represented as the most visible index of economic activity, social, technological, and financial progress, they have come to symbolize much of what this century has been about." (Peponis et al., 2007).

Office building as described by Brill (1984), is the most tangible reflection of a profound change in employment patterns that has occurred over the last one hundred years. In present-day America, northern Europe, and Japan, at least 50 percent of the working population is employed in office settings as compared to 5 percent of the population at the beginning of the 20th century. Office architecture has undergone many interconnected phases and have withstood both discontinuity and inconsistencies. Influences from the past can be found in contemporary office designs just as Prevailing political and social conditions as well as the development of technology further explains changes in the form and use of office spaces (Wineman, 1982).

Through successive trajectory in office design, concepts and high performance Moore et al., (1985), describes an office as a space which is capable of offering both owners and users increased working satisfaction, productivity, improved health, greater flexibility, enhanced energy and environmental performance that is safe, healthy, comfortable and aesthetically pleasing. The Concepts towards office designs are every day evolving and office spaces are

becoming layout set to induce interaction and face-to-face knowledge and information exchange Abuja being the capital of Nigeria, is embraced with lots of office buildings, most of the office buildings have various design patterns and concepts (Wineman, 1986). Office buildings in Abuja tend to symbolize the dominance of work force as they reflect in the efficiency and growth of economic activity, social, technological, and financial progress. However a comparative study on user satisfaction in closed and open office buildings in Abuja will further throw more light on the dominance of office design patterns and concepts, as well as preference and satisfaction for office building types.

Methodology

In a bid to actualize the comparative study between closed and open office layout, the study tend to adopt a qualitative approach. The approach is however much appropriate for the study and thus was effectively used to investigate, analyse and evaluate user satisfaction in closed and open office buildings. The total of 100 structured questionnaires were formulated and randomly distributed amongst respondents (staff) of Airtell call office premised in Abuja which operate an open plan office settings and the federal secretariate office which operate a close office plan settings. The derived and retrieved data is quantitatively analysed using Statistical Package for Social Science (SPSS) software program. However descriptive statistics is further used to summarize and evaluate the data based on the results obtained from participants of the study.

Results And Discussions

From the questionnaire administered to open plan office users in Airtel call centre Abuja, twenty five of the questionnaire were returned out of the thirty administered to respondents, while one hundred questionnaire were administered to open office users with eighty five returned. They are to chose from the following options on how they feel about their office wheither poor, good, very good or excellent. Questions asked were how satisfied they are in

their own office, how effective is their communication within group, interaction with colleague, visual privacy in their office and acoustical privacy.

Satisfaction with own office

Satisfaction in an office is relative to individual. However, it shows how happy or contented an employee is in his place of work or work station, his views on office setting ranging from furniture arrangement, types of furniture, size and shape of the office. The figure below shows the states of satisfaction with own office in open and closed office.

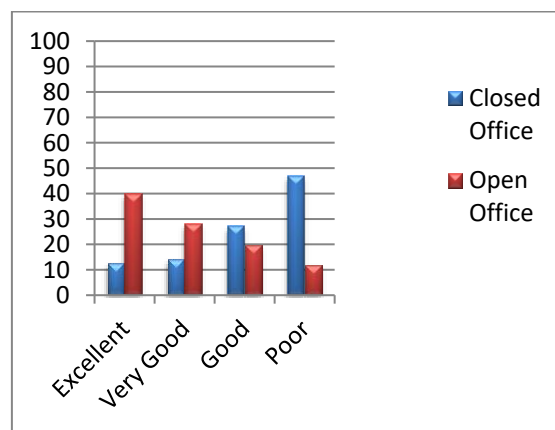


Figure 1: Satisfaction with own office Source: (Author, 2012).

The figure above shows that 40% of open office users are satisfied with their own office against the 12% percentage of the users who rate their satisfaction with own office as being poor. Greater percentage of the respondent are satisfied because it allow them to learn from their colleagues while 47.1% of the close office users are not satisfied with own office because it does not allow them to interact well with their colleagues.

Communication within group in office

The effectiveness of information gathering and dissemination depends on how closely employees are to each other in their places of work Oneil, (2008). and help in managing the day to day activities in the office, its increases efficiency and effectiveness of the staff, allow room for easy feed back on issues that needs prompt attention, hence help in achieving the

organizational goals and objective within a limited frame of time. The figure below shows the percentages of how the rate communication within a group in an office.

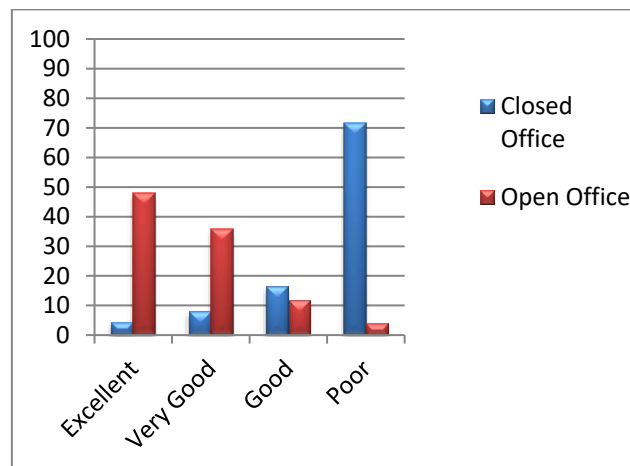


Figure 2:Level of communication of employees within a group. Source:(Author, 2012).

The figure above showed that 70.1% percentage of close office users opined communication within a group is very poor because of the barrier created by partition walls which separate them from each other while 48% percentage of open office users said communication with colleagues is excellent because they are closely seated together in an open space without any form of barrier separating them from their colleagues. From this we can deduce that workers relate with each other better in open office than in closed office.

Interaction with colleagues in office

Study conducted by Robert, (2008) on users satisfaction in open office layout revealed that employees that work in open office interact with their colleagues and are more flexible with their superior than those who work in close office environment, this is because information are share among all the staff irrespective of status in the office, however that those not means that subordinate look down or disrespect their supervisor or superior but relationship is cordial among all members of staff, interaction enhances good relationship and reduces rate at which employees keep grudges against one another thereby reduces rate of fighting or having

misunderstanding among them. The figure below shows the level of interaction among employees in open and closed office buildings.

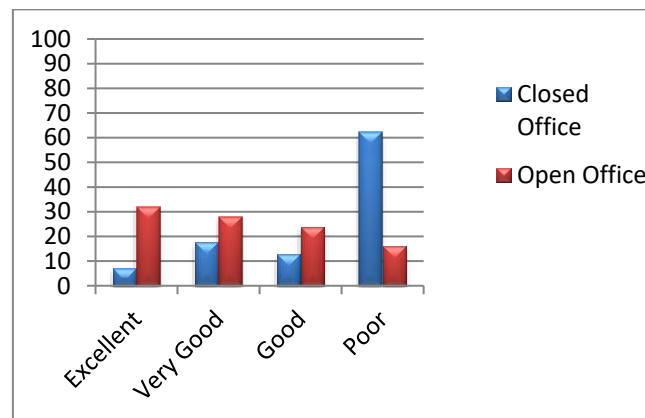


Figure 3: Level of interaction with colleagues in closed and open office. Source: (Author, 2012).

From the figure above 32% of open office users said interaction with colleagues is excellent because the employees are always together in one place while 12% percentage are of the opinion that interaction is very poor possibility because they do not often agree on some issues. 62.4% of the respondent in closed office rate interaction with colleagues as poor because the staff are staying in their own office and it will be cumbersome for them to be moving from one office to the other.

Visual privacy of the office environment

Serene view of the surrounding help in reducing stress in an office environment, however this depends on the quality of landscape employed on the surrounding. Soft landscaping elements like flowers, shrubs, lawns, vegetations, water bodies, rocks and trees gives the building a sense of nature. Yildirim, (2007). In open office, it's become difficult for all employees to have a look at this nature and sky view because majority of the sitting arrangement are within the centre of the office while the remaining ones at the edge are limited, who have this rare opportunity of sky view and landscape elements. While in close office every employee has the opportunity of looking out through their windows whenever they are tired of work to feel

relief from stress not only that but their efficiency and performance in office increases, that way close office plan has more visual privacy than open office plan. The figure below shows the reaction of employees to visual privacy of their environment.

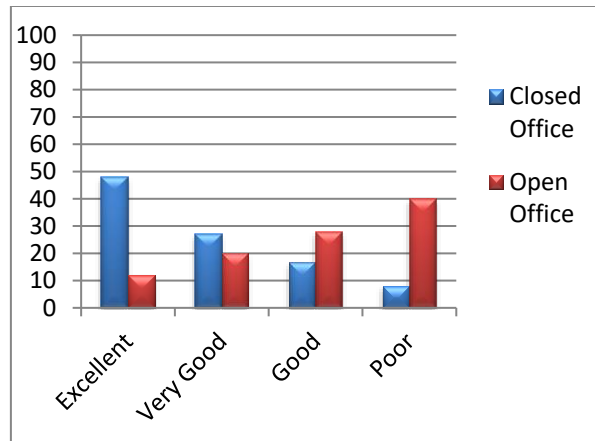


Figure 4: Visual privacy of the office environment. Source: (Author, 2012).

One advantages of closed office to open office is out door view of the office environment as can be seen in the figure above 48.2% of the respodent said visual privacy is excellent as agaaist the 12% of open office users who said out door view of their office environment is excellent, this is because they are restricted in one open space with on a few number that have their work station located along the window side while most of them have their work station station far from the window and door which do not allow them to have a sky view.

Acoustical quality of the office

Noise reduction is a major consideration that one has to take when ever a design is being proposed. Perceived individual privacy facilitate and enhances the desired activities within a confine space Barrett, (2002). Most people desire to work alone in an office hence prefer close office layout plan compare to open office plan, its is essential since the nature and type of work they do strongly influences their choice of office type. For example an architect, medical doctor, nurse, pharmacy, lawyer, and computer programmer whose work required a lot of concentration and thinking prefer to work in an open office environment when compare to system analysis, banker, broker, social welfare workers whose work require

interaction among them for easy sharing of informations. This can be reduce when designing for ceilings, walls, and floors by replacing them with acoustical materials to reduce the noise in design of close office. The figure below showed the acoustic quality of open closed office.

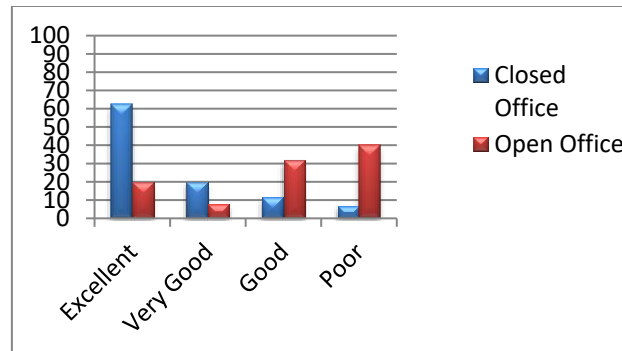


Figure 5: Acoustical quality of open and closed office. Source: (Author, 2012). From the figure above 61.2% of closed office users said acoustical quality of their office is excellent while 20% of the open office users said is excellent, also 40% of the close office users said acoustical quality of their office is poor against the 7.1% in closed office, this could have been to attributed to the fact them in open office employees are much and there is high tendency of noise among colleagues when compare to closed office were employees are few.



Plate 1 : An open office showing employees at their work station (Author, 2012).

The picture above shows workers in an open office layout. Each worker with his own work station separated from his colleague by his desk, chair, computer and their accessories on his

table. Here all workers can view each other since they all operate in an open space hence supervision of workers performances becomes easier by their superior.



Plate 2 : Workstation of one worker in an open office (Author, 2012).

The picture above shows the an employee workspace provided for him in an open office which he controls as his own domain. He is separated from his colleagues by glass frame.

Recommendations and Conclusions

Previous studies have documented that open office layouts increase interaction and communication between employees. However, such layouts can also increase visual and noise distractions, reduce perceived privacy and hinder employees' ability to concentrate on their job tasks when needed. It appears that the open and closed offices have benefits and drawbacks. An assessment of the organizational goals, group objectives and individual responsibilities is needed to decide the right mix of open and closed spaces for a given work area. Sit-stand adjustable furniture that promotes postural changes and body activity can improve employees' perceived energy level and mood state after a day's work.

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Embracing today's economic and technological reality What it means for design professionals

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Abstract

History has shown that technological advancements alter the way we produce, exchange, protect, consume and save all kinds of goods. The First Industrial Revolution, for example, has been named as such since it indeed revolutionized everything related to daily living including art, culture, economy and politics. History has also showed that most cultural actors are reluctant to embrace advanced technology at first as they might see it as taking away something at the core of humanity. Arts and Crafts movement for example, grew out of a concern for the effects of industrialization on design, on traditional skills and on the lives of ordinary people.

Today, economists, scientists and policy makers in developing countries are talking about the coming of the fourth industrial revolution and the Second Machine Age, that not only will redefine the way humans live their daily life but also the very definition of human beings. The aim of this study is to discuss the effects of these changes on theoretical and practical issues related to design professionals and education, including advanced technologies available and social and cultural implications of their use. The paper will argue that today's economic and technological reality will alter the design profession from its education to its implementation.

Keywords: Advanced technologies; industry 4.0; design profession, design education.

1. Introduction

The rate of change in all areas of human life has been increasing ever since the First Industrial Revolution. Today not only the rate of change is drastic but also the number of changes that are taking place are numerous. It has been discussed that we are entering a new era in human history where digital technologies are creating new life practices altering our very way of life and revolutionizing everything related to art, culture, economy and politics. Today, economists, scientists and policy makers in developing countries are talking about the coming of the fourth industrial revolution, termed as Industry 4.0 in 2011 in the Science Fair in Hamburg, Germany, and the Second Machine Age, that not only will redefine the way humans live their daily life but also the very definition of human beings. Internet, the new renewable energies, and 3D-printing are the keys for the Third Industrial Revolution that was initiated after the 1970s which are increasing their effect on human lives.

History has also showed that most cultural actors are reluctant to embrace advanced technology at first as they might see it as taking away something at the core of humanity. Arts and Crafts movement for example, grew out of a concern for the effects of industrialization on design, on traditional skills and on the lives of ordinary people. However, their idea of art for the people could not be accomplished because their exquisitely made and decorated pieces could only be afforded by the very wealthy.

Today's technological advancements offer new perspectives and opportunities that already started to affect all areas from archeology to medicine, from construction to heritage. More importantly, the Industry 4.0 signals the end of capitalism as economist Jeremy Rifkin (2016) suggests, while a new economic paradigm is emerging which he calls collaborative commons which will transform our way of life. The aim of this study is to discuss the effects of these changes on theoretical and practical issues related to design professionals and education, including advanced technologies available and social and cultural implications of their use.

The paper will argue that today's economic and technological reality will alter the design profession from its education to its implementation.

2. First Industrial Revolution and Architecture

At the time when James Watt invented steam engine in 1765, architects were almost unaware of its implications for architecture. Architects were more interested with finding the appropriate 'style' for emerging functions such as banks, libraries, hotels, museums, opera houses, train stations etc. due to social changes taking place. In this period known as Neo-Classism, architects' discussions were focused on finding 'the style' that would fit better into these new functions based on the ideals of their newly established nation states. Italian architects were considering Roman architecture more appropriate to them, for example, while Gothic was declared as the most British. America, on the other hand, decided Greek architecture more appropriate for their newly established democracy, while Baroque was found more appropriate for Paris Opera House by French architects as a place of human emotion and drama.

Technology, however, was already on its way to produce new materials and techniques that would alter architecture drastically. It would take some time for architects to accept and use these new technologies and materials available as representatives of the new age. It required not only the availability of these new materials and technologies but also acceptance of them by architects first and also by the society leading the way to consider technology as the "cultural manifestation of modern man."

One of the earliest examples of steel columns, for example, is in a public library in Paris, Bibliothèque Sainte-Geneviève (1843-1850). Designed by Henri Labrouste, the building (Figure 1) is a representative of how inexperienced and noncreative architects' of the period were. They were hesitant and non-imaginative in using new materials such as these slender cast-iron columns shaped as sort of Corinthian columns having set on stone pedestals. From

the outside the library just looked like traditional stone and brick buildings without ever indicating the use of iron columns and beams inside.



Figure 1: Bibliothèque Sainte-Geneviève (1843-1850).

The architects' preoccupation with style and lack of interest with the technological developments are reflected most clearly in the story of the world's first temporary exhibition building, the Crystal Palace in London. The building's story starts when the world's first developed colonial power Britain wants in 1850 to organize the world's first expo to showcase the latest technologies and innovations from around the world titled 'The Great Exhibition of the Works of Industry of All Nations.' In January 1850 they announce a competition and form a committee to select the winning design. The structure had to be as economical as possible and be built before the exhibition was scheduled to open on May 1st, 1851. Within 3 weeks the committee receives 245 entries, all of which are rejected. None of the designs would satisfy the requirements until a gardener Joseph Paxton, who happened to be in London and heard about the difficulties, visits Hyde Park and quickly doodles his famous concept drawing of the Crystal Palace for the committee (Figure 2).

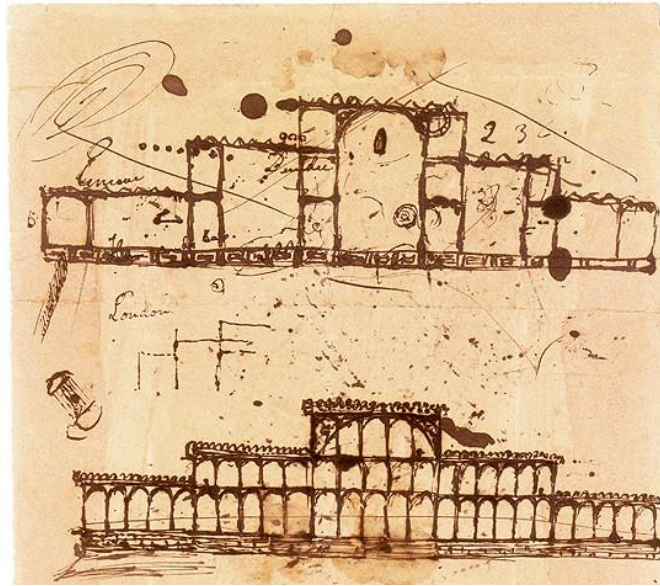


Figure 2: First sketch for the Great Exhibition Building by Sir Joseph Paxton (1850).

Paxton was just a gardener who started to work in 1823 at Chiswick Gardens, then in 1826 appointed by the Duke of Devonshire as head gardener at Chatsworth House. Here Paxton designed gardens, fountains, a model village and an arboretum. Paxton's interest of building greenhouses led him to be interested with the new technological developments as well. It is known that he was friends with engineers of the period such as Robert Stephenson. Using combinations of prefabricated cast iron, laminated wood and standard sized glass sheets, he created the 'ridge-and-furrow' roof designs. In 1836 this system was used for the first time in the 'Great-Stove' the largest glass building at the time.

Paxton's experiments with glass and iron to build greenhouses were reflected in his concept drawing for the exhibition hall which included all the basic elements of the building. The design was a vastly magnified version of his lily house at Chatsworth. It was cheap, simple to erect and remove and could be ready quickly. Its novelty was its revolutionary, modular, prefabricated design and the extensive use of glass, and very low cost. The committee accepted Paxton's innovative plan.

Despite widespread cynicism amongst press and public of the period, when the Great Exhibition opened in May 1851 it was an enormous success. The satirical magazine *Punch* named the building as 'Crystal Palace.' Crystal Palace (Figure 3) resembles a giant greenhouse covering 77,268 sqm area. A total of 3350 cast-iron columns were used in the building, 1851 of which stood at the longer side representing its construction year. Its glass walls and roof cover an area of 83,700 sqm. Paxton's ingenious design created an unprecedented exhibition space. The construction, acting as a self-supporting shell, maximized interior space, and the glass cover enabled daylight. The method of construction was a breakthrough in technology and design, and paved the way for more sophisticated pre-fabricated design.



Figure 3 : The Crystal Palace in Hyde Park for Grand International Exhibition of 1851

Between May and October 1851 millions from across both the UK and the world visited the Crystal Palace. In October, Paxton was knighted by Queen Victoria when he got his Sir title as well as the title of architect. By the time exhibition closed its doors, much of the British public had grown exceptionally fond of their 'People's Palace' and there was great concern that the temporary structure was about to be lost forever. Thus, it was re-erected in Sydenham in south London in June 1854, where it remained until it burned down in 1936.

Starting with the second World Expo Paris 1889, we see architects and engineers designing together such as the ‘Galerie des Machines’ designed by architect Ferdinand Dutert in collaboration with engineer Victor Contamin. The marriage of architectural ideas with new materials made available by the new technologies had to wait until the pioneers of modern architecture put them into use. It required not only the availability of these new materials and technologies but also acceptance of them by architects first and also by the society leading the way to consider technology as the “cultural manifestation of modern man.” Gropius’s glass skyscraper and Le Corbusier’s idea of undivided screens were among the first steps. The time gap between the demise of modern architecture and the technological innovations of first industrial revolution-mass production of glass and steel-is about sixty years.

3. Technology and Architecture Today

Today, economists, scientists and policy makers in developing countries are talking about the coming of the fourth industrial revolution, termed as Industry 4.0 in 2011 in the Science Fair in Hamburg, Germany, and the Second Machine Age that not only will redefine the way humans live their daily life but also the very definition of human beings. Internet and the new renewable energies were the keys for the Third Industrial Revolution (TIR) that was initiated after the 1970s. Another major development in TIR is the 3D-printing. This new technology changed the manufacturing process from ‘subtractive manufacturing’ into ‘additive’ one that will cut down the materials used to produce goods as well as energy used during the process. The development of new materials and technologies are at an unprecedented speed in contemporary period. Though there are some architects playing with the possibilities of emerging third industrial revolution much focus is needed within architectural discourse on the possible effects and interplays between architecture and the emerging new era with its new economic social and political agenda.

There are new avant-garde projects already experimenting with the application of the 3D printing technology. One of such as project is Amsterdam's 3D-printed steel pedestrian bridge that spans one of the city's old canals (Figure 4). The innovative Dutch construction company Heijman's Innovation Manager Jurre van der Ven suggests that we need to start looking at design in a completely different manner since in 3D printing design and construction operate hand-in-hand. Multi-axis industrial robots will construct the pedestrian bridge using cost effective and scalable technologies creating an automatic construction site.



Figure 4: Amsterdam's new 3D-printed steel bridge.

A new Ukrainian homebuilding startup company called PassivDom uses 3D printing robot that prints 20cm-thick walls, roof and floor of 380 square foot house in about 8 hours. The materials used include carbon fibres, polyurethane, resins, basalt fibers and fiberglass. The windows, doors, plumbing and electrical systems are for now added later on by a human worker. PassivDom's houses are now available for preorder online in Ukraine and US. Their designer Maria Sorokina adds that the homes also offer the possibility of living off-the-grid providing an opportunity to live in nature away from civilization but having the traditional house's comfortable conditions.

One of the world's largest architectural firms, Foster and Partners and a UK based 3D printing company called Monolite have teamed up with the European Space Agency to explore the possibility of using 3D printing to construct a permanent base on the moon. The buildings

would be printed using lunar soil as the feedstock. The goal is to construct lunar habitats with locally sustainable materials found on the moon in order to avoid the logistic cost of shipping in materials from Earth.

The developments of Industry 4.0 are way on its way and it will alter many professions and similarly the way we live including the way we produce goods and the way we use them. Digital technologies available are also increasingly getting faster and more developed each day: Limits of image resizing and processing are increasing, new ways for image storage and retrieval lead to new image databases and faster access to images, many documents are digitized for public access including rare books and manuscripts, digital access to many photographic collections are made available each day.

4. Discussion and Conclusion

As discussed above, we have already entered what has been called ‘The Second Machine Age.’ The Industry 4.0 signals the end of capitalism as economist Rifkin (2016) suggests, while a new economic paradigm is emerging which he calls collaborative commons that will transform our way of life. Today we have more powerful computers, cheaper mass storage, higher band-width for internal and global networks, and more importantly soft-wares and file formats are becoming standardized thus enabling sharing.

The different historical layers of the city could be made available as cultural restitutions through digital surrogates. VU City project developed by Gordon Ingram and James Hotown Associates might be a good example for understanding these surrogates. They already digitally scanned and produced the city of London as a case for smart city data, i.e. large data readily available for live use. It is a case where city modelling is at a new level; you can see timeline of buildings in London as you desire for example

We need to evaluate theoretical and practical implications for many disciplines including art, architecture and heritage as well as education in all disciplines. Today, digital technologies

such as the 3D printing and 3D laser scanning might be in still developping, but their properties as well as usage will grow exponentially in the coming two decades as they becomes increasingly efficient and cheaper. Low cost techniques on 3D representation and 3D printing have already started to effect heritage preservation. Many European research projects are already completed such as VITRA (Veridical Imaging for Transmissive and Reflective Artefacts), VASARI, International Dunhuang Project, VU City and Collect Britain. British Library pronounced that the aim is to help people advance knowledge to enrich lives by aiding scientific advances, adding commercial value for businesses and contributing UK's 'knowledge economy' via innovatively exploiting it collections as a resource for the nation and the world. Some of the

To conclude, digital technologies are new tools that are providing new means for us in our work on cultural heritage as well as via internet platforms getting faster and better we have new ways to share our work with the rest of the world, and we may also have new educational tools soon using 3D virtual reality-VR, augmented reality-AR and mixed reality-MR technologies. We already started to have virtual collections available online. All together they can aid us in creating new ways of communicating to increase much needed intercultural dialogue that fosters understanding and peace among different cultures.

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Re-visiting the Park: Reviving the “Cultural Park for Children” in Sayyeda Zeinab in the shadows of Social Sustainability

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Abstract

This paper aims to question the level of success of one of Egypt's contemporary architectural milestones which is the Aga-Khan Award winning project of the Child Park in Sayyeda Zeinab - designed by the Egyptian architect Abdel-Halim Ibrahim; from a community participation perspective. Stemming from the fact that the level of successful community participation in architecture and urban design projects affects the sustainability of the added value, this paper tackles the current process of operation of the Park and the adjacent pedestrian street, as complementary aspects of a community participatory process, and evaluates the social sustainability of the project as well. The study sheds light on the operation of the park after twenty eight years of the initiation of the project, it explores its functional and social role in the district of Sayyeda, located at the center of Cairo city.

The park primarily targeted the local community in Sayyeda Zainab, aiming to address the social challenges that confronted the community, as well as paying tribute to its different layers of historicity. Initially, the process of building the park was utilized by the architect as a vibrant community participatory ceremonial event. The project of the park was awarded the Aga_Khan award based on its announced aspiration to contribute in a long-term community participatory approach.

However, the project has to be revised and analyzed from a critical perspective to evaluate the degree of its success in affecting the local community, and the level to which it contributes to the approach of local community participation. In order to achieve this end, the paper adopts a

two-fold methodology. The first is a literature review of the initial ceremonial participatory process of building the Park and the initial role intended by the architect whether related to the park itself or to the adjacent Abu-ElDahab Street. The second methodology is a qualitative analysis of the current state of the park and adjacent street, based on site investigations, behavioral mapping of the current status, analysis of the roles of the beneficiaries, interviews conducted with different stakeholders about the present challenges of the role of the park in the district. Based on those two main research approaches, the paper concludes with a framework and several guidelines to enhance the social sustenance of the place through rephrasing the park's role in relation to the changing needs of the community.

Keyword: Child Park; Community Participation; Social Sustainability.

1. Introduction

Reviews of many renowned projects reveal that the level of successful community participation in architecture and urban design projects affects the sustainability of the added value of such projects in their contexts. This paper aims to question the level of success of a contemporary architectural milestone in Egypt; namely the Aga-Khan Award winning project of the Child Park in Sayyeda Zeinab - designed by the Egyptian architect Abdel-Halim Ibrahim; from a community participation perspective. The children park was complemented by the project of Abu-ElDahab pedestrian street, both projects functioned collaboratively to respond to the needs of the adjacent community and establish the participatory approach for a sustainable development. After 28 years of its initiation the study revisits the project which was launched with much publicity raising high hopes to achieve its noble aspirations. The methodology adopted in this paper as shown below in (figure 1), is based on primarily, a literature review of the community participatory approaches in contexts of Heritage Value, followed by initial ceremonial participatory process of building the Park and the initial role intended by the architect whether related to the park itself or to the adjacent Abu-ElDahab Street. Following that a

qualitative analysis of the current state of the park and adjacent street is conducted, based on site investigations, behavioral mapping of the current status, analysis of the roles of the beneficiaries, interviews conducted with different stakeholders about the present challenges of the role of the park in the district. Based on those two main research approaches, the paper concludes with a framework and several guidelines to enhance the social sustenance of the context through rephrasing the park's role in relation to the changing needs of the community.

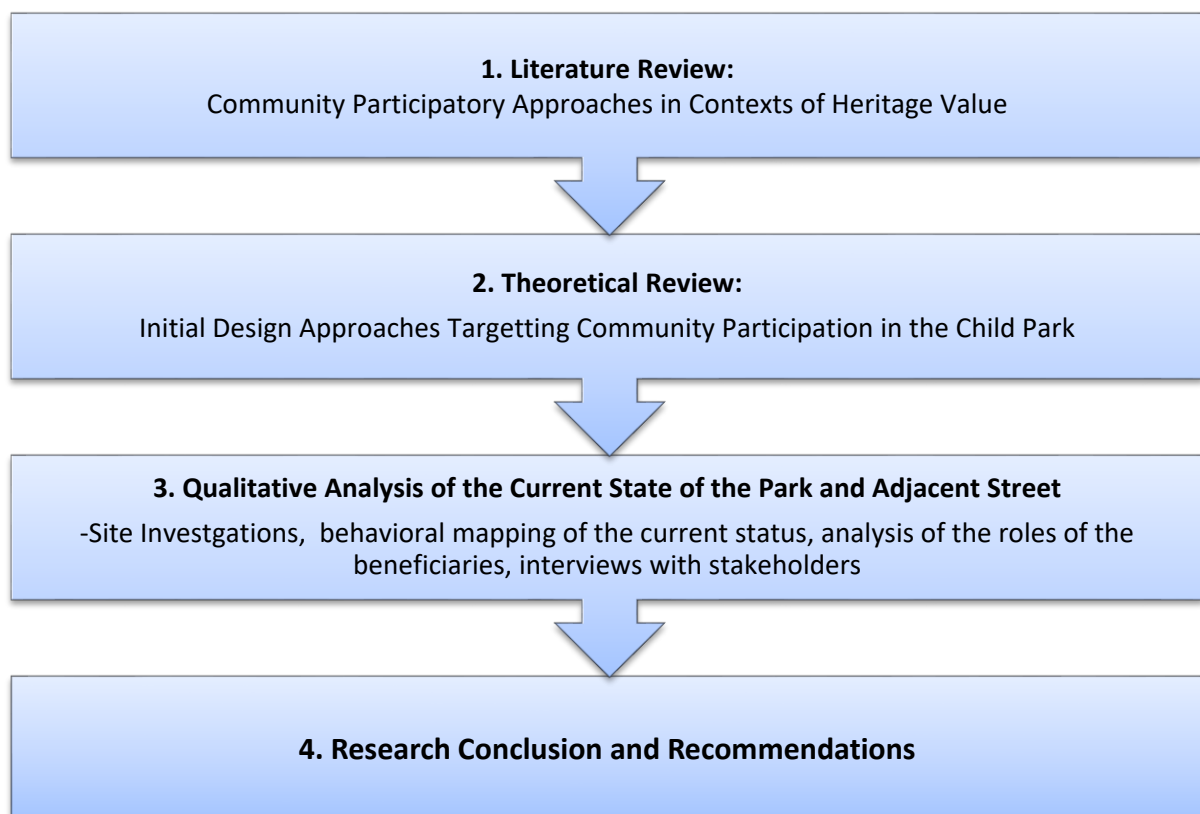


Figure 1: Research Methodology, Authors, 2018.

2. Theoretical Overview to Community Participatory Approaches in Contexts of Heritage Value.

According to (Bens, 1994), the international scale resources for social welfare services are becoming very limited. This is due to the pressures of population increase and the consequent changing priorities of governments. and the changing priorities for governments, (Bens, 1994). Thus, the utilization of non-professionals through citizen involvement mechanisms to address

social problems has become more applicable in addressing the development demands of local communities, (Kaufman and Poulin, 1996).

The term community participation is itself a rich concept that differs according to its application and definition. The way participation is defined also depends on the context in which it is implemented. The definitions selected here focus on the main spectrum of interest of this specific research study. Oakley and Marsden (1991) defined community participation as the process by which individuals, families, or communities assume responsibility for their own welfare and develop a capacity to contribute to their own and the community's development. In the context of urban development, community participation refers to a dynamic process in which the beneficiaries influence the direction and execution of development projects rather than merely receive a share of project benefits (Bamberger, 1991). As to Arnstein (1969), citizen participation is the same as citizen power. However, she argues that there is a critical difference between going through the empty ritual of participation as a process only and having the real power needed to affect the outcome of the process itself.

In the realm of urban development, participation in housing and urban service management is a process where people as consumers and producers of housing and urban services are involved in the planning, implementation and maintenance of the projects. Participation is based on voluntary relationships between various actors, which may include government institutions, individual housing and urban services users, community-based organizations, user groups, private enterprises, and non-governmental organizations, (Nour, 2011).

Nour (2011) further asserts that the concept of participation in development is certainly not a new one. According to Moser (1987), in rural development, community participation has been evidenced as an important success factor since 1950. This is evidenced through experiences with participatory housing and urban development projects which show that community-based organizations and housing users can make important contributions to the

provision and operation and maintenance of housing and urban systems. Benefits are achieved not only from reducing cost and active resource mobilization, but also from better targeting of project measures to peoples' real needs through their involvement in the planning phase, which will be further evidenced in the case study.

In addition to that as Nour (2011) proposes, participation enhances the "ownership" of the facilities by the involved community and thus ensures maintenance and sustainable use of facilities and more reliable operation. From another dimension, Rashed el al., (2000), focus on the importance of paying special attention to community participation while dealing with the issue of heritage conservation. This was evidenced in the restoration projects handled by Rashed in the conservation projects implemented in Quseir city. Local community participation within participatory environment, from the very beginning, was the policy adopted. Involvement and sharing with the people of Quseir started with the planning and strategy of work as well as using workers and technicians from the city people in the execution phase, (Rashed el al., 2000). This helped the engagement of the community in the process in a way similar to what will be explained in the case study below.

3. The Role of Community Participation In Achieving Social Sustainability

As addressed in the definitions and understanding of the term community participation, the issue of participation in development is intertwined with the sustainability of the implemented planning or project. The level in which the community gets involved varies. In order to understand the possibility of community participatory approach, the Arnstein ladder will be used as a reference model.

According to Choguill (1996), the best known attempt to determine the scale of participation by the public is that of Arnstein. She views citizen participation as a term for citizen power. Thus, Arnstein defines participation as "the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately

included in the future”. Arnstein categorizes the levels of involvement in the form of a ladder composed of the following milestones, empowerment, partnership, conciliation, dissimulation, diplomacy, informing, conspiracy and self-management, (figure 2).

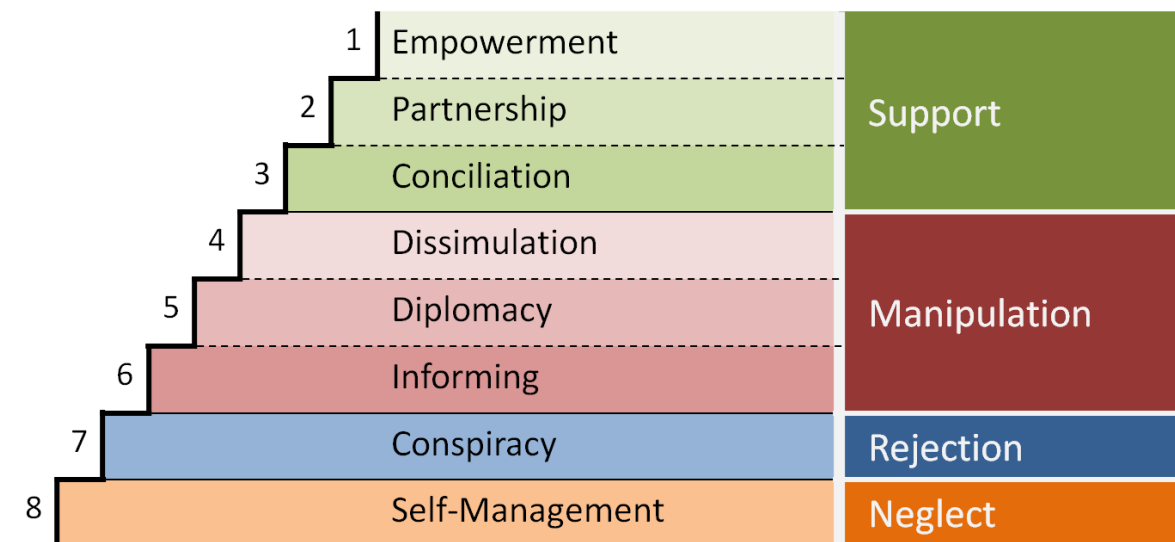


Figure 2: Arnstein's Ladder of Community Participation, Choguill, 1996.

As Choguill (1996) explains, supportive governments help achieve the first three levels of participation, namely empowerment, partnership or conciliation, depending on the degree of governmental willingness and/or confidence in the community's ability to contribute to the development process. Not-so-supportive governments will hide their discouraging attitude in an unskillful and sometimes very destructive approach to the problem, because it demobilizes an otherwise more effective organization of the people for the self-help they need. In this case, there is no clear/effective opposition to the community organization/activity, represented by several kinds of manipulation. When the poor are not yet ignored by the government, but rather they are seen as an inopportune and unwelcome group to be eradicated at any cost, a clear governmental opposition may result in a fearsome conspiracy. This is usually manifested as destructive governmental top-down projects which stimulate community solidarity and violent

reaction, Choguill (1996). This model will help in understanding the level of changing community involvement in the case study, in relation to governmental support and the sustainability of community participation in the operation of the park.

In addition to that as Enyedi (2004) explains, it is crucial to create a dialogue between decision makers and user groups as a pre-requisite for sustainable urban development. Towns and communities constitute the basic unit of local government in a democratic state. This is the level at which citizens come into direct contact with the state and the authorities in conducting their everyday affairs. Sustainable urban development depends to a very large extent on whether the public's encounter with democracy at the local level is a stimulating and satisfactory experience. It is evidenced that urban conflicts generate social exclusion which leads to deteriorated urban environment and political instability, Enyedi (2004).

In order to achieve sustainable public participation, the process can be implemented as a formal or informal procedure. This procedure can be led either by formal decision makers intervention, or through informal designer led procedure as will be explained in the process of design of the Child Park.

4. Design Approaches and Philosophy of Aga-Khan Award winning “Community Park”

This part will briefly explain the design process of the local case study which is the Child Park, depending of academic articles by the architect and other scholars. This explanation will be linked to the previous literature review to discuss the levels of community participation in the process as well as the sustainability of the participatory approach after years of operation and discuss the dilemma between intended values and implemented operations. It is important to note that the project was awarded the Aga Khan Award based on the community participation in the design process rather than an end product.

The official name of the project is the ‘Cultural Park for Children’; the park designer, Architect Abdel Halim Ibrahim mostly refers to the project as ‘the community park while the manager

simply describes it as ‘the child’s park’. In between ‘community’ and ‘child’ lies the conflict between the architect and the manager about the role of the park and its functional appropriateness. The ‘community park’ reflects the architect’s interest in the development of this community through the projection of his theoretical background, which is braced by the architect’s belief in the park as ‘an educational instrument’ (Saleh, 1989). The manager on the other hand showed more interest in the child’s everyday activities in the park. In other words, the architect read people through the wider social context of place, community, while, the manager read people as child’s activities within place, Abdel Wahab (2009).

The architect introduces the event through a ‘Building Ceremonial’, which involved building up a full scale model in wooden poles and canvas of the fountain and exhibits, whereas platforms and terraces were marked on the ground. Dancers, musicians and artists were invited to participate as well as the community of Al-Houd Al-Marsoud. The intent was to show the community how the project would be; this is not part of the contemporary Egyptian building culture, Abdel Wahab (2009).

According to the architect and designer of the park, the life and environment of the communities are regulated by an imposed, top-down process of planning and production which draws its principles from sources dislocated to the community and its cultures. The result is underdevelopment, and waste and destruction of the environment and its resources. The architect regards any environmental plan in context of these developing communities should be taken as an opportunity to re-establish the relation between the culture and the production of its environment. The responsibility of the architect in any public project in this context is to re-establish that relation; hence, the fundamental task of architecture is to try to understand local life, and search for the mechanisms that bridge the gap between technology and society, the material and spiritual, and become once more vital to communities in the process of the rejuvenation of their identities, (Ibrahim, 1996).

The design concept was based on layers of symbols and of bridging the missing gap between the community and the park, (fig.3, 4). The first layer is the formal layout inspired by the spiral pattern whereby the components of the project are organized around the palm-tree promenade. The existing trees of the earlier Al-Hod Al- Marsoud garden were maintained and reinforced, becoming the main axis for the conceived geometry of the park. The starting point of this geometric order is, fittingly enough, also the place for water, the source of life and growth. The end point is a lone tree at the other extremity of the palm-tree axis. The site is then organized in stepped platforms following the geometry created by the spiral. The platforms move upwards toward the middle of the site to form an arena-like park, and then they turn in the opposite direction forming a downhill arrangement towards the end of the site where the museum is located. The theatre is situated at the turning point of the two movements. Those three elements, the water point, children's museum, and the theatre are the main poles around which sets of activities, and hence meanings, are created within the realm of the park, (Ibrahim, 1996).

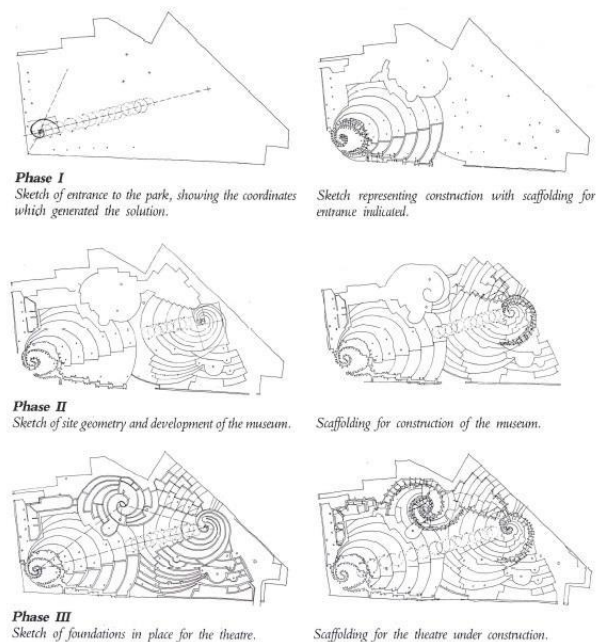


Figure 3: Development of Park Design Concept, Ibrahim, 1996.

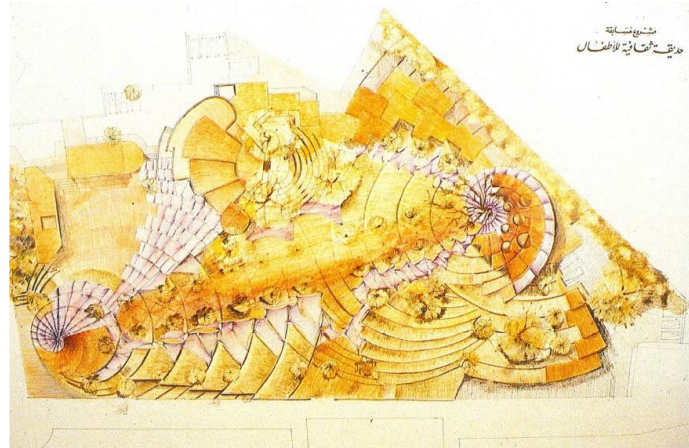


Figure 4: Park Design Entry in the Competition, Ibrahim, 1996.

The second layer is a circumstantial layout resulting from the ceremonial process. The building process was organized in a series of events, each of which combined technical work with cultural aspects of that particular operation. The park was built in stages, and the precise shape of each stage was defined as the work progressed. The building ceremony was thus not simply an empty ritual but a dynamic process where the static order of the original blueprint became flexible. Actual communication was established with local residents and creative decisions regarding how best to integrate the project into the community ensued, giving legitimacy to the process. Ideas and images emerged for the park that would not have transpired in the sterile environment of an architect's drawing office (Ibrahim, 1996).

In addition to the previous layers, the park wall, rather than preventing access, as is common in Cairo, became permeated by a series of openings to allow access to cultural facilities beyond. Again, in order to create a practical link between the service strip and abutting neighbors, the side street was pedestrianised. In addition, the Cairo Governorate was successfully lobbied to overrule an old expropriation law that prevented the renovation of the houses overlooking this street. Once residents were assured that their homes were not going to be demolished, they set about repairing their apartments, thereby upgrading the entire area.

In our case, the surrounding community became vibrant with activities. Residents upgraded their homes, street weddings and festivals became once again a feature of the community. For two years they celebrated the impact of the park in improving their environment, (Ibrahim, 1996).

However, after those two years, the official neglect by local authorities and the lack of institutional mechanisms at the community level to make up for this neglect led to the gradual deterioration of the street again. With no regular maintenance, elements like street lighting and regular garbage collection disappeared. As a result, the area once again appeared deserted and invited acts of vandalism from outside the area against the park. Drugs and prostitution, after being driven away for two years, reclaimed the territory. The proposed studios, shops, and community cafe along the side street, which were initially met with the much enthusiasm, failed to materialize due to government bureaucracy and now their establishment is looked on with skepticism and doubt. In response to formal mismanagement and the general sense of apathy in the community, some members chartered a community-based organization called the Abu Dahab Street Association to address these problems. Since its establishment the association has helped improve security in the area by lighting the streets once again and ensuring that they remain so. All these are positive indications of a community trying to have a bigger say in the nature of their surrounding urban environment and make the impact of the park in upgrading the area sustainable, (Ibrahim, 1996).

Based on observations later by Abdelwahab (2009) a significant change in the park is evident later after the published articles by the architect. The realities of the park's everyday life, and Abu Al-Dahab Street in particular, shows indifference to the original design scheme, creating conflicting community activity and isolating the park from Al-Sayyida Zeinab context. This change is also manifested through a conflict between the architect and the manager of the park (Hassan, 1996), where the manager intervened in the design and made several changes to the

park. Thus, the next analytical part will present the current case of the street and the park in order to re-visit the valaubale addition in the Cairene context. The analysis will be based on behavioral mapping of the activities in the park and the adjacent street during different times of the day, walk throughs and observations and finally interviews with the main beneficiaries of the zone.

5. Analysis of the Current State of the Park and the Adjacent Abu-Eldahab Street”

The next part will cover the analytical part of the paper, based on site visits during various timings for the park and the adjacent Abu-Eldahab Street. The fieldwork coincided with the annual ceremonial event of Al-Sayyeda Zeinab’ “Mulid“, a religious ceremony where a considerate number of the Sufis visit the place to pay tribute to the Prophet’s daughter on the assumed day of her birth.

During the period of the study, the space was occupied with the Moulid activities event, in additon to the original everyday ones. It has to be acknoweldged here, that the illustrations of the behavioral mapping were conducted by students enrolled in a Double Matsers Degree program by BTU Cottbus and Cairo University; and supervised by the authors of the paper. The students' contribution to the research is greatly useful in this context.

5.1 Behavioral Mapping of The Park And Its Context

The Park is currently forming a strict boundary between the resident’s of Sayyeda neighborhood. As apparent in (figure 5), the park is surrounded by impermeable walls from all sides, with the main and sole access is from the main street. Visitors of the park have to cross a security gate which embodies a strong territorial definition. Then, the security only allows children, or schools’ teachers accompanying school trips or organizations for disabled children. Parents are not allowed to accompany their children, which creates a gap between the users and the place, especially with the lack of visual connectivity between the outside and the inside. As shown in the map, the main attractions for children were associated with the traditional mud

crafts, and the talents show organized by an organization for mentally retarded children in the theatre at the end of the axis inside the park.

In the meanwhile the fountain zone, the open amphitheatre and the library rooms remain unoccupied; since the school trip is scheduled to use the closed theatre solely and children cannot move freely in the park. The activities in the park do not follow a voluntary pattern of use, the supervisors plan a designated schedule which leaves most of the park area unoccupied for most of the day.

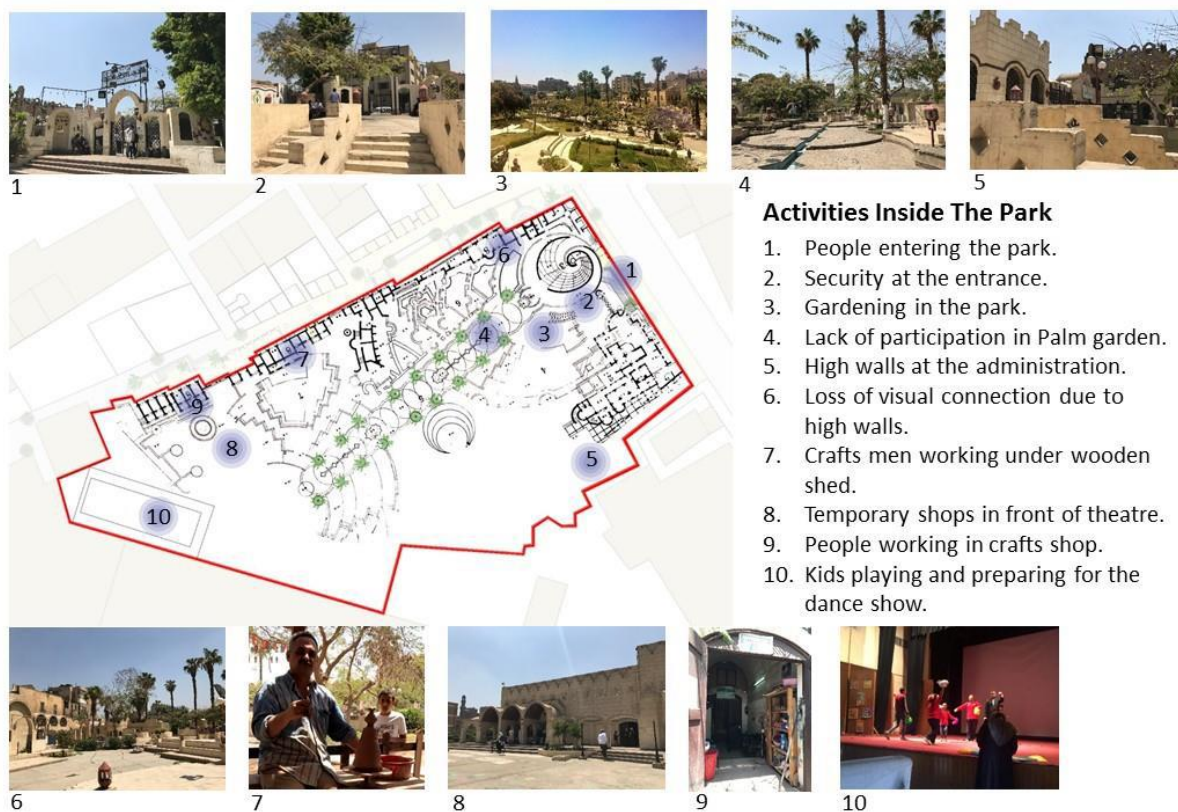


Figure 5: Overview of Activities Inside the Park, BTU-Cottbus Double Msc Degree Students, 2017.

As to the pedestrian street, Abu El-Dahab Street, it shares its entrance from Qadry street. The street has a wide entrance with palm trees and evergreen trees yet it has cars parking in this entrance which make it look narrower, the street is spitted into two halves the first half is adjacent to the park and it has the shops doors which are totally vacant and closed. This part is elevated with some steps. While the other side is on the zero level and is adjacent to the

residence and local shops. This difference in the street levels, although intended by the architect to create a special realm for the retail shops and to allow more street activities, resulted in the case that it segregates the park even more from the adjacent neighborhood due to the current lack of activities adjacent to the park's wall whatsoever.

Unfortunately the behavioral mapping and the observations show that the street is dead most of the time which is exaggerated by the absence of vehicular traffic as well. There are few active zones, as shown in figures 6, 7 and 8, which cover the behavioral mapping for the same place during different times of the day. The first one was the zone of "Ahmed Ninja" shop, which provides recreational activities for the youth in the neighborhood. The shop extends three billiard tables in the street, attracting youth playing billiards and others waiting for their turn, otherwise the place is so calm and most of the shops are closed. The second active zone is the wood workshops and little leftover wood in front of it. In this zone the street changes from pedestrian to Vehicle Street. The third active zone is at the end of the street, where car repairing shops with a coffee shop for people to wait for their cars there.

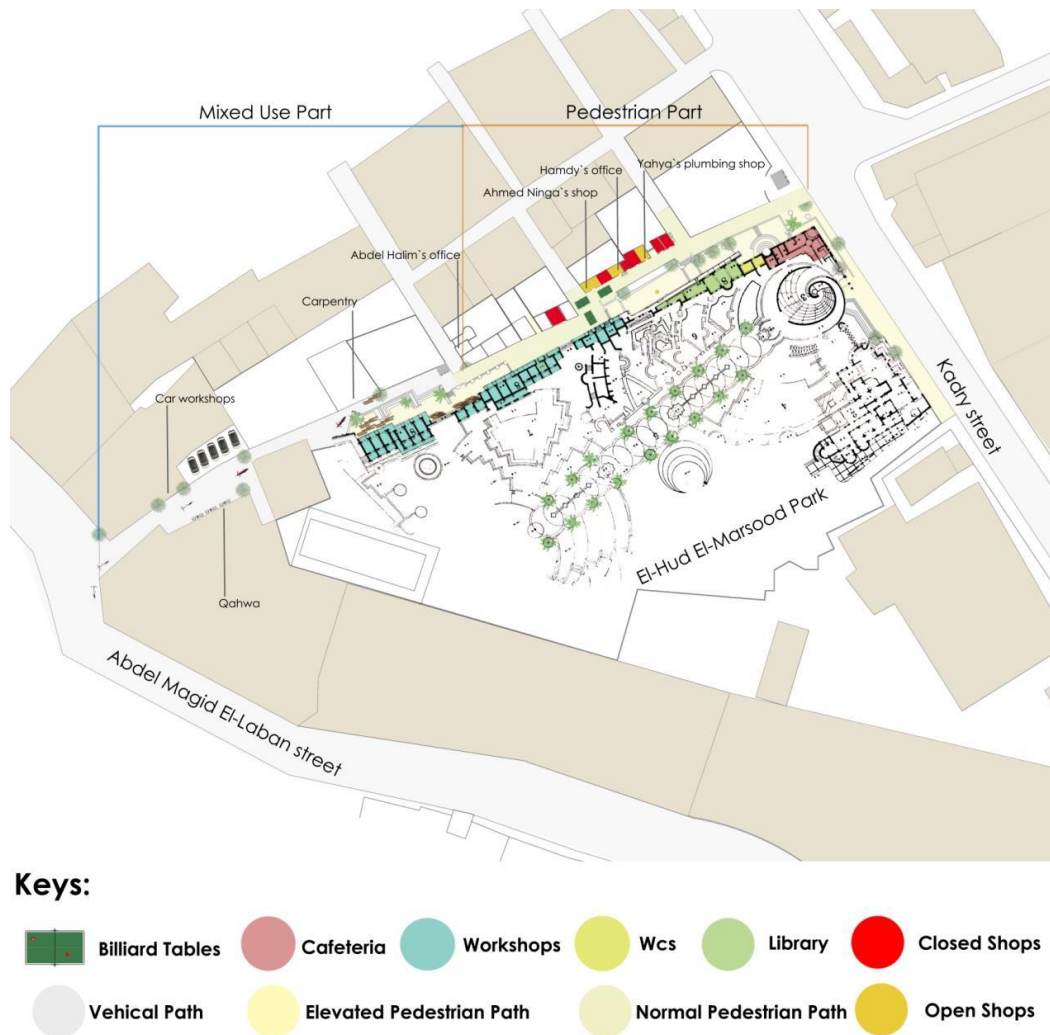


Figure 6: Activity and Users' Mapping of the Park and adjacent street, BTU-Cottbus Double Msc Degree Students, 2017.

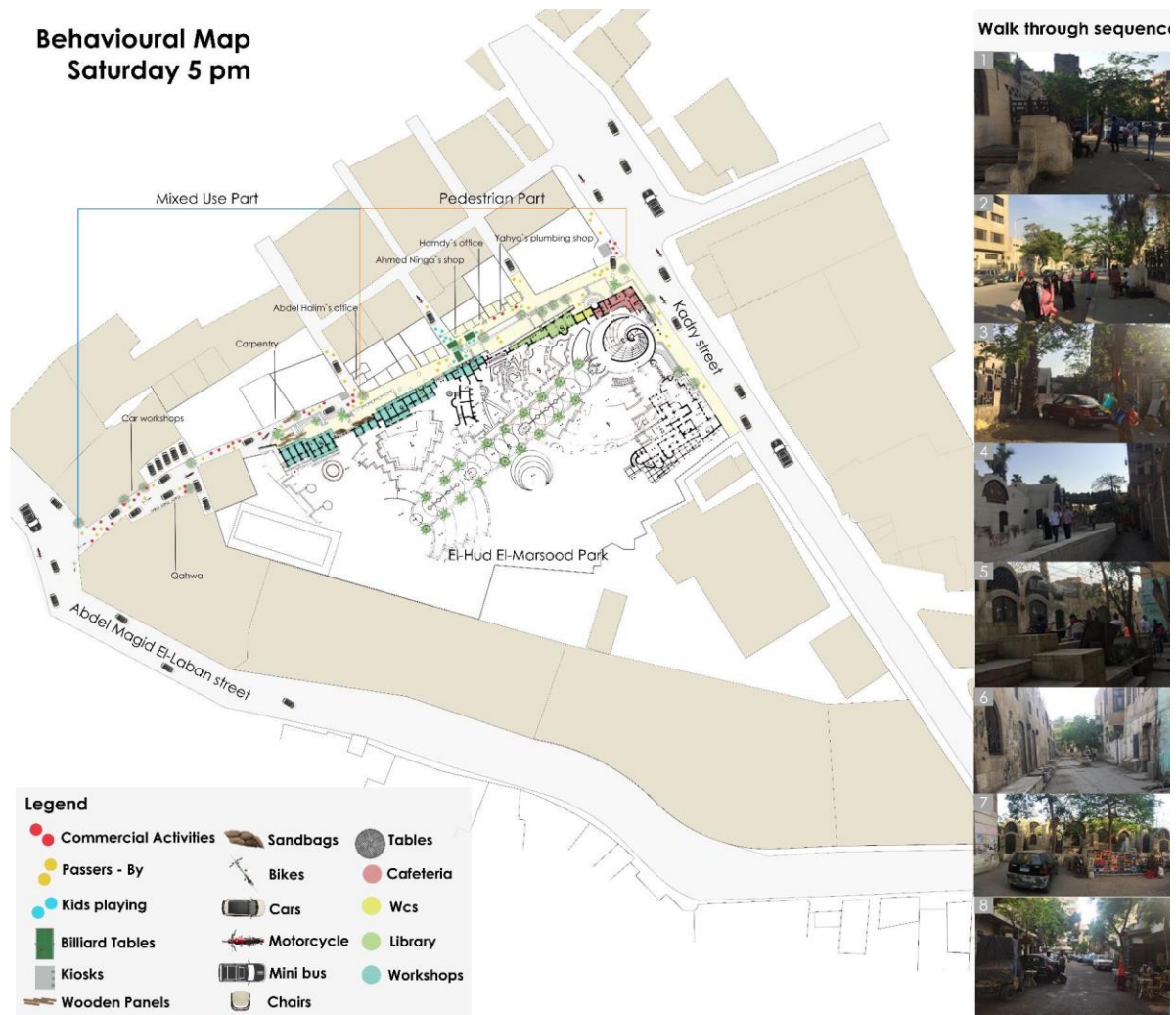


Figure 7: Behavioral Mapping of the Park and Street, BTU-Cottbus Double Msc Degree Students, 2017.

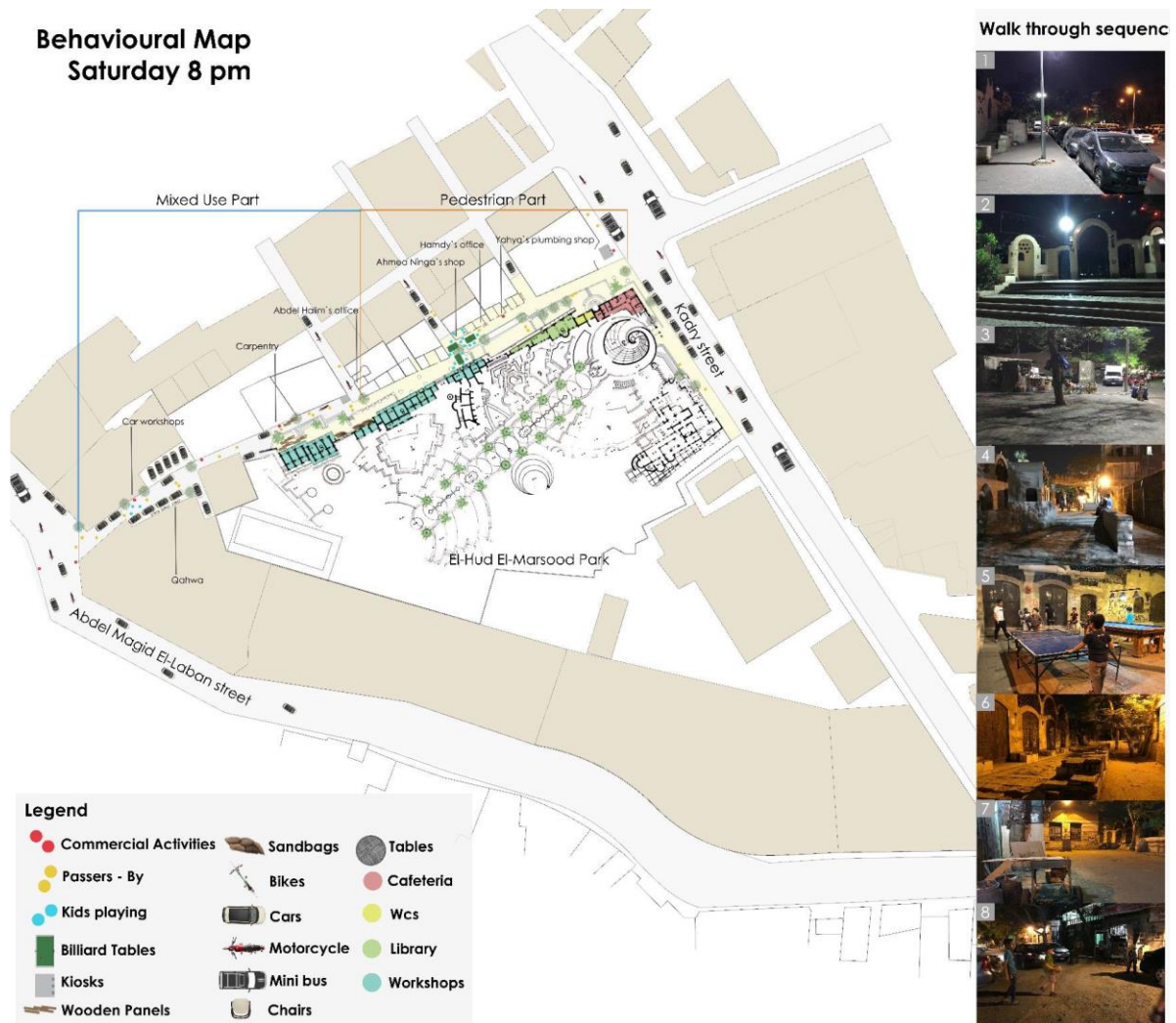


Figure 8: Behavioral Mapping of the Park and Street, BTU-Cottbus Double Msc Degree Students, 2017.

5.2 Walk through and site observations

In addition to the behavioral mapping which showed the various activities inside the park and in the adjacent street during different hours of the day, the authors conducted three consecutive walk through visits to highlight the major community oriented activities which take place in the park's territory. The first visit was on the weekly holiday of Egyptians, which is Friday, (figures 9 and 10). As obvious in the photos, no activities related to the community were taking place on this vibrant day. As a matter of fact, only exceptional entry to the park was granted to the researchers based on a letter for research facilitation. However, no children were allowed in on the holiday, because since the operation was held through the ministry of culture, the

employees were also given that day a holiday. From another side, the pedestrian street appeared vacant and deserted as well, since no community oriented activities are taking place anymore.



Figure 9: View inside the Park on the weekend holiday, Authors, 2018.



Figure 10: View from Abu-ElDahab Street Entrance, Authors, 2018.

The second site visit was organized during a working week day. As shown in figures (11 and 12), the two main magnets for community activities were the theatre and the traditional arts corner. The theatre was exhibiting a homemade crafts exhibition and market whose income will be subjected to disabled children. This was organized by a national governmental school. However, due to the previously explained operational procedures, the visitors were merely the schools' teachers and children from the National school. Those observations and site visits reflect the de-attachment between the park and community in a dramatic way. The park turned into a governmental type of building, rather than a positive community collector for various standards and age groups to engage and celebrate as initially intended in the building ceremony by the architect.



Figures 11, Activities Inside the Park, Authors, 2018.



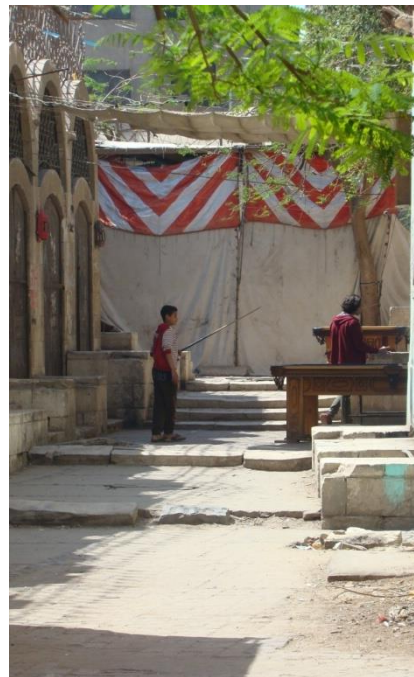
Figure 12, Activities Inside the Park, Authors, 2018.

The final field visit was conducted during the annual celebrations of Sayyeda Zeinab's "*Mulid*". As shown in figures 13 to 17, the pedestrian street seemed the most active in that period of time. Visitors from all over the country come to attend the celebration, one week beforehand. They build temporary prayer and accommodation spaces. However, celebrations and community interactions are limited to the outer walls of the park. No celebrations are admitted inside the park. Also, during the peak times of celebrations, the park operators close the park completely to avoid clashes with the visitors of the "*Mulid*".

The outer walls of the park are used as supports to the temporary structures. The mulid woodens posts and traditional tents are constructed with the approval and permission of the local authorities who are also present in the scene to restore order and ensure the safety and security of the worshipers and residents. The celebrations are never admitted inside the park; during the peak days of *Mulid*, the Ministry closes down the park completely to avoid clashes and disturbances from the "*Mulid*" visitors. Also participation in the *Mulid* is limited to Suffi worshipers; who are mostly strangers and not necessarily members of the community. The original residents and community members prefer to stay indoors during the *Mulid* and leave the streets to worshipers.



Figures 13, 14, The Park's Walls, Authors, 2018.



Figures 15, 16: Celebration of the Mulid in Abu Eldahab Street, Authors, 2018.



Figure 17: Mulid Temporary Structures in Abu-Eldahab Street, Authors, 2018.

5.3 The Role of the Beneficiaries and Stakeholders Interview Summary

The last point of analysis to be addressed in this paper, is the analysis of the roles of beneficiaries and stakeholders. The analysis focuses at this point on the roles of stakeholders and beneficiaries of the project; represented by the groups and individuals who can affect and/or be affected by decisions and actions related to the park and street. Stakeholders often reflect diverse and conflicting interests and concerns. In addition; different stakeholders have different degrees of involvement at the community level and accordingly are addressed differently in the research analysis. Even though the park was initiated as a gathering point for all members of the community equally, at the present time the beneficiaries of the project are divided into two identifiable groups; those involved with activities inside the park, and those who operate outside it in Abou ElDahab street.

Inside the park the Ministry of Culture is the owner and operator who controls the park and all the personnel associated with it, the administrators, employees, craftsmen, security staff. The users are children with special needs. In Abu-ElDahab section the municipality with its police force and regulations controls activities on the street. The users of the street include residents

of adjacent buildings; passers-by and customers interested in services provided along the street; and finally the stakeholders or the private sector represented by shop owners who influence activities in the pedestrianized section of the street; namely the owner of the youth games center, kiosk owner, plumber, and carpenter. At the vehicular end of the street the coffee shop owner and car repair mechanics control the scene.

In addition, Abou ElDahab street one established an organization formed by different stakeholders with the objective of sustaining the participatory project by means of operating the shops built within the park wall as an arts and crafts center. The center would be leased by the ministry to local craftsmen and would establish the economic backbone to the project. the shops income would be the main resource supporting the organization. This financial and economic scenario was never implemented due to the change in policy exemplified by the change of the Minister of Culture. In absence of resources the project lost its main element of sustainability; and since then the idea of community participation was dismantled gradually. The Ministry of Culture - the main authority in the park - operates it as a governmental bureau; changing craftsmen, artists and landscape designers into administrative employees; waiting for guaranteed salaries hoping to exert minimum effort and spend less working hours in the park. concern is that any intervention of the park's operational system would make them work harder or for longer hours.

Interviews with the children - the end users of the park - reveal that they are hoping for more exciting activities and extend working hours of the park. They hope for a park where all are admitted equally to share the fun of the gatherings. Despite the concern of overcrowding the park; they still hope to be joined by their parents and peers in special events. Accordingly, it can be observed, that the lack of sustainable management of the park leads to diverse and conflicting aspirations between the project's beneficiaries.

6. Discussion

Based on the conducted analysis, it is crucial to start a new participatory process that integrates all concerned entities to reach a sustainable approach in which the park and the street can play a vital role in developing the community. The gap which is now occurring is expected to widen with time. Therefore, a comprehensive approach could be initiated by one of the local community organizations to adopt a strategy to strengthen social cohesion, foster local economy and promotes physical environment.

7. Conclusion

The research studied one of the important milestones of contemporary Egyptian architectural additions. Although the Aga-Khan award winning park aimed to create community mobilization, the case nowadays is the complete opposite due to the operation and segregation of the park from its original role. It is highly recommended after the course of this research to maintain a sustainable approach based on social participation, economic sustainability and architectural upgrade to re-attract users to the park in order to maintain its original intended role in the community.

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Towards a sustainable environment of the metropolis Algiers, case: project “Great Winds Park-Dounya Park-Algiers”

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Abstract:

The issue of environment and development was discussed in June 1992 in Rio de Janeiro at the United Nations Conference, known as the Summit « Planet Earth». This summit adopted a declaration which has advanced the concept of rights and responsibilities of countries in the environmental field. It is, therefore, to include the city in an ecological approach that is today the concern of the capital Algiers.

As the metropolis Algiers is the capital and the facade of the country, it was the first city of Algeria that benefited from an ecological project. Through the latter, the state tries to apply the principles adopted during the "planet earth" summit. This project, which is the "Great Winds Park -Dounya Park-", occupies an important area within the urban perimeter of Algiers. Moreover, it is called to develop on a plate of 1059 Ha. It brings a unique set of solutions to the issues related to the protection of the environment and green space in urban areas, including that of the city of Algiers, around ecological principles and sustainable development.

The objective of this work is to identify the contribution of the project "Great Winds Park - Dounya Park- Algiers". It is a question of determining the important role of this park in the environment of the metropolis Algiers, in order to highlight the means and the adequate tools to the ecological approach using the quantitative and qualitative method based on directive and semi-directive interviews and an established questionnaire to determine the reach of the project.

Keywords: Environment, ecological approach, park, Algiers

1. Introduction:

Global phenomenon, urbanization poses problems to the different nations of the planet. Knowing a rapid evolution, this process has become more complex throughout history with the emergence of metropolises, megacities ... This excessive growth has generated nuisances affecting all aspects of the city and its space, especially its environment. Faced with the problems of the contemporary city, a warning bell was sounded at the United Nations Conference held in Rio de Janeiro (Brazil) in June 1992. This summit "Earth" had the merit of highlighting the dangers to the planet if urgent measures are not taken.

At this stage the Algerian government has committed, in the framework of the first National Report on the State and Future of the Environment, to prepare a National Environment Strategy and a National Action Plan, for the environment and Sustainable Development (Ministry of Spatial Planning and Environment - National Action Plan for the Environment and Sustainable Development - January 2002. Thus, the latter is interested in the protection and preservation of the environment, within the framework of the implementation of the National Plan of Territorial Development 2025 through Territorial Action Programs such as the master plan of the natural spaces and protected areas, (National Scheme of Spatial Planning 2025).

A country of northern Africa, Algeria has a large territory whose spatial constitution is varied but characterized. It consists of a littoral region formed by a coastal fringe and a Tellian zone, and another interior, which is subdivided into two distinct entities: the highlands and the desert: Sahara. Today, the Algerian city knows important environmental problems with the proliferation of concrete constructions and the disappearance of green spaces. To humanize the urban environment of the cities, the Algerian State is committed to implement the programs of actions, in various forms, within the framework of the program of support for the economic growth 2005-2009 (National Scheme Land Use Planning 2025).

Indeed, *"Algeria is an exceptional ecological entity in the biosphere. The current demographic growth, the difficult climatic conditions, the overexploitation of the natural resources generated problems of degradation and irreversible loss of the structure of the grounds"*¹.

Today, Algerian natural green spaces, currently fragile, need to be protected because they have many assets in relation to their great biodiversity and their impact on the socio-economic balance of the urban space (the city) or even the country. The Law N. 2007-06 of May 13, 2007 on the management, protection and development of green spaces reinforces the protection of the environment through the preservation of natural green spaces in Algeria. It aims to improve the urban living environment, maintain and improve the quality of existing urban green spaces, to promote the creation of green spaces of all kinds.

Today, the question of sustainable development of the metropolis of Algiers has become critical. In other words, the matter is to take into account the ecology (increasing needs in terms of natural areas) of a city three millennia old where the quality of the air and the water is deteriorating, where the space is diminishing. It is urgent to repair the damage caused by accelerated and uncontrolled urbanization of the Algerian cities by improving the living environment, reducing inequalities and preserving the rights of future generations.

At this point, Mr. HANIFI², during a day of awareness of the protection of the nature said that : *" National Conservation projects are being prepared for the conservation of animal and plant heritage of our country that is a true ecological wealth"*³. Therefore, the city of Algiers has been given a park called park of "Great Winds ". This project involves the development of a large green space in the form of a park. The latter *" derives most of its objectives from the Law on Development and Sustainable Development of the Territory and the Law on the Protection*

¹ BENDARADJI MED EL HABIB, ALATOU Djamel, ARFA AZZEDINE Med Toufik, BENACHOUR Kheireddin: Problems of environmental degradation through desertification and deforestation - Impact of the phenomenon in Algeria. (2006) NEWMEDIT

² M HANIFI Ayad: Director general of the National Agency for the Conservation of Nature- ANN

³ URL: ALGERIE PRESSE SERVICE : <http://www.aps.dz/algerie/2551/2551>

of the Environment and Sustainable Development. The Great Winds Park joins the priorities of the State for the metropolisation and internationalization of Algiers, proposing to transform a free space today unspoiled and undeveloped but nevertheless coveted and threatened, to make it a model of functional and social mix in a recreational site open to all those who are inclined to discover nature and soft energies. It will constitute one of the ecological support points needed to revitalize Algiers and leverage to harmonize environment of the capital."⁴ In fact, it contributes to the enrichment and greening of the capital by the development of a large green space to ensure a high environmental quality and ecological balance essential to a large city like Algiers. This project aims, thus, the rehabilitation of the soil, the exploitation of the natural resources (wind, water, sun, etc.), the planning of the spaces and the programming of the equipment of information, training and the recreational activities in adequacy with the problem of the preservation of nature.

2. Literature review:

2.1. Urban ecology:

In the context of sustainable development, urban ecology has emerged as a new and unavoidable discipline to address the concerns of the city's current ills. It plays an important role in the development of urban space. It aims to study the living conditions of living beings in their environment. The term ecology has emerged since several decades in the late nineteenth century. It refers to the science that studies the relationships of living things with each other and with their environment (Jean-Paul Deléage, A History of Ecology, 1992). It helps to find an urban balance between man and city in all fields of urban life: transport, industry, public spaces, green spaces, etc.

⁴ General Organization file: Great Winds Park (2015). Ministry of the DEVELOPMENT OF THE TERRITORY AND THE ENVIRONMENT.

However, there are other visions that define and explain ecology including that emitted by Lindeman (Raymond L. Lindeman, *The Trophic- Dynamic Aspect of Ecology*, 1942). He tried to define the general organization and functioning of ecosystems. Anisi Odum, in his book in 1953⁵ spoke about the energy aspect of the functioning of ecosystems, their productivity, the flow of matter and energy that passes through them. Moreover, Vicary⁶ seeks to analyze the city according to the links that exist between the different components of the city, which are themselves linked through a series of feedback loops creating between these elements equilibrium and / or dynamics (Box 6). The goal of J. Vicary is to point out the dysfunctions of the urban system and to locate the elements on which it is necessary to intervene in order to act effectively on the system.⁷

2.2. Urban Park:

The park is a extent of land partly or totally wooded, arranged in a city, carefully maintained and intended for the pleasure and the walk (Bassma LOUKIL- urban parks in Tunis: for whom and why?)⁸. It constitutes space-space relational contexts, social localization and identity of the place (Ronnie Donaldson, Sanette Ferreira, Sophie Didier, Estienne Rodary, Janie Swanepoel - Access to the urban national park in Cape Town: where urban and natural environment meet- Article in *Habitat International* 57 (2016) 132-142).

Indeed, the urban park is a place with a natural environment surrounded by urban environments (Mohd Ali Waliyuddin A. Razak, Noriah Othman, Nurul Nazyddah Mat Nazir- Connecting People with Nature: Urban park and human well-being- *Procedia- Social and Behavioral Sciences* 222 (2016) 476- 484). It provides aesthetic and recreational services and improves

⁵ Eugene P Odum (1953). *Ouvrage Fundamentals of ecology*.

⁶ Jacques VICARI. (1981). *Urban Architect: Author of the book Acting on the City: Urban Ecology Test*.

⁷ Extract: from the dream of urban ecology to the reality of the modern city, sustainable development in the face of territories: a non-fractal concept? <https://www.v1.agora21.org/entreprise/these-ABoutaud-02.pdf>

⁸ Seminar Act (2006) organized by the Higher Institute of Environmental, Urban and Building Technologies- City and Green Space - coordination of Sami Yassine Turki

the quality of life in cities (V. Milano, J.Cortet, Baldantoni D., Bellini A., Dubs F, Nahmani J., Strumia S., Maisto G.- Collembolan biodiversity in Mediterranean urban parks: impact of history, urbanization, management and soil characteristics- Article in press *Applied Soil Ecology*, journal homepage: www.elsevier.com/locate/apsoil). Currently, the urban park has become a place of relaxation, attractiveness, and meeting.

3. Methodology:

This article is interested in a project that is initiated and programmed by the state. Thus, to conduct this research several methods were followed. It is a question of studying if this project assures the environmental role which is attributed to it. To obtain the data in situ, direct observation is used as a necessary first step that the researcher must perform. Surveys and photographs are taken as proof and reference bases from which the case study is approached. Another method, which is quantitative, comes to complete the qualitative one. For this purpose, the quantitative method is based on direct and semi-directive interviews conducted with the decision-makers concerned by this project. These methods are useful for gathering information first and data analysis second.

4. Case study : the Great Winds Project –Dounya Park- Algiers:

The development of the Great Winds project - Dounya Park - aims to create a landscaped park of leisure and relaxation at the confluence of the Sahel and Mitidja. It is located at the gates of Algiers and in the continuity of the development of the new technological city and cyberspace of Sidi Abdellah. In addition, the Great Winds Park is located along the East-West motorway in a site threatened by urbanization, even though it is classified as an unbuildable zone in the master plan of planning and urban planning of Algiers. It can become and acquire a real green pole status integrated into a network of major green centers: the Concorde National Park, the Bainem forest, the large urban park of Sidi Abdellah, the Bouchaoui forest, Sidi Fredj and

Zeralda. (General organization file PARC DES GRANDS VENTS - Ministry of Regional Planning and Environment).

4.1. The land property:

The land area of the Great Wind Project is estimated at 1059H (Figure01). The land is located between five communes of wilaya Algiers: Dely Ibrahim, Ouled Fayet, Baba Hassen, El Achour, and Draria. In fact, its area was taken from these five municipalities. Its scope includes a variety of properties of various legal nature, belonging to the public domain (State), the private domain of the state (agricultural and other), Melk property (private), and other properties of unknown legal nature.

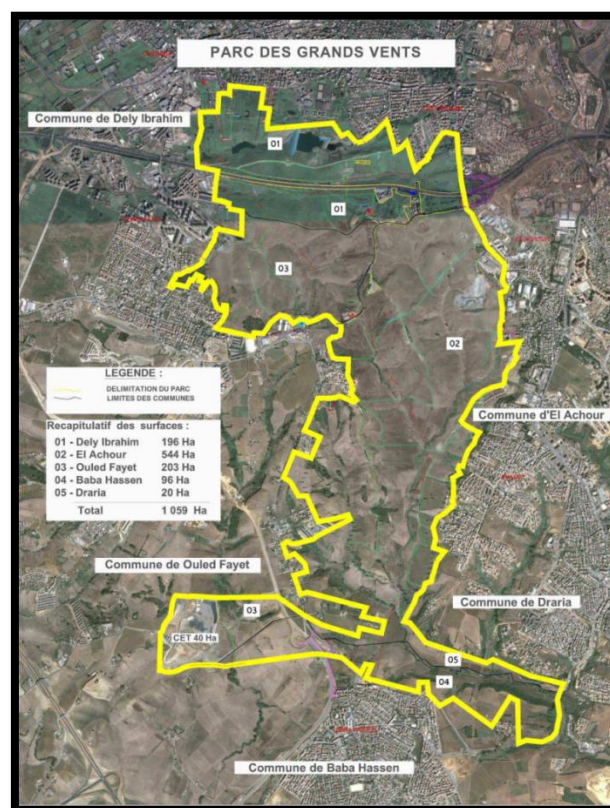


Figure 01 : Plan delimitation of the 1059H Great Winds Park in accordance with Executive Decree No. 12-168 of April 05, 2012

Source : Great Winds Park Promotion Agency

Thus, the table below (figure02) shows the distribution of 800 H of the Park according to their legal nature. Private lands were concerned by the expropriation procedure for reasons of public utility. This operation was fixed by the following executive decrees:

- Executive decree No. 06-235 of 4 July 2006 declaring the public utility operation for the development of the Great Winds Park, (630 hectares).
- Executive decree No. 08-285 of 17 September 2008 amending Executive Decree No. 06-235 of 4 July 2006 declaring a public utility the operation relating to the development of the Great Winds Park, (800 hectares).
- Executive decree No. 12-168 of April 5, 2012, amending and supplementing Executive Decree No. 06-235 of July 4, 2006, declaring a public utility the operation relating to the development of the Great Winds Park, (1059 hectares) .

municipalities	Private lands	Land of the State	Unknown Land
Ouled Fayet	269,380	1 151 087	21,613
DelyIbrahim	442 733	1,657,187	8,925
El Achour	349,295	2,207,330	213,375
El Achour extension	26,250	1,663,687	10 063
TOTAL	1,087,658	6,679,291	253,976
Percentage	13.56%	83.27%	3.17%

Figure 02 : Distribution of 800H of the park according to their legal nature

Source: Quantified balance sheet of investments + Authors

This table highlights the high percentage of land owned by the state. It is clear that there is willingness on the part of the authorities to realize and complete this project despite the problems encountered.

4.2. Project stakeholders

The Great Winds Park Project involves several stakeholders (Figure 03). However, the Agency for the Promotion of the Great Winds Park (APPGV) is the delegated project manager who plays the main role in the project. It must implement the general plan of development of the Park, which is adopted by regulation on the one hand, and to assure the management of the park and in particular of its common services, and to ensure the protection and preservation of heritage and the park in general, on the other. (Article 03, Chapter II, Executive Decree No. 2006-369 corresponding to 19 October 2006 on the creation, organization and operation of the Grands Vents Park Promotion Agency).

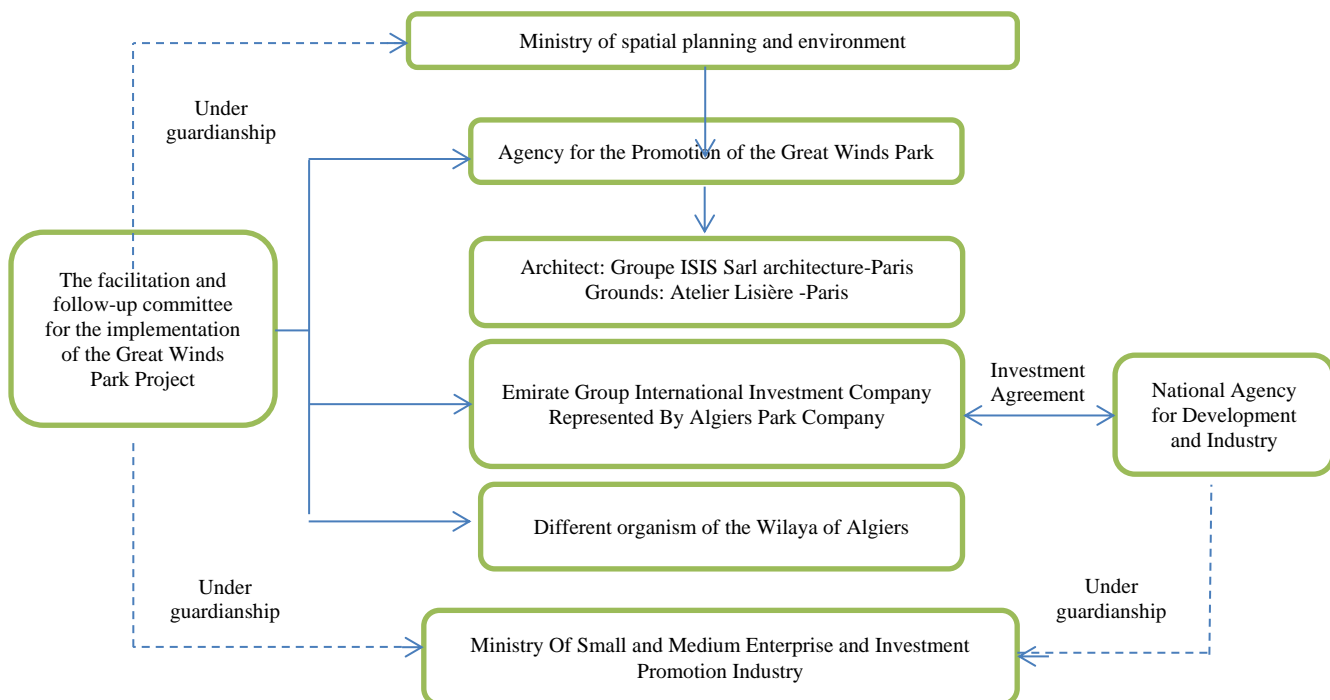


Figure 03: Stakeholders of Great Winds Park Project – Dounya Park -

Source: Authors

4.3. An integrated project, meeting the needs of the development of the city of Algiers

The Great Winds Park project is an exceptional project by :

- Its area 1059H ;

- Its location: in the heart of Algiers,
- The quality of the services offered: High Standards,
- The importance of its economic, social and cultural stakes,
- Its degree of openness towards the international: the influence of the city of Algiers and attractiveness for investors and national and international operators, as well as tourists.

The Great Winds Park project is a project that favors the general interest :

A new place of centrality for Algiers: a favored destination for young people and families ;

- A vibrant hub of creativity and innovation,
- A place of life and meetings,
- A dynamic and motor territory for Algeria,
- An exemplary model of life, seduction and ideal, to be imitated elsewhere in Algeria and the Maghreb.

4.4. Four axes of force define the coherence of the park⁹ :

- A set of activities : The activities of Dounya Park are grouped according to five according to five distinct zones :
 - Cultural enrichment,
 - Social space,
 - Active space,
 - Agrarian landscape,
 - Dominant forest.
- Green traffic: traffic in the park favors the modes of ecological transport, in order to minimize motorized traffic inside the park. Thus, it has a wide range of trails

⁹ The park of Dounya (2015). Algiers Park Company. Great Winds Park Promotion Agency

for hiking, cycling, horse riding or jogging. A streetcar will propose an ecological mechanical movement to serve the different attractions of the park.

- Floral arrangements: The Park's design is based on distinct landscape typologies that help to frame the development while preserving the ecology and topography of the site. The main typologies of the flora are :

- Forests,
- The oasis valley,
- The orchards,
- Meadows,
- Hedges,
- Trees planted along the streets,
- Gardens and sustainable courses,
- The forest belt.

- Management principles of the environment: the application of the latest technologies of “green architecture” will make the Dounya Park fully in line with the principles of ecology and sustainable development, source of sustainability. Recycling techniques will be heavily used :

- Recycling residues from garden maintenance,
- Selective sorting of waste,
- The park's light infrastructure will be composed primarily of recycled materials.

4.5. Sustainable development and planning of the Dounya Park:

- Respect for nature and the environment by:
 - The development of orchards;
 - The use of plants and trees adapted to the local environment.
- Nature takes precedence over development:

- The strengths and natural constraints of the site must be respected in the design of each building;
- The establishment of a set of aqueducts.
- Responsibilities of visitors and residents:
 - Establishment of a set of operating rules focused on respect for nature;
 - Development of a public-private partnership to promote the consideration of sustainable development considerations.
- Take into account the overall impact of development on nature.

5. Results and Discussions:

5.1. Action taken to protect and preserve the park:

For the protection and preservation of the Park, many actions have been put in place¹⁰:

- Maintenance and monitoring of the irrigation of plant heritage.
- Creation of experimental nurseries.



Figure 04: experimental nurseries of the Great Winds Park Project - Dounya Park-
Source: photo taken by the authors (2016)


- Cleaning the park.
- Follow-up of the planting work.

¹⁰ Promotion Agency of the Great Winds Park (2015)

- Fight against attacks of all forms, including wild dumps and illegal constructions.

5.2. Tools and means used for the preservation and ecological management of the

Project:

 As the agency of Promotion is the first person in charge of the project, it is called to implement tools and means, which ensure the protection of the park:

- 1- Agency action plan: this plan is issued every year in order to verify and put the various actions into practice to ensure the good conduct of the agency and the Great Winds Project in particular.
- 2- Roadmap with monitoring of planting work: is done every month. It concerns the planting work that must be followed.(figure 05)

NOT	désignation	Completion time						observation
		Month of April				May	Month of June	
		S1	S2	S3	S4			
1	Monitoring of EDEVAL planting works	×	×					
2	Follow-up of the Rose Garden Transplant Work Cleaning the site		×					
3	Follow-up of EHEV planting work	/	/	/	/			Unsigned convention
4	Police garden multiplication works		×	×				
5	Greenhouse propagation work - Potted cuttings -marcotting of indoor plants -maintenance of the greenhouse.		×	×				
						×		
		×	×	×	×	×	×	

Figure 05: Roadmap for monitoring plantation work


Source: Great Winds Park Promotion Agency

3- Roadmap for the maintenance of the plant heritage: it allows to implement the various works that serve to preserve the plant heritage of the park (Figure 06)..

NOT	designation	Completion time						
		April month				May	Month of June	Month of July
		S1	S2	S3	S4			
1	Manual weeding of trails	×	×	×				
2	Liming of trees	×	×	×				
3	Mowing by Mechanical gear		×	×				
4	Manual mowing					×		
5	Mechanical disruption				×	×	×	
6	Size of cypress trees		×	×	×			
7	Palm pruning			×	×	×		
8	Setting up of hardwood stakes	/	/	/	/	/	/	
9	Maintenance and shaping of watering bowls					×	×	
10	Irrigation campaign						×	×
11	Maintenance of grassed areas, mowing and cutting					×	×	
12	Garbage collection and waste disposal	×	×	×	×	×	×	×

Figure 06: Roadmap for the maintenance of plant heritage

Source: Great Winds Park Promotion Agency

 Protocol of Agreement for scientific and technical collaboration between the Great Winds Park and the National School of Marine Science and Coastal Development with a view to promote the development of scientific and technical exchanges between the two parts by:

- Joint reflection on topics of interest to both parties, and the exchange of information and the development of their respective funds, as well as the study of layouts and development of biodiversity in the aquatic domain of the Great Winds Park. As such, the preliminary draft of the Multilateral Collaboration Agreement between the National School of Marine Science and Coastal Planning and the National Coastal Commissariat and the promotion Agency of the

Great Winds Park, which has an ecological, scientific and recreational purpose, defines the main missions of the different parties such as¹¹:

- The settlement of water bodies by fish species.
- The creation within the park of a pole of scientific, environmental and educational interest.
- The promotion and development of recreational fishing.
- The future realization of a public aquarium.
- 🚦 The environmental impact study report of the Great Winds Park project, by the Algiers parks society;
- 🚦 The Environmental Impact Study Report of the Great Winds Park Project, by Emirates International Investment Company (EIIC).
- 🚦 The preparation of monthly progress reports.
- 🚦 The creation of the facilitation and follow-up committee for the implementation of the Great Winds Project¹² (one-stop shop): which aims to ensure coordination and collaboration between Project stakeholders, who meet once a month.
- 🚦 A protocol of agreement is signed between the Promotion Agency of the Great Winds Park and the Spanish Foundation of Islamic Culture in the framework of the creation of an Andalusian Spanish Garden at the Great Winds Park.
- 🚦 The different conventions of creation of thematic gardens of excellence: garden of China (figure 07), garden of the kingdom of Spain, garden of Japan, garden of Vietnam, garden of Austria.

¹¹ Draft Multilateral Collaboration Agreement (2013). Great Winds Park Promotion Agency

¹² Interministerial Instruction No. 03 SPM of 24 April 2012 establishing the facilitation and monitoring committee for the construction of the Great Winds Park.

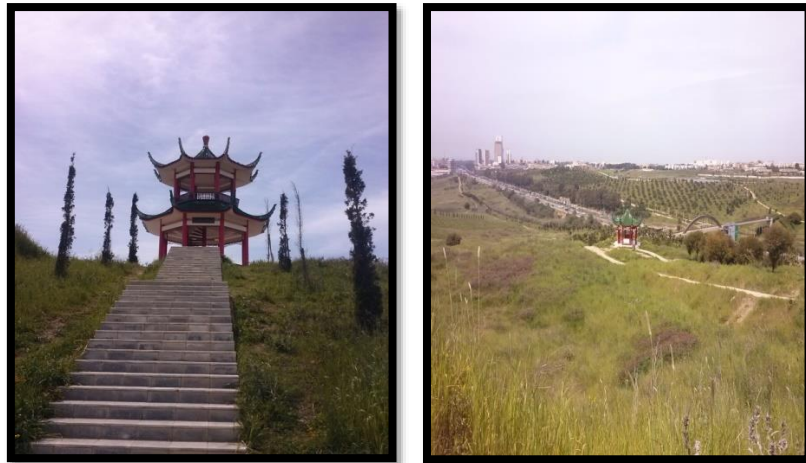


Figure 07: Thematic garden of excellence: garden of China of the Great Winds Park - Dounya Park -

Source: photos taken by the authors (2016)

5.3. Some achievements of the Great Winds park project



Realization of the house of the environment



Figure 08: The house of the environment of the Great Winds Park - Dounya Park -

Source: photo taken by the authors (2016)



Realization of the green bridge linking the two parts of the project



Figure 09: The green bridge of the Great Winds Park - Dounya Park -
Source: photos taken by the authors (2016)



Creation of a relaxation area (2014)



Figure 10: Relaxation area of the Great Winds Park - Dounya Park -
Source: Quantified balance sheet of investments (2015). Great Winds Park Promotion Agency



Realization of a playground (2014)



Figure 11: Playground of the Great Winds Park - Dounya Park -
Source: photo taken by the authors (2016)

Supply and construction of the renaissance gardens, fruit garden and agricultural area, and windbreak grove (figure 11) realized by the Establishment of Development of the Green Spaces of Algiers



Figure 12: Playground of the Great Winds Park - Dounya Park -
Source: photos taken by the authors (2016) and Quantified balance sheet of investments (2015). Great Winds Park Promotion Agency

The project of the park of the Great Winds is so ambitious and great that some parts were realized and others not. Indeed, the part intended for the Emirates International Investment Company (EIIC) could not be executed. The intervention of the Emirates International Investment Company (EIIC) consists in building the equipment that allows the development of the park of the Great Winds such as residences, shops, hotels, hospital, school and other social, economic, tourism, sports, cultural and ecological developments. This delay is caused by the problems encountered during the application of the court decisions to expel the induc-occupiers, who illegally occupied the land of the project belonging to the various municipalities mentioned above. In addition, the expropriation operation for public utility, which was initiated in 2006, is not yet complete. The latter is a major constraint, causing a pronounced delay in the project implementation process. As a result, the situation is ambiguous, marked by several problems that delay the completion of future operations of the Great Winds Park project.

6. Conclusion:

Ecologisation of the city is an act through which the environment is taken into account in public policies. The consequences of this act have a direct impact on the quality of urban life of the inhabitants of the city. Therefore, the greening of the city becomes a major concern for all countries of the world including Algeria. The latter began to be interested in the quality of the urban environment of the capital Algiers through the realization of the Great Winds Park project. Indeed, this project represents a unique operation, interesting and beneficial operation for more than one reason. The management of the urban ecology undeniably passes by this type of operation that must be generalized throughout the Algerian territory.

This ambitious project represents a development operation whose conduct, in the context of an urban project, requires the adoption of a policy and an elaborate strategy. The latter must be based on the principles of sustainable development, on the one hand, and the involvement and definition of the actors with a well - defined financing, and an awareness of the environmental and ecological aspect by all the actors concerned in particular the citizens on the other hand.

In other words, this type of urban project can protect the biodiversity and ecology in cities and make them green, despite the problems encountered. Through this project, the green spaces are preserved as well as the ecosystems of the city. It can solve the problem of urban biodiversity, especially green spaces in urban areas. However, does Algeria have the means to carry out these projects and be able to protect them and ensure their proper functioning? The success of such a project depends on the approach followed, which guarantees the improvement of the ecological and environmental performances of the capital. It is a question of raising citizens' awareness. They must participate in the realization of green projects and ensure their maintenance and the protection of the quality of the environment where they live while thinking to transmit them to the future generations within the framework of the sustainable development policy.

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Towards Reviving the Missing Noble Characteristics of Traditional Habitual Social Life: “Al-Farej” in Kingdom of Bahrain

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Abstract

For a long time, Social life in Bahrain was unique and positive. Public Participation and social cooperative with no reference of segregation or discrimination for long time. Regularly residences were gathering together to discuss the daily life, solving problems, discussing their economic and social issues with spirit of respecting human rights and civilization. In Bahrain, there were many elements, which were positively in city quality of life. For example, “Al-Farej” which is common name for space in old time in Bahrain, played the role of two main issues. The first is a cultural center, which is an organization, building or complex that promotes culture and arts in Manama. It was common within Manama neighborhoods to serve the community with arts and other related facilities. While the second was community centers as public place where members of a community tend to gather for group activities, social support, public information, and other purposes. They may sometimes be open for the whole community or for a specialized group within the greater community. Commonly “Al-Farej” was organizing by residences within private, government-sponsored, or activist-run and from our observation, “Al-Farej” was a node in the old part of Manama city.

The research problem is that, unfortunately, most of the old part of Manama city, Capital of Bahrain, area suffer from losing the identity by modernization in many forms by urban developing. Consequently, day by day, the social life became different and lost most of noble characteristics of traditional habitual Social life. Bahraini heritage alive in the old area of

Manama City, the area needs a node and a reference point for the community to gather in a better-built environment. Therefore, there is essential need for proposing solution to revive the brilliant of social life in Kingdom of Bahrain in term of gathering people for cultural events with economic return to keep the rich history and importance of the area and enhance the environment of the center of Manama.

The aim of the research is to propose solution to solve the missing of social life in old part of Bahrain by giving guidelines in representing “Al-Farej” in modern way matching with the modernization of life in Manama.

Keyword: Urbanization; social planning; sustainability; quality of life.

1. Introduction

The discreteness and positive credence of the social life in Bahrain had stood the test of time by virtue of public participation and social cooperation void of ethnical or racial discrimination. Since the birth of their community, the residents took to non-stereotypical assembling to settle upon their daily routine regulations, the daily life, sort out the encountered challenges, stipulating their individualistic socioeconomic codes owing to their inherited civilization. The difference lied in their cradle of eminence, for their variant yet solidary composition nourished their life quality. For example, “Al-Farej” played the role of two aspects of premier importance; firstly the city acted as a prominent cultural center, which is an organization, building or complex that promotes culture and arts in Manama. It was common within Manama neighborhoods, to supply the community with arts and other related faculties. While the second was community gatherings centers, where the community members get in touch to perform some group activities, grant social support, gain public information, and secure other purposes. They may sometimes be open for the whole community or for a specialized group within the greater community. Commonly “Al-Farej” had been organized by residencies within private,

government-sponsored bodies, or activist-run. From the researchers' perspective, "Al-Farej" was the node of the ancient part of Manama city.

1.1. Research Importance

The research casts the light on the social and historical roots of Manama in general and Farej Al-Fadhel in specific for they once had the upper hand; thanks to their wealth and worth. Lamentably, these have been no more but decayed ruins after the negligence of the old social pattern and the traditional vernacular architecture of the deceased Bahraini style. In brief, the research comes up with a solution that will revive the Genius loci of the area by an architectural product, serving as a cultural community center at the heart of Manama, to revive the former domineering center of social and cultural values of the Bahraini communities.

1.2. Research problem

The disintegration of the urban fabric and architecture structure in the study area negatively affected the social traits, life quality and cultural values of the residents. Unfortunately, most of the old part of Manama area suffer identity loss by the rampant wave of modernization in many aspects of the action of its urban development. Consequently, each day passes by ripping off the remains of their distinguishing legacy, to mourn the loss of their bygone noble and traditional traits of their regular social life. Consequently, the research will explore problems in depth and find why applying modernism are commonly negative upon the study area.

1.3. Research Goals

Searching about a node "reference point" for the community which should be a building with social, culture, historical, economic, urban,...etc values. Moreover, introduce guidelines to enhance social residence life in the study area

1.4. Research Achievement:

"Al-Farej" at the heart of Manama gathers people for cultural events for financial profits is the key to enhance and revive the cultural and social of the center of Manama.

1.5. Pilot study

Studying the history of Manama in general while concentrating on Al Fadhel District (block 305), while Manama is the minor context, this research will review and analyze the urban, social, economic, architectural developments throughout its timeline past to present chronological sequence.

1.6. Research Methodology

- i. Theoretical Phase: Data collection about old district from different resources about Manama throughout assembling old photos. Interviewing residence even elderly or recently residents in Al-Fadhel district or its novice immigrants for information retrieval from Al-Farej residents.
- ii. Analytical Phase: gathered data and generating a timeline comprising the most important information
- iii. Findings: After analyzing all data that were collected, design guidelines will be generated.

2. Manama city, Capital of Kingdom of Bahrain

2.1. Location

The kingdom of Bahrain is in the Gulf between Saudi Arabia and Qatar and is made up of 36 islands. The capital city of Manama serves as the hub of most of the population and economic activities. (Susan Wolfinbarger, 2014). Before the development of the planning schemes and housing projects from the government, the island's inhabitants were dispersed in approximately fifty small settlements, which primarily included villages and hamlets. These villages were mostly located near the coast and in the interior part of the island near the springs. The

settlements were based on the sources of natural springs and the presence of date palms. (Al-Nabi, The history of land use and development in Bahrain, 2012)

Manama (Al Manamah), the capital, is located on the northeastern tip of the island of Bahrain. Moreover, Manama has the most commercial and cultural centers. Manama's expansion since 1960, when its population was only 62,000 and estimated the population of 152,000 in 1992. Most of the residences were in entire villages, fields, and palm and fruit groves located to the east, north, and south being incorporated as part of the urban sprawl. Recently, it also spread to the west through the reclamation of hundreds of hectares from the sea. (Pike, 2011).

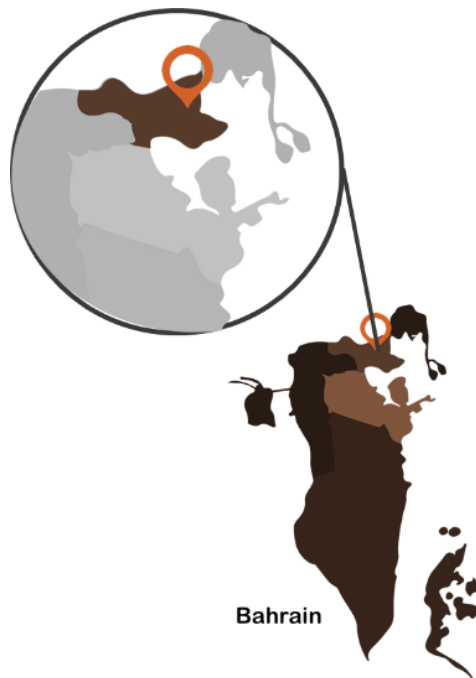


Figure 1: Principle springs of Bahrain
(Al-Nabi, 2012)

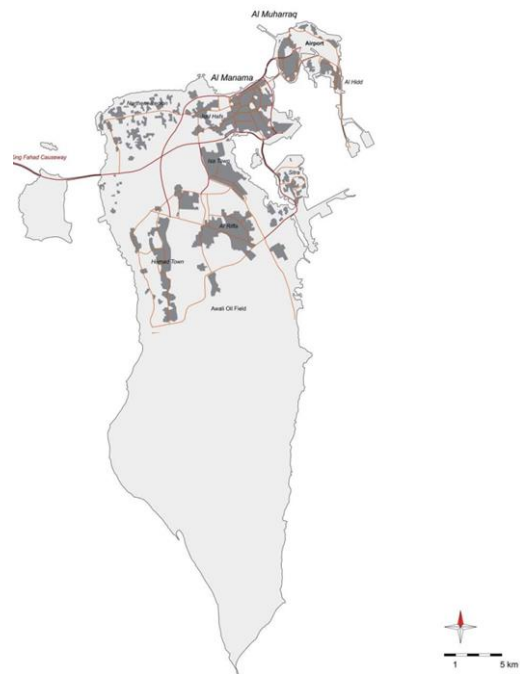


Figure 2: Settlement areas of Bahrain in 1996 (Wiedmann, 2010)

2.2. Manama in the Decay Aftermath Era

Historically Manama started developing as a gateway to the central Bahrain Island. The old Manama Port, the place on which the present Bab-Al-Bahrain building was erected during 1940, was the starting point for the growth of Manama and expanded eastwards towards Ras Ruman and westwards towards Naeem along the coast. Gradually it also extended towards the south.

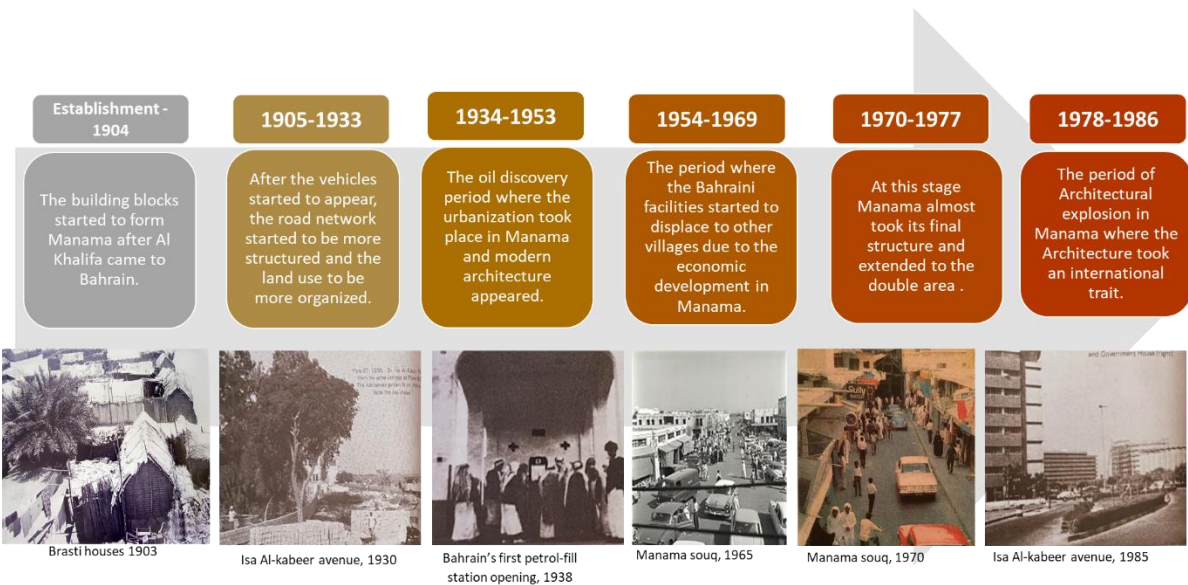


Figure 3: Manama developments timeline, source: Authors

The 1951 aerial photograph below shows the extent of growth of Manama as a dense contagious area extending to the south up to Sunni graveyard and up Hoorra and Gudaibiya in the southeast. (Hamosh, Manama City Plans. Bahrain, 2009). Further, south and at southeast, there was barren land and at the southwest were palm tree gardens up to the sea. It should be noted that this district of Manama was built and developed by residents' needs abiding by no planning strategy. (Al-Nabi, the History of Land Use and Development in Bahrain, 2012)



Figure 4: Aerial view of Manama, circa 1950s., Droodkin, (Droodkin, 2007)



Figure 5: Ras Roman Residential district Droodkin, (Droodkin, 2007)

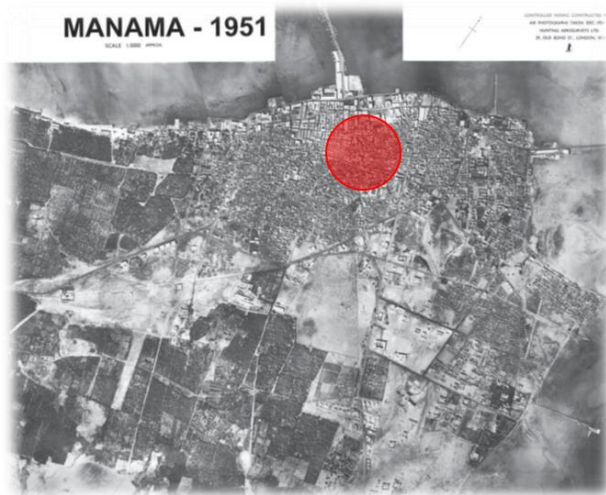


Figure 6: Topographic Map of Manama 1951.

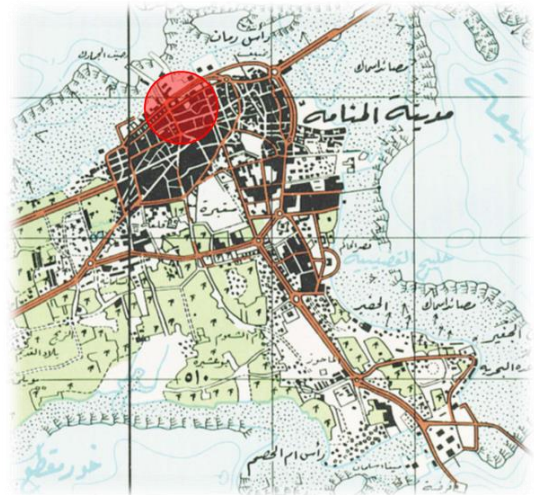


Figure 7: Topographic Map of Manama 1930
(Al-Nabi, The History of Land use and Development in Bahrain, 2012)



Figure 8: Existing soft scape in the British colony period end of 1960. (Hamosh, Manama City Plans. Bahrain, 2009)

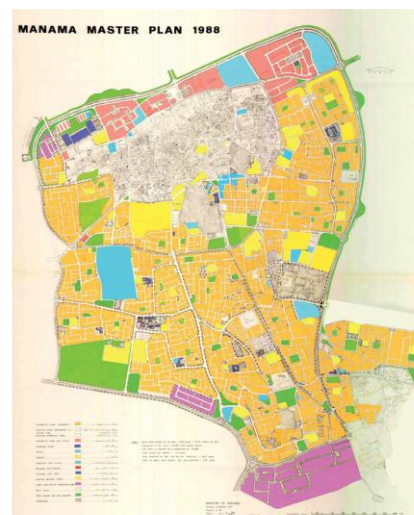


Figure 9: Implementation of Manama Master Plan 1988
(Al-Nabi, The History of Land use and Development in Bahrain, 2012)

3. Identity and Urban Changes on Social Life

The economic forces growth is developing with a growing number of new buildings projects in individualistic designs, leading to an urban development that is not guided by any general urban master plan but built up of separate case-by-case decisions instead. The rapidness and size of these projects in a grouping with shrinking restrictions have resulted in decreasing the quality

of the built environment in Bahraini districts, mainly due to a deficit of technical and social infrastructure. The affected development of Bahrain's capital Manama is a witness of the deficiency of the current urbanization in old districts, where speculation-driven growth has led to fast urban progress without sufficient integration of the needs of native residents (Wiedmann, 2010). The urbanization process affects social life in many forms. In the study, the researcher will tackle the prime constituent of the country which is identity. The identity is acknowledged to be manifested in the urban pattern, architecture and social and economic activities in a named community. The following points will explore the significant changed locations.

3.1. Identity of Vernacular Architecture in Bahrain

The term identity, from the Latin word meaning (sameness), has become problematically defined throughout the history to mean differences as well as similarities, within traditional Western/Euro-centric approaches to the study of cultural identity; many people have been excluded as (others).

“The issue of architectural identity has been a global concern for many nations, especially in the last century”(Al-Bahar, 1985, p.98). Contemporary architecture in some Arab countries lost the traditional values, which encouraged the researcher to investigate these values and try to revive them in the contemporary architecture. According to Guibernau (2007) identity is defined as the continuity over time and differentiation from others taking into consideration the fundamental elements of national identity. Continuity springs from the conception of the nation as a historically rooted entity those projects into the future. Individuals perceive this continuity through a set of experiences that spread out across time and united by a common meaning, something that only 'insiders' can grasp. Differentiation stems from others leading to the distinction between members (those who belong) and "strangers", who are looked upon as "the different' and, sometimes, 'the enemy'.

3.2. Key Questions Concerning identity in Vernacular Aspects in Bahrain

The critical questions concerning identity in Vernacular aspects in Bahrain are (Who am I?) (Who are we?). In fact, defining identity; as an interpretation of the self in both social and psychological terms that establishes what and where the person is. Mainly social relations and representations emerge within a system to present those identities. In Bahrain, there is a force to spread their national identity in national projects, as it is a subject of architectural significance. (Figure 10)



Commercial complex, Seef area



Governmental Housing
2018)



UoB campus (Authors



Waqef Local market Handcraft center Bahrain center (Travelerpedia, 2007)

Figure 10: Recalling the vernacular architecture in Bahrain

3.3. Modernization and Lost Identity of the Vernacular Architecture in Bahrain

The modernization development in all life fields as the Western cultural and intellectual invasion in the beginnings of the 20th century with the steady increase in population. Furthermore, in buildings, the local design principles were replaced by foreign standards that have changed the architectural and urban form, such as the human scale.

The urbanization affects the urban pattern and the related architectural designs. It directed

towards using the western ideology rather than its local counterpart, in many of Bahrain cities. This reckless course of infringements towards the vehicular architectures adopted the westernization policies to the architectural design in different approaches. Most of the new building designs did not flow the ideology of the characteristic of vehicular architecture in Bahrain. Therefore, identity loss in the urban fabric is the ultimate result of that narrative. These areas have turned into a westernized environment as well as the most of the new buildings' forms and appeared with a new Western-style rather than a Bahraini one. Thus, they often failed to achieve environmental and humanitarian functions. In return, it negatively affects the social interaction between residences in general. High buildings are contradictory to the vernacular architecture as well buildings materials.



Figure 11: Different type of new Buildings in Bahrain are not related to social roles leads to lose the identity.

3.4. Bahrain National Planning 2030 and identity of the Bahraini Social life:

Referencing of Bahrain National Planning 2030, they stated that, The National Plan seeks to transform Bahrain into a prosperous and innovative city-state of the 21st Century. In the time of petroleum discovery, many national master plans were created to serve the government in managing the economy of Bahrain. Many significant elements such as natural resources, inadequate housing, needs for specific zoning and insufficient public open space, low standard of transport infrastructure, and the need for improved education and depth economic issues and employment studies were addressed in these plans. The 2030 National Plan of Bahrain lays out

ten key strategies that coordinate and focus development, control land speculation, protect resources, preserve historic and ecologically significant sites, integrate transport and ensure public access to open space and the waterfront. As shown in the report, the absence of concerning the modernization process and the negative impact of changing in urban fabrics and the architecture vocabulary upon social life in Bahraini residence.



Figure 12: 2030 Bahrain National Planning Development Strategy. Manama (*Bahrain*, 2007).

3.5. Symptoms of identity Loss in Bahraini Social life

In conclusion, we can find that there is hybrid pattern fusing old traditional concepts with the new contemporary architecture. Consequently, many social changes resulted in the form of losing identity, losing some social spaces, decrease of public participation in developing the district and the loss of social interacting between districts residents. All these consequences led to delicate social fabrics. It should be noted that a large number of the local residences in the old part of Manama city moved out. As a result, the existing residences become a mixture of the native and novice, which cause identities losing most of their social identity and habits. Even in Bahrain 2030 National Planning Development Strategy, the focus upon developing the urban fabric and architecture is to adopt modernization with minor concern towards the impacts of architecture upon social life in Bahraini residents.

4. “Al-Farej” in Manama city

4.1. Defending “Al-Farej”

Studying “Al-Farej”, which is a limited urban area, was due to the significance of social

interacting occurred within old districts. Regularly “Al-Farej” was named is a relation to one of the prominent families in the area. The name of the Al-Farej is derived from the old craft of the pearl hole, which is a pearl breach. The nearest definition and the meaning of Al-Farej is a small district or a neighborhood. Defending and exploring the importance of selecting Al-Farej came from the essential positive function of Al-Farej. Homogenous interweaving between different social background with different faiths, approaches and beliefs.

4.2. Main features of “Al-Farej”:

The family and its structure as members were at all times the most important key factor in survival and success. Its social network helped weak members to survive, and its clear hierarchy with a tribal leader as the sheikh made for an active organization that defended common interests. The size and wealth of a family determined the power in different levels under its control and had led to the substantial identity. The Friday Mosque in “Al-Farej” as an urban element; became the most critical public arena for the community; besides its function as a religious center. It was often used as a court or school, particularly in smaller settlements. Its simple cubic form with an additional square, often enclosed by walls to form a courtyard, could be easily expanded according to the growth of the settlement. Thus, the size of the Friday mosque was often an expression of the number of inhabitants of “Al-Farej” (Wiedmann, 2010). The local market was the heart of urban fabric and considered significant element in intermediate with some Al-Farejs that most of the economic exchanges have regularly happened in considerable scale Families had their intimate space within Al-Farej. They lived and grew to do their business and educated in this fringe, which is a microcosm of Bahrain. Integration and commutation were processed in the regular base, which carries diversity in its social fabric. Residences were living together with the original educational values in different levels and types and learn skills and handcrafts that were instilled within each other. They also grew up in

the love of cooperation among all. The strong bonding of the children of Al-Farej, from the Al-farej urban pattern.



Figure 13: Vegetable Market in Manama 1930s-ish; Droodkin,
<https://www.blogger.com/profile/05791543764371993446>

4.3. Significance of “Al-Farej” in Manama city:

Long time in Manama city, Al-Farej had significant impact upon social and economic of Bahraini and non-Bahraini life. Reviving “**Al-Farej**” in old parts of **Manama city** are to:

- i. Socially;
 - a. Enhance the social life of current residences.
 - b. Attract the society again to the culturally rich districts and educate them about the values of these areas.
- ii. Economically;
 - a. Enhance the commercial and trading life and the economy of current residences.
 - b. Make advantage of the “opportunity cost” (In microeconomic theory, it also known as alternative cost)
- iii. Physical Environmental;
 - a. Revive the historical cultural principles.
 - b. Decrease aesthetic pollution and bridge the gap in Manama city.

4.4. Changing Al-Farej Characteristics

Recently, there was actively changing Al-Farej characteristics due to the changing of the urban fabrics, local emigration from the old families, changing of economic activities, and style of

life instead of the local emigrants, most of the original families belong to their unique roles and homes. Extending from the depth of belonging to Al-Farej residential spirit. (Al Humar, 2012).

4.5. Pilot study; Farej Al Fadhel (District); Manama City

Farej Al Fadhel (Al Fadhel District) located in Manama, capital of the Kingdom of Bahrain, is adjacent to the Manama market and Farej Al Maharka, which was one of the main areas of the capital before its expansion in the 20th century. Unlike other regions of the Manama market, Farej al-Fadhel is inhabited by Omanis, Indians (especially the Bohras) and Jews, as well as Bahraini. Although, we can find that most of the Farej residents celebrate religious and national holidays together. Al-Fadhel District (Block 305), a minor context of Manama.

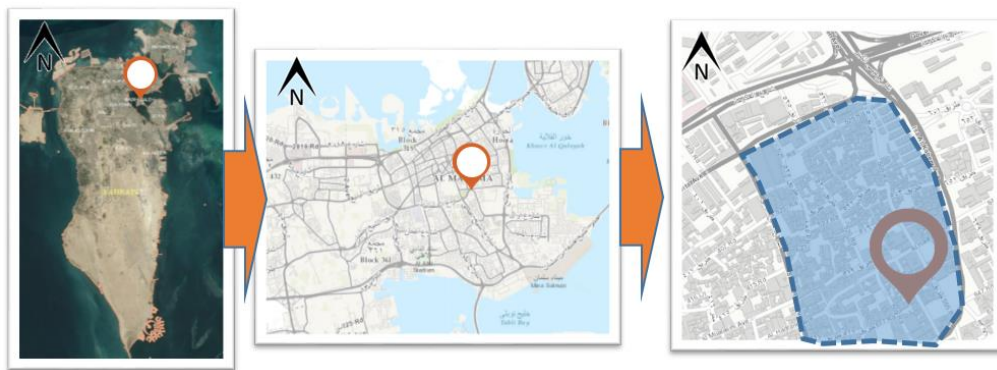
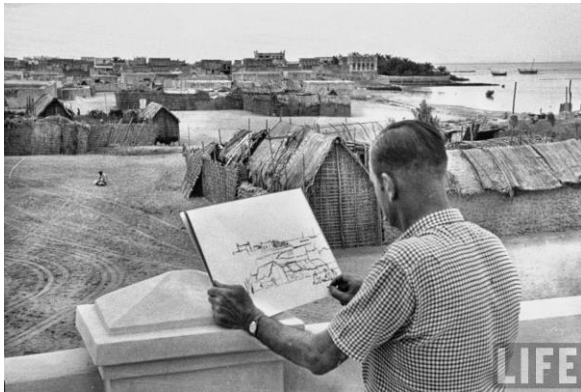


Figure 13: Al-Fadhel District relate to Bahrain and Manama Governorate map (google map 2018)

Recently, Al-Fadhel District suffers from many urban context problems in term of missing the open public spaces that were regularly used in meeting or gathering. These open spaces were used in meeting or convention in different circumstances as part of their traditional habits. Regularly, residences run conferences and gathering to manage their daily life in such areas. Solving problems and controlling the inters life process in their districts were sun as well, which regularly is operated by one of the selected old people with social and economic power.

Al-Fadhel District sustained missing these types of open spaces or buildings, lacking greenery and water surfaces, which once was schematic; loss of reference point for the old community (The old residents) nor the new city for social life and losing the historical and cultural heritage.

Al-Fadhel residences run some social celebration events but in some multipurpose halls out the district which is meaningless compared with the original target of such gathering.

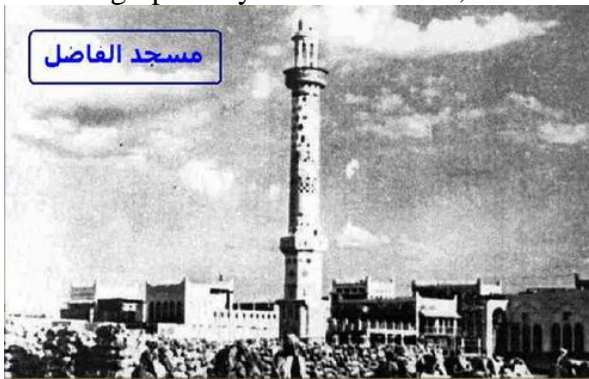


Sir Charles D. Belgrave sketching a view of wooden barastis in Manama.

Photographed by Walter Sanders, 1952



The office of the British Overseas Airways Corporation, in Ras Ruman



Al Fadhel mosque in Fadhel neighborhood of Manama



House of the poet Abdul Rahman Rafea, in the Fadhel neighborhood of Manama

Figure 14: Historical buildings and old life of Farej Al-Fadhel district
<http://intlhistory.blogspot.com/2013/01/bahrain-old-photographs-part-ii.html#!/2013/01/bahrain-old-photographs-part-ii.html>

4.6. Summary of the Inventory and Site Analysis of Farej Al-Fadhel

Field survey and interviews with Farej Al-Fadhel residences were designed to examine the hypnosis that inhabitants are missing the spirit of Al-Farej in their life. The main observation are as follows:

4.6.1. From the Social Perspective

- i. It was the town for many well-known families.

- ii. It consisted of Arab families, however, that the majority population is foreigners, but Manama is still an attraction and valued space for all Bahrainis.
- iii. In religion events, Mostly people in the past go from one religious institution to another.
- iv. Other religions respected and loved the Bahraini families and their religious activities as they fasted in Ramadan with the Muslims.
- v. The mixed-use of a large percentage of buildings combined with the population density and minimal open space provides minimum conditions for a diverse urban life.
- vi. The small plot size of most land holdings is also a factor in limiting the intrusion of large, single-use buildings which would threaten the current and historic diversity.
- vii. Neighbors had a healthy relationship, and they were always together, so they never got bored.
- viii. The first school for girls was built in Al-Fadhel district (Aisha Um-Almumineen School).
- ix. The relationship between the families and their houses were always open to welcome anyone and were so intense.
- x. It had one spring, which was in Al-Fadhel mosque, and it had a pool, then residents made a showering area from to ab accessible by the residents to shower.
- xi. They had two central Majlis (halls) for gatherings, cooking and welcoming guests from the Gulf countries



Figure 15: Annual forum of Al-Farej Al-Fadhel to discuss their district issues.

4.6.2. From the Economic Perspective

- i. The top car trading, perfume business and famous for pearl trading owner lived there.
 - ii. Best teachers and best driving trainers lived there.
 - iii. Best ice cream, sambusa shop in the district, they were famous even in KSA.
 - iv. The first fire, trucks were brought there.
 - v. There is missing of having centers for traditional crafts and skills interacting, running the family production project or even managing public participation meetings to develop the district.
 - vi. Near the Main Market, which was beneficial for the businesspersons, as they used to walk to their works without using Vehicles, minimum air and noise pollution are there.
- a. From the Environmental Perspective:
- i. It is the essential district as it is located in the heart of Manama, most of the residences manage the collecting and disposing of wastes there.

- ii. A surprisingly large number of traditional houses also still stand in low-quality conditions while many of these have become almost invisible under a cloak of renovations and cosmetic changes considering environmental hazards.
- iii. The overwhelming car traffic and undisciplined parking in the narrow, winding streets is also a significant force in speeding the decay of Manama causing different type of pollutions such as aesthetic, noise and air pollutions.

4.7. Reviving Traditional Social Interacting of Al-Fadhel District

From the previous justifications, **Al-Farej idea** is a community hub (node) inspired from **Al-Farej concept** following Bahraini heritage inspiration. A building in the heart of Manama that gathers people for different events and cultural activities to keep the rich history and importance of the area. It will be a place for the community to:

- Gather, talk, share knowledge and skills,
- Educate the new generation the artistry handcrafts.
- Reference point for them to meet and gather inside the district in a suitable built environment instead of gathering outside carried by the Majlis concept. Al-Farej concept will be applied to keep the Bahraini heritage strong.
- Having facilities like a cultural café and restaurant to benefit the current community (economic value).



Figure 16: 1959 Freej Alfadheel/

(freej.alfadheel, 1959)

Therefore, the concept of the project is:

a. **The revival:** The old residents and elderly of the well-known families gather in halls inside the district to achieve the projects targets. The revival of the system of the Majlis for Al-Fadhel district to return as the core of meetings. The poets of Bahrain are famous for their poetic verses and carry on established traditions while also exploring new themes, as well as the art of storytelling. Using the pure Traditional Bahraini style in designing the spaces and elements of the building (Windows, doors, ... etc.).

b. **The anchor:** The project will be the node in the cultural activities map of the Municipality of Culture. A point of reference to the community. “Al-Farej” idea should be installed on the Municipality of culture events calendar. “Al-Farej” idea aims to become anchor the history and cultural heritage in Manama consequently will not lose Manama identity, as well as attracting people again to Manama.

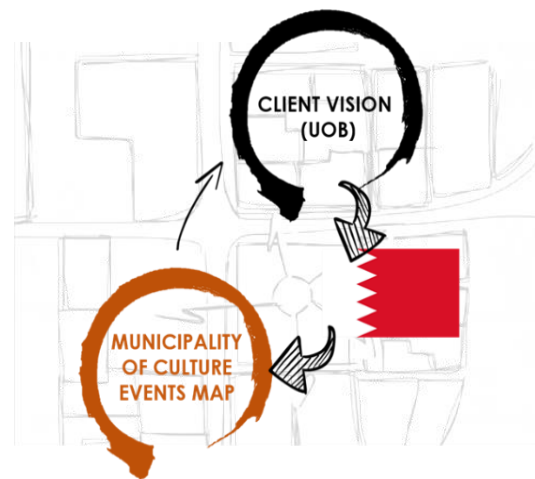


Figure 17: The anchor, source: Author

4.8. Conclusion:

Bahrain was known since decades for its rich history and culture, the nest of all the deep and rooted history is anchored in Manama. Unfortunately, most of the old parts of Manama is suffering from the decay in its identity and heritage by modernization. The social life, which once was strong and formed the urban fabric of the cities, is changing making communities weak while losing the traditional habits and nodes. The old areas and neighborhoods in Manama city lack public spaces for residents to meet or gather for the revival of the traditional culture and heritage that once was rich in the districts. From the previous studies, due to the accelerated

development, urbanization and globalization have negative impacts upon the vernacular and traditional built environment, which dramatically affect negatively upon social life of Bahraini within Manama city. Specifically, there is no clear identity for the district there. Moreover, there are no sufficient tries that deal with the traditional issues of Manama city. Consequently, the idea of reviving the Missing Noble Characteristics of Traditional Habitual Social Life should be examined by preserving architecture solution, which shows the identity of Vernacular issues in Bahrain. “Al-Farej “; is the Bright of Reviving the Brilliant of Social Life in the Kingdom of Bahrain.

Reviving the idea of Al Farej in a modern way has to respect technology, improved transportations, modern construction technologies and changing values and attitudes. Unquestionably, as observed from the field survey and the questionnaire for residences in the pilot study, the feelings of intimate relationships between built-environments and the residences have been splintered. As explained before, such building has to include social and economic activities that targeting the improvement of residences conditions and improve the physical environment of the districts.

5. Findings – Design Guidelines

Having the concept of Al-Farej will keep the Bahraini heritage alive in the area by the locals’ contribution in the process of conservation. The district needs a hub (node) and a reference point for the community to gather in an excellent built environment that hosts cultural events and conserves history, traditions and culture.

The idea is a space that will be created and conserved for and by the old community. It will be a space that will be conserved and maintained and will be set as an example to encourage the conservation of the other ancient and historical parts of the areas. Facilities like a cultural café and restaurant will be introduced to benefit the current community and of economic value.

Reference to the data analysis of the interviews, Al-Farej project, has to follow some fundamentals, such as:

- a. Respect the history of the place and the existing historical buildings.
- b. Reflect the economic significance of the area.
- c. Respond to the social and religious activities.
- d. Revive the greenery and water element, which once dominated.
- e. Reflect the art and crafts which demolished.
- f. Respond to the historical development of Manama.

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Optimization Of Urban Street Lighting Conditions Focusing On Energy Saving, Safety And Users' Needs

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Abstract

The outdoor lighting constitutes a significant part of the night activities of people in contemporary cities. Nevertheless, in many cases, this may result in the increasing and irrational use of it affecting the users of public areas, the environment and driving safety.

The subject of this paper is to extend the discussion on the subject, to provide answers and to suggest methods for the improvement of the existing conditions in urban street lighting through the use of new technologies and smart lighting management systems, with the aim of achieving a smooth relationship between the user's needs, safety, sustainability, quality of life and energy saving.

Keyword: optimization of urban street lighting, LED, adaptive lighting, environmental effect, users' safety.

1. Introduction

Optimization is defined as “the action of making the best or most effective use of a situation or resource” (<https://en.oxforddictionaries.com/definition/optimization>). In the case of urban street lighting, optimization constitutes the correlation of design with the restrictions of the lighting Regulations while using the latest technologies and “smart” lighting management systems. The purpose is to achieve the maximum possible energy saving and reduction of CO₂ and at the same time ensure better living conditions to the users of the city; both drivers and pedestrians. Therefore, apart from the benefits on environmental issues, the study focuses on its effects on driving safety and the reduction of car accidents, the increase of drivers' and

pedestrians' feeling of security, and urban crime in general. The ultimate goal of the research is to get a wide knowledge on the effects of the optimization of urban street lighting in all aspects of urban living conditions in modern cities.

2. Methodology

For the purpose of the study, the scientific material used focuses on primary sources, European and International literature, scientific articles and papers related to the subject and a wide analysis of various case studies using applications from all around the world, mainly Europe and America. A critical composition of the findings leads to conclusions as well as in methods of improvement of the existing street lighting conditions, on the basis of the users' safety, the energy saving possibilities, and also the creation of fair, in terms of lighting, urban areas in connection with the least possible environmental impact.

Primarily the problems of "bad lighting" in urban areas are defined, then optimization methods are suggested in order to upgrade urban environments and in the end the impacts of optimization in the categorized problems are analysed.

3. The definition of "bad lighting" in urban areas

"Bad lighting" is when the final lighting outcome in the streets causes problems to the users or to the city itself. "Bad lighting" can be caused by inappropriate design, wrong maintainance of the system or no maintenance at all. The role of the European Lighting Expert in projects is crucial (<http://europeanlightingexpert.org/en/>), as this person has the knowledge to best design a lighting system by using the Lighting Regulations appropriately, while integrating all other relevant parameters that need to be taken into consideration in each specific case.

"Bad lighting" design can have a negative impact on the environment (i.e. excessive energy consumption and carbon emissions, exacerbation of the phenomenon of light pollution and

the impact of lighting on flora and fauna in protected areas). Furthermore, “bad lighting” can have a serious effect on peoples’ health (disruption of the human circadian system), peoples’ safety (i.e. risk in driving safely, lack of orientation and visibility, weakness of the eyes to adapt to sudden changes in environmental illumination, lack of face recognition and sense of security for pedestrians). It has been proven that serious car accidents happen when lighting is not appropriate or there is no lighting at all, having as victims pedestrians too. Another serious aspect that might be correlated with “bad lighting” is crime. Of course, not all the factors co-exist at the same time, but in each specific case some of them tend to cause problems in the smooth operation of urban areas.

While living in a period of unusual urbanization most people consider as very important to live safely in attractive and friendly environments in modern cities. The growth of the urban population offers great opportunities for economic and social development, while at the same time it presents enormous challenges.

4. Optimization techniques in order to improve street lighting conditions

“Good lighting design” based on Lighting Standards and the use of new technologies and lighting management systems are the two main parameters that will rule the whole discussion in order to examine the impact they have in the urban environment. Additionally to the above, “good lighting design” serves functionality that meets the needs of each case, while using good quality fittings in the right position, the appropriate colour temperature and many other parameters that need to be taken into consideration in order to obtain the ideal solution.

4.1 Designing according to the Lighting Standards

The necessity of the rational use of street lighting to the safety of users, drivers and pedestrians at night imposed to the European Committee for Standardization (CEN) the need for the institutionalization of the Lighting Standard EN 13201 in 2004. With the evolvement

of technology, the installation of innovative lighting solutions and the integration of street lighting control and management systems, was considered necessary to revise the existing standard. Therefore EN 13201:2014 has been published by the CEN/TC 169 in December 2014 which is based on the Technical Report of CIE 115/2010. The revised EN consists of five parts.

The whole idea of the *CEN/TR 13201-1* (2014, p.5) is “to specify the lighting classes and give guidelines on the selection of the most appropriate class for a given situation”. It also introduces Adaptive Lighting and dimming techniques in order to further reduce energy consumption and improve environmental conditions under reduced traffic volume during certain periods of night or under varying weather conditions. While adaptive lighting is applicable, luminance or illuminance levels can fluctuate but the other qualitative features such as uniformity and the threshold increment (TI) for disability glare as defined in EN 13201-2 remain unchanged.

EN13201-2 (2015, p.6) “defines performance requirements in order to cover the visual needs of road users and considers environmental aspects of road lighting”. *EN13201-3* (2015, p.6) “specifies conversions and mathematical procedures to be adopted in calculating the photometric performance of road lighting installations”, while *EN13201-4* (2015, p.7) “specifies measurement conditions and procedures for measuring the photometric quality parameters of road lighting installations”. Additionally, the conditions that might lead to inaccuracies are identified and precautions are provided to minimize potential errors. Finally, *EN13201:5* (2015) introduces the Energy Performance Indicators of the designed system using the calculated Power Density Indicator (PDI/Dp) and the calculated Annual Energy Consumption Indicator (AECI/De), in order to compare the energy performance of different lighting solutions and choose the best one for each specific situation.

The Standard categorizes the streets into three classes (M class for motorized traffic, C class for conflict areas and P class for pedestrian and low speed areas) while introducing additional categories and criteria; the SC class for pedestrian areas for improving facial recognition and increase the feeling of safety and the EV class for situations where vertical surfaces need to be seen. In some cases, it is also necessary to take measures to control disability glare and/or control obtrusive light (EN13201-2:2015).

4.2 Designing with LED technologies and “Smart” Lighting Management Systems (Adaptive Lighting)

At a time when energy adequacy is imperative, lighting has turned towards saving energy, discovering and developing modern, environmental friendly lighting technologies with a special type of light source, Solid State Lighting (SSL). Light emitting diodes (LED) is a promising technology and a new trend in the lighting industry.

LED lighting systems surpass other lamp types, especially for their high energy efficiency, operational lifespan (up to 100.000h), directionality of light output that reduces undesirable environmental impact and increased glare. They have the ability to adapt to the spectral content as they are available in a CCT range, ensure lighting requirements with half the power of HPS lamps and are working with suitable lighting systems in order to meet the actual lighting needs (“The Realized Results of LED Streetlights: Seizing the Opportunity”, 2017). They are also considered environmental friendly without containing mercury, IR and UV radiation and show resistance to high temperatures. They can be produced in a variety of sizes, they have the ability to switch colors without using filters and provide a wide range of dimming settings. It is a technology that is constantly evolving and its cost and performance are areas of continuous improvement (Brodrick, J. 2017).

LED technologies, optics and control systems provide the necessary tools for achieving high-quality public lighting installations. The luminaires can be equipped either a) with built-in luminous intensity control systems, b) with pre-set luminance adjustment scenarios or c) communicate with a central remote control system. The right amount of light related to traffic density, road and weather conditions, where and when it is needed, is the preferred practice compared to any other method that requires switching off the lights. The combination of increased safety and return on investment due to energy saving makes adaptive street lighting technology the best solution (“The Voice of the Lighting Industry in Europe”, 2016).

5 Urban Street Lighting Optimization

In the following sections, the effects of the optimization of street lighting by using LED technology and “smart lighting” management systems are investigated and analyzed with regards to energy saving, light pollution, car accidents and crime.

5.1 Optimization and Energy Saving

The large proportion of electricity consumed globally where combined with installation and maintenance, is one of the major costs of each society. This fact makes the use of new technology along with “smart” management systems necessary, in order to achieve the best possible energy saving, to avoid light pollution and at the same time reduce CO₂ emissions.

According to a study from International Energy Agency (IEA), lighting contributes up to 20% of the worlds’ electrical usage. If efficient lighting systems apply worldwide, it is estimated that the world’s electricity bill can be reduced to one-tenth (<http://www.revolite.com/energysavingprogram.html>).

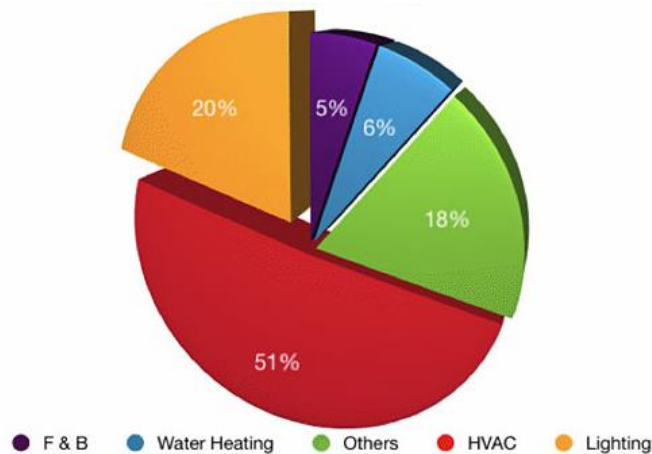


Figure 1. Global Electrical Consumption
(<http://www.revolite.com/energysavingprogram.html>)

At the same time while global climate changes, the rising cost of electricity and the need to reduce CO₂ emissions are some of the key issues that the modern city is facing.

In 2010, the European Union has set as ambition for three energy targets to be achieved by 2020; a) the increase of energy efficiency by 20% from lighting, b) 20% reduction in CO₂ and c) 20% of produced energy to come from renewable sources (“Lighting the Cities - Accelerating the Deployment of Innovative Lighting in European Cities”, 2013). Moving forward, the European Parliaments’ new goals for 2030 are: a) a 40% reduction in Greenhouse Gas (GHG) emissions, b) at least 30% renewable energy sources and c) a 40% target for energy efficiency (Erbach, 2014).

Especially for street lighting, energy saving potential is expected to rise to 80% by 2020 (“World on the Edge by the Numbers – Shining a Light on Energy Efficiency”, 2011), in order to save €85 billion annually for European consumers and at the same time reduce emissions by about 200 million tonnes of CO₂, equivalent to 270 less power plants (“The Voice of the Lighting Industry in Europe”, 2015). By 2027, LED and smart streetlights are projected to reach 89% and 29% of the total streetlight market, respectively (“Global LED and Smart Street Lighting: Market Forecast 2017-2027”, 2017).

In most countries there is an obligation the design to follow the Lighting Standards with particular emphasis on energy saving. In 2008, a research towards this direction took place from the first major European Research Project, the E-Street project, for which representatives of the lighting industry, national energy organizations and some European municipalities have cooperated. The survey concluded that authorities across Europe could reduce street lighting energy bills by an average of 66% if they manage road lighting with flexibility, either by adjusting the light levels or by replacing old fittings with new LED systems (“Substantial savings from smarter street lighting”, 2015).

5.2 Optimization and Light Pollution

For three billion years, the daily shift from light to darkness on the planet was governed by natural celestial sources, especially the moon, the airglow, the stars and the Milky Way (Kontorigas, 2007). The great revolution in artificial lighting that took place in the 19th century has led to the changing of the urban cities at night.

Light pollution describes the phenomenon of excessive outdoor lighting emitted to the sky, either directly or indirectly through reflections. The intense glare of street lighting, the overlighting of shopping windows, the advertising billboards and the increase of urban lighting for safety reasons, has led to the increase of the lightglow of the sky and represents a profound change in the fundamental human experience. Even small increases in the sky brightness can deprive people from the opportunity to see the night sky.

Studies show that over 80% of the world and more than 99% of the US and European populations live under a light-polluted sky. Milky Way is not visible to more than a third of humanity, including 60% of Europeans and nearly 80% of North Americans Falchi et al, 2016)

According to the International Dark-Sky Association (IDA), light pollution is a multidimensional problem of our days with serious environmental consequences on humans, flora and fauna, but also of economic importance. Scientific evidence shows that artificial light at night has negative and sometimes fatal effects on many living beings (amphibians, birds, mammals, insects and plants), causing their disorientation or problems in reproduction. Light pollution also affects the environment from the uncontrollable electricity consumption that leads to the depletion of energy resources and the direct increase of the carbon dioxide emissions (<http://www.darksky.org/light-pollution/>). Additionally, the phenomenon of light pollution does not leave astronomy unaffected (Walker, 1973).



Figure 2. Before and during the 2003 Northeast blackout, a massive power outage that affected 55 million people. Photo by of Todd Carlson (<http://www.darksky.org/light-pollution/>)

The exposure to high light levels during the night has also a negative effect to humans on the transition to the normal stages of sleep as it contributes to the complete decomposition of circadian rhythm. Studies show that the circadian rhythm cycle controls 10-15% of our genes, therefore by interfering to that many health problems can be caused (Chepesiuk, 2009).

Lastly, light pollution can cause driving safety issues. Extremely high light levels in the streets can lead to the decrease of object visibility due to the reflection generated by bright light sources, with a direct impact on the driver's inability to locate pedestrians and adjacent

obstacles, especially when the surrounding area is dark. Due to the above, serious car accidents may occur (Kraus, 2016).

Unlike many other forms of pollution, light pollution is reversible, therefore it should be addressed effectively. The basis for truly effective protection is (Walker, 1973), (Chepesiuk, 2009), (“Guidance Notes for the reduction of light pollution”, 2000):

- The applicable street lighting design based on lighting classes as defined by the Standards
- The installation of high quality lighting fixtures that reduce energy consumption by 60-70% can save billions of money and reduce CO₂ emissions
- The use of fully shielded and full cut-off luminaires in order to reduce direct light emissions on the horizon while at the same time minimize the light reflected from the illuminated surfaces. In order to eliminate glare, the beam angle of the luminaires should be kept below 70°, as well as the position of luminaires in high poles to allow for lower beam angles. In areas with low level of ambient light, special care must be taken into consideration when installing and orientating the luminaires in order to minimize disturbing reflections.
- The use of warm white LED lamps ($\leq 3000\text{K}$) in order to avoid blue light that creates intense brightness in the sky and makes viewing more difficult at night.
- Turn off lighting when used for decorative purposes or when it is not required for safety reasons.
- The installation of lighting management systems, presence/motion sensors and timers that help reduce average light levels and save even more energy.

5.3 Optimization and Crime

The sudden rise in crime that has been observed in recent decades in many countries worldwide has led to systematic measures in order to prevent it. The optimization of urban street lighting is intended for many purposes, one of which is the prevention of crime, towards people and properties in public areas. The correlation between urban light levels and the reduction of crime is the focus of long-term research.

A credible survey through experiments that has followed high-quality methodologies, was developed by UK Police College researchers to sum up the “best available” assessments of effective street lighting in relation to the reduction of crime levels. The study has shown that improved street lighting has a positive effect on reducing crime, such as burglaries and theft. However, it did not have any positive effect on violent crimes. Taking into account all the data of the survey, a relative 21% reduction of crime was found in the areas where light optimization was performed compared to similar areas where there were no corresponding interventions in lighting conditions (“The effects of improved street lighting on crime: What Works Briefing”, 2008).

Regarding the correlation between street light levels and the reduction of crime, two main theories were developed. Firstly, improved lighting in urban areas contribute to the increase of surveillance, while the guarding by police is much easily achieved. Adequate lighting increases the risk of identifying and arresting the offenders. At the same time, people tend to use more the public spaces, increasing the number of potential witnesses in any violation that might take place. Secondly, the installation of efficient and effective lighting signifies and upgrades the marginalized areas, having as a result the minimization of criminal behaviors (Farrington and Welsh, 2008). However, as every area is unique, studies should clearly

describe the nature and intensity of lighting improvements, the general neighborhood conditions, and other crime prevention actions in order to have reliable results (Clarke, 2008). Most studies that analyze the relationship between the optimization of road lighting conditions and crime are mainly conducted by criminologists and not by lighting experts. Consequently, very few studies take into consideration street lighting designed according to the current Standards. In these cases available information usually refer either to the upgrading of lighting or increased light levels, better uniformity and colour rendering.

In conclusion, by improving street lighting in an area, an upgrade of local community is achieved and at the same time a sense of security is provided. In other words, improved lighting is not a natural obstacle to crime, but contributes to the reduction of delinquent behaviors and can work as a catalyst for social action and cohesion but also as a mechanism that will contribute to further environmental improvements (Farrington and Welsh, 2008).

5.4 Optimization and Car Accidents

Through the research that has been carried out to date it is obvious that driving outside the daily hours is more dangerous. Only one forth of all car drivers move between 07:00pm and 08:00am, and during this period of time 40% of fatal accidents and serious injuries happen (“Road Safety factsheet: Street Lighting and Road Safety”, 2017).

Also, age range and the capabilities of nighttime drivers are different from those at daytime. For example, elderly people with visual impairment often avoid driving at night, while there may be more road users who have consumed alcohol or drugs or are simply very tired at night. In addition, average speed tends to be higher at night, partly because there is less traffic. Furthermore, there is likely to be a strong interaction between road lighting and the prevailing headlight technology of vehicles, causing accidents. The brightness of the

headlamps has increased by about eight times over the past 60 years and at the same time street lighting has increased dramatically during the same period (Gaston et al, 2014).

According to European Commission statistics published on road safety in 2016, 25.500 people lost their lives in the EU streets and 135.000 people were seriously injured, 37% of which on average occurred in urban areas (“Road Safety factsheet: Street Lighting and Road Safety”, 2017). Additionally in Switzerland, the number of fatalities with pedestrians as victims at night is 60-70% higher (Ghazwan, 2014).

The US Pedestrian Traffic Accident Report investigated data from 2006 to 2015 and found that during this ten year period pedestrian deaths as a percentage of total motor vehicle crash deaths increased from 11% to 15% in 2014 and 2015. About half of the pedestrian fatalities in 2015 occurred between 06:00pm and midnight, with 74% occurring after dark (Retting & Schwartz, 2016). Similarly, the same conclusion came from a survey conducted by the University of Manchester's Institute of Science and Technology where it was found that low light is an important factor contributing to night time mortality. In particular, on motorways that are already lit, 2,6% of accidents are fatal compared to 4,3% of accidents where there is no illumination (“Road Safety factsheet: Street Lighting and Road Safety”, 2017).

The effect of lighting on road accidents also depends on several factors, such as the street type, the speed limit, the traffic volume, the junction density and the traffic composition, always depending on the requirements of each lighting class. Additionally, visual performance while driving is a complicated issue as it is associated with a variety of elements such as uniformity, object visibility, visual targets, lighting of surroundings, weather conditions etc (Ghazwan, 2014).

In a pilot study that took place in New Zealand's urban areas to assess the relationship between light levels and car accidents, it has been proved that the increase in traffic accidents

is a matter of visibility and is associated with a reduction in the contrast between an object and its surrounding. The achieved average luminance or average illumination was important in all cases. The Threshold Increment (disability glare) was also an important factor in all experiments performed. The lower value of the TI in conjunction with the achieved light levels is the second basic parameter for reducing accidents, while energy efficiency and uniformity levels were not statistically significant in any of the tested models. (Jackett and Frith, 2012).

Empirical evidence and a comparison of road traffic accidents revealed that the optimization of road lighting can actually prevent car accidents, as satisfactory light levels provide users with the ability to react faster and more accurately on the road surface. It also provides time to identify potential risks and the ability to react in a timely manner to prevent serious injuries. Particularly (Gastons et al, 2014), (Crabb and Crinson, 2017):

- Road lighting on an urban road network can achieve an average reduction in accident rates of around 30% as an average percentage worldwide
- The benefits are directly connected with the parameters that determine the lighting class of the street
- Road lighting seems to have an impact on reducing the severity of accidents, and in particular on pedestrian-related accidents and not the car occupants
- The impact of road lighting is intensively reduced in conflict zones
- There may be hedging effects, in which lighting can lead to increased speeds and reduced concentration, but these effects are likely to be small
- The installation of lighting posts is an additional risk that is often involved in a significant number of injured accidents, but it cannot be a reason for not installing lighting in the area.

6. Analysis of worldwide case studies

In our days, cities tend to consume 40% of their annual budget on electricity, while most road installations are outdated and extremely inadequate. There are about 300 million luminaires worldwide, most of them in urban areas and only 10% have been changed to LED. At the same time, the need for driving and pedestrians' safety is growing rapidly (Marinoa et al, 2016). Therefore, it is of great emergency to upgrade old installations with new technologies by using smart management systems.

For the purpose of this research, implemented cases have been studied such as Birmingham (UK), Mechelen (Belgium), Lyon (France), Tilburg and Eindhoven (Netherlands), Albertslund and Copenhagen (Denmark), Glasgow (Scotland), Gothenburg (Sweden), Helsinki (Finland), Norway, Canada, USA and others, in order to investigate the connection between theory and the real effect of lighting interventions in the urban environment and on users. The worldwide representative examples had as common the use of LEDs and dynamic lighting systems designed to be a key tool to make cities more "smart". Each case had its own targets to achieve according to its needs and used new technology for different reasons.

In the analysed case studies, more than 100.000 luminaires were replaced in European cities and over 170.000 in America. The improvement of the lighting systems results in the following, without mentioning separately the benefits of each case.

a) Instant Cost Savings

The renewing of the street lighting systems with LED fittings and automations, correspond to direct cost savings from energy but also from system conservation.

All the cases achieved 30-60% energy saving while most of them between 50 and 60%. When adaptive lighting is also used, further reduction to energy consumption is achieved, as in some cases luminaires are dimmed down to the least necessary levels.

Additionally, the new LED systems have extended lifetime (60.000-100.000 hours) compared to conventional lighting and extremely low failure rates, therefore it is expected immediate cost savings from reduced maintenance requirements. However, this will give accurate results after some years of operation.

The LightSavers Technical Advisory Committee (2017) evaluated 12 LED lighting fixtures in 7 cities worldwide. The scope of coverage included 29 different LED lights and adaptive lighting technologies used in parking areas, pedestrian paths, urban roads and high speed lanes. The results have shown that more than 70% of the new technologies have achieved at least 50% energy savings. In addition, the failure rate for all luminaires tested was 1,8% for an operating time between 4.000 and 6.000 hours, significantly lower than the typical HID failure rate of 10%. In cases where LEDs were combined with adaptive lighting systems, they showed, at least, an extra savings of 20%. Also, the majority of pedestrians and drivers agreed that visibility improved significantly (“The Realized Results of LED Streetlights: Seizing the Opportunity”, 2017).

b) Environmental Benefits

The expected reductions in CO₂ emissions can be calculated on the basis of the resulting energy reductions and the volume of carbon emitted from the electricity produced and varies between installations. Furthermore, when warm white colour temperature is used ($\leq 3000\text{K}$) LED lighting systems emit more “friendly” light and cause less problems to the nature equilibrium. Additionally, due to the directionality of LEDs, there is less light pollution on roads and the problems of unnecessary diffusion and undesirable glare are reduced (“Road, paths and squares”, 2014).

c) Reactions of the Road Users

Using LED lights usually increases light levels and achieves better lighting quality that improves visibility and thus drivers and public safety (“Road, paths and squares”, 2014). In some cases there has also been observed a reduction in crime rates between 07:00pm and 07:00am; in crimes such as vehicle theft, burglary, robbery and vandalism. Additionally, the positive contribution of light bulbs with a recommended color temperature of 3000K indicates that lighting can improve safety and driving safety, as well as contributing positively to the health of road users.



Figure 3. Before and after the refurbishment in a street in Bielefeld, Germany (“Road, paths and squares”, 2014).

Apart from the key benefits mentioned above, each case had additional benefits due to the objectives that have been targeted in each individual case.

In the case of Lyon (France) for example, by using proximity sensors on the pedestrian bridge of Passerelle St. Vincent, the light levels were reduced to 10% when there was no pedestrian in the area. Additionally, the main street light levels were reduced by 60% overnight and they achieved a reduction in power consumption of more than 65% (“Lighting the Cities - Accelerating the Deployment of Innovative Lighting in European Cities”, 2013). In the case of Eindhoven (Netherlands), street lights were programmed to blink red to alert residents to floods or storms. In the same way, they indicate an emergency evacuation route for traffic in

case of a flood of the road or natural disasters (“Intelligent Road and Street Lighting in Europe”, 2008). In the city of Patras (Greece), intelligent parking and smart lighting systems with specific sensors were installed in selected points so that drivers are immediately informed of the availability of a parking space (<http://www.ypodomes.com>). In Norway, when snow covers the streets, the need for lighting is lower so the light levels are reduced (“Intelligent Road and Street Lighting in Europe”, 2008).

The analysis of the implemented cases confirm the contribution of LED lighting systems into the creation of viable "smart cities", with optimal conditions for street users, the environment and the least possible energy consumption.

It is very important before an installation to have a pilot study, in which people also participate in order to analyze the real needs of each case. As it is shown above impacts on visibility, energy savings, capital costs, safety and environmental protection can not be optimized with a single solution for all systems. New management lighting systems make it possible to adapt lighting to different needs at a time and place.

7. Discussion

Light contributes to the creation of the nighttime appearance of the city, which is depicted in a variety of ways according to its social, political, economical, cultural and geographical context and the current way of living. The purpose of this research was to find out the benefits of the optimization of street lighting conditions to the needs and reactions of users, to driving safety and the environmental effect. Key benefits of efficient urban lighting are demonstrated and information on International Standards and Regulations are provided in order to define a common framework for the development of street lighting with the ultimate goal of improving human life.

Improved lighting provides a sense of security and reduces offending behaviors, without being proved to be a physical obstacle to crime. An urban space that provides the feeling of safety can act as a catalyst for social action and cohesion but also as a mechanism that will contribute to further social upgrading and environmental improvement.

Similarly, empirical evidence has shown that properly designed areas in an urban road network can achieve a reduction in accident rates of about 30% worldwide. The benefit is directly dependent on variables related to the achieved light levels and the respective needs of the users. At the same time, the use of energy efficient light sources along with “smart lighting” management systems provide the possibility of creating a dynamic urban lighting that respond to the needs of each specific case and time, enhances energy saving and the reduction of CO₂ emissions.

Furthermore, the need for immediate action for the minimizing of light pollution is imperative. With careful selection, installation and targeting of modern light fixtures, the negative effects of the phenomenon can be avoided.

8. Outcomes from optimizing urban lighting conditions

In response to the queries that have been stated at the beginning of the study, it has become obvious that flexible LED lighting solutions combined with a holistic approach of “good lighting design” according to the Lighting Standards provide to the urban road network excellent flexibility to the final outcome. This ability leads to a shift from “quantity” to “quality” that offers people and society a great deal of benefits. By summarizing, the benefits from the optimization of the street lighting urban network are listed below and are divided in three sections:

Environment	Economy	Society
<ul style="list-style-type: none"> • Reduction of unreasonable energy production • Reduction of CO₂ emissions • Limiting light pollution; minimize reflected light, unnecessary diffusion and undesirable glare • Use of LED light sources with no mercury contain • The use of warm white LEDs causes less problems to the nature equilibrium 	<ul style="list-style-type: none"> • Reduction of energy consumption by 60-70% • Preserve energy resources • Energy savings up to 60% and more • Further reduction achieved by the use of adaptive lighting • Reduction of maintenance requirements and consequently of more expenses • Extended lifetime of new systems (up to 100.000h operation or >20 years) • Extremely low failure rates 	<ul style="list-style-type: none"> • Enhance the sense of security to the users • Improves visibility and driving safety • Users react faster and more accurately • Reduction of accidents especially with pedestrian victims • Improving the quality of life of residents • Providing greater sense of well-being and visual comfort • Limitation of offensive behaviors • Prevention of crime towards people and properties in public areas • Increase of surveillance • More use of public areas

Figure 4. Street lighting optimization expected results (Developed by the Autors)

With this background and an interdependent relationship between lighting needs and aesthetics, the night-time appearance of the modern urban road network can become a new experience where visual comfort, safety and the opportunity to explore the urban environment can prevail.

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Evaluation of the Thermal Comfort in the Design of the Museum Routes: The Thermal Topology

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Abstract:

Museums are nowadays among the most popular projects for the public, the concept of thermal comfort in museums is often treated after the realization. Even if in the design, the architect shows a particular intention to work with daylight which is considered for these projects as main, the architect often considers certain elements that have an influence on the energy balance of these projects such as: orientation, building materials,....The museum route is the key to the success of any museum project, it is the space of the visitor, the space in which he is invaded by sensations.

In this study, we will first evaluate the thermal comfort in the museum as a whole (building) and then through its route. the objective is to guide reflection in the design of the museum towards the route in order to reduce energy consumption. In order to carry out our study, some European museums were analysed by means of simulation, according to the thermal comfort of their designs for the most unfavourable conditions, then by a thermal analysis of the museum route according to the segmentation principle using the average radiant temperature. this method allowed us to bring out correspondences between the architectural form and the route.

finally, the segmentation method constitutes the basis of a new methodological approach called "thermal topology" based on the discontinuities of the temperatures in the route.

Keywords:, segments, route, thermal comfort, design, topology.

1. Introduction:

The birth of architecture had always been linked to the human being and his needs. Theories on the architectural space have passed from the metric dimensional character to the ambient psychological character. Reflections on the human body have shown that the body does not stop at the surface of the skin, it has an immaterial boundary called bubble that is located in close proximity to his body. (J.Cousin, 1980)

Thus, it will be necessary to imagine that the body is included in a bubble which is also composed of several layers taking the form of a protective eclamptic sphere. Man is thus surrounded by several spheres of variable dimensions; these variations are due to his way of moving in space and the route between several spaces. These variations affect human man's behavior and his ways of appropriating space. The requirements of the human being as to his space are multiple, it can be noticed that from our reading, there are three ways of appropriating the space, a very personal way making it private, a way slightly personal making it semi-public, and a not personal way making it public.

The house is currently considered as the private space of the human being, many are the research works that deal with its aspects, however there are also projects that are considered by the human being as private with varying degrees of change such as offices, or work offices or even schools, hospitals ... in our era there are also many project intended for the general public, we find shopping centers, theaters, museums...

The museum has a public character because it is designed and intended since the beginning of its appearance to the public, however it also has its private property and many characteristics in relation to its user who is its visitor. visitors must be transported by their emotions and live a very personal adventure in a space intended for the public

1.1. The museums a "place" for the public:

Previously, the architecture of the museum, directly inherited from the great princely residences, had been adapted to become at the same time the setting, the decoration of a private collection; then a

public, and place of its ideal contemplation. The laws derived from the theories of "Gestalt" have developed the design of these spaces. They are not the only ones, there are also the various studies carried out in the company of visually impaired people, which made it possible to establish some rules in the perception of space. Certain principles of the psychology of perception can also find an application in architecture and especially in museum architecture.

For a person who has all his senses, the experience of architecture is primarily visual (sense of movement). The movement of the body, even if it is not one of our five senses, offers us the measure of things and space. The route, the visit, allow the appreciation of the grandeur. we note that the exploration of a space is carried out by simple gestures such as approaching, moving away, going around, going up, going down, penetrating, etc. These actions invite us to control what we want to see, hear, smell, taste, touch in a given environment.

During an exhibition, the visitor perceives and appropriates an ambience, and at the same time, "dialogue" with what he sees, hears, or touches, etc. It is no longer in a "space" (quantifiable volume, whose physical dimensions and surface can be determined), it is located in a "place" that has a history and that we will discover. The "place" is the result of a state of mind, a feeling of well-being or malaise, a feeling.

1.2. The design of contemporary museums:

In this paper we will focus on contemporary museums, with an overview of the steps that the museum has taken to reach its present complete form, and finally, the relationship between its external and internal aspect thanks to the notion of the route.

1.2.1. An overview of the evolution of the design:

The appearance of the museum design had evolved, according to I. Bayón Juan (2013) in the city of the 19th century, the museum was consolidated as an important building in the urban context with a social function, the consolidation of several elaborate and defined models generated new typological qualifiers i) the Museum-temple, ii) the Museum-palace, ii) the Composite Museum.

The great social and cultural transformations of the 20th century changed the concept of the museum, its social function and the way it was exhibited. The museum will no longer be a national sanctuary of art or science, but a tool for the conservation and transmission of knowledge. (I. B. Juan, 2013)

In the post-war period, a new type of museum appeared, the museum as a “white cube” of modernity, linked to the universal space of Mies van der Rohe. The first reactions against the white cube and the museum's association with the mausoleum began to appear in the 1970s. Van der Rohe's ideas for spaces have been taken up by a new generation. The museum had ceased to be a temple or a treasure house, The best example of these new ideas was the Centre Pompidou opened in 1977.

In the 21st century the museum surpasses all others in its symbolic character. For this, the architecture of the museum has become a gigantic sculpture on a tray or a recognizable silhouette tower. The most representative museum of this new image of monumentality and the media is the Guggenheim in Bilbao. (I. B. Juan, 2013)

The design of the museum went through four main stages: i) The collection of objects as a sacred act: one rarely exposed to the public that during the festivals according to the period and the dominant religious belief of the time, it was practiced at temples, churches, While the collections were in the hands of the church, exposed in temples and cloisters, there was no need to create special spaces for them, ii) Presentation to the public: Everything changed when collectivism became secular and began to be exercised by princes and nobles. This is how the need to develop new types of spaces to preserve and exhibit is born. this period of visual design appears according to the historical chronology: the studios of the Renaissance princes, the palaces of Belvedere, the galleries ,The creation of object cabinets, iii) as varied function : Baroque art brought a flourishing of the art by encouraging the spaces of exhibition for a better valorization of the collections, it is at this time that one conceived the first architecture for the conservation and the exhibition of the collections, The museum opened in 1683, and had to wait until the 19th century so that the operation of removal of the collections can be carried

outiv) varied design: according to the content, the architectural form and the current of the architect; according to the routes,... (I. B. Juan, 2013)

In the contemporary museum the concept of the route is the key element of the design of the museum since its appearance, we will now see how it is treated in the museum.

1.2.2. An interior design and the notion of the route:

Le Corbusier (1977) had highlighted the fact that architecture is a journey, with its concept of "architectural walk". If villas, religious buildings, etc., offer architectural walks, it is obviously the museums that are the clearest examples. Jean-Raphaël Pigeon (2013) notes that it is only possible for man to visualize himself in his route if he becomes aware of his environment through his body, this awareness allows a better understanding of architectural space. The first relationships between man and the route refer to visual abilities, man tends to understand the environment in which he finds himself and appropriate it through decoding information that space sends him.

J-R-Pigeon (2013) evokes the works of J Cousin, the use of the bubble by the latter can better define the relations between man and his space and beyond the route, the bubble is much more than a series of layers extending on the periphery of the human body. It does not have fixed dimensions or a particular shape, but changes in the spatial route according to the movements of the body, it marries the body at a certain distance, but can expand, widen, or also compress itself according to the context. The location of the components of the architectural route (such as transition and intermediate spaces) have a particular importance and influence on the users of the route. However, the direction taken in the user's route, through the spaces, influences the perception of the latter.

The concept of route is not easy to define, because of its polysemy. we can adopt, for example, the definition of LAROUSSE (2009, p. 356): "it is the route or route followed to go from one point to another". Common sense gives various meanings. Showing the complexity of this term: (path, circuit, route, triathlon, course, crossing, stage, etc.). For some researchers, the route represents the movement

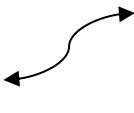

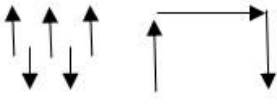
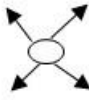
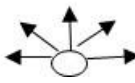
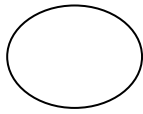


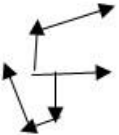

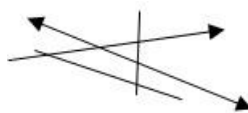
of the body in space. For others, it is described as a design-visit interaction, the route being taken into account according to the context. With the route, the simple act of moving begins to make sense.

Many solutions to traffic principles have been developed; they fall into three categories according to their form (Mariani. R, 2000). (i) The "linear" route: an obligatory scheme, (ii) The "labyrinth" route: no traffic constraints, (iii) The "centered" route: The public is free to choose the route of its visit.

This typology proposed by Mariani. R (2000), is very complete if we associate it with the one proposed by Jean Davallon linked to the three levels of exhibition: i) the conception (thought route), ii) the setting in exhibition (proposed route), iii) and the visit (lived route).

However, this typology proves insufficient if we compare it to the work carried out by A. Borie and al (1985) and P. Panerai and al (1983), we have noticed for the same typology several other sub-typologies are associated, and after a reading of the two proposed typologies we have summarized them as follows (Table 1):

Table 1. Different route configurations

Integral Configuration	Linear configuration	<div style="text-align: center;">Line</div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> Curvilinear Rectilinear  </div> <div style="text-align: center;"> segmented  </div> <div style="text-align: center;"> with branches  </div> </div>		
	Cantered configuration	Radial 	Arborescent 	loop 
	Ribbon configuration	Spiral 	Broken line 	
Partial configuration	Labyrinth 	Regular 	Irregular 	

1.3. The notion of comfort in the museum and thermal comfort:

If we take the research carried out on museums from the angle of comfort, we will realize that the first aspect of comfort that researchers deal with is visual comfort, this is due to the initial function of the museum, which is the exhibition of works of art, if the visitor is there it is to visually appreciate the exhibition. The element of ambience linked to the visual comfort that is often treated in museums is the light, it is studied not for the comfort of the user and the success of the exhibition but also its influence on the works of art (deterioration).

However, despite the importance of light and visual comfort, there is also another type of comfort that can influence the success of the exposure is thermal comfort. This comfort is linked to the thermal environment often very much influenced by the architect's choices during the design with regard to the choice of materials... it is mainly linked to the conditions of temperature, humidity and wind as the users are exposed, but it also concerns the works of art and their lives, since in the museum it will be necessary to maintain a precise temperature and relative humidity for the maintenance of the works.

It is very important to specify that the thermal performance will say as much about the energy performance, generally expressed in kilowatt-hours of primary energy consumed for 1 m² and over a year (KWh-ep/m².an), the energy performance of a building designates its ability to limit energy consumption within a project, taking into account the quality of its heating equipment, but perhaps above all, its thermal behavior. The latter refers to the evolution of temperatures inside the building. (H.T Minassian, 2014)

Returning to thermal comfort, and starting with the users, the first essential condition to provide thermal comfort to a person is to balance his energy balance. The calorific power produced by the metabolism must be equal to the power dissipated in the environment by the five exchange means. (M. Le Guay, 2009) Thermal comfort is linked to energy performance, we are now seeking to make energy performance optimal, and it is by improving thermal comfort that this will be done.

Research in the thermal field concerning the museum without very rare and since we are interested in contemporary space we quote the work of Philippe Rahm (2005) in which he speaks of the birth of a new thermal approach with the free plane of Le Corbusier, he begins from the observation that the way of heating a space passes by heating each sub-space separately, and therefore he proposes with the same principle of the free plan or everything communicates to try to think of the whole house as a global atmosphere, this led to the birth of a new concept which is the thermal landscape.

Philippe Rahm had first of all tried to found a new architectural language linked to the thermal aspects and inspired by the values of the invisible. He then adopted the concept of the Gulf stream which is based on : i) the creation of an invisible, complex and rich thermal landscape, defined according to multiple zones of different temperatures as many climates, sensitivities, territories, ii) In this architectural design process, an atmosphere is created first, before the program, before the spatial forms, iii) It is then that the program is placed in space, looking for sensual thermal conveniences that cross localized ambient temperature criteria, clothing, physical activity. (P. Rahm,2014)

In the case of museums, we can mention his work on the THERMAL DISTORSION for the Contemporary Art Gallery in Grand Palais (Paris, 2009), which first takes place through the zoning of activities, defining space by nuance of heat that generates different zones and functions (Working seated: 21°C, visiting walking: 16°C, Storing: 12°C). He therefore established from these needs a design according to the temperatures of the space to be designed.

Rahm's work is more than interesting insofar as he begins to analyze before designing and according to that he designs. The observation made on the case of European museums is that the thermal comfort component is often linked to the construction phase, the architect chooses the materials, proposes a particular orientation of the projects and the interior spaces, sometimes use software for the calculation and estimation of the energy balances related to the heat of his building, except that the real heating and air-conditioning powers to install his estimate once the project is completed.

In the case of museum projects realized with a particular architectural form, is there a relationship between the chosen form and thermal comfort for the most unfavorable conditions (daily and seasonal)? and how does the choice of the course participate to make the thermal comfort during the visit better? Can better thermal comfort conditions be expected from the project design phase?

2. The methodology and case study:

2.1. The methodology:

The element that we will use to evaluate the thermal comfort in this paper is the mean radiant temperature (MRT). This last represents from a theoretical point of view one of the elements with major influence on the comfort, it is the average of the surface temperatures of the walls which surround the person, it allows to give an idea on the resulting temperature of the comfort which is calculated by the relation: Resulting temperature \approx (Ambient + mean radiant temperature) / 2

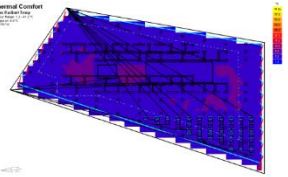
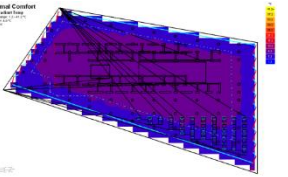
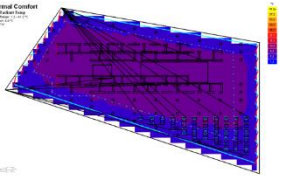
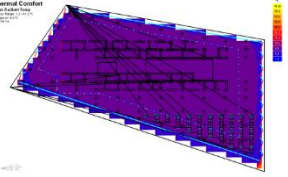
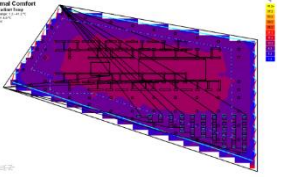
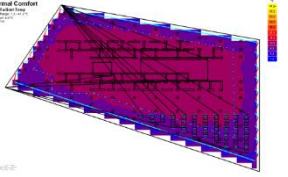
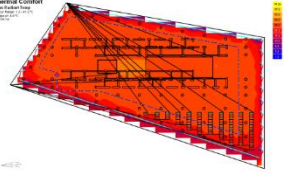
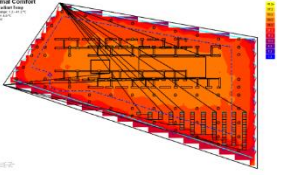
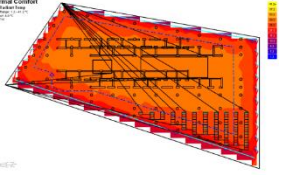
2.1.1. Evaluation of the comfort of the building:

We first calculate the different coefficients of form, of compactness and the ratio surface loss / living area in order to obtain information on the thermal capacities of each architectural volume.

We modelled after reduced models of our case studies with their real dimensions, their climatic files and all the characteristics of the construction materials and the context. We then simulated the thermal comfort as a function of the mean radiant temperature using the Ecotect 05 software, the simulation was carried out in several stages as follows:

- The plan views of the analysis grids for the critical hours of the most unfavorable day according to the season, we obtained 6 representative results by plan views. In this regard, we cite the case of the first floor of the Acropolis Museum in Athens (Table 2).

Table 2. Variation of the mean radiant temperature in the Museum of the Acropolis of Athens

Ground floor	Morning	Noon	Afternoon
21 December	 Thermal Comfort map for 21 December Morning. The map shows a triangular floor plan with a color scale from blue (low temperature) to red (high temperature). The temperature is generally low, with most of the plan in blue and purple.	 Thermal comfort map for 21 December Noon. The map shows a triangular floor plan with a color scale from blue to red. The temperature is slightly higher than in the morning, with some areas turning purple.	 Thermal comfort map for 21 December Afternoon. The map shows a triangular floor plan with a color scale from blue to red. The temperature is similar to the morning, with most of the plan in blue and purple.
21 Mars/ 21 September	 Thermal comfort map for 21 Mars/ 21 September Morning. The map shows a triangular floor plan with a color scale from blue to red. The temperature is higher than in December, with more areas in purple and red.	 Thermal comfort map for 21 Mars/ 21 September Noon. The map shows a triangular floor plan with a color scale from blue to red. The temperature is higher than in the morning, with more areas in purple and red.	 Thermal comfort map for 21 Mars/ 21 September Afternoon. The map shows a triangular floor plan with a color scale from blue to red. The temperature is higher than in the morning, with more areas in purple and red.
21 June	 Thermal comfort map for 21 June Morning. The map shows a triangular floor plan with a color scale from blue to red. The temperature is high, with most of the plan in red and orange.	 Thermal comfort map for 21 June Noon. The map shows a triangular floor plan with a color scale from blue to red. The temperature is high, with most of the plan in red and orange.	 Thermal comfort map for 21 June Afternoon. The map shows a triangular floor plan with a color scale from blue to red. The temperature is high, with most of the plan in red and orange.

- We determined the recommended radiant temperature and compared it with the simulation results to obtain the percentages of the temperatures in the interior building spaces that respect this temperature.

The correspondence between the different case studies allowed us to make a first reading.

2.1.2. Assessment of thermal comfort in the museum route:

We then took the schematic results of the resulting mean radiant temperatures and on these we drawn the route, considering each colored part of the plan with a temperature as segments a part, we calculated the number of segments for each temperature and from this calculation we determined the temperature differences that can exist in the route (Figure 01) first for each day (morning, noon, afternoon) by the Excel program then for each season (winters, summer and mid-season.) by Statistica 07 software.

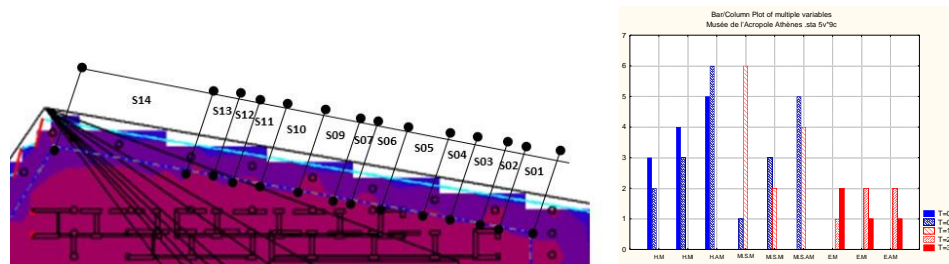


Figure 01: Schematic segmentation, and graph of number of segments by temperature (source: author, 2018)

2.1.3. The correspondence between the two methods of analysis:

It is by means of the Statistica 07 software that we will proceed to carry out correspondences between the various parameters analyzed by means of a multivariate analysis. All methodology had been explained in Figure 02.

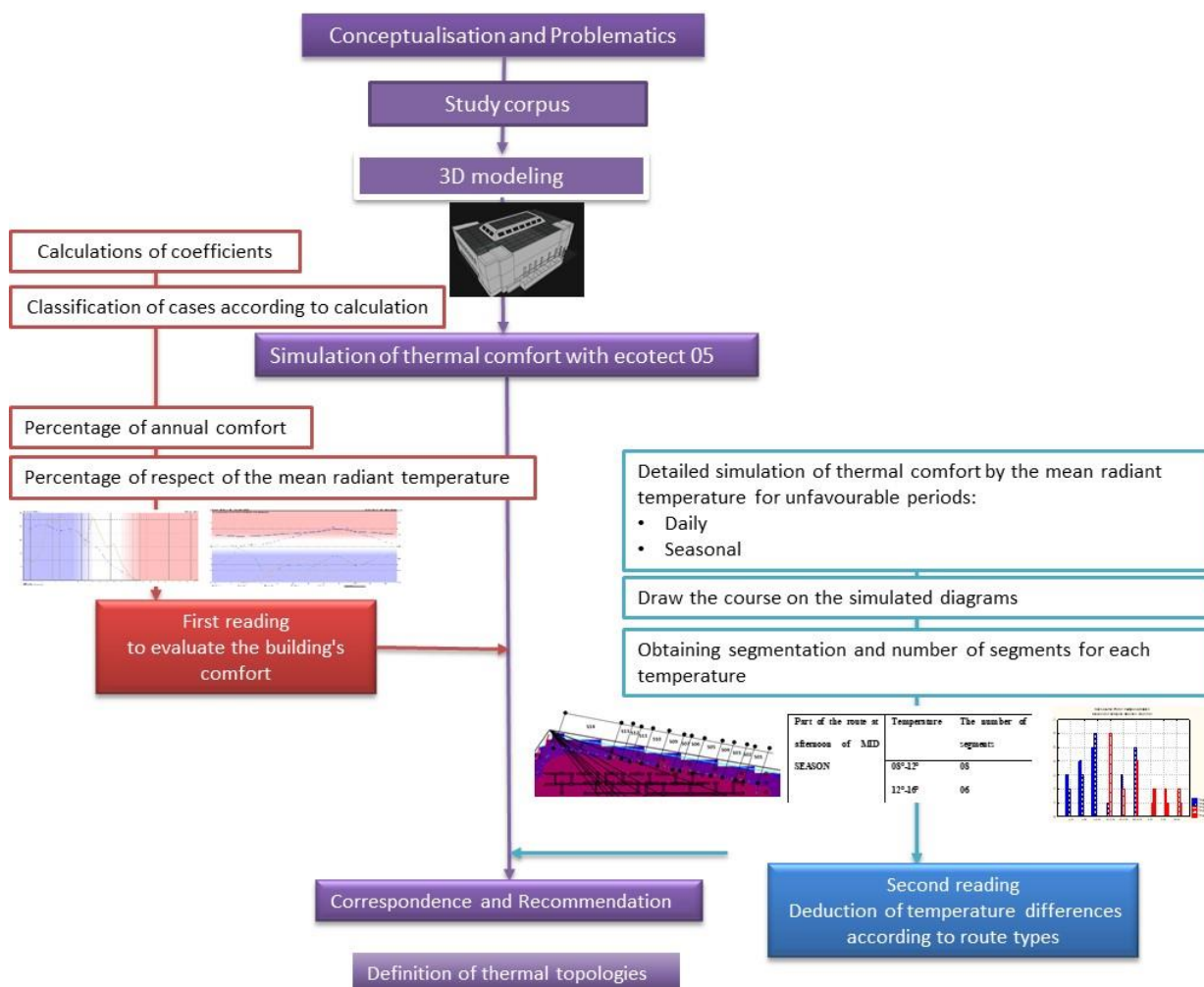


Figure 02: Methodological principle (source: author,2018)

2.2. Case studies:

We have chosen our case studies according to a selection criteria grid, and we quote to this effect:

2.3.1. Architecture and architectural form: It should be noted that the selected museums all belong to the same historical period (1980-2008), museums where the architect had tried to display a particular intention to work with the daylight given the function of exposure (orientation, materials, daylight,) which will have a particular influence on thermal comfort. For the plan shape based on the optimum which varies according to the latitude of place. Our museums are all located on latitudes between (37°N_59°N) and altitudes which vary between 0 and 300m.

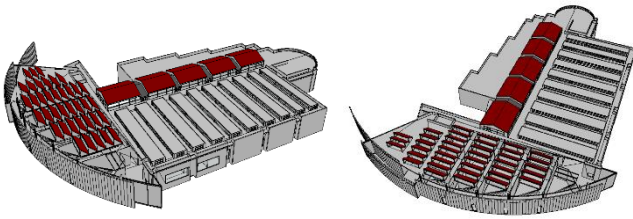
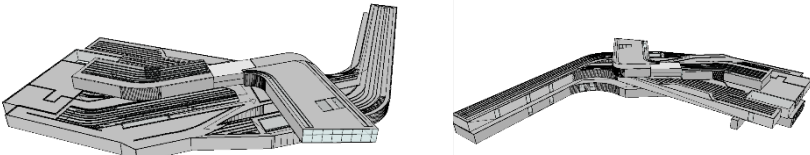
2.3.2. geometry, shape and compactness coefficients: The size and geometry of the building partly determine the heating and cooling requirements. We have therefore classified our selected cases according to their shape coefficient, representing the ratio between the surface of the envelope and the habitable volume (m^2/m^3), it indicates the degree of exposure of the building to climatic factors, it is a very important criterion in the thermal evaluation of the building but delicate to apply because it depends on several factors, such as the geometric shape, the size and the mode of contact of the buildings. (Roger Camous et al,1979)

2.3.3. The orientation: The southern exposure is interesting because the sun is high and it is easy to protect oneself. It is the most favorable exposure in summer after full north, while being the best in winter. For that we chose museums oriented South or South-East or South-West.

So, we have proposed, according to the architectural form and in relation to thermal comfort, 09 museums presented in the table 3:

Table 3. Summary of case studies and coefficients.

The museum	Area (m²)	Volume (m³)	Cf	C compactness V/A	Af/Ah
Prehistory departmental museum (France) Roland Simounet Île-de-France Paris 48°51'24"N 2°21'03"E 35m	6666,5	13761,15	2,06	0,4844	3,148
Beyeler Riehen Museum (Switzerland) Renzo Piano Bale 47° 34' 01" nord, 7° 34' 59" est 254m	9540,4	18409,2	1,93	0,518	2,383
Centro Gallego de Arte contemporaneo(Spain) Alvaro Siza Coruña 43.37°N 8.40°W 309M	18161	37136	2,0448	0,49	3,91
Acropolis Museum Athens (Greece) Bernard Tschumi 37°59'02.3"N 23°43'40.1"E 70M	13577,6 5202 18779,6	69120 21924 91044	4,84	0,206	2,355
Jewish Museum Berlin (Germany) Daniel Libeskind 52°31'00"N 13°23'20"E 34m	17958	79560	4,430	0,225	1,805
Hergé Museum (Belgium) Portzamparc Christian 50.671115°N 4.612809°E 50m 2006	7878	35640	4,520	0,221	1,287
Guggenheim Museum Bilbao (Spain) Frank Gehry 43° 15' 25" nord, 2° 55' 24" ouest 19m	14970,18	130351,7	8,707	0,11	0,574
	15120	102222	6,670	0,147	0,665

<p>Grenoble Museum of Fine Arts (France) Olivier Félix-Faure, Antoine Félix-Faure et Philippe Macary 45° 11' 16" nord, 5° 43' 37" est 204 m</p>					
<p>Museum DE MAXXI (Italy) Zaha Hadid Rome 41°54'N 12°30'E 21M</p>	17145,6	107427,2	6,314	0,158	2,003
	1230	8610			
	18375,6	116037,2			
					

3. Results and discussion:

3.1. Evaluation of the comfort of the building:

3.1.1. In relation to the coefficients:

For the coefficient of compactness, we found very varied results, the Bilbao Museum presents the lowest coefficients (0,11) compared to the proposed museum, however the Jewish Museum of Berlin and the Hergé Museum and the Maxxi and the Acropolis Museum Athens have a coefficient in the same interval (0,15 and 0.25). The prehistoric departmental museums, the Beyeler Riehen and centro Gallego de Arte contemporary have practically the same coefficients (0, 5).

In the case of the ratio of loss area to living area, we did not find any relationship between the results obtained for the different case studies. We go from 0,5 for the case of Bilbao to 1,2 for the Museum of Hergé, 1,8 for the Jewish Museum, the Museum of the Acropolis Athens, the Beyeler Riehen between 2 and 2,3 .and finally the great values for the Prehistoric Departmental Museum and centro Gallego de Arte contemporary ≤ 3 .

These coefficients do not give us a plausible reading of the thermal quality of buildings, the most interesting from a scientific point of view is the ratio surface loss / living area, but for our study cases there is a variation between the floor area and the footprint which makes the relationship between the

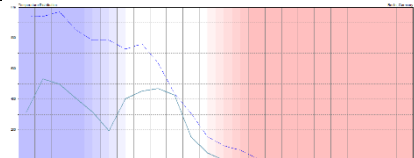
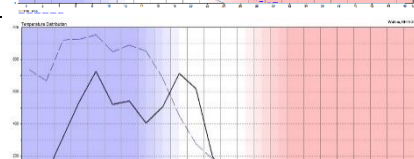
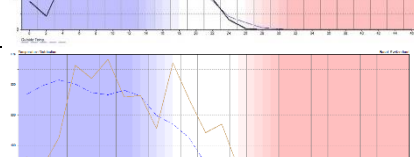
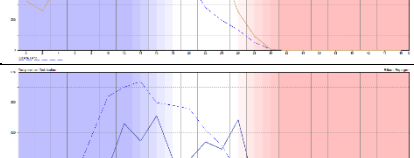
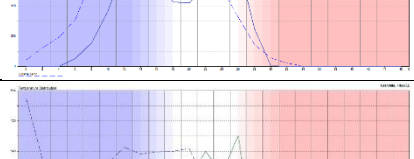
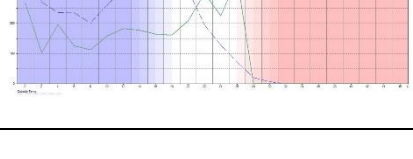
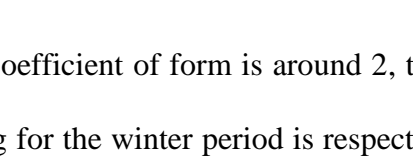
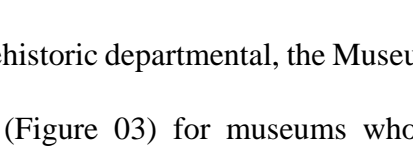
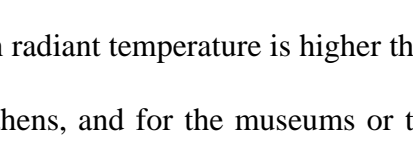
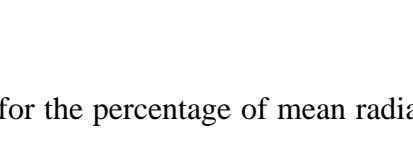
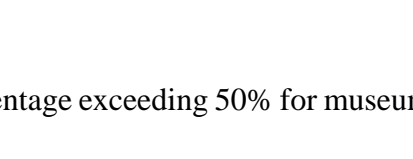
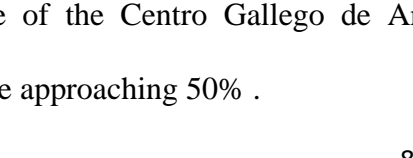


results very subjective. However by the coefficients of form we can already classify our museums into three formal categories: i) museum of simple form ($Cf \approx 2$): Prehistoric departmental museum, the Centro Gallego de Arte contemporaneo and the Beyeler Riehen, ii) Museums of simple form modified to 50% (see ≈ 4 to 5): the Jewish Museum of Berlin, the Hergé Museum and the Museum of the Acropolis Athens. And finally, the museum with complex form ($Cf:6,3$): the museums Guggenheim Museum Bilbao, DE MAXXI and Grenoble Museum of Fine Arts.

3.1.2. The percentage of annual thermal comfort and the respect of the MTR:

After the simulation we obtained the percentage of the overall comfort (Table 4) of the building and we can say that for all museums there is no particular relationship being the results all museums achieve almost 50% percentage of comfort.

Table 4. Annual thermal comfort and the MTR

The museum	period	MRD recom mended	TRD Percentage respected	Percentage and Hours of annual comfort	Graph
Prehistory departmental museum	winter	10°	40%	44.8% 2126 Hrs.	
	mid-season	16°-18°	90%		
	summer	24°-26°	70%		
Beyeler Riehen Museum	winter	10°	20%	33.4% 2926 Hrs.	
	mid-season	14°-16°	100%		
	summer	22°-24°	70%		
Centro Gallego de Arte contemporaneo	winter	10°-12°	30%	51.2% 4486 Hrs.	
	mid-season	14°-16°	70%		
	summer	24°-26°	100%		
Acropolis Museum Athens	winter	10°	90%	47.6% 2143 Hrs.	
	mid-season	14°-16°	60%		
	summer	24°-26°	40%		
Jewish Museum Berlin	winter	10°-12°	70%	46.4% 1953 Hrs.	

	mid-season	14°-16°	80%		
	summer	22°-24°	45%		
Hergé Museum	winter	10°	100%	45.3% 1816 Hrs.	
	mid-season	14°-16°	70%		
	summer	22°-24°	40%		
Museum de MAXXI	winter	10°	60%	40.6% 3559 Hrs.	
	mid-season	14°-16°	80%		
	summer	26°-28°	50%		
Guggenheim Museum Bilbao	winter	10°	60%	48.8% 2818 Hrs.	
	mid-season	14°-16°	90%		
	summer	24°-26°	50%		
Grenoble Museum of Fine Arts	winter	10°-12°	30%	44.6% 1721 Hrs.	
	mid-season	14°-16°	80%		
	summer	22°-24°	60%		

For the unfavourable period of the winter, for museums whose coefficient of form is around 2, the percentage of the mean radiant temperature in the global building for the winter period is respected with a percentage less than 50%, such as the case of museums : prehistoric departmental, the Museum Beyeler Riehen and Centro Gallego de Arte contemporaneo, (Figure 03) for museums whose coefficient is equal to 5, the percentage of the respect of the mean radiant temperature is higher than 50% we quote the example of the Museum of the Acropolis Athens, and for the museums or the coefficients is higher than 6 the percentages approaches 50%.

For the unfavourable period in mid-season, there is no variation for the percentage of mean radiant temperature, in all museums it is greater than 50%.

For the most unfavourable period of the summer, we notice a percentage exceeding 50% for museums where the coefficient of form is equal to 2 such as the case of the Centro Gallego de Arte contemporaneo, for the rest of the cases it is considered as average approaching 50% .

This reading does not offer any particular information with regard to the notion of comfort from conception, and despite the disparities that may exist, it does not present any particularity of thermal point specific to the museums in the corpus of study.



Figure 03: Diagram of the percentages of the MRT in the study cases

3.2. Assessment of thermal comfort in the museum route:

3.2.1. Differences in mean radiant temperature in winter:

The differences of mean radiant temperature are present within the route of two museums of case studies which are: Museum of the Acropolis Athens, and the Prehistoric Departmental Museum. (Figure 04) These differences characterize the three periods of the day when we passed for example in the case of the Acropolis Museum from 03 segments of 05° and 02 segments of 09° in the morning of the coldest day to 04 segments of 05° and 03 segments of 09° at noon, and 05 segments of 05° and 06 segments of 09°. The correspondence also shows the total absence in these cases of a study of radiant mean temperature differences for the summer period.

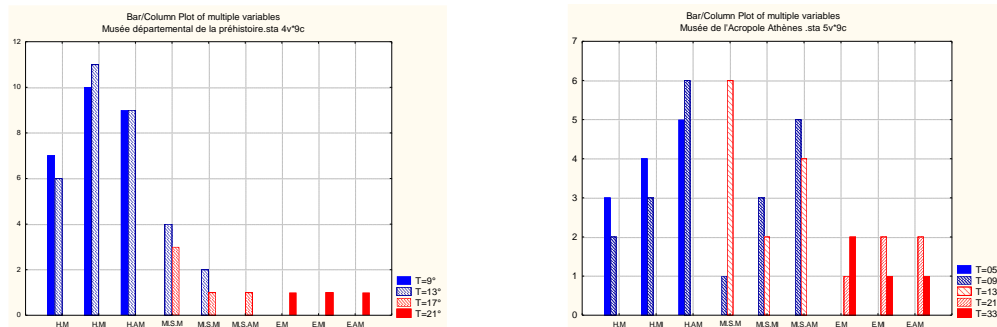


Figure 04: Diagram of variation in number of temperature segments, daily and seasonal variations

If we return to the initial segmentation of the route according to temperatures, we will notice that for these two cases (Figure 05) the visit begins from the same point and also ends in the same point, the route is considered linear for the visit but from a conceptual point of view it is rectilinear centered.

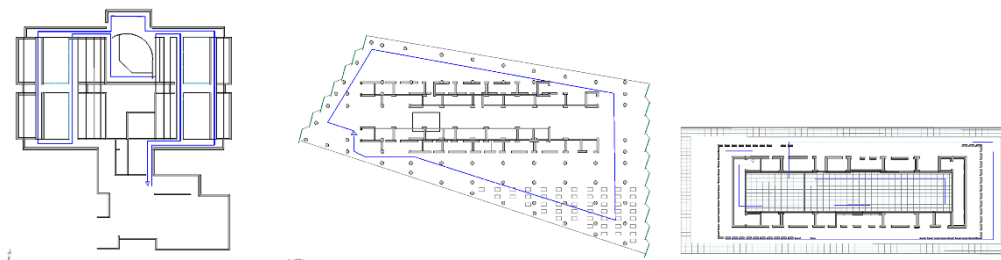


Figure 05: the route plan for the case of Prehistoric Departmental Museum and Museum of the Acropolis

3.2.2. Differences mean radiant temperature in summer:

These types of Differences characterize three museums of our case studies which are the Beyeler Riehen Museum, The Centro Gallego de Arte contemporaneo and the Hergé Museum, with a total absence of temperature differences during the winter period (Figure 06).

We cite the case of the Beyeler Riehen museum, where we notice according to the graph that for the morning of the hottest day the route consists of 03 segments, a first one with a mean radiant temperature of 18°, and 02 segments where the temperature is 22°, at noon for the same day the route will have 03 temperatures, 18° on a segment, 22° on 10 segments, and finally 30° on 07 segments. For the afternoon of the hottest period we will have 02 segments of 18°, and one at 22°.

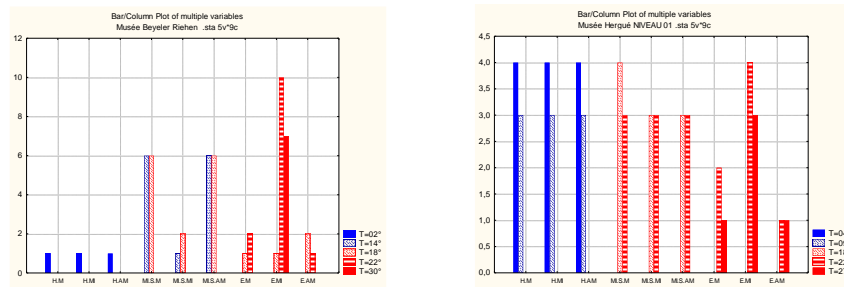


Figure 06: Diagram of variation in number of temperature segments, daily and seasonal variations

The route for these three case studies is of the same nature as it appears in the Figure 07, it is considered linear for the visitor, from the conceptual point of view, the linearity of this route can be in the case of the Museum Beyeler Riehen segmented, the Centro Gallego de Arte contemporary adopt the form of a zigzag and finally the Museum Hergé be labyrinthine in nature.

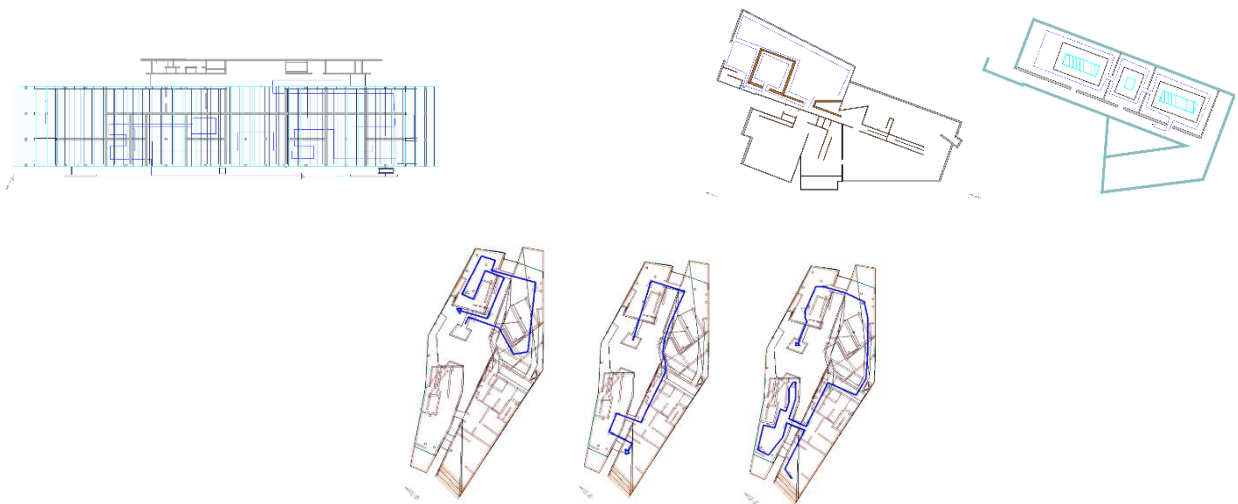


Figure 07 : the route plan

3.2.3. Differences in the mean radiant temperature in mid-season:

These differences are the most important for our study cases, given the fact that they can extend over a long period of the year that is 06 months, there are two groups of this type of difference completely opposite, the first is the one where the differences of the mean radiant temperature are present, it includes the Jewish Museum in Berlin and the MAXXI Museum in Rome (Figure 08).

For this purpose we mention the case of the Jewish Museum of Berlin or for the two periods of the mid-season, for the morning 02° and 08°, at midday the distribution will remain with equality but we will have 04 segments of each temperature 02° and 08°, the route will be composed of 04 segments, divided equally on two temperatures, for the afternoon we will have three temperatures, 02 segments of 02°, 07 segments of 08° and 06 segments of 12°.

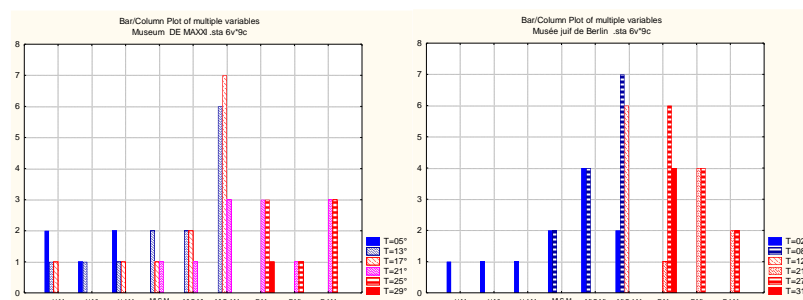


Figure 08: Diagram of variation in number of temperature segments, daily and seasonal variations

The second group is the one where these Differences are absent and we find two types of museums in this category, the Museum of Modern Art and Architecture in Stockholm and the Guggenheim Museum in Bilbao.

In the case of the Guggenheim Museum in Bilbao, the route consists of a single segment with a mean radiant temperature of 09° and those for the three periods of the day. In the case of the Museum of Modern Art and Architecture in Stockholm the route consists of 05 segments spread out at 03 over a temperature of 05° and 02 segment for a temperature of 09°.

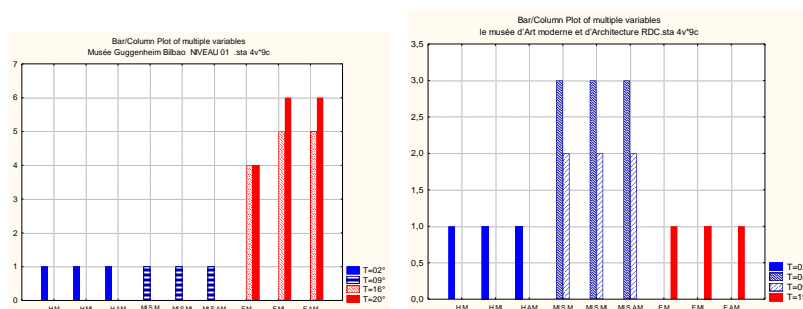


Figure 09: the route plan

For these four types of museum buildings in Figure 10, the route is labyrinth type, however for the Maxxi and the Jewish Museum this labyrinth has a conceptual character of linearity, and for the Museum of Modern Art and Architecture in Stockholm and the Guggenheim Museum in Bilbao, a perfect labyrinth.

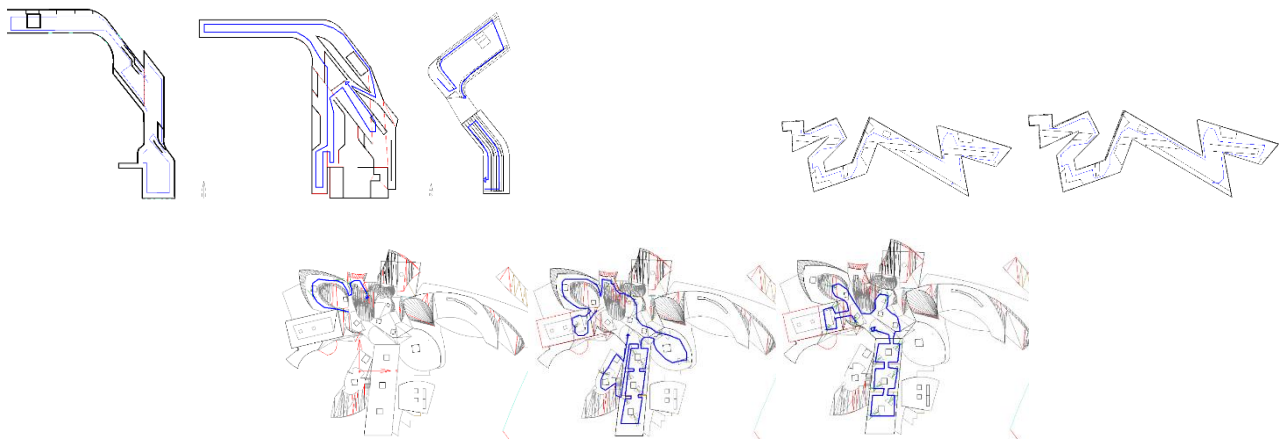


Figure 10: the route plan

3.3. Correspondence and Recommendation:

First, we studied the correspondence between the comfort of the building and that of the route with the software *statistica 07*. This recommendation concerns directly the museums of our case studies and those of the same formal configuration, the recommendation will take effect if we respect from the design: Optimal shape / appropriate route / optimal mean radiant temperature:

- The optimal architectural form is the simple form (primary), simple forms are characterized by the existence of temperature differences that will last no more than 03 months (the time of a season). For the type of route, we recommend a route with Full Configuration, all varieties are required (simple, centered, or zigzag).
- The mid-season differences which can affect the museum route over a period of 06 months, very often characterize the architectural forms having kept 50% of their simple primary form, it will be necessary to propose the most compact architectural forms possible and without disengagement, as far as the route is concerned, we propose the routes with Integral Configuration.

- The mid-season differences are also absent in the case of museums with complex shape (organic form), or the route is often labyrinthine or mixed type seems the most appropriate, it will however be necessary to find solutions for the winter and summer periods.

3.4. The birth of the thermal topology:

The segmentation method we have proposed in this paper has nothing to do with metric dimensions of space, it depends on changes in temperature in space. While looking for a meaning of this segmentation in the field of thermal, we found that this segmentation corresponds to what O. Gregory and A. Kumbaro (2013) had named the “thermal topology”.

The thermal topology has not been evoked where to present in various works of urban planning or architecture, however it is related to the field of the physics of the buildings. The notion of topology designates the thermal balance, it is related to them different regimes of heat flow in the wall or within the space itself. Topology is used in Thermomotor simulations to qualify color (pixel) variations for each image rendering and each temperature.

If we take the museum route in relation to the visitor's movement, we will notice that each segment corresponds to a specific temperature, or we pass from one temperature to another through a transition (a thermal event corresponding to the change in temperature) the segments in this case can be called "sequence", and we can thus define thermal topology as the transformations or discontinuities affecting the mean radiant temperature throughout route and we can then propose a new method of analysis based on temperature variation named sequential analysis. This new way of reading the space topologically will allow to qualify the architectural space from the thermal point of view "topologically", or within the route we can find several discontinuities based on the variations of temperatures.

This new methodological approach, linked to the thermal environment, can support simulation in order to improve the thermal performance of a design, or the study of a possible correction based on the micro (detail) and not the Marco (the whole project). The method of sequential analysis of ambient

topologies (Saraoui.S, Belakehal, A, and al, 2018) had already been tested on the museum route for the sound and light ambiences.

4. Conclusion:

Museums are very important projects in our time, their importance emanates from the architectural aspect of the external form which plays a very important role in contemporary museums. If from a conceptual point of view the architect displays a particular intention for visual comfort and daylight in museum, the concept of thermal comfort remains ambiguous and often treated after the realization. However, it is essential to know how to choose the appropriate forms so that the piece of art do not deteriorate under the effect of variation of temperature and humidity.

The museum route is the link between the external architectural aspect and the interior of the museum space, whether it is an architect's choice, an imposed constraint or a result. It is the visitors' space on which the whole visit rests, the space in which visitors are invaded by sensations. This route can also be the place of variation of an essential element of comfort which is the mean radiant temperature influencing the visitors' feeling.

In this paper we have taken as elements to analyze the mean radiant temperature which gives an overall idea on the thermal comfort. We first analyzed the thermal comfort of the museums in question as a building, the results of this part seemed too general and without any particular relationship. The evaluation of the museum through its route, allowed us to detect the temperature differences that can characterize each type of museum, first for the periods of the most unfavorable days, then for each season. This allowed us to make recommendations for the choice of the form and the typology of route which goes with, this reflection related to the design of the museums makes it possible to reduce the consumption of energy.

Approaching the museum route by means of the segmentation method by mean radiant temperature interval, put the emphasis on a new methodological approach that can bring a new definition to the museum space based on the discontinuities or temperature differences that can characterize the route,

This new way of reading space we have called “ thermal topology” can define new spatiality of architectural space other than that based on dimension.

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Access to Land Influencing the Urban Development of Egypt

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Abstract

The paper seeks to assess the impact of access to land of Egypt on urban development in an attempt to identify policies and laws that can be categorized as a catalyst in urban conflict.

Systematic review of Data on land tenure environment of Egypt, land access, land governance and tenure security, the actors involved in these processes, their roles, the land tenure related challenges they face and measures that can be taken to address these challenges was collected at country level.

In the context of Egypt, Access to land is deemed with obstacles confronting beneficiaries and legal procedures that uncover dispute. By investigating the land tenure environment, conclusions could be drawn on how to improve the systems so that they can be used as development tools that decrease the probability of conflict to happen. Furthermore, by understanding how access to land plays a crucial role in urban development patterns, we can allocate recommendations for more sustainable developments.

Keyword: Access to land, Urban development, Urban growth patterns.

1. Introduction

Research done on urban developments in Egypt shows there is a link between land tenure and physical and spatial characteristics of developments. The UN-Habitat (2007) in their research on the condition of informal settlements in Egypt identified land tenure systems as one of the factors contributing to informal settlements in the country. The report highlighted unclear

tenure relations where multiple interests on one piece of land held by different people as a major limitation to development control and direct cause for urban conflict.

Johannsen (2008) investigated informal mechanisms of accessing land in informal settlements in Cairo. His study focused on behavior patterns of key actors involved in land access from obtaining information on plot availability, setting of parcel boundaries to registration of rights. Findings of this research showed that informal processes of accessing land in Cairo are not disordered but are regulated by informal rules which draw from existing legal policies and customary rules. Yet, these policies are the main reason for conflict around multiple areas in Cairo causing the city to be contested.

Although previous research on land tenure and urban developments in Egypt discussed above highlight uncertainty over existing tenure relations as a burden for land use planning, they do not illustrate how this has led to urban conflicts which leads a city to be contested. This research by examining land tenure environment processes under different land tenure systems clarifies the roles, interests, strategies and interactions of actors in these processes providing insight on the stage of the land development process in which informality occurs. The output of this research would be useful to (a) Institutions responsible for land management in Egypt (b) bodies charged with management of urban developments in Egypt (c) Civil Society Organizations undertaking various interventions on informal urban developments in Egypt (d) Institutions charged with land conflict resolution measures

2. Methodology

Qualitative methods was applied in collecting the data needed to adequately address the research questions. Although quantitative methods were relevant, they weren't applied due to the lack of resources and security permissions.

Data relevant to the access to land was collected mainly through literature review. Review of relevant literature also aided in the identification of bodies involved in land tenure environment

processes under the land tenure systems in Egypt from which information significant to this study was pursued through expert interviews.

Responses obtained from expert interviews were transcribed and the questions as set in the interview guide and the additional questions that came up during interviews matched with the responses given.

3. Tenure types in Egypt

Five main types of formal land tenure exist in Egypt:

Private ownership (freehold)

Freehold land is land registered with the local district office of the Real Estate Registry Division and owned by private persons or companies. The great majority of agricultural land is privately owned, especially in the older, settled rural areas. All land not registered to private entities is technically considered to be publicly owned, although informal tenure of unregistered land in some areas is in fact considered to be quite secure. There are several restrictions on agricultural landholdings. Law No. 50 of 1969 provides that an individual cannot own more than 50 feddans of agricultural land (or its equivalent in uncultivated and desert lands) and that a family cannot own more than 100 feddans of agricultural land. The law prohibits construction of any buildings on farmland without a license from the Ministry of Agriculture and Land Reclamation.

Public ownership

Land registered as state property and not leased to a private entity is publicly owned. Land under public ownership falls into two categories: state domain, which includes desert or unclaimed lands and is administered by the governorate; and public domain, which serves a public utility such as rivers, roads, military installations, land for antiquity sites, and land set aside for development.

Publicly leased land

Land owned by the state can be leased on a long-term basis to its occupants. These leases apply in a number of circumstances, most importantly for land in reclaimed areas and for squatters (by way of a request to the governorate). In reclaimed areas, lease rates are limited (e.g., at the cost of irrigation or at 6% of the total land value) and rights may convert to ownership rights after a particular period of time.

Endowment or Al-Awqaf land

Endowment land is land set aside by the state for charitable or religious intention and usually administered by a specific ministry for it (Al-Awqaf). The purpose for categorizing land as Waqf is to avoid subdivision and to eliminate conflict among descendants. The revenues from the land belong to the beneficiary; Waqf land cannot be sold or mortgaged.

Encroachment (Wadaa Al-Yad).

The Civil Code makes it possible for the user or holder of a plot of land to acquire ownership of that land if it is occupied constantly for 15 years without the owner claiming his rights (UN-Habitat, 2007).

4. Access to land

4.1. Introduction

The lack of systematic land registration has become an increasing problem in Egypt. Approximately one hundred people are killed annually in Egypt due to land conflicts (Mahrus, 2009). The problem has been on the increase because of the fast growing population in Egypt. There are more than 93 million Egyptians in Egypt today and this number is expected to reach 100 million by 2025 (World Bank, 2016). This growth has necessitated the development of unused land. As these extensions, especially in villages or rural areas, were not implemented according to a plan followed by the state they depended on society and individuals to arrange them amongst themselves. Therefore, clashes due to a conflict of interests have been increasing and have become hard to control. Furthermore, the population growth (Egypt has a population

growth of 2.51 percent per year (World Bank, 2016) creates additional problems because of the limited cultivatable land in the country. More and more people, both poorer people forced to move to the border of the old inhabited land because of the limited land available for housing in the old areas, and investors and spectators who have seen this development as a way to make money, have felt compelled to move from registered old land to the non-registered newly reclaimed desert areas.

This has meant an increase in the number of disputes about desert land that is reclaimed or that people want to reclaim. In this section we will look at the laws and regulations concerning landownership in Egypt. Afterwards, we will focus on legalizing of land channels and procedures that beneficiaries follow. Finally, the history of encroachment will be investigated while exploring all the factors that support this phenomena. Through an understanding of those factors we will be able to discuss the different elements of the phenomena of land disputes and analyze how disputes and conflicts might be prevented in the future.

4.2. Explanation for the lack of land registration in Egypt

Land registration is a relatively recent phenomenon in Egypt. Before the 1952 Revolution, only 6 % of the population owned 65 % of the land. Afterwards, the land was redistributed and small farmers started to own some feddans. The average number of feddans owned by small farmers was one to three (Johannsen, 2008). Nowadays, still only 25 percent of cultivated land is registered. There have been efforts by the state to register the rest of the land but those measures have not corresponded with the population growth and extensions of the villages (Abdel-Qadder, 2009).

Registration fees for landownership in Egypt have always been very costly, compared with most people's resources, in spite of the government's efforts to reduce costs. This is one of the main reasons why people avoid registration (Johannsen, 2008). The fees have therefore also been one of the main reasons for land violations as individuals have often been satisfied with

just keeping customary contracts. This has allowed criminals to create forged Customary contracts and to attempt to prove the validity of these contracts at court and thus be able to register them.

Even foreign investors tend not to register their real estates. One example is that of Saudi investors, who own more than 100.000 properties but have not registered their property in Egypt. According to the Center of Information of the Egyptian cabinet, only 27 percent of the real estate that the Saudi investors own, is registered (Hamilton, 2012). In 2004, the Egyptian parliament approved a bill to reduce the fees of ownership registration by one third. In this concern, the fees paid for the registration are 3 percent instead of 4.5 percent of the price of the registered land. The reason for this reduction was to get the remaining real estate that is estimated to be worth 32 billion dollars, registered. Nevertheless, in 2006 Law no. 83 was issued to modify the Real Estate Registry fees at a fixed price instead of a percentage in order to encourage investment and development in Egypt.

The objective of this law is to stop the customary contracts that have increased ownership disputes and violent conflicts in Egypt dramatically. But customary contracts are still widely used among citizens as the owners of unregistered contracts, when necessary, can prove ownership of their real estate in two lawsuits:

First: By proving the validity of the signature of their preliminary contract.

Second: By proving the validity of the whole contract. Thereafter, they can register their real estate in the Real Estate Registry Department .The state is unwilling to force citizens to register their land; instead the law tolerates the holders of unregistered contracts and gives them the chance to register their contracts in case they need to. Thus it seems that the authorities, so far, have not implemented one way standards, but instead proceed with laws and rules contradicting each other. Instead of encouraging people to prove ownership in court and thereby to register

the land involved in disputes the law allows people to use unregistered land which easily can become subject to conflict.

Other reasons for the lack of land registration are due to the maze of bureaucratic procedures a person has to go through if he wants to own his land officially. In order to officially own a piece of land in the newly reclaimed areas in Egypt one has to go through 24 procedures, in 13 different offices, involving three different ministries (Abdelhamid, 2016). A procedure which, on average, takes between six and 11 years. Further, the formulation of urban and rural areas is unclear in the law, which has led to some problems in the areas close to the desert. Law no. 3 of 1982 illustrates the lack of formulation in the law by giving only a blurred definition of urban areas. This has led to brokers escaping both rising prices in the cities and laws directed toward the cities' urban areas by moving to the rural areas. There is a general lack of cooperation between the different authorities dealing with the issue which opens up the possibility of conflict and violations of laws as well. Experts have pointed out that there is a big problem concerning under staffing, lack of facilities and equipment (available maps are often outdated) in the authorities involved with landownership (Ismail, Head of Legal department - The Egyptian Survey Authority, 2016). Each governorate in Egypt experiences an average of 9000 land violations every year. At the same time, the average number of employees in a governorate dealing with this issue is 50 people (El-Hefnawi, 2005). This fact shows how difficult it is for authorities to handle the large number of violations. The employees' salary is very low and this makes it even harder to keep experienced officials or keep out corruption or attract a new work force.

All land in Egypt is in theory reserved for the military. To gain land ownership you need to obtain permission from the military to use the land. After getting permission from the military you can move on to getting permission from the other ministries involved. The ministries involved in land registration in Egypt are the Ministry of Agriculture and Land Reclamation,

the Ministry of Housing, Utilities and Urban Communities, the Ministry of Justice, the Supreme Council of Antiquities (SCA) and the Ministry of Petroleum (Johannsen, 2008). A person needs the approval of all these authorities to officially own land. Still the military, even in case of proved ownership, has the right, at any time, to reclaim the land they consider necessary for military purposes (Sims, 2010).

In addition to the ministries involved in land registration there are local authorities in the governorates that play a role. It is the governor's responsibility to implement laws and ministerial decrees. However this also means that there are differences in coping with land ownership from governorate to governorate, though no customary contracts and encroachment are legally used in the very deep desert area, Sinai or the desert of the Red Sea area. This coincides with article 10, law no. 143, 1981 which considers Encroachment a violation of state property (Mahmoud 2009).

There are though differences in this matter from governorate to governorate. This can be seen in the case of the governorate of Marsa Matrouh where Encroachment is not illegal. There Encroachment is registered through the extradition of documents with the governor's seal and considered a step toward official ownership. This is possible in Marsa Matrouh because of Presidential Decree no. 632, article one, 1982,22 which states that certain areas and governorates, Marsa Matrouh being one of them, do not have to apply law no. 143, 1981, but can apply their own laws concerning land ownership as dictated by the governor of the area (Johannsen, 2008).

4.3 Land Legal Access Systems

There are different procedures and challenges to acquire legality for each land tenure form in Egypt. These procedures and challenges are different if the applicant deals with land legal obtainment or property legal obtainment. The upcoming part will be focusing on legal land obtainment.

4.3.1. Legal Access Process of Private Land and State Private Land

As David Sims stated, since 1946 (Law no. 114), all sales, purchases, and transfers of land must be registered with the Real Estate Registry to ensure complete legal protection for the owner, to recognize the property and allow property tax payments (Séjourné, 2012). Real Estate Registry is under the Ministry of Justice and an office exists in every governorate ((Egyptian Ministry of Justice, 2008).

Acquiring land or transferring it in Egypt is not an easy or simple procedure. On the contrary it is a very long and complicated process. To acquire a property legally there are many procedures that should be followed. Acquiring private property is the easiest among all forms of property. While acquiring state Public Domain is completely forbidden and any kind of squatting on it cannot be registered by the governmental authorities. The state Private Domain can be legalized in case of squatting but with very difficult and strict procedures. The property is subdivided into built property or not built property

4.3.2. Legalizing of land transmission "Non Built Property"

The procedure is really complicated and time consuming. The owner of the property should prepare a file including application form, a primary contract and receipt of property tax "Cashf Al-Moshtamalat المشتملات" to the Real Estate Registry (see **Error! Reference source not found.**). Afterwards, the Real Estate Registry investigates the file and send it to the survey authority -Hayaat Al-Mesaha هيئة المساحة - that send a personnel for a field visit to check the exact location of the property, the boundaries and the total surface area and if there is an existing conflict about the land or its boundaries (Ismail, Head of Legal department - The Egyptian Survey Authority, 2016).In the field visit, if the survey authority delegate finds any conflict about the land boundaries, the legalizing process is cancelled until the conflict is resolved. This condition is itself a conflict generating policy, since whoever wants to stop the process of legalizing the ownership may create a dispute while the field visit is happening. In

addition, the survey authority cannot resolve the conflict, since the maps they refer to is outdated paper based maps. Yet, up until now, no survey authority department in Egypt has a complete computerized maps for the territory it manages, including detailed parcel sizes with their owners (Ismail, Head of Legal department - The Egyptian Survey Authority, 2016).

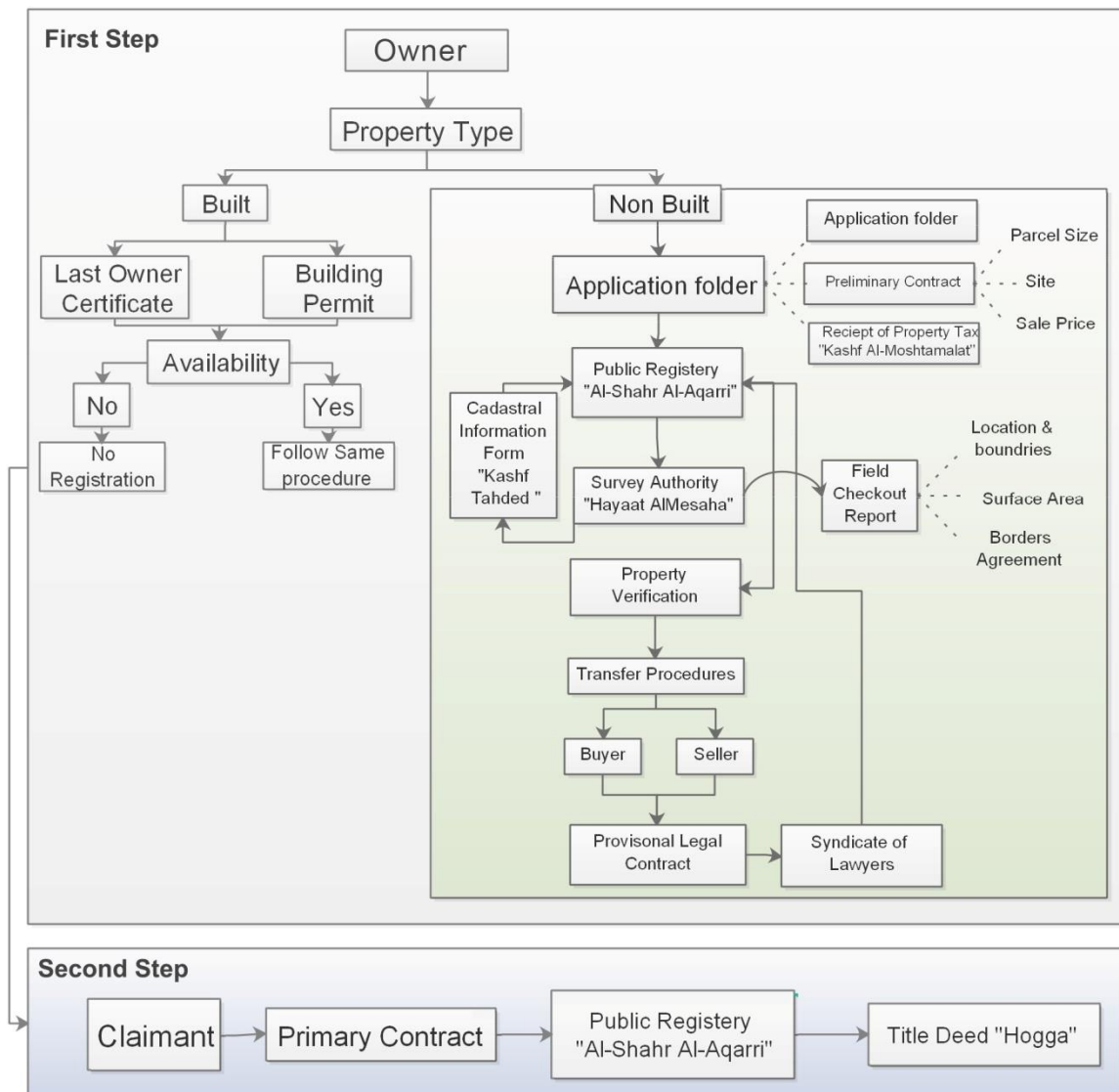


Figure 1: Legalizing of Land Transfer Property - Source: Researcher

If the field visit occurred without any dispute or conflict around the land. The survey authority send a report "Kashf Tahded كشف تحديد" to the Real Estate Registry with all the details of the field visit. The Real Estate Registry after checking the report and the legal aspects of the application, verifies the property to the owner. The Real Estate Registry provides the owner

with a temporary legal contract that should be signed from both the seller and the buyer to complete the transfer.

This contract is first approved by the syndicate of lawyers and afterwards, sent to the Real Estate Registry for final approval. Not only that, but also a second step should be made afterwards, where the new owner (applicant for ownership) takes the primary contract to register it in the Real Estate Registry which in return provides the applicant with a title deed for the property, while the original contract remains in the Real Estate Registry in a specific department "Dar Al-Mahfozat المحفوظات" (Abdelhamid, 2016). This procedure is really inhospitable, very complicated and time consuming.

4.3.3. Legalizing of land transfer "Built Property"

To register a built property, the applicant for ownership should ensure two main things: (a) the seller should be registered as the last owner of the land in the Real Estate Registry and (b) the building is in the construction permitted building zone. If the two conditions are met the applicant for ownership follow the same procedures as the preceding case. While if not met, the property can never be registered. In the case of private property, the buyer and the seller must sign a primary contract "Aqd Ebtadaai - عقد ابتدائي", while signatures observed by two witnesses. The primary contract contains land's details, for example: parcel size, parcel location and sale price. For the contract to be considered officially legal, it should be registered in the Real Estate Registry (Abdelhamid, 2016) see figure 2. If the property is a state Private Domain, it gets more complicated and hard as the seller in this case is the state and it takes a lot of time to finish this transfer, according to the Egyptian Center for Economic studies, this procedure can last for 435 waiting days and costs nearly 20,000 L.E (Alfiky, 2014) .

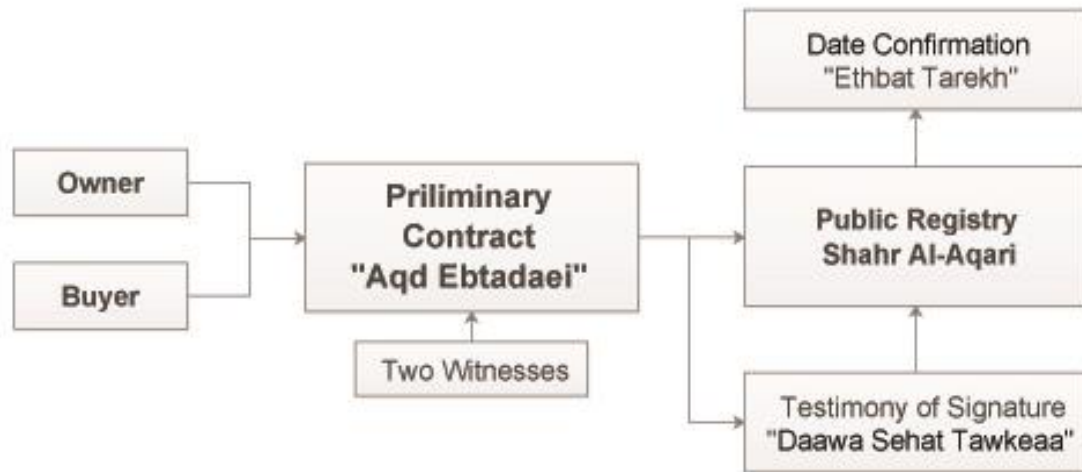


Figure 2: Legalizing of Private Property, Source: Researcher

4.3.4. Formalization of Sales Contract

There are two tricks that squatters use to get tenure security. The first is testimony of signature "Daawa Sehat Tawkeaa" *دعوة صحة توقيع*. In this case, both the buyer and the seller sign a contract. Afterwards, the seller appears before the court; requiring confirmation for his signature. The judge gives him a testimony after verifying his signature, without giving attention to the terms of the contract. The second trick is validation of purchase date "Ethbat Tarekh" *إثبات تاريخ* (see Figure 3). In this case, the buyer after signing the contract, approaches the local Real Estate Registry to confirm the date of sale. According to an interview conducted by the author with a lawyer (Al-Gammal, 2016), these papers are not title deeds and do not secure tenure. Yet, they can be used afterwards in the court along with other documents to strengthen the applicant for ownership situation in the court to achieve tenure security and prevent forced eviction.

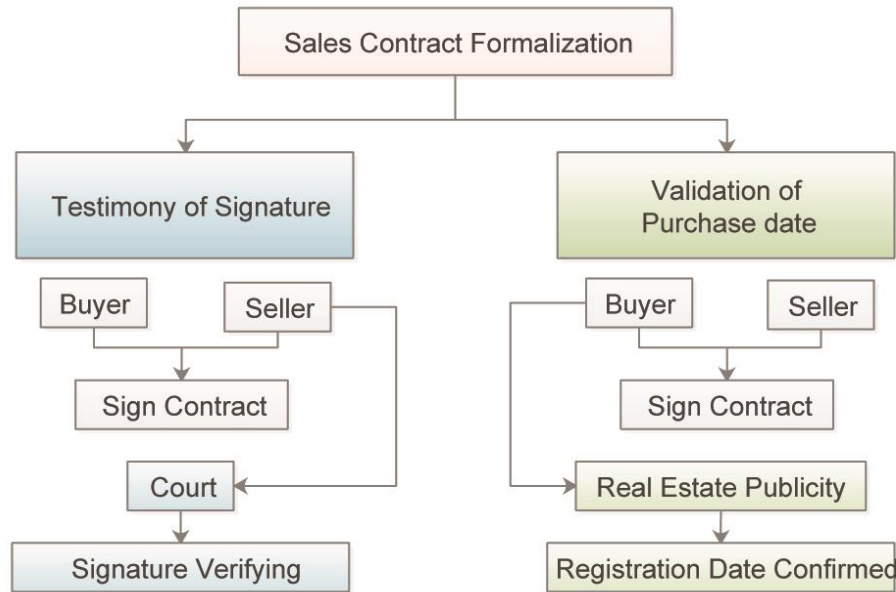


Figure 0: Formalization of Sales Contract - Source: Researcher

4.4 Conclusion

There is insufficient law enforcement in Egypt. The Egyptian authorities have for decades tried to implement legal land registration without much success. Most of the conflicts and the violations over land are due to the lack of implementation and monitoring of laws. Although the state has criminalized encroachment in most places in Egypt, the practice continues and even increased after implementation of Law no. 134, 2006, which prohibited any further acquirement of land through encroachment after August 2006 (Abdelhamid, 2016). The continuing increase of the practice was partly due to people trying to gain as much land as possible before the activation of the law.

Law no. 143, 1981 was clear about considering encroachment a crime in large parts of Egypt. However, so far the state has not intervened to stop the violators. Furthermore, the state has not protected official landowners, as an individual can buy land legally and be forced to pay a second time because of tribes who claim land ownership through encroachment (Al-Gammal, 2016). The state's reduction of registration fees has not encouraged people to register their land. The law gives the right to holders of customary contracts to have legal possession of their land,

although not through full ownership. As long as customary contracts are partly legal, there is little chance that people will start to register their land.

5. Impact on Urban Development patterns

According to (Gaudiano, 2005) There are five types of urban growth patterns which can be represented in fractal cells (see figure 4:) :

- 1-Type 1: Small and isolated build up patches
- 2-Type 2: Dispersed built up patches
- 3- Type 3: Metastatic growth
- 4-Type 4: Rapid growth and metastatic consolidation
- 5-Type 5: Consolidated compact areas

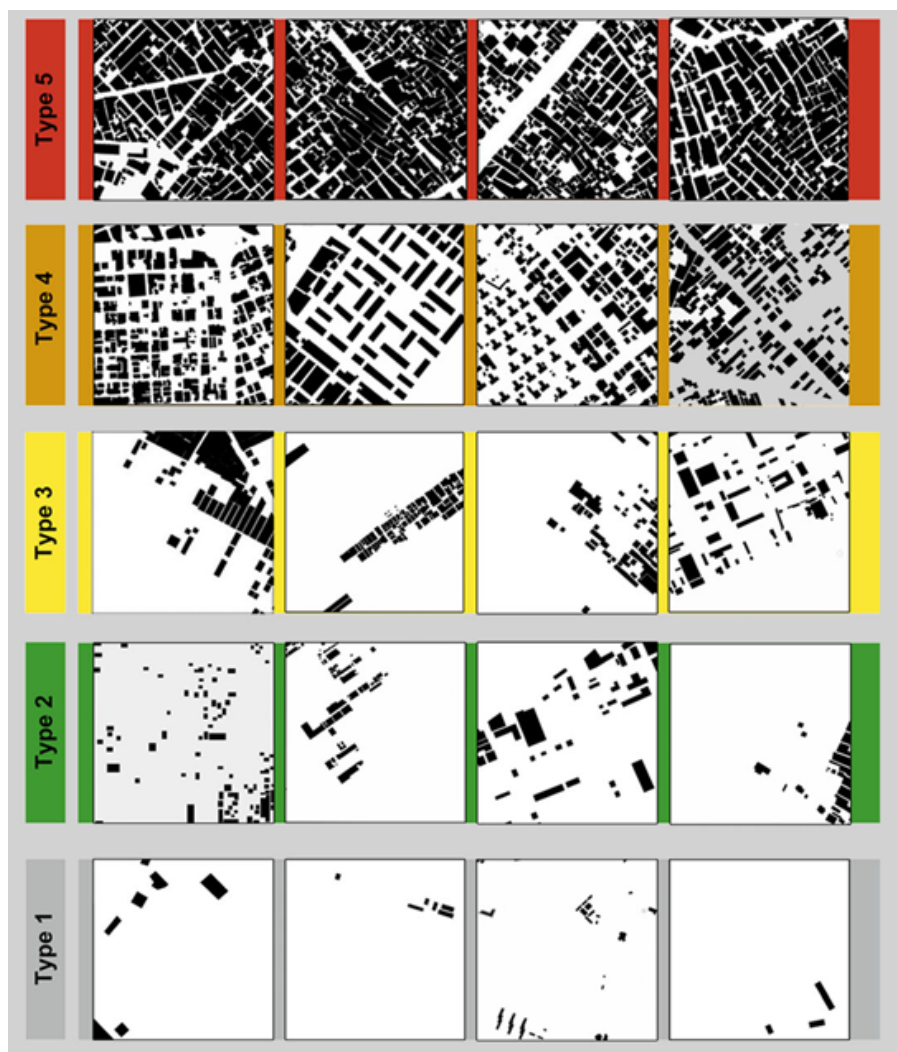


Figure 4: Types of Urban Growth Patterns - Source: Gaudiano 2005

By referring to the fractal analysis of the Eastern part of Metropolitan Alexandria of years 1959, 1985 and 2014 applied by (Hasan, 2012), shows five different types of urban growth patterns: Ranging from the cells that have high fractal dimensions (type 4 and 5), representing the most compact, homogenous patterns and uniform distribution of built-up masses, and found generally in the middle and eastern districts; to the cells that have lower fractal dimensions (types 2 and 3), representing non uniform distribution of urban patterns and contrasting lacuna sizes as represented in the emerging peri-urban informal expansions.

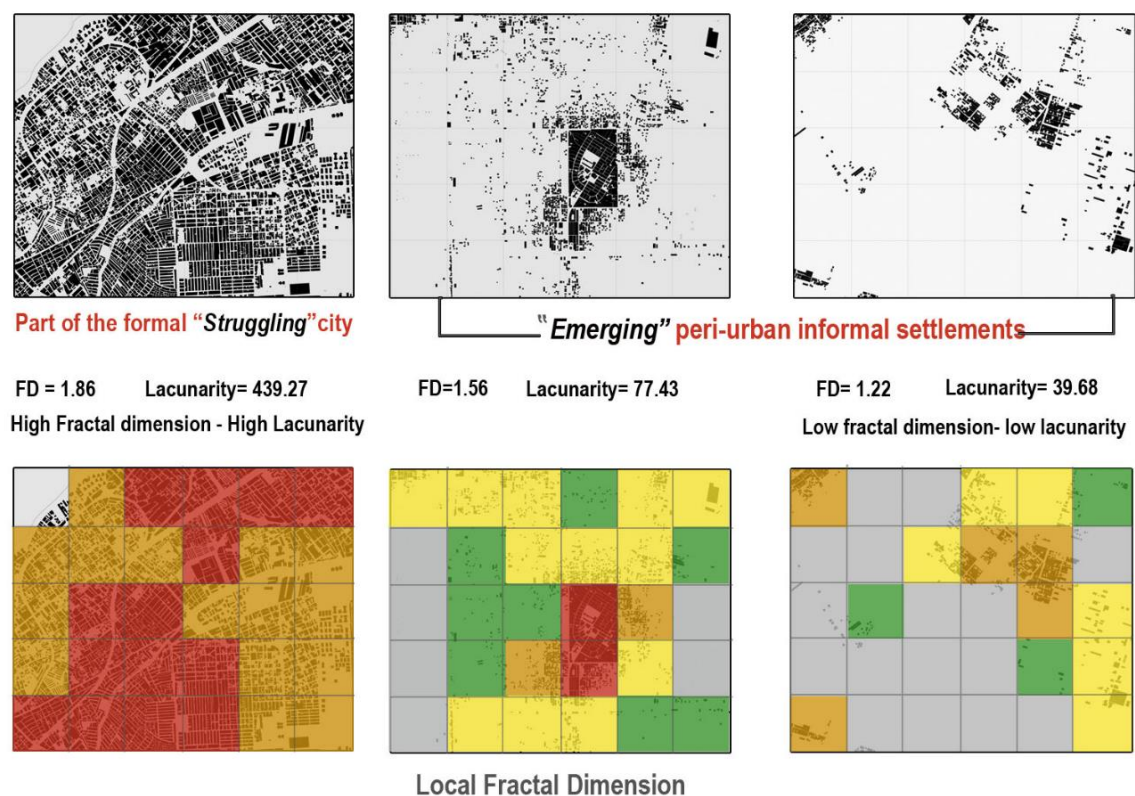


Figure 5: Examples of Fractal cells representing different growth types in Alexandria -
Source: Hasan,2012

According to Hasan (2012), results from the historical data analysis reveal that the development of urban areas in Alexandria generally starts by type 1 and then evolves to higher types that are more compact. It is observed also that the types 1,2 and 3 dominate dispersed areas (at the city peripheries)(See Figure 5). In contrary, the built-up areas in the city core and extensions are

dominated by cells of type 4 and 5. It is observed that the Central Business District (CBD) exhibits a uniform saturated distribution of high fractal dimension (mainly types 4 & 5) that did not change throughout the study timeline.

5.1 Impact of Land Tenure Policies on Urban Growth Patterns

In the upcoming section we will investigate one case of change from one type of urban pattern to another. By focusing the study on the role of access to land policies play as a catalyst in changing urban growth patterns. The case of Al Maamoura zone will focus on the change from type 2 (Dispersed built up areas) to type 3 (Metastatic growth). In the case study we will investigate the characteristics of the focus zone, the accessed land tenure form, how tenure security is acquired and the urban growth pattern across time.

5.2. Case Study: Al-Maamoura

Al-Maamoura zone is located in Al-Montazah Second District in the eastern part of Alexandria. The zone is composed of roughly 60% agricultural land while the rest is considered informal peripheral urban settlements apart from the gated community of Al-Maamoura Coastal apartments see figure (Ismail, Head of legal department, Egyptian Survey Authority, 2017). The zone is connected with the rest of the city through two main roads, Mostafa Kamel and Malek Hefni.

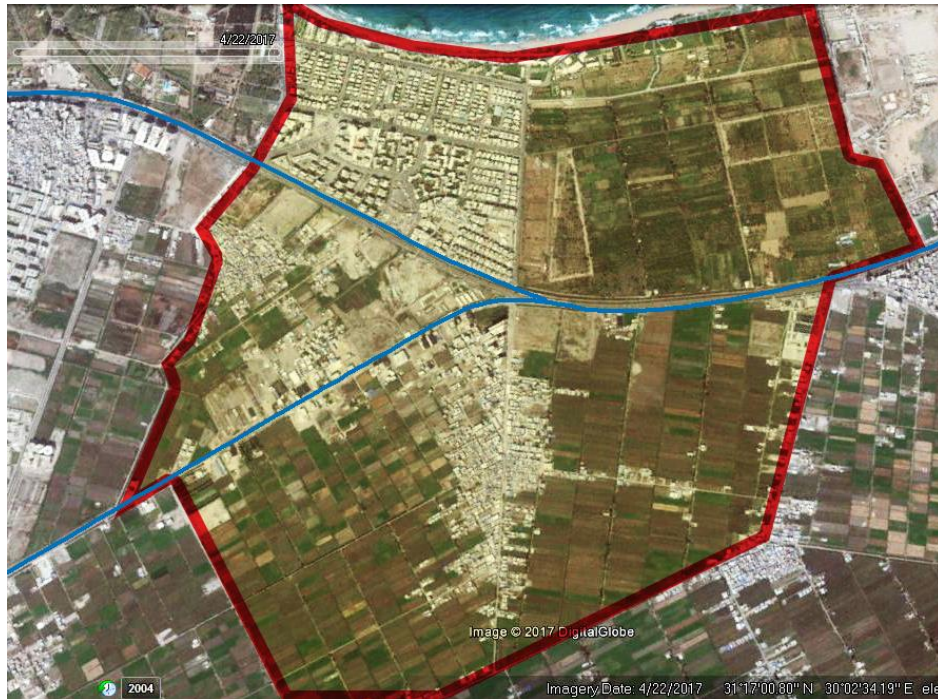


Figure 6: Focus Zone in Al-Maamoura - Source: Google Earth



Figure 7: Scattered Built up areas in Al-Maamoura - Source: Google Earth

In 2004, urban growth pattern in Al-Maamoura could be categorized as scattered built up areas, where families working on the agricultural land gathered in groups of small rural houses see figure 7. These houses were registered and organized through the governorate with supply of fundamental amenities like electricity and sewage.



Figure 8: Urban sprawl on Agricultural land in Al-Maamoura - Source: Researcher

Due to the system of land subdivision mentioned earlier, one piece of land could be subdivided into small plots as a result of the inheritance system. Consequently generation after generation the land becomes smaller, and nowadays the characteristic width of many plots is 7.29 meters. Most of the cases, owners of these plots have two options, either sell or rent this plot cheaply for the adjacent owner to add it with the same crops he cultivate , or build a house to live in or sell it for a much higher price. While the later is the more feasible option for the owner, it is the main reason of the long term of urban sprawl on agricultural land (see figure 8) .

Starting from 2016, the urban growth pattern had changed to be metastatic growth where built up areas are becoming more densified and starting to outreach to surrounding areas. It's anticipated with that range of growth to reach type 4 of urban growth patterns within 5 years. While by 2030 most of the agricultural land of Al-Maamoura will be malformed into informal settlements unless the authorities took serious measures (see figure 9).

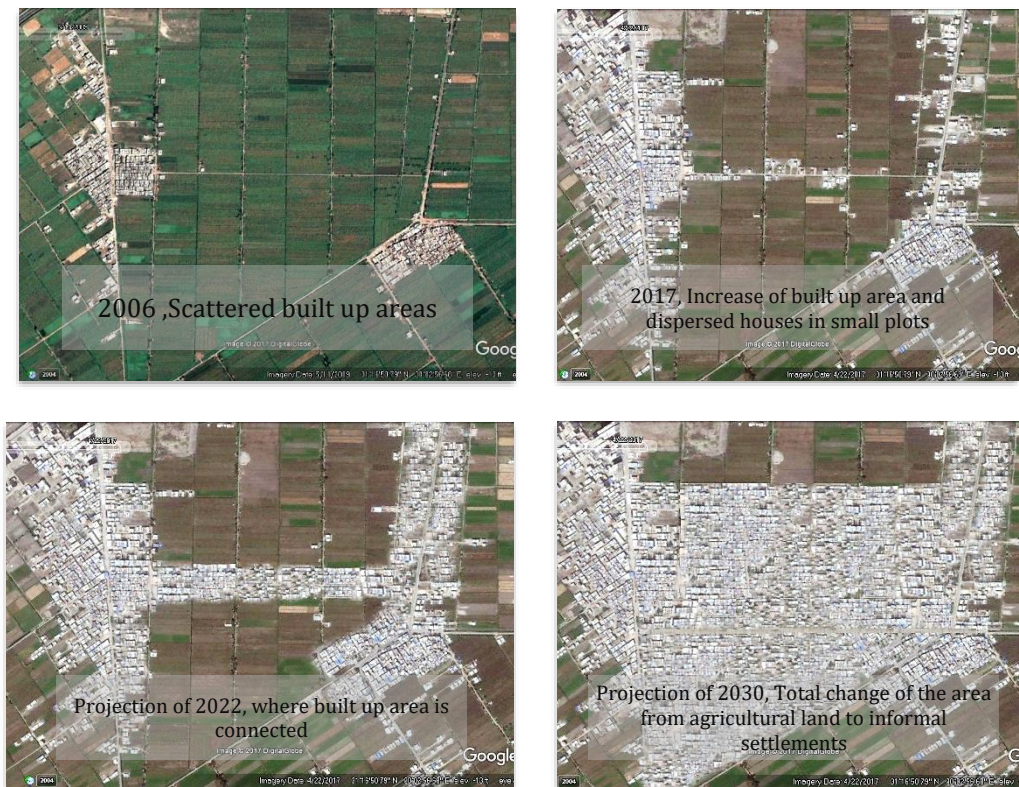


Figure 9: Development and Projection of informal settlement growth in Al-Maamoura - Source: Researcher

Since legalizing of non-built property transfer is a very difficult and time consuming procedure as mentioned earlier, Most of the owners tend to go with legalization of sales contract in any property transfer. Through Testimony of Signature which is acquired from court and Validity of purchase Date acquired from Real Estate Publicity, the owner and the buyer affirm their purchase. Although, these papers are not title deeds and do not secure tenure. Yet, they can be used afterwards in the court along with other documents to strengthen the applicant for ownership situation in the court to achieve tenure security and prevent forced eviction.

Another vital aspect in this case, is that the type of tenure has greatly affected how holders of the land dealt with their agricultural land. In figure 10, the red shaded area are under tenure type of publicly leased land, yet the blue shaded areas are free-hold land. It's well-conceived that the publicly leased land plots have no violations however holders of the free hold have altered and subdivided their land informally and their abuses couldn't be monitored easily.

While building on agricultural land is criminalized, still there are law loopholes that the owners use to get away with this act. When an official from the district files a violation case on agricultural land, the court requires a testimony to affirm the violation. The testimony could be acquired from an agricultural engineer, which can easily be bribed from the owners or, from a neighbor of the agricultural land in question who mostly has his own violation or might falsify his testimony for his neighbor (the violator owner). According to Al-Gammal (2016), this could easily be avoided if the court acquired its testimony from the official who filed the violation or his head.

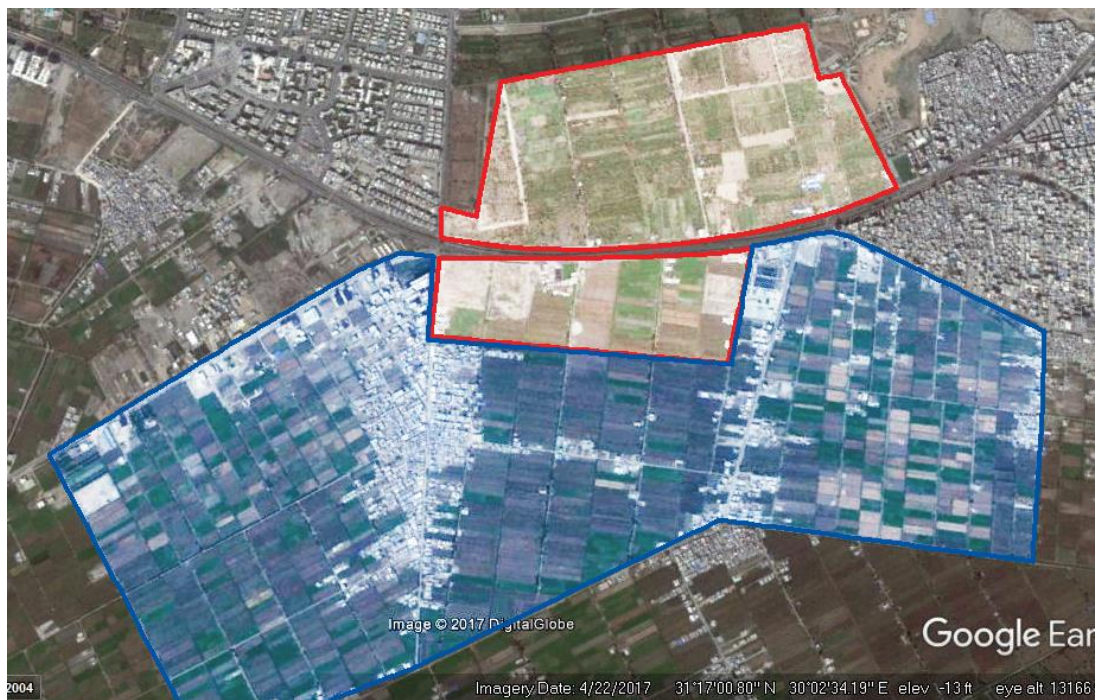


Figure 10: Areas of different land tenure form in Al-Maamoura - Source: Researcher based on Google Earth

6. Conclusion

The objective of this study was to investigate the role of the access to land conflict situations and its impact on urban development patterns. It explained how although the structures for land tenure development programs, administrations and legal policies are in place, they can fail to act as development tools and can actually generate conflict. Access to land can be addressed

in the developing environments through laws reforming efforts in which state led and community led approaches are used to increase the accessibility of land to landless individuals, as well as law enforcing regulations related to legal access. The main purpose of this research was to show that the land tenure environment can play a vital role in developing strategies for land tenure. To do so, it was crucial to explore the value of the land tenure environment in addressing the issues that often lead to conflict. The hypothesis is made that the more effective the environment, the greater its ability towards acting as a development tool. By investigating the land tenure environment, conclusions can be drawn on how to improve the systems so that they can be used as development tools that decrease the probability of conflict to happen. This paper focused on Egypt due to its history of high rate of land tenure conflict together with its dependence on land for economic growth. In many other countries, land tenure conflicts either appear in the outcome of other profound conflicts.

This study can be expanded in several ways to fully understand the relationship between the land tenure environment and land conflict, where a comparative study could be conducted between various land tenure environments in different countries and how policies were reformed in order to vanquish land conflict from its roots.

Acknowledgment

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Tafilelt, the neo traditional model of ksour in Algeria: Assessment of the multifunctionality of urban spaces.

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Abstract

The new ksar of Tafilelt situated in Ghardaia in southern Algeria has attracted a lot of interest in scientific work, being a « neo traditional » urban model that reproduces the principles of composition and spatial organization of the ksour in the pentapolis of Ghardaia. This ksar embodies the adaptation between tradition and modernity: it refers to the local setting of the ksourien space production, contribute to the valorization of these ancient centers that date back to the XIth century.

In parallel to the work of thesis undertaken on « the neo traditional models of reference in Algeria for the new cities », we ask the following questions according to the case of Tafilelt: Is this ksar really a model? Does it take the traditional model fully? Is this indeed a new city? In addition, speaking about the concept of multifunctionality. How to detect this integral reproduction in the urban spaces between the old and the new ksar?

This work will be an analytical reading of the spaces of this ksar according to the four concepts above, namely: the urban model of reference, the criteria of the new city, the criteria of the former ksour and the multi-use character of their spaces. We will try to apply the concept of multifunctionality on urban spaces in different scales to assess the multifunctionality of the ksar's spaces in a comparative approach between the old and the new ksour.

Keywords: Tafilelt, multifunctional urban spaces, neo traditional model, Algerian ksour.

1. Introduction

The M'zab Valley in Algeria contains the most ancient urban centers in the world. The Ibadite Muslims have built these fortified cities in the XI the century after running of the Rostumids from their original settlement in western Algeria (Marçais, 2004). They tried to get along with the hard climate in the Sahara and kept the ksar's houses for winter and the palm grove's houses for summer (Addad, 2013). The Mozabite built the ksour in the slope of the M'zab River to protect them from the floods. Each ksar has several entrances and surveillance towers, a mosque in the top and a marketplace (Souk). The UNESCO listed them in the world heritage since 1982 (Bouali-Messahel, 2011).

Since the 1990s, the Algerian government constructed new ksour beyond the old cores for many reasons (Gueliane, 2014):

- Treat the crisis of housing due to the increasing number of population.
- Improve the conditions of the framework built.
- Protect the cultural and natural values of the tangible and intangible heritage of the Valley.
- Have access to housing to the average class of Mozabite.

These ksour have a modern spatial organization, different from the local typology in adaptation with the specific conditions in Ghardaia. The introduction of the modern lifestyle recently participates in a standard composition in new housing and the new built up areas seems to be similar in the north or the south of Algeria, which leads to a lack of the local identity in the architectural and the urban scale.

The local foundations or the Mozabite themselves, fighting the loss of their model of reference, tried to build new cities that embodies the adaptation between tradition and modernity. It is the case of Tafilelt, it reproduces the traditional urban model of ksour, this study attempts to assess the multifunctionality of spaces in the new ksar according to the traditional model.

The figure 1 is illustrated the structure of the study about the urban models in the M'zab Valley and its importance to preserve the local heritage of this ancestral region.

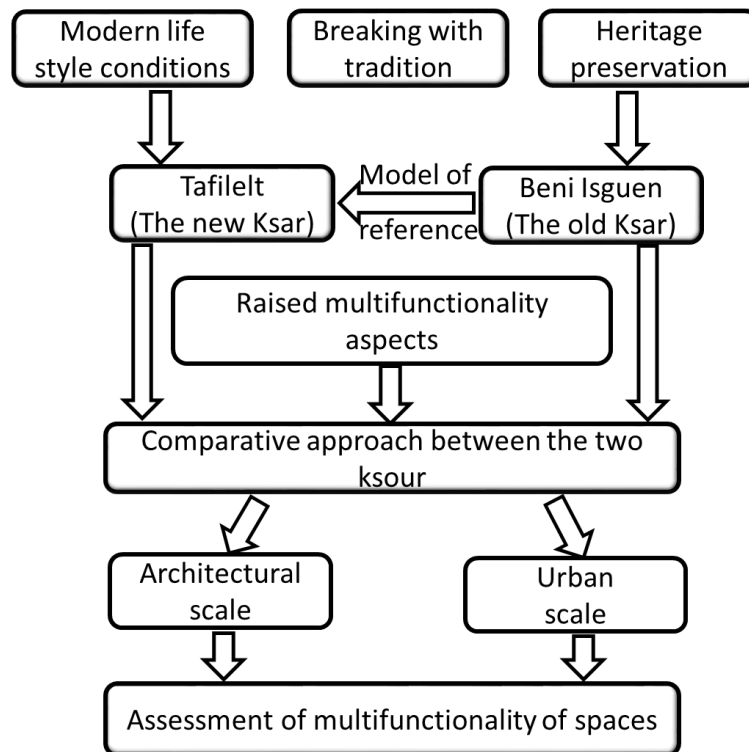


Figure 1. Structure of the Study (Developed by Author).

2. The neotraditional urban model in Ghardaia (Algeria)

The first part of this study will attempt to present Beni Isguen as an urban model and Tafilelt as the modern adaptation of the fortified ancient city and will demonstrate that the former ksour were an urban model for the new ones.

Ghardaïa is a well-known region in Algeria, since Marc Cote and André Ravéreau up to present, its ksour have fascinated many architects and planners who wrote on the M'zab and were inspired in their achievements. The M'zab is a Muslim community of the very conservative Ibadite Sect. They always have a tendency to build and go live in a new ksar if the former is no longer enough for the new population. The descendants of the same tribe will then build the extension of their own city. This community has since long respected a “sustainable” lifestyle:

wise recycling of household waste, use of local building materials and economical use of space. These criteria have advanced the work on the multifunctionality because density and multi-use space go together. The pentapolis contains five former ksour: El Atteuf built in 1012, Melika in 1350, Bounoura in 1046, Beni Isguen in 1347 and Ghardaia in 1048 (OPVM, 2017). The Algerian Government named the entire city after the last one. Guerrara (1631) and Berriane (1679) are located in a few kilometers from the pentapolis (Chabi, 2008). The new ksour are Tinemmirine (1992) and Tafielt (1997) fully completed and Thaounza (2004), which are the extension of Beni Isguen. The ksar of Ioumed (1995) belongs to Melika, Tineaâm (2008) annexed to Bounoura. Finally, the ksar of Hamrayat (1996), Agherm Ouazem (2007) and Ayrem Babaousmail (2008) located outside the Valley, belonging to the municipality of El Atteuf (Gueliane, 2015).

2.1 The new ksar of Tafielt

Tafielt is a project initiated in 1997 by the “Amidoul” Foundation, completed in 2011 on an area of 22.5 hectares, it contains with the 1050 housing units intended for Mozabite young couples, non-existing equipment in the former ksour: Gym, party hall, madrasa, cultural center and an ecological park (Gueliane, 2014). The mode of funding to build the houses is tripartite between the government, the foundation and the population. Therefore, Tafielt is not a new town, the foundation didn't built it after a governmental decision and the laws, which regulate the new cities in Algeria, are not applied on this ksar. It is a purely an initiative from the foundation and the inhabitants. It is winner of the first prize of the "sustainable city" to the Conference of Parties (COP) 22 in Marrakech, Morocco in 2017.

This ksar is the extension of the ksar of Beni Isguen. One of the objectives of Amidoul Foundation in the project was the reinterpretation of the principles of urban planning in the local traditional housing (Addad, 2013). The Intergenerational mix is also one of the element keys of the house design in Tafielt, it can accommodate two to three generations (Addad,

2011), we found after the distribution of the housing that the social mix is rather absent in this project (Gueliane, 2014).

2.2 The old ksar of Beni Isguen

Beni Isguen is the fourth fortified city in the M'zab Valley, known by its ancient mosque and its battlement of 2500 meter of length and three meter of higher including two principal surveillance towers: Boulila and Badahmane (OPVM, 2017). Its population is characterized by quite strict behavior rules and morals (Bouali-Messahel, 2011).

Like the other ksour, Beni Isguen contains an important marketplace where the commercial transactions were organized weekly; it was one of the rare opportunities where Mozabite allow to strangers to come into the city. The commercial streets contain the daily activities (hairdresser, greengrocer and grocery store). The houses are the most important component of the ksar, closely positioned to avoid the winds, built in gradient in the slope of the valley from the bottom until the top where the mosque is symbolically situated. It constitutes one of the last traditional ksourien model built by the mozabite.

In his book "A city fulfils its Valley: Ghardaia " Marc Cote (2002) said that the ksar is a module that is reproducible, organized in trilogy between the river, the ksar (the winter's settlement) and the Palme grove, which is the summer's settlement where the presence of the freshness mitigates the heat of the Sahara. Each module is independent and limited. The extension of each former ksar by a new and the description of Marc Cote confirms that the M'zab Valley has well and truly, a reference model reproducible for its new cities.

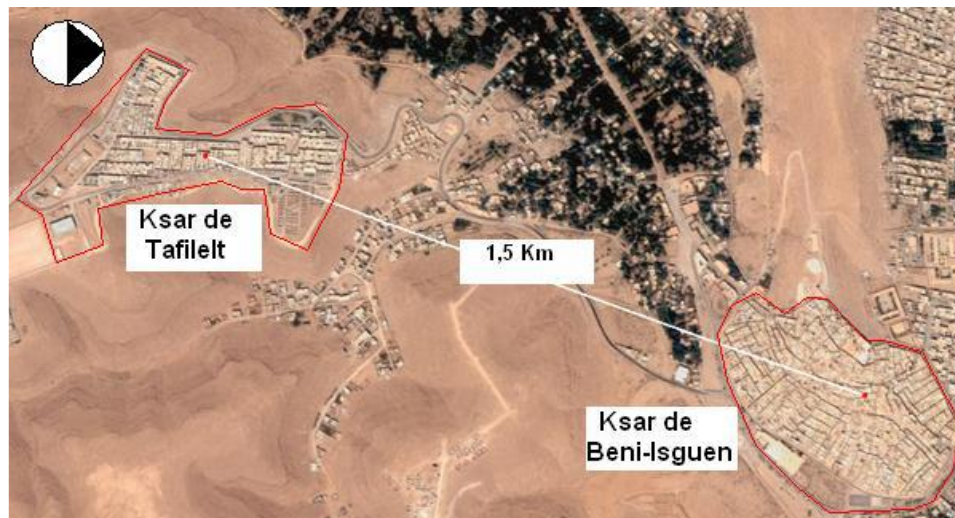


Figure 2: Situation of the two ksour with the distance between them. (Chabi, 2008)

According to Nora Gueliane, Tafilelt shares with Beni Isguen the same principles of planning to know: the compactness, templates, the prospect and the integration to the site. We are going in this work to take interest to the first principle of the “economical consumption of space” which logically generates the principle of multifunctionality of spaces. During the construction of Tafilelt, some urban problems have been resolved thanks to the traditional urban planning. However, the constitution of the ksar of Tafilelt demonstrates that this new urban model aspires not only the protection, the enhancement and the sharing of the ksourien heritage; it also revisits these cultural values for an adaptation to a more modern life framework.



Figure 3: General view at Tafilelt at left and Beni Isguen at right (Author, 2017).

The table 1 attempts to compare between Beni Isguen and Tafilelt according to several elements both in architectural and urban scale. This information has been gathered during the visit to Ghardaia in December 2017 from documents provided by the architects who work in the OPVM (Office for the Promotion of the M'zab Valley).

Table 1. A comparison between the old and the new ksar of the Valley (Developed by the author).

Comparison Elements		Beni Isguen	Tafilelt
URBAN SCALE	Site	Generally, a land with weak agricultural opportunity, the ksar is perfectly integrated into its site, a responsible implantation inside the Valley.	Amidoul also choose a land with weak agricultural opportunity, the ksar is perfectly integrated into its site, a responsible implantation outside the Valley.
	Occupation	Seasonal occupation, the house in the ksar is only occupied during the winter.	Annual occupation, the households have average incomes and thus occupy the house during all the year (permanent habitat).
	Battlement and towers (Defensive elements)	Of a simple form, unified for all ksour.	The simple form is respected for the battlement; a tower is built symbolically for the seat of the Amidoul foundation.
	Doors	Five doors including two principal ones: the eastern and the western.	A principal door is built to symbolize one of the elements of the ksar, which takes part in the preservation of the traditional urban frontage.
	Streets, alleys and dead ends	Have only one function, which is the service road and cannot be occupied by another function.	Hierarchical streets larger than the reference model streets to allow the mechanical access.
	Mosque	Located in the western part of the ksar at the highest level.	It occupies the eastern part of the ksar.
	Market	On a week, the public place is the market of the ksar. Stranger traders can get into to sell their products.	On a week, the public place is the market of the ksar.
	Places	The only public place in the ksar is a marketplace and a men's gathering place.	Several hierarchical places in the whole ksar to promote the social mix.
	Wells	Several water points are located in the ksar for water supply.	The wells are only symbolic elements in the new ksar.
	Urban landscape	Must be homogeneous in the height of the constructions, the colors of the facades and terraces.	Must be homogeneous in the height of the constructions, the colors of the facades and terraces.
	stores and commercial streets	It is forbidden to open a store for noisy activities or an activity that may generate waste inside the ksar.	They are located in the parties giving on the streets and the marketplaces and are not allowed to be in the heart of the Ilot.
	funerary mosques	Near to the cemetery, it is destined for the dead's prayer.	Non-existent in the new ksar.
	Residential space (houses)	An organic form and are almost all similar.	A regular form with three variants (three, four or five rooms in the house).
	The houses	Develop in two levels maximum and all their spaces are functional.	Develop in two levels maximum and all their spaces are functional and more spacious than the former houses.
	Entry	The entry creates an intermediary space for a separation between the inside and the outside,	A corridor communicates directly between the entry and the patio.

H I T E C T U R A L S C A L E		which may also be occupied in the summer because of its freshness.	
	Distribution	The ground floor is the space the most used by women especially during the day, the rooms are organized around a central space in the middle of the house, which is open in the ceiling (patio). There is a room dedicated for the reception of women and relatives. The first floor is more reserved for the newlyweds where its parts are organized around a covered gallery and thus gives access to the terrace and has a room for the receipt of men and of foreigners. This room can also be located on the ground floor far from women's daily activities.	The ground floor distributes the spaces from the patio; we also find a court and a garage. The first floor is closed and completely occupied by the rooms and gives access to the terrace.
	Building materials	Economical use of local materials (stone, palm wood and lime).	Introduction of the concrete and use of terracotta brick, lime, plaster and cement.
	Terrace	The terrace must be horizontal any other form is prohibited. It also includes a corridor reserved for household tasks in winter.	An open terrace and includes a laundry.
	Front and external openings	Must be similar and harmonious for all the ksar's houses, following a local typology.	They still belong to the public domain and must therefore be similar, harmonious and homogeneous. The openings are larger protected by moucharabiah.

This comparison provides us the following information:

- At an urban scale, Beni Isguen was a model of reference to Tafilt in the site choice and implantation. The new settlement could protect the rare agricultural lands in the Valley from urban sprawl and because of the economic situation of its inhabitants, it has been yearly occupied and more appropriate for the modern lifestyle. It is also a way to guarantee a multifunctionality of land use. The urban landscape was respected because it refers to the model of reference and the ethics of Mozabite, the homogeneous height and colors of facades reflect equality between families.
- The main streets in Tafilt are wider than in Beni Isguen. In fact, each household has a car in the ksar, the large dimensions of the streets guarantee a mechanical accessibility.
- There are many places in Tafilt dispersed between the neighborhoods unlike Beni Isguen where a main place was the public space for all users.

- At an architectural scale, and thanks to the social cohesion between the Mozabite, Beni Isguen still a model of reference to Tafilelt with an adaptation to the modern lifestyle, the differences between Beni Isguen's houses and Tafilelt's houses are minimal (the existence of a garage and a yard in the new houses).
- The neotraditional house is more spacious and occupies the whole first floor; it also contains a laundry room in the terrace.

At the end, we may conclude that Tafilelt is a neo traditional urban model of ksour in Algeria even if it is not a new town; this ksar could preserve the traditional model in either the architectural or the urban dimensions with a successful adaptation of the current life framework. It reproduces symbolically some elements in order to maintain the heritage conservation. This project has broken with the current Algerian policy of standard housing. Therefore, one of the ancient concepts that Tafilelt maintains is the diversity of its activities in a limited space. Inside the ksar, the inhabitants tried to project all their needs in order to create an urban diversity and a functional mix.

3. Assessment of multifunctionality between the ksour of Ghardaia

The second part of the study approaches the concept of multifunctionality in general and in the two ksour of Ghardaia in particular in order to assess this concept between the traditional and the neo traditional models.

Multifunctionality as a concept has several roots (Ghafouri, 2016): some authors consider it as an old architectural concept in urban areas by relating it to the ancient Greek or medieval constructions (Zeidler, 1985), others consider it as the ability of spaces to fulfill more than one function simultaneously (L. Grant, 2010).

The concept of the mixed and compact town appears with the "smart growth" in the United States at the beginning of the 1990s, it emphasizes on diversity of use and urban functions with the creation of a favorable environment for pedestrians. This concept had an echo in Europe

and with a Dutch then a German evolution that it becomes the "urban multifunctional land use MLU" or the concept of multifunctional use of urban space. It was inspired by the agriculture field where it was largely applied to increase the rural production (Dufour et al., 2007). It encourages a model of a compact city with diverse functions especially with a synergy between the proposed functions (H. de Groot, 2004). Recently, MLU inspires urbanists in sustainable urban planning because it breaks with the zoning design of the modern style, cause of the urban sprawl (Jacobs, 1961). This concept has also other benefits: reduces the need for new constructions, increases the density in urban areas and leads to more cities that are vital economically and socially (Batty et al., 2003).

The assessment of MLU in urban spaces uses the aspects below (Ghafouri, 2016):

- Space: which is the most important topic; the study area is a place, a street, a building, a house, a room, a terrace or even a sidewalk. It could be open or closed, public or private.
- Time: in architecture, an activity occurs in a time framework (Ghafouri, 2016): during the day or the night, during a week, a month, a season or all over the year.
- Function: a space could have various functions; we can distinguish different types of activities that occur in a space: necessary and functional, optional or social activities (Gehl, 2011).
- Users: the people that are occupying the space could be recognized according to their gender (men or women), or age (children, young or elderly person).
- Scale: Basically, there are three scales in urban studies: architectural scale (the building analysis), neighborhood scale and urban scale (at the level of a town or city).
- Legal status: it refers to who owns the concerned space; this could give us an idea about the importance, accessibility and flow of a space.

In fact, there is a close relationship between time, space and function to characterize the multifunctionality. For this reason, we will consider those three aspects in addition to users to

assess MLU in the two cases. We already divide the study according to the scale and will mention, but not consider the legal status.

3.1. Multifunctionality in Beni Isguen

Like other ancient cores, Beni Isguen is compact with a mixed uses. This returns to the climatic conditions of Ghardaia in one hand and the principle of land economy in another hand. The table 2 studies the aspects of multifunctionality in the old ksar in the most important and significant spaces. We will consider each type of space according to the degree of its multi-use:

- A functional space is considered with the sign (0) because it does not contribute to the multifunctionality of the ksar. However, it has a function, few users and one occupation time at a long period (week, month or season).
- A multifunctional space is considered with the sign (+) because it has more than one function, attracts different types of users who occupy it in different time a year.
- A mono functional space is considered with the sign (-), this kind of spaces have only one function intended for one kind of users and rarely occupied.

The study will not treat in an exhaustive manner the gradation of each degree of multifunctionality for the amenities of the presentation. The next table represents the different ksourien spaces with a description of their aspects.

Table 2: The analysis of the multifunctionality in Beni Isguen according to their aspects.

Scale	Spaces	Time	Functions	Users	Consideration
URBAN SCALE	Ksar	Seasonal occupation (winter)	Necessary/Optional/ Social functions	All types of users	(+)
	Battlement and towers (Defensive elements)	Occasional occupation (of surveillance)	Necessary function	Young men who volunteer to survey the ksar	(-)
	Streets, alleys and dead ends	All day except afternoon while the inhabitants of the ksar stay at home	Necessary function	All users/ Women use often the alleys and dead ends more than main streets	(-)
	Mosque	Permanent occupation	Necessary/Optional/ Social functions	Generally men at different ages and children	(+)

Architectural Scale	Market	Weekly occupation	Necessary/Optional/ Social functions	Generally men at different ages and children	(+)
	Places	Occasional occupation	Optional/ Social functions	Men/children	(+)
	stores and commercial streets	Permanent occupation	Optional/ Social functions	All users	(0)
	funerary mosques	Occasional occupation	Social function	Men	(-)
	Residential space (houses)	Permanent occupation	Necessary/Optional/ Social functions	All users	(+)
	Rooms	At night	Optional function	All users	(0)
	Entry	Occasional occupation	Optional function	Women at different ages, men use it as a passage	(0)
	Patio	Daily occupation	Necessary/Optional/ Social functions	Women generally	(+)
	Terrace	Permanent occupation	Necessary/Optional/ Social functions	All users	(+)
	Kitchen	Daily occupation	Necessary function	Women only	(0)

3.2. Multifunctionality in Tafilelt

Tafilelt follows an orthogonal tracing, hierarchical wider ways with a compactness due to the land economy. New equipment appear in the new ksar and the mosque always keeps the summit of the ksar.

The table 3 resumes the same aspects with the same considerations mentioned above in Tafilelt architectural and urban spaces.

Table 3: The analysis of the multifunctionality in Tafilelt according to their aspects.

Scale	Spaces	Time	Functions	Users	Consideration
URBAN SCALE	Ksar	Annual occupation	Necessary/Optional/ Social functions	All types of users	(+)
	Battlement and towers (The seat of the foundation)	Daily occupation	Symbolic/ optional functions	The foundation members	(+)
	Streets, alleys and dead ends	Permanent occupation	Necessary/Optional/ Social functions	All types of users	(+)
	Mosque	Permanent occupation	Necessary/Optional/ Social functions	Generally men at different ages and children	(+)
	Market	Weekly occupation	Necessary function	Generally men at different ages and children	(0)
	Places	Daily occupation	Optional/ Social functions	Men/children	(+)
	stores and commercial streets	Daily occupation	Necessary/Optional/ Social functions	All types of users	(+)
	Residential space (houses)	Permanent occupation	Necessary/Optional/ Social functions	All types of users	(+)

Architectural Scale	Ecological park	Occasional occupation	Optional/ Social functions	All types of users	(+)
	Party hall	Occasional occupation	Optional/ Social functions	All types of users	(0)
	Gym	Occasional occupation	Optional/ Social functions	Young men and children	(0)
	Cultural center	Occasional occupation	Optional/ Social functions	Men at different ages and children	(0)
	Rooms	At night	Optional function	All users	(0)
	Entry	Occasional occupation	Optional function	Men and women use it as a passage	(0)
	Patio	Daily occupation	Necessary/Optional/ Social functions	Women generally	(+)
	Terrace	Permanent occupation	Necessary/Optional/ Social functions	All users	(+)
	Kitchen	Daily occupation	Necessary function	Women only	(0)
	Garage	Occasional occupation	Optional function	All users	(0)
	Yard	Seasonal occupation	Optional function	All users	(-)

3.3. Results

This study shows that the logic behind the construction of the traditional cores is implied. A ksar is always a reflection of deep social, cultural and religious values. The intention to separate between the architectural and the urban scale was hard in this case because the traditional design thinks simultaneously the micro and the macro scale. It is a complex thought that users practice to build their settlement long time ago, different from the linear planning of towns nowadays. Tafilelt respects integrally the traditional model and reflects perfectly the multifunctionality of its spaces mostly in the architectural scale using the same spaces: patio, terrace, reception rooms, and kitchen with the same traditional concept.

The neo traditional ksar has indeed mono functional spaces like the cultural center and the madrasa who were included in the mosque in ancient times. The yard, the garage and the laundry room in the house have one function, previously, their activities were practiced in the patio.

Fortunately, in urban scale, Tafilelt was a multifunctional neo traditional model:

- The annual occupation densifies the ksar with multiuses and protects the palm grove from urban sprawl and consumption of agricultural lands.
- The reuse of symbolic elements like the surveillance towers also increase the multifunctional land use after their occasional use.
- The introduction of new equipment helps reach the intense land uses in a limited space (inside the ksar's limits) and an adaptation of the modern life (the ecological park, the gym for young and children).

4. Conclusion

This work tries to respond to the questions formulated previously, namely if the former ksour were urban models for the new and confirms the hypothesis, that Tafilalt is really a neo traditional model by its modern reinterpretation of the ksourien space.

In the first part of the work, we have demonstrated that Tafilalt is not a new city according to the Algerian regulations, but it takes Beni Isguen as an urban model of reference thanks to the social cohesion between the Mozabite who still respect their social and cultural heritage references. We have also been able to raise the criteria of multifunctionality of a space in the old centers.

In the second part, we checked the multifunctionality of spaces in the old and the new ksar in a comparative approach according to the raised and applied criteria of MLU in both architectural and urban scale.

These results showed that a neo traditional model could preserve the ancient advantages of the traditional model (the site choice, the implantation, the spatial organization in the traditional house, marketplaces and stores). It also develops some modern criteria and integrates them with the traditional advantages (the yard and garage in the house and the gym, cultural center and the ecological park, which is a leisure area and an opportunity to increase the agricultural land in addition to the palm grove)

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Tafilelt, the Neo Traditional Model of Ksour in Algeria: Assessment of the Multifunctionality of Urban Spaces

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Abstract

The new ksar of Tafilelt situated in Ghardaia in southern Algeria has attracted a lot of interest in scientific work, being a « neo traditional » urban model that reproduces the principles of composition and spatial organization of the ksour in the pentapolis of Ghardaia. This ksar embodies the adaptation between tradition and modernity: it refers to the local setting of the ksourien space production, contribute to the valorization of these ancient centers that date back to the XIth century.

In parallel to the work of thesis undertaken on « the neo traditional models of reference in Algeria for the new cities », we ask the following questions according to the case of Tafilelt: Is this ksar really a model? Does it take the traditional model fully? Is this indeed a new city? In addition, speaking about the concept of multifunctionality. How to detect this integral reproduction in the urban spaces between the old and the new ksar?

This work will be an analytical reading of the spaces of this ksar according to the four concepts above, namely: the urban model of reference, the criteria of the new city, the criteria of the former ksour and the multi-use character of their spaces. We will try to apply the concept of multifunctionality on urban spaces in different scales to assess the multifunctionality of the ksar's spaces in a comparative approach between the old and the new ksour.

Keywords: Tafilelt, multifunctional urban spaces, neo traditional model, Algerian ksour.

1. Introduction

The M'zab Valley in Algeria contains the most ancient urban centers in the world. The Ibadite Muslims have built these fortified cities in the XI the century after running of the Rostumids from their original settlement in western Algeria (Marçais, 2004). They tried to get along with the hard climate in the Sahara and kept the ksar's houses for winter and the palm grove's houses for summer (Addad, 2013). The Mozabite built the ksour in the slope of the M'zab River to protect them from the floods. Each ksar has several entrances and surveillance towers, a mosque in the top and a market place (Souk). The UNESCO listed them in the world heritage since 1982 (Bouali-Messahel, 2011).

Since the 1990s, the Algerian government constructed new ksour beyond the old cores for many reasons (Gueliane, 2014):

- Treat the crisis of housing due to the increasing number of population.
- Improve the conditions of the framework built.
- Protect the cultural and natural values of the tangible and intangible heritage of the Valley.
- Have access to housing to the average class of Mozabite.

These ksour have a modern spatial organization, different from the local typology in adaptation with the specific conditions in Ghardaia. The introduction of the modern life style recently participates to a standard composition in new housing and the new built up areas seems to be similar in the north or the south of Algeria, which leads to a lack of the local identity in the architectural and the urban scale.

The local foundations or the Mozabite themselves, fighting the loss of their model of reference, tried to build new cities that embodies the adaptation between tradition and modernity. It is the case of Tafilelt, it reproduces the traditional urban model of ksour, this study attempts to assess the multifunctionality of spaces in the new ksar according to the traditional model.

The figure 1 is illustrated the structure of the study about the urban models in the M'zab Valley and its importance to preserve the local heritage of this ancestral region.

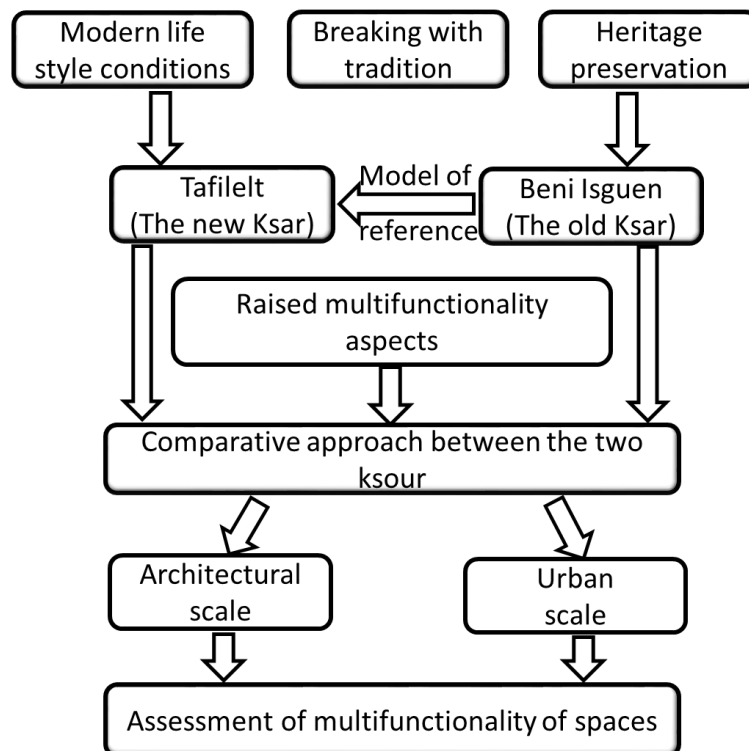


Figure 1. Structure of the Study (Developed by Author).

2. The neotraditional urban model in Ghardaia (Algeria)

The first part of this study will attempt to present Beni Isguen as an urban model and Tafilelt as the modern adaptation of the fortified ancient city and will demonstrate that the former ksour were an urban model for the new ones.

Ghardaïa is a well-known region in Algeria, since Marc Cote and André Ravéreau up to present, its ksour have fascinated many architects and planners who wrote on the M'zab and were inspired in their achievements. The M'zab is a Muslim community of the very conservative Ibadite Sect. They always have a tendency to build and go live in a new ksar if the former is no longer enough for the new population. The descendants of the same tribe will then build the extension of their own city. This community has since long respected a “sustainable” life style: wise recycling of household waste, use of local building materials and

economical use of space. These criteria have advanced the work on the multifunctionality because density and multi-use space go together. The pentapolis contains five former ksour: El Atteuf built in 1012, Melika in 1350, Bounoura in 1046, Beni Isguen in 1347 and Ghardaia in 1048 (OPVM, 2017). The Algerian Government named the entire city after the last one. Guerrara (1631) and Berriane (1679) are located in a few kilometers from the pentapolis (Chabi, 2008). The new ksour are Tinemmirine (1992) and Tafilelt (1997) fully completed and Thaounza (2004), which are the extension of Beni Isguen. The ksar of Ioumed (1995) belongs to Melika, Tineaâm (2008) annexed to Bounoura. Finally, the ksar of Hamrayat (1996), Agherm Ouazem (2007) and Ayrem Babaousmail (2008) located outside of the Valley, belonging to the municipality of El Atteuf (Gueliane, 2015).

2.1 The new ksar of Tafilelt

Tafilelt is a project initiated in 1997 by the “Amidoul” Foundation, completed in 2011 on an area of 22.5 hectares, it contains with the 1050 housing units intended for Mozabite young couples, non-existing equipment in the former ksour: Gym, party hall, madrasa, cultural center and an ecological park (Gueliane, 2014). The mode of funding to build the houses is tripartite between the government, the foundation and the population. Therefore, Tafilelt is not a new town, the foundation did not built it after a governmental decision and the laws, which regulate the new cities in Algeria, are not applied on this ksar. It is a purely an initiative from the foundation and the inhabitants. It is winner of the first prize of the "sustainable city" to the Conference of Parties (COP) 22 in Marrakech, Morocco in 2017.

This ksar is the extension of the ksar of Beni Isguen. One of the objectives of Amidoul Foundation in the project was the reinterpretation of the principles of urban planning in the local traditional housing (Addad, 2013). The Intergenerational mix is also one of the element keys of the house design in Tafilelt, it can accommodate two to three generations (Addad,

2011), we found after the distribution of the housing that the social mix is rather absent in this project (Gueliane, 2014).

2.2 The old ksar of Beni Isguen

Beni Isguen is the fourth fortified city in the M'zab Valley, known by its ancient mosque and its battlement of 2500 meter of length and 3 meter of higher including two principle surveillance towers: Boulila and Badahmane (OPVM, 2017). Its population is characterized by quite strict behavior rules and morals (Bouali-Messahel, 2011).

Like the other ksour, Beni Isguen contains an important market place where the commercial transactions were organized weekly; it was one of the rare opportunities where Mozabite allow to strangers to come into the city. The commercial streets contain the daily activities (hairdresser, greengrocer and grocery store). The houses are the most important component of the ksar, closely positioned to avoid the winds, built in gradient in the slope of the valley from the bottom until the top where the mosque is symbolically situated. It constitutes one of the last traditional ksourien model built by the mozabite.

In his book "A city fulfils its Valley: Ghardaia " Marc Cote (2002) said that the ksar is a module that is reproducible, organized in trilogy between the river, the ksar (the winter's settlement) and the Palme grove which is the summer's settlement where the presence of the freshness mitigates the heat of the Sahara. Each module is independent and limited. The extension of each former ksar by a new and the description of Marc Cote confirm that the M'zab Valley has well and truly, a reference model reproducible for its new cities.

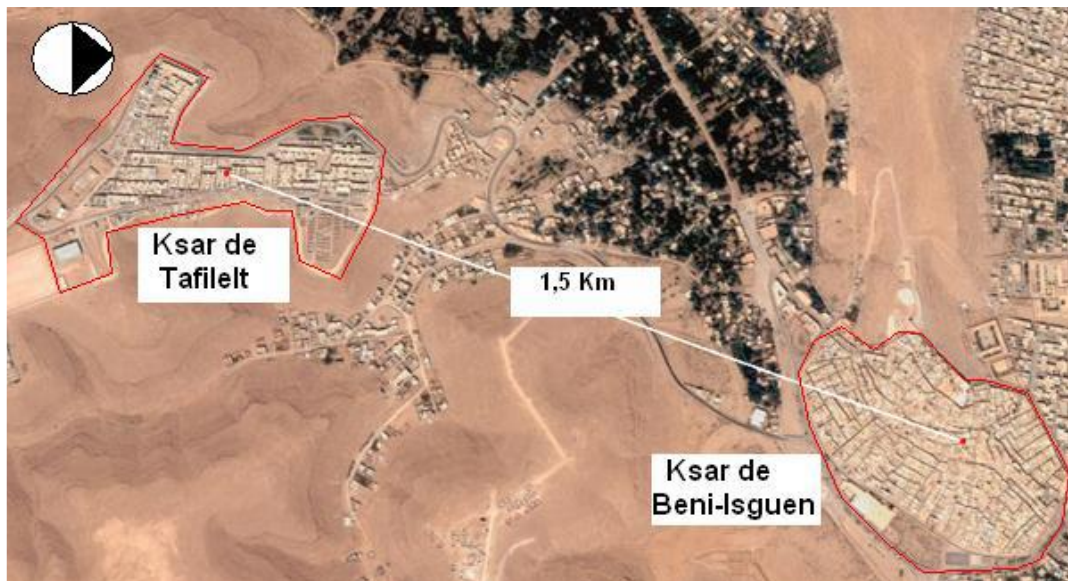


Figure 2: Situation of the two ksour with the distance between them. (Chabi, 2008)

According to Nora Gueliane, Tafilelt shares with Beni Isguen the same principles of planning to know: the compactness, templates, the prospect and the integration to the site. We are going in this work to take interest to the first principle of the “economical consumption of space” which logically generates the principle of multifunctionality of spaces. During the construction of Tafilelt, some urban problems have been resolved thanks to the traditional urban planning. However, the constitution of the ksar of Tafilelt demonstrates that this new urban model aspires not only the protection, the enhancement and the sharing of the ksourien heritage; it also revisits these cultural values for an adaptation to a more modern life framework.



Figure 3: General view at Tafilelt at left and Beni Isguen at right (Author, 2017).

The table 1 attempts to compare between Beni Isguen and Tafilelt according to several elements both in architectural and urban scale. This information has been gathered during the visit to Ghardaia in December 2017 from documents provided by the architects who work in the OPVM (Office for the Promotion of the M'zab Valley).

Table 1. A comparison between the old and the new ksar of the Valley (Developed by the author).

Comparison Elements		Beni Isguen	Tafilelt
URBAN	Site	Generally, a land with weak agricultural opportunity, the ksar is perfectly integrated into its site, a responsible implantation inside the Valley.	Amidoul also choose a land with weak agricultural opportunity, the ksar is perfectly integrated into its site, a responsible implantation outside the Valley.
	Occupation	Seasonal occupation, the house in the ksar is occupied during the winter only.	Annual occupation, the households have average incomes and thus occupy the house during all the year (permanent habitat).
	Battlement and towers (Defensive elements)	Of a simple form, unified for all ksour.	The simple form is respected for the battlement; a tower is built symbolically for the seat of the Amidoul foundation.
	Doors	Five doors including two principal ones: the eastern and the western.	A principal door is built to symbolize one of the elements of the ksar, which takes part in the preservation of the traditional urban frontage.

LEADER	Streets, alleys and dead ends	Have only one function, which is the service road and cannot be occupied by another function.	Hierarchical streets larger than the reference model streets to allow the mechanical access.
	Mosque	Located in the western part of the ksar at the highest level.	It occupies the eastern part is of the ksar.
	Market	On a week, the public place is the market of the ksar. Stranger traders can get into to sell their products.	On a week, the public place is the market of the ksar.
	Places	The only public place in the ksar is a market place and a men's gathering place.	Several hierarchical places in the whole ksar to promote the social mix.
	Wells	Several water points are located in the ksar for water supply.	The wells are only symbolic elements in the new ksar.
	Urban landscape	Must be homogeneous in the height of the constructions, the colors of the facades and terraces.	Must be homogeneous in the height of the constructions, the colors of the facades and terraces.
	stores and commercial streets	It is forbidden to open a store for noisy activities or an activity that may generate waste inside the ksar.	They are located in the parties giving on the streets and the market places and are not allowed to be in the heart of the Ilot.
	funerary mosques	Near to the cemetery, it is destined for the dead's prayer.	Non-existent in the new ksar.
	Residential space (houses)	An organic form and are almost all similar.	A regular form with three variants (3, 4 or 5 rooms in the house).
ARCHITECTURE	The houses	Develop in two levels maximum and all their spaces are functional.	Develop in two levels maximum and all their spaces are functional and more spacious than the former houses.
	Entry	The entry creates an intermediary space for a separation between the inside and the outside, which may also be occupied in the summer because of its freshness.	A corridor communicates directly between the entry and the patio.
	Distribution	The ground floor is the space the most used by women especially during the day, the rooms are organized around a central space in the middle of the house, which is open in the ceiling (patio). There is a room dedicated for the reception of women and relatives. The first floor is more reserved for the newlyweds where its parts are organized around a covered gallery and thus gives access to the terrace and has a room for the receipt of men and of foreigners. This room can also be located in the ground floor far from women's daily activities.	The ground floor distributes the spaces from the patio; we also find a court and a garage. The first floor is closed and completely occupied by the rooms and gives access to the terrace.
	Building materials	Economical use of local materials (stone, palm wood and lime).	Introduction of the concrete and use of terracotta brick, lime, plaster and cement.
	Terrace	The terrace must be horizontal any other form is prohibited. It also includes a corridor reserved for household tasks in winter.	An open terrace and includes a laundry.
SCALES	Front and external openings	Must be similar and harmonious for all the ksar's houses, following a local typology	They still belong to the public domain and must therefore be similar, harmonious and homogeneous. The openings are larger protected by moucharabiah.

This comparison provides us the following information:

- At an urban scale, Beni Isguen was a model of reference to Tafilelt in the site choice and implantation. The new settlement could protect the rare agricultural lands in the Valley from urban sprawl and because of the economic situation of its inhabitants, it have been yearly occupied and more appropriate for the modern life style. It is also a way to guarantee a multifunctionality of land use. The urban landscape was respected because it refers to the model of reference and the ethics of Mozabite, the homogenous height and colors of facades reflect equality between families.
- The main streets in Tafilelt are wider than in Beni Isguen. In fact, each household have a car in the ksar, the large dimensions of the streets guarantee a mechanical accessibility.
- There are many places in Tafilelt dispersed between the neighborhoods unlike Beni Isguen where a main place was the public space for all users.
- At an architectural scale, and thanks to the social cohesion between the Mozabite, Beni Isguen stills a model of reference to Tafilelt with an adaptation to the modern life style, the differences between Beni Isguen's houses and Tafilelt's houses are minimal (the existence of a garage and a yard in the new houses).
- The neotraditional house is more spacious and occupies the whole first floor; it also contains a laundry room in the terrace.

At the end, we may conclude that Tafilelt is a neo traditional urban model of ksour in Algeria even if it is not a new town; this ksar could preserve the traditional model in either the architectural or the urban dimensions with a successful adaptation of the current life framework. It reproduces symbolically some elements in order to maintain the heritage conservation. This project has broken with the current Algerian policy of standard housing. Therefore, one of the ancient concepts that Tafilelt maintains is the diversity of its activities in

a limited space. Inside the ksar, the inhabitants tried to project all their needs in order to create an urban diversity and a functional mix.

3. Assessment of multifunctionality between the ksour of Ghardaia

The second part of the study approaches the concept of multifunctionality in general and in the two ksour of Ghardaia in particular in order to assess this concept between the traditional and the neo traditional models.

Multifunctionality as a concept has several roots (Ghafouri, 2016): some authors consider it as an old architectural concept in urban areas by relating it to the ancient Greek or medieval constructions (Zeidler, 1985), others consider it as the ability of spaces to fulfill more than one function simultaneously (L. Grant, 2010).

The concept of the mixed and compact town appears with the "smart growth" in the United States at the beginning of the 1990s, it emphasizes on diversity of use and urban functions with the creation of a favorable environment for pedestrians. This concept had an echo in Europe and with a Dutch then a German evolution that it becomes the "urban multifunctional land use MLU" or the concept of multifunctional use of urban space. It was inspired by the agriculture field where it was largely applied to increase the rural production (Dufour et al., 2007). It encourages a model of a compact city with diverse functions especially with a synergy between the proposed functions (H. de Groot, 2004). Recently, MLU inspires urbanists in sustainable urban planning because it breaks with the zoning design of the modern style, cause of the urban sprawl (Jacobs, 1961). This concept has also other benefits: reduces the need for new constructions, increases the density in urban areas and leads to more cities that are vital economically and socially (Batty et al., 2003).

The assessment of MLU in urban spaces uses the aspects below (Ghafouri, 2016):

- Space: which is the most important topic; the study area is a place, a street, a building, a house, a room, a terrace or even a sidewalk. It could be open or closed, public or private.

- Time: in architecture, an activity occurs in a time framework (Ghafouri, 2016): during the day or the night, during a week, a month, a season or all over the year.
- Function: a space could have various functions; we can distinguish different types of activities that occur in a space: necessary and functional, optional or social activities (Gehl, 2011).
- Users: the people that are occupying the space could be recognized according to their gender (men or women), or age (children, young or elderly persons).
- Scale: Basically, there is three scales in urban studies: architectural scale (the building analysis), neighborhood scale and urban scale (at the level of a town or city).
- Legal status: it refers to who owns the concerned space; this could give us an idea about the importance, accessibility and flow of a space.

In fact, there is a close relationship between time, space and function to characterize the multifunctionality. For this reason, we will consider those three aspects in addition to users to assess MLU in the two cases. We already divide the study according to the scale and will mention but not consider the legal status.

3.1. Multifunctionality in Beni Isguen

Like other ancient cores, Beni Isguen is compact with a mixed uses. This returns to the climatic conditions of Ghardaia in one hand and the principle of land economy in another hand. The table 2 studies the aspects of multifunctionality in the old ksar in the most important and significant spaces. We will consider each type of space according to the degree of its multi-use:

- A functional space is considered with the sign (0) because it does not contribute to the multifunctionality of the ksar. However, it has a function, few users and one occupation time at a long period (week, month or season).

- A multifunctional space is considered with the sign (+) because it has more than one function, attracts different type of users who occupy it in different time a year.
- A mono functional space is considered with the sign (-), this kind of spaces have only one function intended for one kind of users and rarely occupied.

The study will not treat in an exhaustive manner the gradation of each degree of multifunctionality for the amenities of the presentation. The next table represents the different ksourien spaces with a description of their aspects.

Table 2: The analysis of the multifunctionality in Beni Isguen according to their aspects.

Scale	Spaces	Time	Functions	Users	Consideration
URBAN SCALE	Ksar	Seasonal occupation (winter)	Necessary/Optional/ Social functions	All type of users	(+)
	Battlement and towers (Defensive elements)	Occasional occupation (of surveillance)	Necessary function	Young men who volunteer to survey the ksar	(-)
	Streets, alleys and dead ends	All day except after noon while the inhabitants of the ksar stay at home	Necessary function	All users/ Women use often the alleys and dead ends more than main streets	(-)
	Mosque	Permanent occupation	Necessary/Optional/ Social functions	Generally men at different ages and children	(+)
	Market	Weekly occupation	Necessary/Optional/ Social functions	Generally men at different ages and children	(+)
	Places	Occasional occupation	Optional/ Social functions	Men/children	(+)
	stores and commercial streets	Permanent occupation	Optional/ Social functions	All users	(0)
	funerary mosques	Occasional occupation	Social function	Men	(-)
	Residential space (houses)	Permanent occupation	Necessary/Optional/ Social functions	All users	(+)
Architectural Scale	Rooms	At night	Optional function	All users	(0)
	Entry	Occasional occupation	Optional function	Women at different ages, men use it as a passage	(0)
	Patio	Daily occupation	Necessary/Optional/ Social functions	Women generally	(+)
	Terrace	Permanent occupation	Necessary/Optional/ Social functions	All users	(+)
	Kitchen	Daily occupation	Necessary function	Women only	(0)

3.2. Multifunctionality in Tafilelt

Tafilelt follows an orthogonal tracing, a hierarchical wider ways with a compactness due to the land economy. New equipment appear in the new ksar and the mosque always keeps the summit of the ksar.

The table 3 resumes the same aspects with the same considerations mentioned above in Tafilelt architectural and urban spaces.

Table 3: The analysis of the multifunctionality in Beni Isguen according to their aspects.

Scale	Spaces	Time	Functions	Users	Consideration
U R B A N S C A L E	Ksar	Annual occupation	Necessary/Optional/ Social functions	All type of users	(+)
	Battlement and towers (The seat of the foundation)	Daily occupation	Symbolic/ optional functions	The foundation members	(+)
	Streets, alleys and dead ends	Permanent occupation	Necessary/Optional/ Social functions	All type of users	(+)
	Mosque	Permanent occupation	Necessary/Optional/ Social functions	Generally men at different ages and children	(+)
	Market	Weekly occupation	Necessary function	Generally men at different ages and children	(0)
	Places	Daily occupation	Optional/ Social functions	Men/children	(+)
	stores and commercial streets	Daily occupation	Necessary/Optional/ Social functions	All type of users	(+)
	Residential space (houses)	Permanent occupation	Necessary/Optional/ Social functions	All type of users	(+)
	Ecological park	Occasional occupation	Optional/ Social functions	All type of users	(+)
	Party hall	Occasional occupation	Optional/ Social functions	All type of users	(0)
	Gym	Occasional occupation	Optional/ Social functions	Young men and children	(0)
	Cultural center	Occasional occupation	Optional/ Social functions	Men at different ages and children	(0)
Archi tectu ral Scale	Rooms	At night	Optional function	All users	(0)
	Entry	Occasional occupation	Optional function	Men and women use it as a passage	(0)
	Patio	Daily occupation	Necessary/Optional/ Social functions	Women generally	(+)
	Terrace	Permanent occupation	Necessary/Optional/ Social functions	All users	(+)
	Kitchen	Daily occupation	Necessary function	Women only	(0)
	Garage	Occasional occupation	Optional function	All users	(0)
	Yard	Seasonal occupation	Optional function	All users	(-)

3.3. Results

This study shows that the logic behind the construction of the traditional cores is implied. A ksar is always a reflection of deep social, cultural and religious values. The intention to separate between the architectural and the urban scale was hard in this case because the traditional design thinks simultaneously the micro and the macro scale. It is a complex thought that users practice to build their settlement long time ago, different from the linear planning of towns nowadays.

Tafilelt respects integrally the traditional model and reflects perfectly the multifunctionality of its spaces mostly in the architectural scale using the same spaces: patio, terrace, reception rooms, and kitchen with the same traditional concept.

The neo traditional ksar has indeed mono functional spaces like the cultural center and the madrasa who were included in the mosque in ancient times. The yard, the garage and the laundry room in the house have one function, previously, their activities were practiced in the patio.

Fortunately, in urban scale, Tafilelt was a multifunctional neo traditional model:

- The annual occupation densifies the ksar with multi uses and protects the palm grove from urban sprawl and consumption of agricultural lands.
- The reuse of symbolic elements like the surveillance towers also increase the multifunctional land use after their occasional use.
- The introduction of new equipment helps to reach the intense land uses in a limited space (inside the ksar's limits) and an adaptation of the modern life (the ecological park, the gym for young and children).

4. Conclusion

This work tries to respond to the questions formulated previously, namely if the former ksour were urban models for the new and confirms the hypothesis, that Tafilelt is really a neo traditional model by its modern reinterpretation of the ksourien space.

In the first part of the work, we have demonstrated that Tafilelt is not a new city according to the Algerian regulations but it takes Beni Isguen as an urban model of reference thanks to the social cohesion between the Mozabite who still respect their social and cultural heritage references. We have also been able to raise the criteria of multifunctionality of a space in the old centers.

In the second part, we checked the multifunctionality of spaces in the old and the new ksar in a comparative approach according to the raised and applied criteria of MLU in both architectural and urban scale.

These results showed that a neo traditional model could preserve the ancient advantages of the traditional model (the site choice, the implantation, the spatial organization in the traditional house, market places and stores). It also develops some modern criteria and integrates them with the traditional advantages (the yard and garage in the house and the gym, cultural center and the ecological park, which is a leisure area and an opportunity to increase the agricultural land in addition to the palm grove)

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Reformation of Slums

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Abstract

The world keeps getting better in every aspect including housing and infrastructure and the growing technology keeps improving affordable housing, but the chances of completely eradicating slums will remain slim because there will always be people unable to afford better housing than slums have to offer. Aside from the fact that a slum is known as being the residential environment with the poorest living conditions, it is also known for various negative activities and a relatively high crime rate. The notion that an environment greatly influences an individual holds out the necessity to create better-living conditions that will in time nurture and improve the individual. To this end, the reformation of slums should be a priority. In as much as these slums cannot be eradicated completely, physical upgrading of slums with improved street networks, better building materials, better air quality, easy access to basic municipal services, improves natural ventilation, natural lighting and better drainages will prove to make positive changes economically, socially and reduce crime rates in many cities. It will also improve the physical general wellbeing of communities. In conclusion, a community, no matter how small has the ability to influence the general well-being of an entire nation. Paying a little more attention to the physical reformation of slums will positively affect the world at large in the long run.

Keyword: Reformation; slums; infrastructure; growth; technology; environment; investment.

1. Introduction

A slum is defined as a heavily congested or populated, deteriorated, temporary human urban settlement characterized by substandard housing, mostly with no security, prone to crime and anti-social activities, a shortage of safe drinking water, inadequate power supply, lack of proper sanitation, and little or scarce medical and social facilities (UN-Habitat, 2007; Simon et al. 2013). The slum structures are predominantly made of plastic sheets, mud walls, cardboards or tin sheets, with high potential risk to rain leakages and fire outbreaks. The slum possesses narrow and inaccessible paths, rubbish dumps, and stagnant, dirty water bodies, poor drainage systems, little or non-existent of utilities, and the settlers are prone to ailments, diseases and abuses (Alagbe, 2005).

The slum household is people dwelling together with no access to basic services, comfortable living space, electricity, clean water, sanitation, security, etc. The urban poverty in developing countries has resulted in congested, disorderly, and poorly erected informal slum settlements (Uduak, 2009).

Slums have been around for as long as the 19th century and one of the major causes was urbanization which was as a result of industrialization. According to the available statistics, the slum areas were first defined by the 'regimen of congestion' orchestrated by the mass movements of people in the mega cities since centuries ago. The global urbanization process, distribution and realignment of population in character, size, and networking or system, have a lot of relationships with slum formation as too many people began competing for too few dwellings and rooms due to the rapid influx of poor migrants to the cities in search of jobs and a cheap place to live (Simon et. al. 2013).

The urban population of the world has grown rapidly from 746 million in 1950 to 3.9 billion in 2014. In 2014, it was reported that 54 per cent of the world's population lives in urban areas, and predicted to increase to 61 and 66 per cent by 2030 and 2050 respectively. The

projections show that the world's population could add another 2.5 billion to 3.2 billion people recorded in 2007 making it total of 5.7 billion by 2050, with close to 90 percent of the increase concentrated in Asia and Africa, according to a new United Nations report 2014. By 2050. India, China and Nigeria are projected to add 404, 292, and 212 million urban dwellers (UN Commission on population and Development, 2007; World Urbanization Prospects, 2014). The present trends of global urbanization are becoming neither orderly nor sustainable, thus, squatter and informal slum settlements are proliferating despite many urban development plans and strategies (**references**).

Slums today are becoming only places with the cheapest possible infrastructural amenities, especially accommodation (housing) adjacent most mega cities in the world. However, the slums have become settlements with the worst possible living conditions in terms of infrastructure, health care, security, economy, education, hygiene and every other condition necessary for human survival. In fact, slums are one of the most stigmatized parts of mega cities. When slum residents are thought of, they are perceived as overcrowded people not just with poor living conditions but also as people with little or no morals, norms or standards of public decency (i.e. people involved in drug abuse, crimes, violence, etc.), which is a rather harsh perception. According to UN-Habitat 2016 report, urban growth and unlawful land conversion to slums are resulting to higher crime rates, environmental degradation, and threats to global ecosystems and human existence (George, 2002). The UN-Habitat 2016 report states that the slum dwellers are estimated to grow by nearly 500 million before 2020. To this end, the chances of getting rid of slums become slimmer as time goes on not only due to the increasing population of slum dwellers, but also because of the factors which lead to its growth and the negligence of governing bodies to the present conditions of these slums. Therefore, if these slums cannot be eradicated, it is possible to create better living conditions and give a new face and identity. The aim of this paper is to discuss the reformation of slums

that have been created, managing the emerging ones and to prevent the future development of others.

2. Reformation of Slums (An Investment)

Investing in general is defined as allocating money or a valuable resource such as time to a certain cause or action with the expectation of some benefits in the future. A lot of people invest in real estate and affordable housing, but hardly is anyone interested in investing in slums reformation probably because the benefits of doing so have not been spelled out. Slum reformation is a process of making positive changes in the present conditions of slums such as creating better road networks, providing access to basic services and amenities such as pipe borne water, electricity, better air quality, good drainages, waste management facilities and security. The reformation of slums will have a lot of positive impact on the communities at large in terms of health, economy, and security. A community with little or no crime rate and humane living conditions is to the benefit of the general populace. The reformation of slum can be attributed to some basic elements, which include urban sustainability, comprehensive, integrated and strategic visions, plans and actions (Robert, 2006). Such elements are able to effect a long lasting improvement in the economic, environmental, physical, and social conditions in slum areas. The reformation of slums with a well detailed and precise approach can revitalize slum into a more an investment platform. This will bring positive benefits to slums in the future, with more actions taken in order to improve the living conditions in slum settlements. For example, most slum settlements were created and have existed for a century, which implies that some slums have historical significance, but due to poor conditions of the slums, they are not perceived as potential tourist locations for economic benefits. If slums are improved or reformed and are therefore preserved like most of the world heritage sites, the poor will not be the only benefactors. Giving more people a chance for better living should be good enough reason to invest in slum reformation.

3. Effects of negligence of slums

Slum negligence has over a time period resulted in a lot of problems which affect primarily the slum dwellers and communities with slums on them. Below are some of the major problems faced:

Poor Housing Structure: Materials used in house construction in most slum dwellings are often materials which slum born owners find affordable and in most cases these materials are substandard, flammable, weak and even inadequate for building. Coupled with poor building materials, most lands on which slums exist are undesirable and, in some cases, prone to natural disaster such as floods, landslides and earthquakes. When such disasters occur, rescue on the hand becomes a struggle and, in some cases, impossible due to the densely packed building patterns of the homes. In Bam, Iran, poor structural quality of housing played a major factor in the earthquake-related deaths of 32,000 people in 2003. Days earlier, and earthquake of a similar magnitude killed only two people in California (Alon Ungar, 2007).

Poor Health Conditions: Cooking, sleeping, living with 13 - 14 people per 45m² room, as in the slums of Kolkota, India, according poses a lot of health threats for example respiratory infections. Overcrowding also increases the speed of a circulating airborne disease. Lack of inadequate safe water, lack of proper toilets, poor air quality and so on are all conditions in slums which makes the health of slum dwellers a cause for concern (Alon Ungar, 2007).

Insecure Residential Status: Lands on which most slums are situated do not belong to the slum dwellers which means that these slum dwellers can be evicted by the government at any point in time rendering them homeless. In some countries, slum dweller's homes are demolished, which in time results in a lot of negative side effects. Alon Ungar, 2007 stated that "between 1991 and 1997, 1.5 million people were evicted from central areas of Shanghai and Beijing, respectively."

Inadequate Access to basic amenities and infrastructure: Most slum-dwellers being excluded from basic provisions like good water, proper drainages and sewers, electricity, and in some cases education, security, etc. is a known fact and the lack of the basic needs affects all aspects of an individual's life. Lack of proper street lights makes women and girls vulnerable to sexual assault, due to inadequate toilets, their environment is constantly contaminated therefore resulting in a lot of health problems. Slum dwellers remain potential victims of homicide because they are excluded from the benefits of formal policing.

There are many other challenges faced by slum dwellers and the impact of these factors on nations with a high population of slum dwellers. Taking a good look at these challenges and effects of slum negligence beyond all doubt necessitates making reformation of slums a priority.

4. Possible reformation strategies

Over time, some strategies have been put in place to either control slum population growth or upgrade slums. These strategies have in some slums proven effective but, in some others, have been unsuccessful due to various factors, for example, poor administration or inadequate funding, as a case study.

4.1. Proposed Slum Reformation Strategy

The Millenium Development Goal can only be achieved by deliberate and conscious strategies, planning, and implementation of government policies to re-engineer the environmental condition, economic base, physical fabric, and social structure of the potential or existed slum settlements. The major slum challenge is substantial in term of the people to household relationship. Therefore, the restructuring of the slum settlement using comprehensive government policies on a scale with strategic planning and implementation of durable, sustainable, orderly arrangement of slum housings is very paramount. The prefabricated modular housings are suitable for the slum settlement upgrade.

Modular homes are sectional prefabricated units of living spaces which have been completely constructed and are just installed on the sites. The proposed modular homes can be built in the simplest form of a basic home and with the most cost-effective, durable, and sustainable materials.

Advantages of cheap modular homes

- As mentioned in earlier parts of this paper, the lands on which most slums are situated do not belong to slum dwellers, therefore there is always a risk of eviction and demolition, but in the case of this prefabricated homes, they can be placed in a new location thereby preventing waste of building materials and loss of properties during demolition by the government agencies.
- Creating modular homes one at a time helps in defining a precise road network, which in a long run makes solving other problems easier such as sewers and drainage networking, better chances of each module to access better ventilation and sunlight.
- Prefabricated structures make it easier for plumbing systems to be created and installed, thereby solving the problem of unsafe drinking water, eliminates water borne diseases.
- Prefabricated structures make it easier for sanitation systems to be created and installed, thereby solving the problem of improper waste control.
- The prefabricated housings provide appropriate housing spacing within the slum, thereby solving the problem of congestion, insecurity and disorderliness in the slum settlement.
- The modular homes will improve the identity of the slum, thus reduce the crime rate, molestation, stigmatization, violence and other anti-social vices within the slum area.

5. Conclusion

The reformation of the slum is an issue if taken seriously with all hands-on deck, including investors, governing bodies and the slum dwellers themselves, slums will no longer be sites with more negative remarks than positive, instead slums will become properly planned communities with as much privileges as any other planned part of an urban city. The reformation of slums anywhere is not a project that can be concluded in a hurry, but with patience and commitment, we will all contribute to developing better communities and at large a better world.

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Non-Quality Cost Effect on an Architectural Project

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Abstract:

Quality management and its application to the construction process is still a relatively new concept as are the notions of waste, quality and efficiency, those concepts are difficult to appreciate and quantify in the project, the objective of this work is to study and evaluate the costs of non-quality and its effect on the project budget .Non-quality is a recent notion often defined by a set of events that leads to generating a gap in a process inscribed in the quality approach and cost associated with this non-quality is the cost to resolve this gap. Factors conducting to waste in building design are examined and appear to be mainly management problems, the cost of defects of quality is important in the majority of the projects that they exceed the 10% of global cost.

Non-quality is expensive, the cost of non-quality (CNQ) is an indicator that can help the company management to understand the problem of quality, to highlight opportunities for improvement and to measure the progress of the actions of this improvement.

Keywords: Quality Management; Non-Quality; Cost; Waste.

1. Introduction

The standard or the quality approach became an inescapable element in the environment of any company which aims to be competitive, so signing the end of the traditional modes of organization. It is the notion which pulls nowadays, all the actors of the company to act in a

constant quality concern and profitability, or the definition of needs is made from now on even before these show themselves. (*MAMI Elias Fouad 2004*)

The quality approach in architecture was inspired by industrial initiatives. The climate of spending decreases, performance to be developed widely contributed to the introduction of the quality approach inspired by the industry.

The history of the introduction of the quality in public administrations is not only the declension of a method applied to the company, it is also a dive in the depths of the traditional functionings of the administrations, as well as a necessary questioning of organizations. The qualification of all the organizations , the division of the activity, the multiplicity of the actors, the subdivision of the tasks, the heterogeneousness of needs, the outbreak of the activity are only some evoked and contributory factors in the organizational difficulties.

On the other hand, the quality is a fuzzy concept. Its heterogeneous interpretation brings a particular characteristic to the integration of this notion in architecture generally. it so includes in its meaning several approaches: that of the product in terms of durability, reliability and efficiency; that of user in terms of satisfaction with the notion of received subjective quality. Very often nevertheless, the quality is associated with a search for the excellence by the idea of continuous improvement, even with a managerial incantation.

Nevertheless, in a wider way, the quality at these professionals appears as an inescapable. Indeed, the implementation of the continuous improvement approaches of the quality is registered from now on in the strategic axes of the establishments, within the framework of the development of a quality policy and in the definition of the organization chart. (*Sandrine Hayo-Villeneuve 2017*)

To appreciate the quality concept, it's better to leave its opposite in this particular case the non-quality, and to confine its costs which are connected to dysfunctions which can affect the

functions of the company. These dysfunctions can concern the consumption of rooms raw materials, the production, the administration and the marketing.

2. Quality management:

Indicates the new ideas which arrived in quality at various points in history. The advent of a new era does not necessarily mean that the practices and principles espoused by earlier eras died out; in fact, many examples of craftsmanship or quality assurance can be found today. Nor is the beginning of each era meant to represent the first articulation of theories or approaches, but where they became mainstream. The bands indicate, broadly, times when those ideas were pre-eminent in the quality domain.(Graeme Knowles quality management)

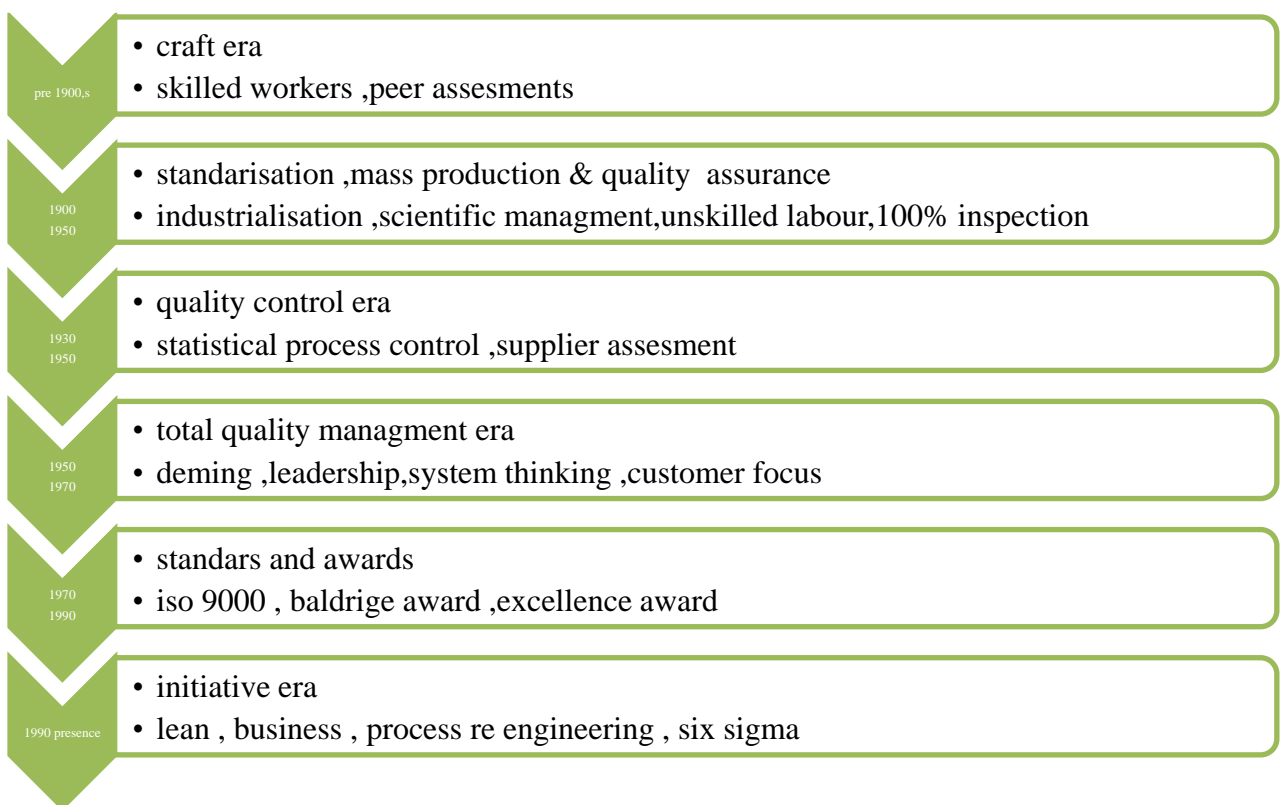


Figure 1. Quality concept development cross the centuries

The quality thus crossed the centuries. The methodical initiatives which compose it evolved the simple control a posteriori of the quality in the insurance of the quality, the continuous

improvement in the total quality. This evolution allowed its distribution towards the service sector. More recently these initiatives began to attract the non trade organizations.

The company which tries to improve the quality of its products has to reduce at first its non-quality costs

3. Non-quality costs:

We cannot address quality without managing the non-quality, otherwise we obtain additional costs, which decreases the competitiveness of products.

Perhaps the most obvious tangible benefit of quality improvement is the reduction of costs associated with non-quality. If we have to throw a product away because we have made an error in its manufacture, it is clear that there is an immediate financial impact as all the costs sunk into the product are lost. Similarly, doing an incorrect operation over again absorbs cost (operator time, power, additional materials, etc.).

3.1. Cost of quality:

Cost of quality refers to the sum of costs incurred to prevent non-conformance from happening and the costs incurred when nonconformance in products and system occurs which is commonly known as cost of poor quality.

Cost of poor quality is actually the cost of doing things wrong Cost of poor quality refers to the costs associated with providing poor quality product or service.

Table.1. Types of quality cost	
Cost of Conformance	Cost of Non-Conformance
Prevention cost	Internal failure cost
<i>The cost of any action taken to investigate, prevent or reduce the risk of a non-conformity.</i>	<i>Cost incurred when products And services do not conform To specifications.</i>

Appraisal cost	External failure cost
<i>The costs associated with</i>	<i>The costs arising after delivery</i>
<i>Measuring, checking, or</i>	<i>Of product or service to the</i>
<i>Evaluating products or services</i>	<i>Customer due to nonconformities</i>
<i>To assure conformance to</i>	<i>Or defects.</i>
<i>Quality requirements.</i>	

- Price of Non-Conformance (PONC) :

All expenses involved in doing things wrong.

- Price of Conformance (POC)

What is necessary to spend to make things right which includes quality functions, prevention effort, quality education

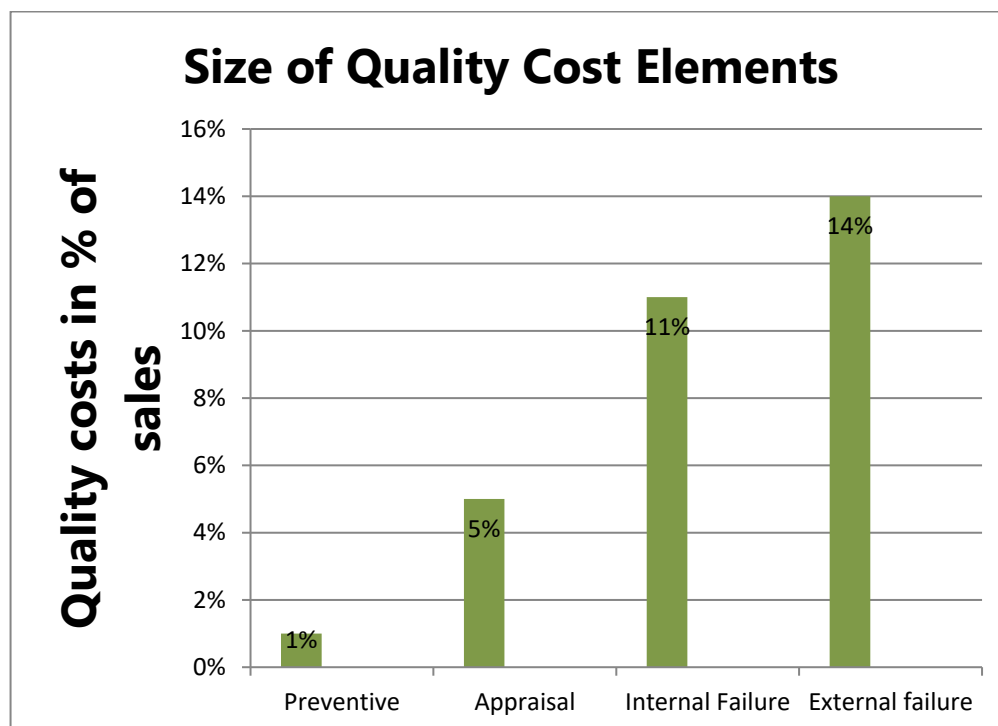


Figure 2. Size of Quality Cost Elements

Preventive costs:

Preventive costs are the cost of all activities specifically designed to prevent poor quality product or service. These costs are incurred to keep appraisal and failure costs at minimum.

Appraisal costs:

These are the costs associated with measuring, evaluating or auditing product or service to assure conformance to standard or performance requirement.

Internal failure cost

These are the costs incurred when product or service fail to meet quality requirements prior to the transfer of ownership to the customer.

External failure cost

These are the costs incurred by a business due to failure of product or service at the customer end. These costs results into warranty claims and loss of reputation.

Although anyone who works in an organization will be familiar with many examples of both of these issues, business accounting systems are not set up to capture these costs. Traditional accounting approaches are designed to track the inflow and outflow of money in an organization (and, by extension, to product lines or departments). There is little emphasis on whether the money in the department is spent effectively. Even when it does highlight a cost of poor quality, perhaps in an over-budget condition in material spend, it will give no clear indication of where exactly the over-spend occurred.

The lack of clarity of the cost of poor quality in organizations led to a lack of focus on improvement for many years. It was only with the advent of the “Cost of Quality” approach in the 1950’s that organizations had a financial tool to assess the costs associated with quality failures and thus focus on the most important areas for improvement.

3.2. Waste :

Cost of Quality models are certainly helpful in generating momentum in the quality improvement movement, however, they are, at best, a partial view of the economic benefits. The focus on failure neglects aspects of waste which relate to flow and efficiency as opposed to accuracy. For example, an operator having to wait for products from a previous process would not register on the P-A-F model, but would clearly have an impact on the costs of the organization. The concept of waste is fairly generic in nature and has been around for a long time. Many organisations refer to ‘nonvalue added activities’ and ‘process waste’.

However, these are rather broad terms and, whilst it is easy to agree that waste is bad and should be eradicated (or at least reduced) it does not much help in the process of improvement. The Seven Wastes were identified by Ohno as part of the Toyota Production System (Ohno, 1988) and have since been widely applied to process improvement, becoming particularly associated with the principles of lean manufacturing

- **Waiting:** A typical example of this form of waste is found when dealing with components or paperwork in batches. The first item in a batch has to wait for the remainder of the batch to complete that operation before the whole batch can move on to successive operations. This has a significant effect on increasing lead times.
- **Correction:** Put simply, this is the waste resulting from a failure to achieve a ‘right-first time’ way of working. Having to rework or scrap components or paperwork, adds additional processing cost as well as introducing delays that affect lead-time.
- **Over-production:** This is where more than is required is produced, usually under the misapprehension that the company is ‘saving’ set-up time. It fails to appreciate the extra costs involved in working capital, storage space and the delays affecting following jobs by doing more than is required.

- **Processing:** Over-engineering, a good example of this form of waste, is where additional operations are performed that do not add any value for the customer.
- **Conveyance:** This is the movement of materials, components or paperwork around a business; in order that the various value adding operations can be performed.
- **Inventory:** This not only ties up working capital, but adds storage costs and reduces the businesses flexibility in being able to bring in new products.
- **Motion:** This is an ergonomic factor where employees are forced to undertake unnecessary movement in order to perform their tasks. Examples include ill-considered positioning of equipment and material in relation to the workplace.

It can readily be seen that some of the costs associated with these activities would fit neatly into the Cost Of Quality models discussed in the previous section, but that some would be transparent to that system. Table 2 indicates the kind of financial impacts that might be caused by the types of waste.

Table.2. Types of waste and associated costs

Type of waste	potential associated costs
Waiting	Labour cost associated with idle time Value of lost production (if units are lost) or cost of overtime if this has to worked to catch up Cost of late delivery if overall process time affected
Correction	Rework cost(direct and overhead if applicable) Cost of delays Inspection costs Disposal costs if correction is not possible Paper work system costs
Over-production	Storage costs Extra material costs if excess cannot be sold Deterioration/depreciation costs Cost of delays
Processing	Additional processing costs Transportation costs
Conveyance	Additional cost of unnecessary conveyance system Cost of late delivery if overall process time affected Deterioration /damage costs
Inventory	Storage costs Deterioration /depreciation costs Obsolescence costs
Motion	Additional labour costs

This type of approach allows for a clear identification of potential cost savings, whilst also allowing for the improvement and ‘what to do differently’ elements of the waste based approach.

3.3. Service quality:

The unique aspects of service are readily apparent:

- The service is often created and delivered at the same. This means that the option to ‘inspect quality in’ is very limited.
- Service inherently includes a human element.

There are many approaches to delivering service quality, but they all start from an understanding of what the key elements of service quality are?

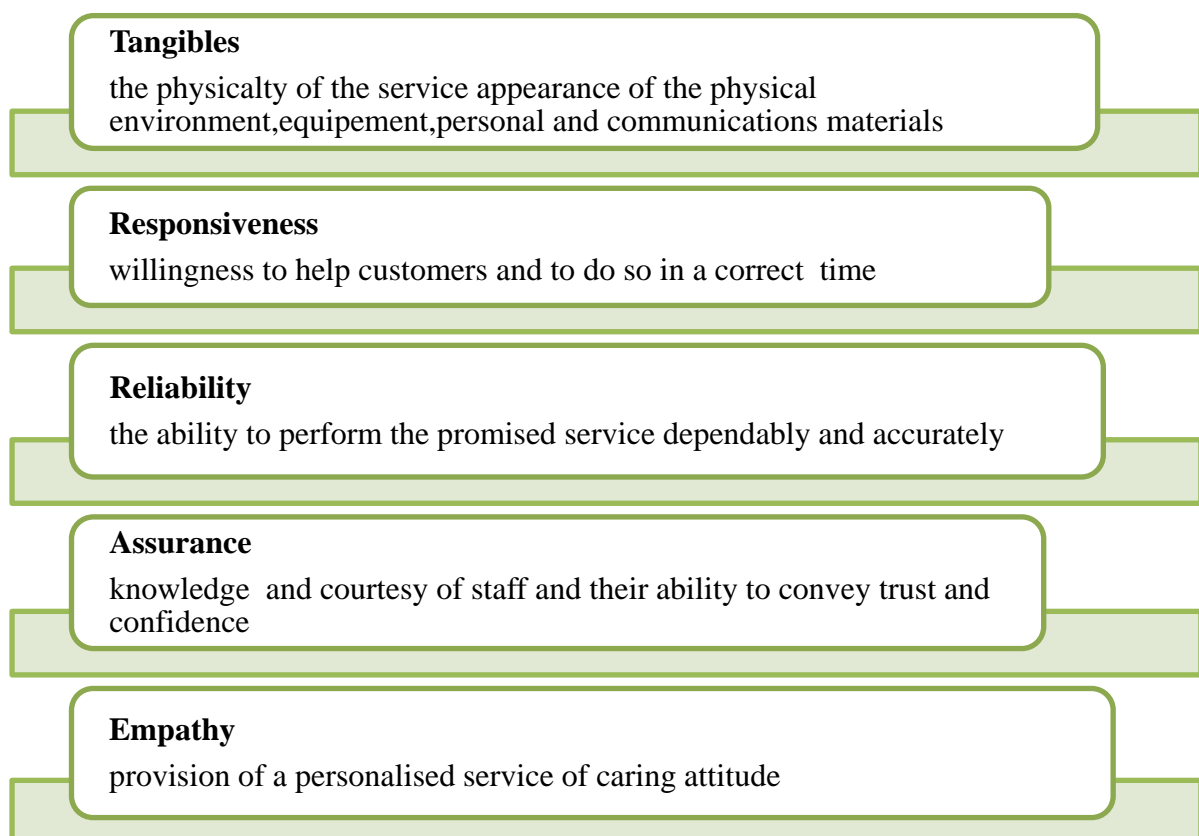


Figure 3. The Five Dimensions of Service Quality (Zeithaml, Parasuraman and Berry 2009)

The five elements create a holistic view of any service environment; firstly the tangible aspects of the environment must look right. Note that 'right' does not necessarily mean that it should be luxuriously appointed in all cases

Secondly, the organization needs to 'do what it says on the tin' in terms of delivering customer promises and expectations.

Thirdly, a responsive organization would attempt to customize the service for the customer, and respond effectively and quickly to any particular requirements

Fourthly, assurance would be the confidence inspired by the staff

The final and most challenging piece of the jigsaw is empathy. Empathy is the ability to put yourself in the place of the customer. An empathetic service make the customer genuinely feel at the centre of the service and cared for. An obvious place for empathy might be in a funeral directors; it is necessary to pick up on the cues from the bereaved in terms of the type of service and products will fit them best, at a time when they are unlikely to wish to have long discussions about choice of casket, or flowers etc. Perhaps less obviously, a car salesperson might improve the customer experience (and long term performance) by recognizing and responding to customer preferences, rather than attempting to 'up sell' and get them to buy the most expensive car and options that they can be persuaded to. Empathy is often a nebulous concept, but customers know when they have experienced it, and will seek it out over and again.

It should be noted that the dimensions of the model have been criticised (e.g. Buttle, 1996; Lages and Fernandes, 2005)

in terms of their completeness and direct linkage to customer decision making processes, but the model makes intuitive sense and, as Nyeck, et al 2002 note it is still probably the most complete attempt to conceptualise and measure service quality, and allows for comparison across a range of service industries.

3.4. Measuring Service Quality:

Historically, service quality has been measured by customer satisfaction audits, where customers either rate satisfaction

on an ordinal scale or give verbal feedback on their experience of the service (or a combination of both). This has often proved to be little more than a ‘feel good measure’ where organizations get a general sense of doing OK or not doing OK.

It often does not, however, impart much impetus for, or data to support, detailed improvement activity. One useful way of thinking about this is to consider the equation for customer value described in chapter 6 on customers:

$$\text{Value} = \text{Results} - \text{Expectation}$$

The SERVQUAL model (Parasuraman et al, 1988) suggests that, in fact, we should modify this equation, because the results as delivered are moderated by the perceptions of the customer, that is, what we perceive as the result may not actually be an accurate reflection of the actual result. For example, the time to deliver a meal may meet our expressed tolerance, but due to circumstances such as mood, urgent appointments elsewhere or degree of hunger, it may feel too long to us at that particular time. So the equation modifies to:

$$\text{Value} = \text{Perception} - \text{Expectation}$$

This equation can be applied to all of the 5 dimensions of service quality identified in order to establish which elements of customer value are being delivered, and where improvement is required. The overall measure of service quality is the sum of the equation for all of the dimensions modified by the importance placed upon each dimension by customers. Clearly the importance of a dimension will vary for different services. For instance, customers at a high end restaurant will have a great focus on the tangibles whereas at a doctor’s surgery they will have a strong focus on empathy, and a train operator might be tasked principally with

reliability. This is not to say other dimensions are not important, just where customers place their emphasis. So the equation further modifies to:

Value = $\Sigma I(E-P)$ Where,

I = Importance to the customer P = Perception E = Expectation

(Parasuraman et al, 1988)

4. Measuring cost of quality:

COQ data can be measured and presented in many different ways:

- % age of sales
- % age of profits
- % age of manufacturing cost
- Rs per direct labor hr
- Rs per unit of product

Steps in implementing quality costs

The following sequence applies to most organizations

- . Review the literature on quality costs or consult others in similar industries who are using the same tool.
- . Select one organizational unit of the company to serve as a pilot site
- Discuss the objectives of the study with the key people in the organization
- Collect whatever cost data are conveniently available from the accounting system
- Make a proposal to management for a full study
- Publish a draft of the categories defining the cost of poor quality
- Finalize the definitions and secure management approval
- Secure agreement on responsibility for data collection and report preparation
- Collect and summarize the data

- Present the cost results to management along with the results of a demonstration quality improvement project

Benefits of using quality costs

- Quantify the size of the quality problem
- Identify major opportunities for cost reductions
- It helps in Identification of opportunities for reducing customer
- Dissatisfaction and associated threats to product salability
- Measures the results of quality improvement activities
- Align quality goals with organizational goals
- Set cost reduction targets

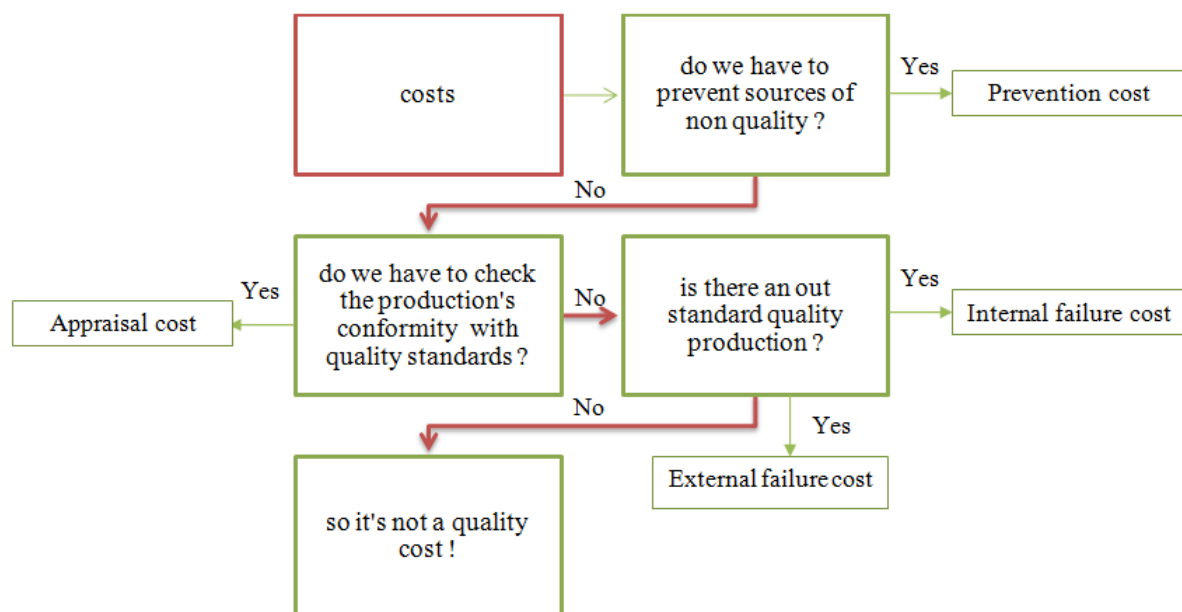


Figure 4. Steps of Quality determination and classification

5. Conclusion

If Quality management is about anything, it is about change; change for the better, improvement and learning are crucial if a construction is to achieve a degree of excellence. The three are intimately connected in that change management and learning are both necessary for improvement to happen. Learning, however, is a more holistic concept covering culture, attitudes and behaviors as well as mechanistic processes and short-term benefit. For sustainable benefit organizations need to become learning organizations, continually challenging the status quo and re-inventing how they do business at all levels.

The basis of continual improvement of processes is the scientific model, as embedded in the Plan, Do, Study, Act (PDSA) cycle. This model suggests that we need to begin with a goal and then develop a plan as to how the goal might be achieved; the plan needs then to be enacted and the results (good and bad) observed. The analysis of these then leads to act to modify the original plan, which brings it back to the start of the cycle. There are a huge number of improvement models, but careful analysis reveals the PDSA underpinning all of them.

It is imperative that when we seek to improve a process we recognise that we need to remember what we are trying to do, and how we shall know when we have achieved it. A practical model is provided by Process Management International (Gillet and Seddon, 2009).

The plan-do-study-act cycle (PDSA) guides the definition of appropriate actions, allowing for learning as implementation happens and promoting reflection on the outcome of actions, while this occurs in the context of a clear understanding of not only the goals of the change, but also (crucially) how we will recognise improvement. This recognises that all improvement requires change, but not all change is an improvement.

Improvement activities basically focus on one (or a combination of) three areas:

1. Reducing process cost.
2. Increasing process quality.

3. Increasing process speed (reducing time).

Finally, I can say that major causes of hidden costs where it is the object of present contribution to introduce the main characteristics is the non quality of constructions ,costs that we don't measure them in the present time and its effects on society , culture , economics and environment .

So the problem in construction's quality is to find the real link between the construction and its environment and to respond to the standards in a lasting way in a hand, in the other hand it have to respond to the social demand in the other hand , non respect of the previous parameters is what causes non quality costs in a construction on a long term .

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Transformation of Berber Traditional Planning and Living Spaces

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Abstract

The Algerian Berber region was animated by a network of human settlements built according to the urban model of the Islamic medina and its traditional habitat of adobe. Various rural and urban development and transformation of planning and living spaces have recently come under the pressure of rapid urban growth. This study aims to analyze and compare Berber domestic spaces across a sample of houses from Aures valley, this region of Algeria which presents distinctive geological, geographical and historical characteristics. The study will look, first at the houses, then at similarities and differences in space configuration in order to pose questions of how this traditional architecture with its climatic and cultural solutions could be utilized or transplanted in the new urban context. The study focuses particularly on observing and analyzing different factors which influence urban life like social patterns, family lifestyle, migration which may have led to some modifications in the social structure. This attempt to analyse and compare the physical structure of Berber housing and settlements in Algeria might help to better understand the planning space organization and give us clues to the formulation of communities in the past; their culturally and climatically significant design methodology has considerable relevance to contemporary architecture. This study attempts to learn how the traditional Berber built environment may be considered as a good example of an end product of an interaction between constant elements such as the religious factors, the climate, the landscape and changeable elements such as economic, technological and industrial means, that is to say a product of a societal process.

Keyword: Social structure, urban growth, Transformation of planning, Berber housing.

Introduction

Traditional built environment is, essentially, a manifestation of the group. It is the result of a collective social code responding to basic needs, a shelter to ensure physical well-being, satisfactory comfort, security, while at the same time responding to society's common respect and preservation of its natural environment. The house is the center of the society; a built-up space in which all the functions of this very society intermingle and present themselves, and in order to establish a better understanding of the habitat, it is imperative to apprehend all its aspects. This research focuses on the traditional habitat grouped and perched in some agglomerations of the Aures massif; it is a vast mountainous region of around 11,000 sq. km, situated in the northeastern part of Algeria between the high plains and the Saharan borders. Whose approach is to establish a typology of this type of traditional habitat, highlighting main factors and several logics that have brought about the architectural and morphological transformations. The degradation and dilapidation of houses are mainly due to social and economic changes. This study aims to examine vernacular housing forms in the Aures valley to identify the common characteristics, which may better explain the factors of transformation in the domestic spaces in this very region. In addition, self-builders have been utilizing “**Alien**” house-design components in their projects. This new housing does not fulfill residents' social and cultural requirements, such as their need for privacy. New house designs were needed, based on the main traditional requirements of daily life, as adapted to modern.

1.1. Physical aspect of the Aures massif

The Aures massif is subdivided into Aures Chergui (eastern) and Aures Gharbi (western), and is characterized by the two deep and parallel valleys of Wadi EI-Abiod and Wadi Abdi. It has a continental climate, which shows wide variation, with a very cold winter and hot summer (Figure. 1).

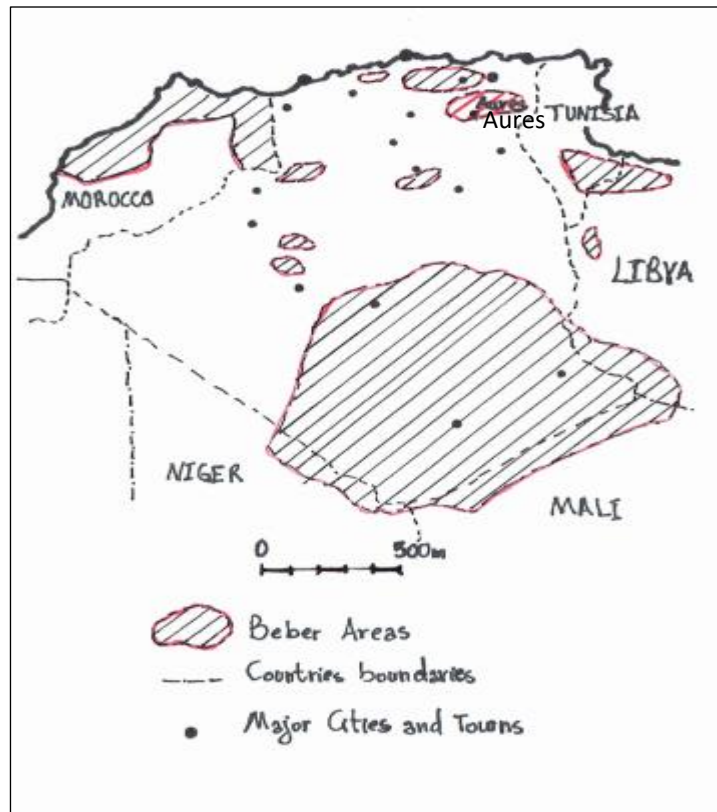


Figure 1. Map showing Berber area hatched. LEBBAL drawings.1989 (Developed by Authors).

The physical aspect of the region is uneven, with rocky surfaces and very steep slopes. In addition to that, the aridity of climate and scarcity of water do not even allow the practice of cereal culture. Therefore, for economic reasons the inhabitants of the Aures valleys built their villages on the top of the hills and cliffs, Villages are thus composed of a series of separate living areas corresponding to the separate clan groupings, each with its own territory (Figure. 2). Whatever the environmental constraints, the choice of a site for a house is based on social criteria and on fundamental economic and cultural factors. The house is a social and economic unit, within which the disposition of the numerous spaces is intimately related to the structure of the family and the way it lives.

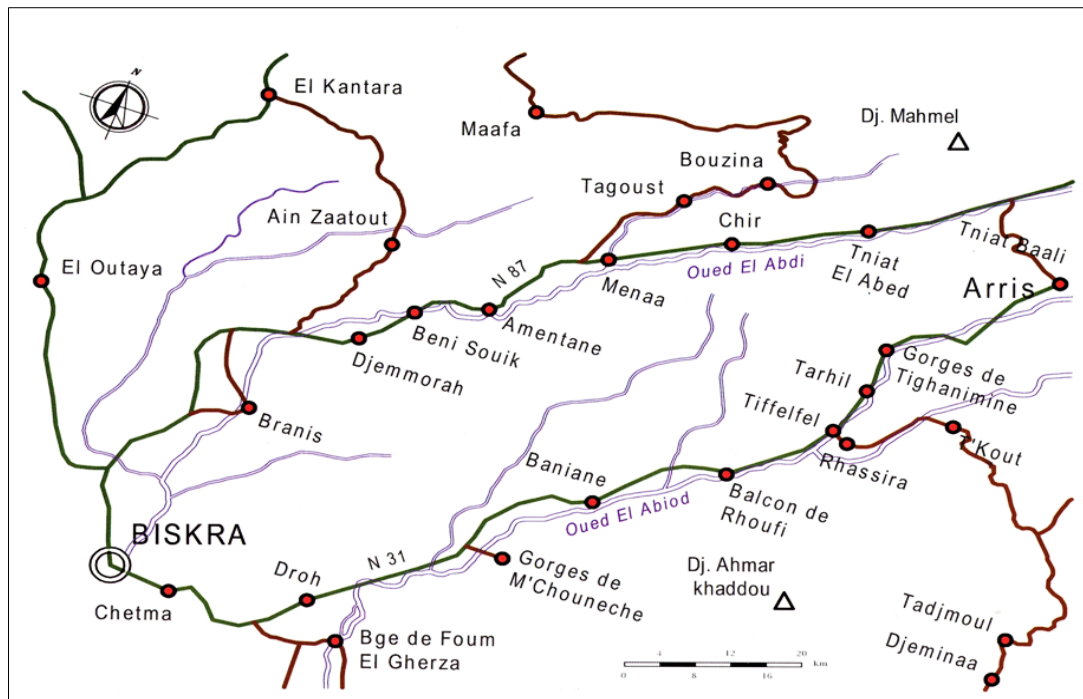


Figure 2. Localization of the Study area in the Aures valley. (N. Meghraoui Chouguiat. 2011).

2. Factors of Transformation Berber Housing Forms

2. 1. Environmental Factors

In some other cases; environmental conditions may be more influential than sociocultural factor which is the instance of Berber housing. Important factor dictating the location of Shawia settlements has been the lack of water and fertile land. This forced local population to build their villages on top of hills and cliffs in order to save lands for agriculture, as well as to protect themselves from the flooding of rivers. Formerly, this strategic position taken by the “Shawia” had a social and political reason during inter-tribal wars. In the Aures region the houses are generally grouped in hamlets and villages which high up on the mountains, established there for defensive purposes such as the community of Menaa (Figure. 3).



Figure 3. Mena, Defensive Site. (Authors, 2017)

One of the most marked characteristics of these settlements is the singular unity of their architectural form. Taking advantage of the Cliffside by using the rock as a back wall, the houses, punctuated by a few small windows, are tailored to individual needs. Their juxtaposition produces a remarkable effect, creating villages of real character with a harmony due to the restricted range of materials and colors (Figure 4), and a unity due to related forms.



Figure 4. *Warka*, a typical Berber village. (Authors, 2017).

2. 2. The Social Structure

There were two different types of tribal organization in pre-colonial Maghrib. In the first case several villages inhabited by sedentary farmers formed a tribe, or '*arsh*' in Berber. Every tribe descended from a common mythical ancestor. It possessed a waste common territory also called '*arsh*'. The tribe was ruled by a military chief ('amin ul-'umana') elected every year by the council of elders, called *jema'a*, which was composed of representatives of the villages. It represented the highest judicial power of the tribe. During wars and political troubles many tribes formed military and political coalitions so-called *taqbilt*. This kind of tribal organization was observed in Berber villages of the Kabylia and Rif types (Bourdieu 1963, p 11–12; Hart 1972, p 25). Semi-nomadic groups and recent sedentary farmers formed tribes with the same attributes such as common land ('*arsh*'), military chief and sometimes council of elders (*tajma'at*). But its basic social unit was the faction (*harfiqt* in Berber and *ferqa* in dialectal Arabic) composed of subfractions, which in turn included several lineages, and not a village. This kind of tribes was known among the Berbers of the Aures tribal institutions and practices played a supplementary role in the village life. They protected the village society from destructive outside invasions. In the pre-colonial period, tribe had no permanent administration. Tribal *jema'a* and *tajma'at* did not intervene into inner affairs of village communities (Daumas 1853, p 204). The sense of tribal solidarity of villagers was mobilized very rarely in cases of wars, rebellions and other important disasters. The Berber village was part of wider social and political communities.

The family was the basic social and cultural unit of the village and had many functions, not all of which were explicit. One of its roles is that it guaranteed the continuity of local "tradition" or cultural heritage of the village society; Berbers live and work more in the street than in their houses. Nowhere there is privacy in its modern. In most Berber settlements houses are built very closely. (Vladimir O. Bobrovnikov. 2000). In the everyday life the role of family and

lineage preponderated that of the tribe. The tribal solidarity reinforced the common village solidarity. Extra lineage ties form new numerous relationships between households and individuals. It should be noted, that the peasant conception of the tribe was constructed on the notion of family as that of clan and village. That's why the names of Berber tribes include the notion "children, descendants" (**ayt** and **uld** in Berber and **beni** in dialectal Arabic) (Tillion 1938, p42–54). This kind of social and political organization of the Berbers caused a political segmentation of local society. But, on the other hand, it provided it with a strong inner autonomy based on local social and political institutions.

2. 3. Structure of Berber family

Each nuclear family (parents and unmarried children) occupies one house. The interior of the house is carefully arranged so that each member of the family can preserve a minimum autonomy and proper privacy. The Berber family is a patriarchal one; its cohesion is protected and maintained by a system of matrimonial alliances and also by different judicial measures, for example the right of pre-emption, the disinheritance of women, etc., designed to conserve for the males the ownership of an undivided patrimony. It is therefore uncommon to find married daughters still part of the extended family. Yet the male descendants are expected to remain part of the family even after marriage, subject to the same paternal authority as before. The new wife for her part is considered as a means of increasing the size of the family and of tightening its ties. The head of the family lives with his wife, his sons and daughters-in-law, his unmarried or divorced daughters, his mother, and, generally, his brothers, in order to avoid either division of property or the building of new houses (Figure 5).

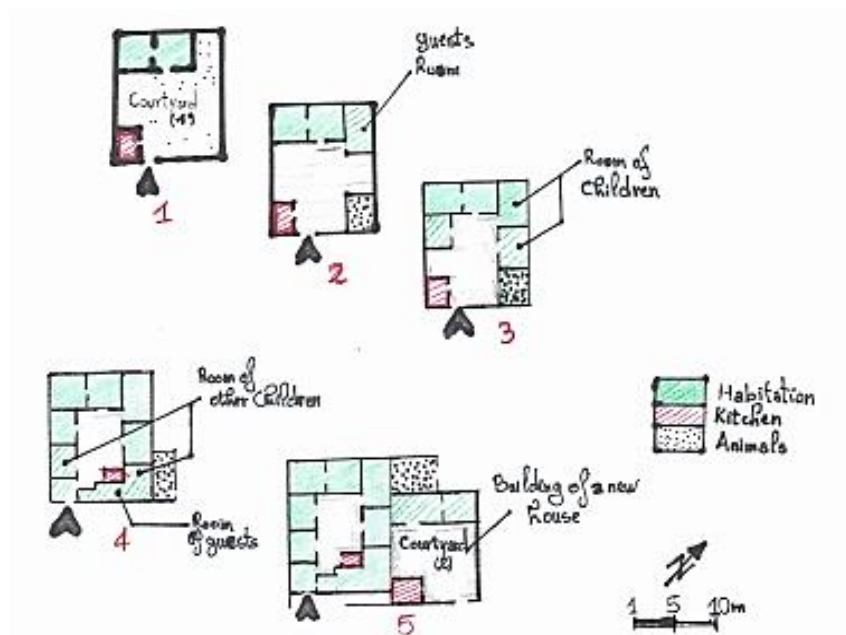


Figure 5. Evolution of a traditional house according to the Structure of Berber family
(Authors developed from analysis and Marc Cote studies).

3. House Types

The traditional house "*thaddart*", like any vernacular architecture, is the result of human adaptation to climatic and social conditions and availability of construction materials and knowledge of their techniques. Indeed, it is a house of long ago in which everything was present: the best techniques, the most efficient dimensions, most effective, friendly, fertile and economical arrangements, where wisdom reigned and expressed itself through poetry. The traditional Berber house was a product of collective efforts: the house was folklore (Figure 6).

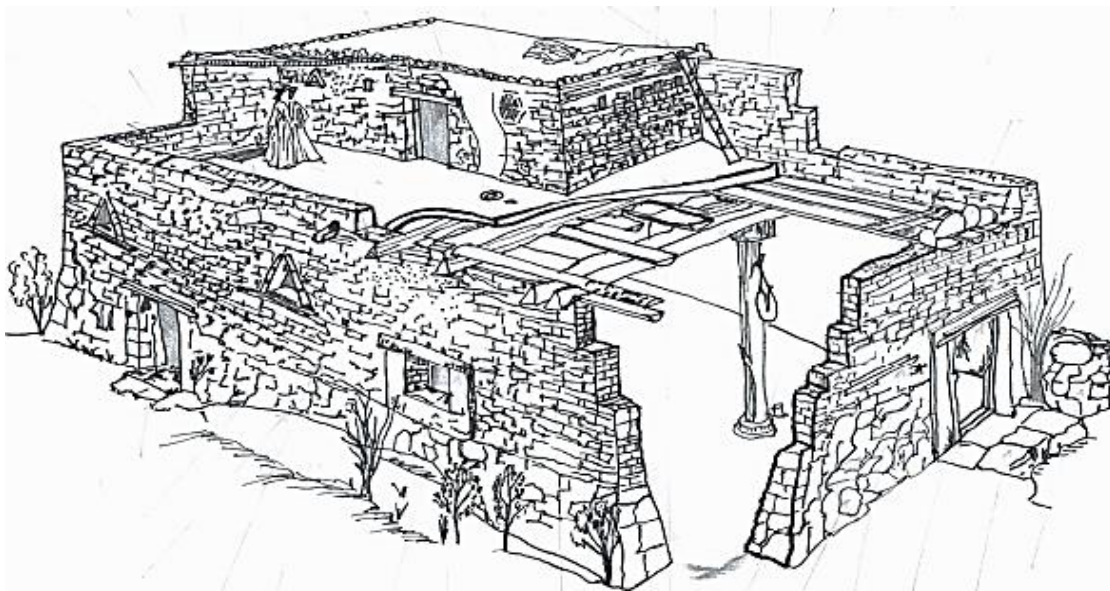


Figure 6. Traditional Berber house, sample of a typical Shawia dwelling (developed by Authors from analysis and Daniele Jemma (1989) studies)

The Shawia settlements in the Aures are less elaborated than other vernacular houses in Algeria. Samia AJALI (1986) described these shelters as a scattered house here and there on a traditional rural frame (Figure 7); if it grouped it constitute the "*dechra*" more structured and well integrated in the environment. According to the study of LEBBAL (1989), there are many types of traditional Berber housing such as:

- Subterranean dwellings;
- Cave dwellings;
- Gourbis;

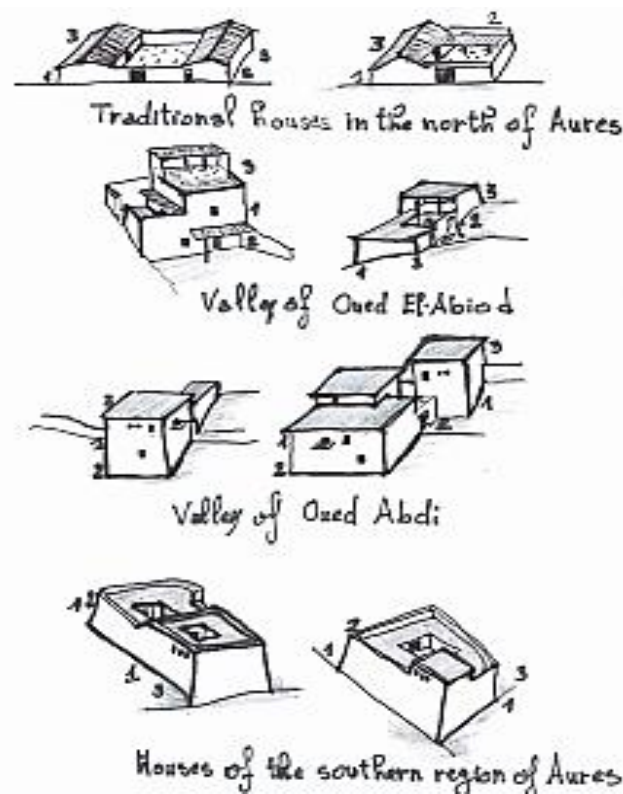


Figure 7. Details of a Berber house types. Samia AJALI (1986).

4. Building Process

In the Aures valleys, as in any traditional society, the construction of a house is a great event. It is not just the result of individual initiative; both main social groups are involved in the task, the domestic group related by blood that forms the family, in which men, women and children participate, expressing the family unity in economic and social terms, and the village group that is the community. Everyone is called in, becoming thus involved in a mutual co-operative effort known as '*tuiza*'.

Usually the Shawia start building their houses between April and October, in order to avoid the heavy rain and snow of the winter. The task involves two distinct phases: the preparation, when the site is selected and the materials gathered and brought to the site, the second is the operation of dwelling construction. The process of construction involves firstly an act of appropriation of the space, and secondly an act of transformation of the space. Generally the site is chosen as

near as possible to the houses of parents or relatives, to tighten the clan. Traditionally the laying out is followed by a ritual ceremony, and the same procedure is repeated at every step of the construction (Figure 8). Religious ceremonial has almost always preceded and accompanied its (the house's) foundation, erection, and occupation (LEBBAL, 1989).

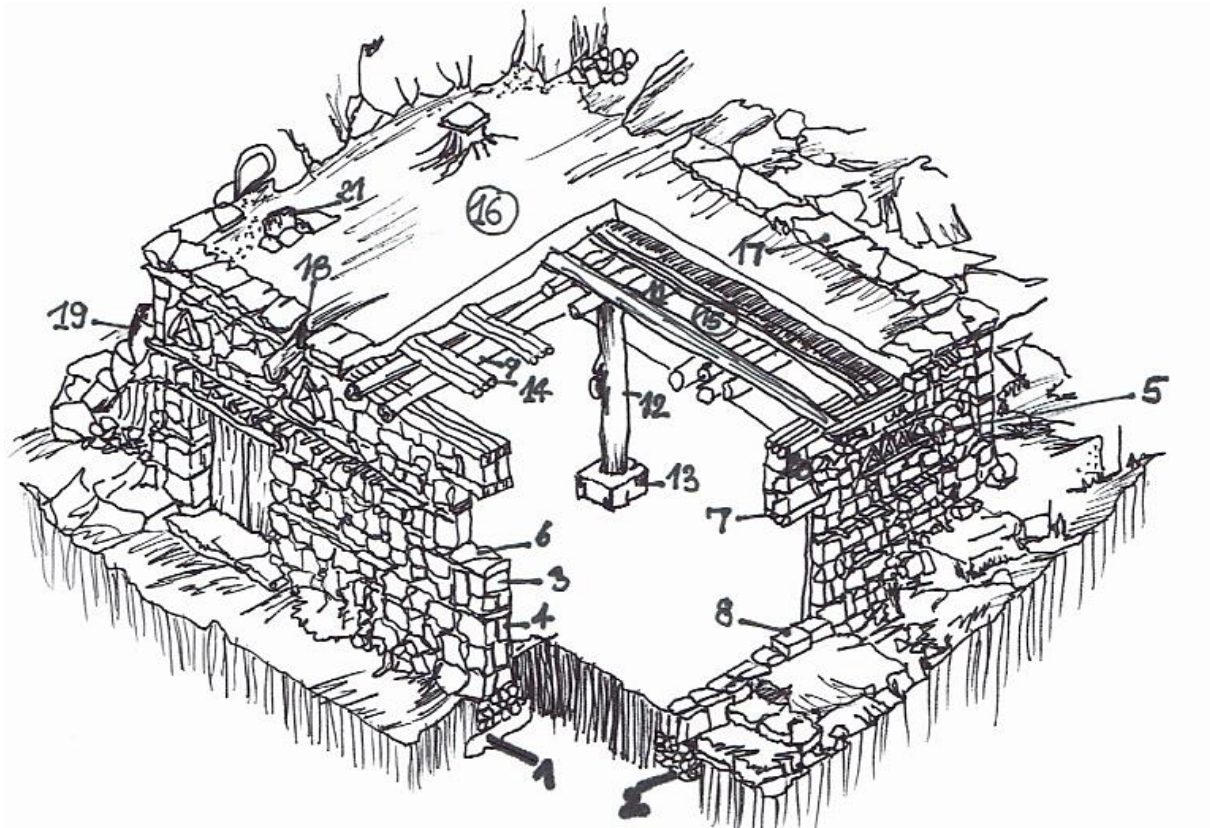


Figure 8. Details of a Berber house. Drawing from LEBBAL (1989), “Traditional Berber Architecture”.

- | | | | |
|---------------------------------|-----------------------|--------------------------|------------------------|
| 1 El-sas: foundation | 2 Footings | 3 Hihd: bearing walls | 4 Aaqod: lacing timber |
| 5 Hbabth: openings | 6 Thaqth: windows | 7 Laatbath: lintel | 8 Laatbath: threshold |
| 9 Iqundasen: main beams | 10 Roof structure | 11 Hsarat: support | 12 Hagidith |
| 13 Hazruthon-Hagidith: padstone | 14 Hikhsasban: joists | 15 Hijridhin: plam stems | |

5. Domestic Space's Strategies of Transformation

According to the investigations in the agglomeration of *Abdi Valley* particularly in the villages of *Mena: Tigherghar, Warka* and *Oughanim*; we have find that the most of population immigrate out the region ,this is due essentially to the economic factor. Houses are more

complex phenomena than accounts based on mode of construction or architectural style. The traditional architecture of the Aures people is a personal adaptation of a group solution. The houses erected by a particular society are of a style which has been communally worked out over several generations (Figure 9).

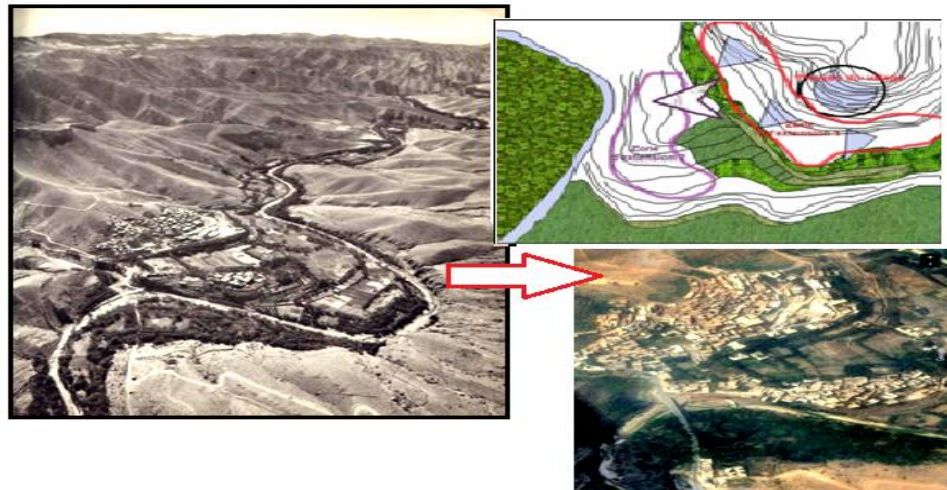


Figure 9. Example of external transformation by the use of new materials which are not local at *Warka* (Authors. 2015)

They constitute a synthesis of the numerous factors controlling their social and physical organization; they respond to the socio-cultural and economic imperatives that are the characteristics of the social group. The vernacular style shows a direct participation of the inhabitants in the creation of their homes, which reflect the expression of their personal and social needs (Figure 10).

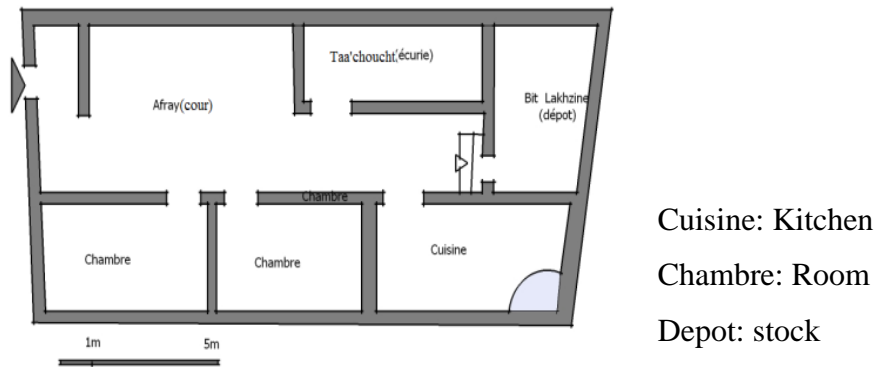


Figure 10. Example of traditional Berber house from *Aoughanim*. (Authors, 2016).

The appearance of the Aures settlements has however, considerably changed (Figure 11), with several western-style houses being built and several traditional ones falling into ruin. Nowadays the potential of indigenous planning and building methods are being neglected. Thus, traditional architectural forms are being progressively destroyed, due to contact with the “*modern world*” BENABBAS (2006).



Figure 11. Transformations in the urban landscape of *Mena*. BENABBAS (2006).

The interpretation of the information collected on the urban compositions of the study area, macro-structure and microstructures, as well as the socio-economic dynamics of Aures Valleys give image to the region. It made it possible to particularities of the study area and to recognize

its specificities. Recognition of structures and dynamics of the Aures massif and their relations with the Plans. The interpretation can be done in terms of:

- Plans and interior domestic spaces;
- Building technology;
- Materials and techniques used in construction;
- Types and dimensions of openings;
- General landscape and urban background of traditional Berber villages.

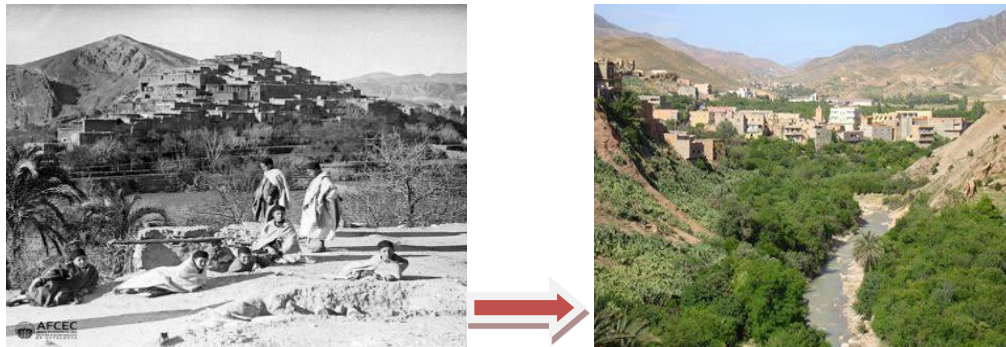


Figure 12. Example of external transformation by the use of new materials which are not local to Menaâ. (Authors: Menaâ between 1943 & 2016).

6. Process of transformation of the Berber traditional living spaces

6. 1. Strategies of transformation



Figure 13. Two Transformation strategies and evolution of domestic spaces in Aoughanim village. Authors, 2016 (Left); 2017(Right).

6. 2. Examples of Structure of New Building in the Study Case:



Figure 14. New House Types with New Spaces and New Materials of Construction.
Saada Choukri, architect in the region of Tigharghar, Menaa. 2017

7. Conclusion

The traditional architecture of the Aures people is a personal adaptation of a group solution. The houses erected by a particular society are of a style which has been communally worked out over several generations. They constitute a synthesis of the numerous factors controlling their social and physical organization; they respond to the socio-cultural and economic imperatives that are the characteristics of the social group. The vernacular style shows a direct participation of the inhabitants in the creation of their homes, which reflect the expression of their personal and social needs. Traditional habitat is the simplest form of living, a profound lesson, elaborated with local materials and techniques, expressing the values and cultures of each society.

The appearance of the Aures settlements has however, considerably changed, with several western-style houses being built and several traditional ones falling into ruin. Nowadays the potential of indigenous planning and building methods are being neglected. Traditional architectural forms are being progressively destroyed due to contact with the '*modern world*'. They are being replaced by western methods, often irrelevant to local conditions and needs.

The indigenous architecture of the Aures constitutes a unique heritage. Definite steps should be taken to preserve it, at least in part.

Through all the Aures, the deep changes which the Aurassien society is undergoing since independence, are expressed by a spectacular transformation of the area (macro- structure), right through, in this vast mountainous mass, one sees a deeply faded vernacular architecture, sometimes with the state of ruin, and an emergence of new forms in the space.

These microstructures, often called “*Dechras*”, are particularly revealing of this cultural duality and the absence of references. The accession to ‘modernity’ passes here by the assimilation of an unsuited “conveniences”, even sometimes not in use. In fact, it is the reproduction or the naive transplantation of a model imported without a doctrine of integration. Despite the modernism apparent of Algerian urban population; most of Algerian society still traditional in social practices. This explains the need for new housing designs which are adapted to contemporary needs, but which still express the principal traditional requirements of daily life. Self-built housing, primarily the architectural expression of middle-income groups, has failed nowadays to address these two needs adequately. Such housing in the Berber massif is neither unique nor appropriate to Algeria. More forms of housing are likely to be developed in the near future, as Algerian look for a new typology that will better balance their requirements.

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The Landscape Quality of Community Spaces in Collective Housing: Case of the City Of Béjaia. Developments, Changes and Evaluation

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Abstract

Today's city is the product of multiple mutations through time and space. Its current state results from urban sprawl and an accelerated spread of residential developments totally disconnected from the surrounding urban space. The housing policy in Algeria, mainly oriented towards the massive production of housing, aims at filling the quantitative deficit to face the emergency situation created by the housing crisis. The reflection on the quality of common spaces is considered to result after the implantation of residential buildings, which represents a failure to take these spaces into consideration, and which considerably alters the landscape quality of the built environment.

Collective housing estates are losing the quality of their living environment day after day, as a result of a process of non-attachment to places where people live together and of a very reduced appreciation of the landscape, creating an image that still needs to be identified and improved. In fact, we wonder about the landscape quality of common spaces, how to evaluate them and how to materialize them.

In this context, Bejaia, characterized by a varied urban fabric and residential complexes of several eras, has seen housing flourish in diverse configurations of community spaces, ranging from the old historic center to the new district of Sidi Ali Lebher.

The objective of this communication is to study the landscape quality of these community spaces and to identify the specific characteristics that flow from them along a chronological axis.

The approach is defined in the evaluation of a set of criteria by referring in particular to the historical evolution of these areas for a better understanding of dysfunctions and to arrive at a decision support strategy that can be used by the various actors of the sustainable city.

Keywords: Community Spaces; Landscape Quality; History; Evaluation; Collective Housing.

1. Introduction

Today, the view and perception of "the city" and the characteristics of urban life and living environment have radically changed. The city has not stopped changing; it has constantly undergone and endured multiple transformations and modifications through time and space.

Repercussion on its multiple domains, this mutation notably affects its distinctive landscape.

Following the example of the city of Bejaia (Candle), a completely metamorphosed and transfigured landscape before the city was built by and for its inhabitants, responds to their needs and obeys a certain dialectic and genius to do and a specific way of being there.

Nowadays, "the city" is embracing a new itinerary and adopting new concepts such as globalization, densification, concreting, etc. This acts in one way or another on the urban landscape but also architectural, making the objective of "sustainable" difficult to achieve and to achieve operationally in the face of these constraints.

Today's city, characterized by natural or artificial growth due to migratory flows, causes an expansion of urban space and a dispersion of centralities, this is what manifests itself under the phenomenon of urban sprawl, which has created a new need in terms of infrastructures, activities, and especially a persistent need in terms of accessibility to housing, which represents a major challenge.

For this purpose, urban fragmentation is expressed much more as a more accentuated phenomenon of urban sprawl, which leads to considerable losses of free space, and which generates particular impacts on the urban landscape and more precisely on the dispersion of collective type residential complexes, giving birth to dormitory cities, monotones and walrus residential districts. The state which calls into question the landscape qualification of residential buildings and the redefinition of the landscape quality of the shared common space.

2. Landscape, habitat and common space

In what follows we speak of landscape as being "simply and more precisely all that we see", its relationship with the living environment in terms of living and not shelter or housing.

Thus, the collective type of housing affects in particular this dimension of living together in a community and sharing spaces between others within a framework of appreciation of the common landscape.

"In an apprehendable landscape, sometimes subordinate places are formed, and thus the capacity of a landscape to accommodate elements that are human works, can vary in different ways"¹. These works include the actions and all human activities, hence the composition of the shared place.

If considering the question of the quality of the habitat and the living environment as fundamental, not only for the landscape, but also for the act of architecture, is a shared position and of general interest.

It is a coexistence of individuals with diverse and varied personalities, origins, cultures, social classes... in places accessible to all within a landscape appreciation framework.

¹ Schulz in « GENIUS LOCI- Paysage- Ambiance, Architecture ». Ed : Pierre Margada 1981.

3. Landscape quality assessment Method

A good landscape-quality assessment Method is one that achieves a balance between reliability and sensitivity.

Given this balance, the next consideration is validity. A method must not only provide reliable and sensitive measures, but the measures must reflect changes in the property that the system purports to measure. This criterion has high intuitive appeal-a landscape-quality assessment.²

It is therefore essential, if this approach to landscape evaluation is to be validated and developed further, to attempt to establish the theoretical basis of such techniques by demonstrating how the physical facets of landscape with which they are primarily concerned relate to visual perception which determine landscape quality³.

We argue that the insights emerging from this initiative, including the concept of the “community landscape” that we developed from it, could productively inform planning and land management in urban neighborhoods.

The importance of urban landscapes is destined to be accentuated in the current transition phase toward the society of culture and knowledge, in which the role of the city is always less entrusted with the classic functions of the tertiary and quaternary sectors, and ever more with symbolic relationships, identifying images, and “intangible” dynamics⁴.

² TERRY C. DANIEL and JOANNE VINING. *method should measure landscape quality* *Methodological Issues in the Assessment of Landscape Quality* . page 40.

³ Steve Shuttleworth (1979). *The evaluation of landscape quality*, *Landscape Research*, DOI: 10.1080/01426397908705925 /<http://dx.doi.org/10.1080/01426397908705925/>.

⁴ Massimo Sargolini. *Urban Landscapes Environmental Networks and Quality of Life*. ISBN 978-88-470-2880-7. DOI 10.1007/978-88-470-2880-7.

4. Problematic

At the global level, the search for a better living environment is ongoing and is accompanied by a reflection based on an architecture-landscape duality. Conversely at the national level, in already highly urbanized cities, the observation is that of the extent of the transformations that affect urban living spaces in the context of random response to the housing crisis following a housing policy that simply responds to an emergency situation, the thing that rots the landscape quality of common spaces. So. What landscape quality do architects in Algeria ensure for community spaces today?

Collective housing estates are gradually losing their dynamic image, the product of a process of non-attachment to places where people live together and of a very reduced appreciation of the landscape, resulting in an image that still needs to be identified and improved.

This image challenges us to identify it and the courses of action to be taken to improve this situation. What is a quality landscape? How to define the quality of a landscape?

Does it vary through time? How to evaluate it, and highlight it (materialize)?

5. Methodology and Approach

In order to evaluate and approach the landscape quality of community spaces in collective housing estates, a selection of a set of parameters and criteria seems to be essential in order to carry out this evaluation objectively.

First, it is a question of establishing a table of criteria and indicators for evaluating the quality of common spaces by selecting those necessary and reflective of the quality of the latter on the one hand, also, to select other criteria of the visual interest of the landscape and the value attributed to the latter on the basis of the detailed routing grid of the visual analysis in order to build a panel of complementary criteria on the other hand. The interest is then to combine all the criteria and indicators in a summary table associated with a scale rating (cardinal value) that varies from (1) to (3) qualifying: low-medium-strong and associated observations.

Secondly, it is a question of establishing a chronological axis of evolution of the city of Béjaia and selecting representative samples of collective housing for each period of evolution.

These samples will be subjected to the criteria and indicators of the general framework in order to deduce, at the end of each period, elements of understanding and response (diagram 1).

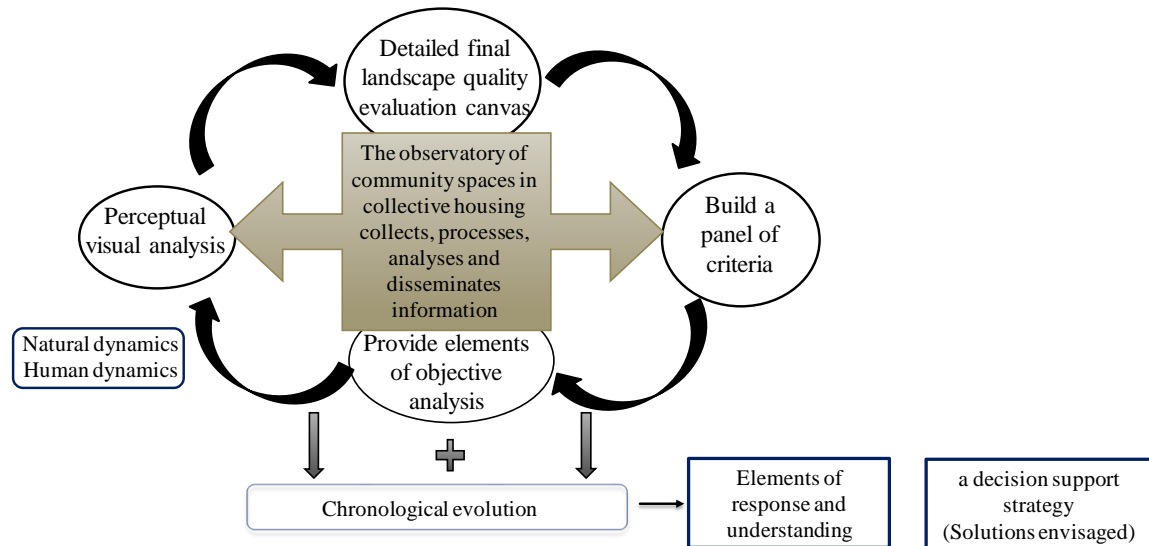


Figure 1. Evaluation Process

We draw up a list of selected synthetic criteria to evaluate the quality of community space:

Summary criteria	Detailed criteria	Indicators for evaluating the landscape quality of common spaces
Management	Maintenance	Designation of waste spaces
		Integration of green spaces/trees
	Management	Management Designation of areas reserved for maintenance; pavement pavements, lighting, furniture
Attractiveness	Leisure/animation	Development of recreation areas
	Adaptability to uses (flexibility)	
	Attractiveness	
	Service offer	Development of multiservice areas
Safety and security	Safety / security	Treatment / surveillance / limits / travel safety
Mobility	Travel	Pedestrian routes

	Space sharing	
	Parking	Supply of parking spaces
Accessibility	Accessibility	Links to the surrounding fabric
		Existence of specific facilities for PRM
	Signage legibility	Barrier-Free Adaptive Pathway
Ambiance	Aesthetics	Colours and texture
	Ambiences	Natural and artificial lighting / noise control
	embellishment	
	vegetation	Vegetation and blue landscaping
Composition	Visibility	Limitations/ benchmarks
	Consistency	
	Spatial continuity	Connexivity between subspaces
Development	Development	
	Density	
	Furniture	Layout and choice
Environment	Noise, air, water	
	climate	Protective layout
	Sanitation water	Water collection and treatment

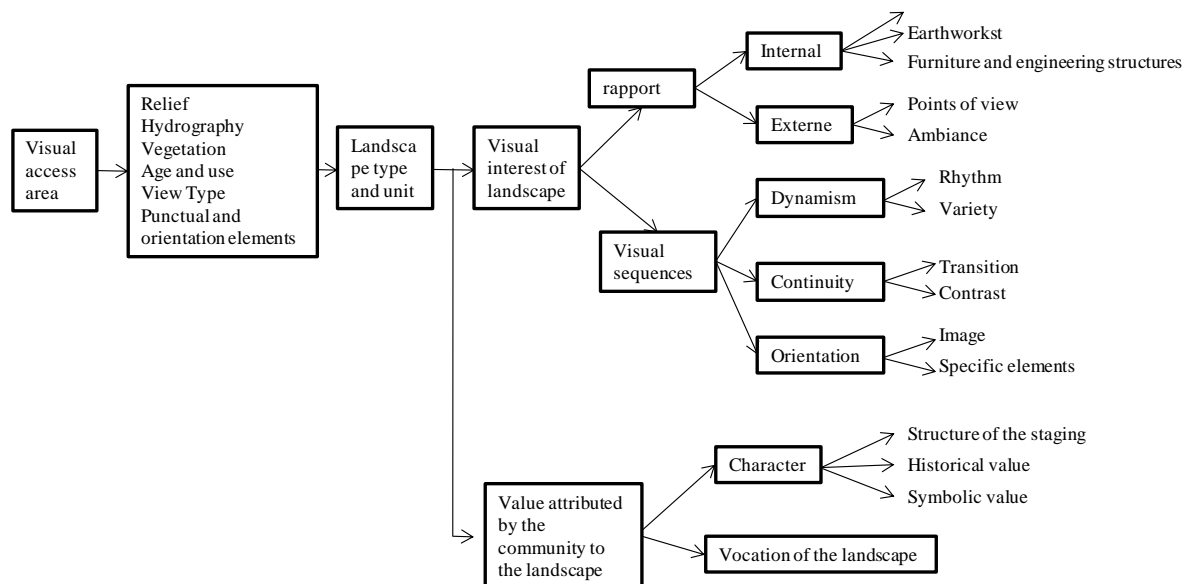
Table1. Synthetic criteria for evaluating the quality of common areas**Figure 2.** Detailed path of a visual analysis

Table 2. Summary analysis grid of the commented routes

Steps	Criteria	Specific criteria	Indicators	Detailed indicators		Rating scale
Delimitation of the visual study space	Visual access area	Relief				
		Vegetation				
		Age and use of space				
		View Type				
Landscape Assessment Inventory of visual characteristics	Visual Accessibility	Accessibility	Links to the surrounding tissue			
			Existence of specific facilities for PRM			
		Signage legibility	Barrier-Free Adaptive Pathway			
	Visual interest	Harmony	Internal	Continuity		
				Alignment		
				Importance		
				Furniture		
				Concordance (colours, texture, shape)		
				Integration into the surrounding landscape		
			External	Points of view		
			vibrancy	Rhythm	variety	

		Visual sequences	continuance	Transition	Contrast	
			Orientation	Image	Specific elements	
		Attractiveness	Leisure/animation	Development of recreation areas		
			Adaptability to uses (flexibility)			
			Attractiveness			
			Offer of services	Development of multi-service areas		
	Value assigned	Character	staging			
			Historical value			
			Symbolic value			
		Vocation of the landscape	Functions and activities			
		Ambiance	Aesthetics	Colours and texture		
			Atmospheres	Natural and artificial lighting / noise control		
			embellishment			
			vegetation	Vegetation and blue arrangements		
		Composition	Visibility	Limits/ markers		
			Consistency			
			Spatial continuity	Connexivité entre les sous espaces		
		Development	Development			
			Density			
			furniture	Layout and choice		
		Environment	Noise, air, water			

			climate	Protective layout	
			Sanitation	Water collection and treatment	
		Management	Entretien	Designation of waste spaces	
				Integration of green spaces/trees	
			Management	Designation of spaces reserved for maintenance; pavement pavements, lighting, furniture	
		Safety and security	Safety / Security	Treatment/monitoring/limits/ travel safety	
		Mobility	Movements	Pedestrian routes	
			Space sharing		
			Parking	Supply of parking spaces	

6. Results and discussions

The remarkable site of Bejaia is intended as a city site characterized by the proximity of the sea, mountains at the mouth of a long river, proximity to a fertile plain and an excellent anchorage, which makes it "the pearl of Africa".

Bejaia, characterized by a varied urban fabric and residential complexes of several eras has seen the development of housing in diversified dispositions of community spaces.

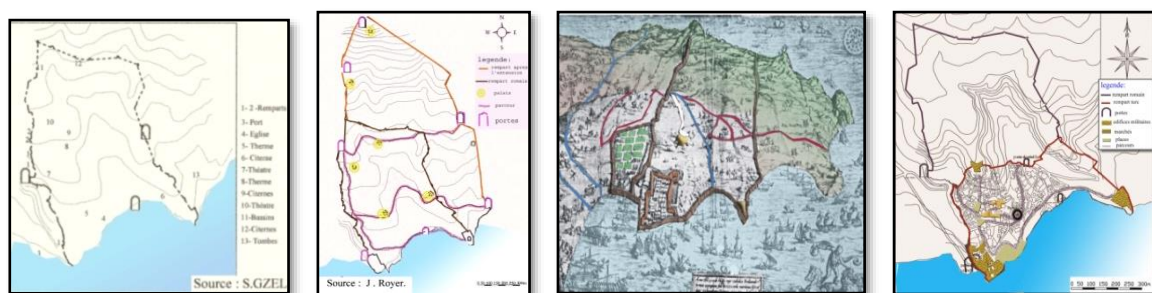
The evolution of the city of Bejaia will allow us to better grasp it in its entirety from a dynamic perspective, later we will approach a more detailed study revealing the fixed points of previous transformations.

The process of formation and transformation of the city of Béjaia lived three great moments:

Before, during and after colonization.

I-Pre-1830 we find in Béjaia: the prehistoric period, Phoenician 7th-Ist century BC, the Roman occupation (saldæ) 33 BC, the Hammadite period (Naciria) 1067/1152, the Spanish period (Buggia) 1510-1555, and the Turkish regency (Medina) 1555-1833.

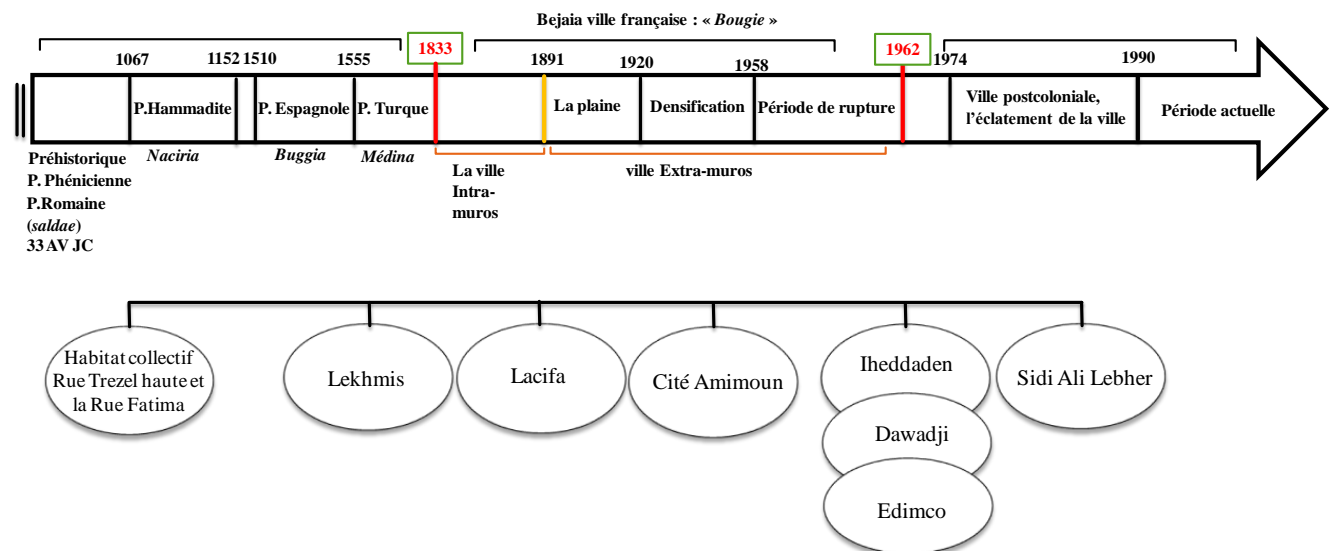
The city's choice of location is based on the potential of the natural environment's structure sheltered from such violent winds, protected and ventilated site, or relief defines the installation and delimits the city into an internalized space (see maps below).



Bejaia (P. Romaine) Bejaia (P. Hammadite) Bejaia (P. Espagnole) Bejaia (P. Turque)

Figure 3. Bejaia in different periods

Chronological evolution axis of the city of Béjaia :



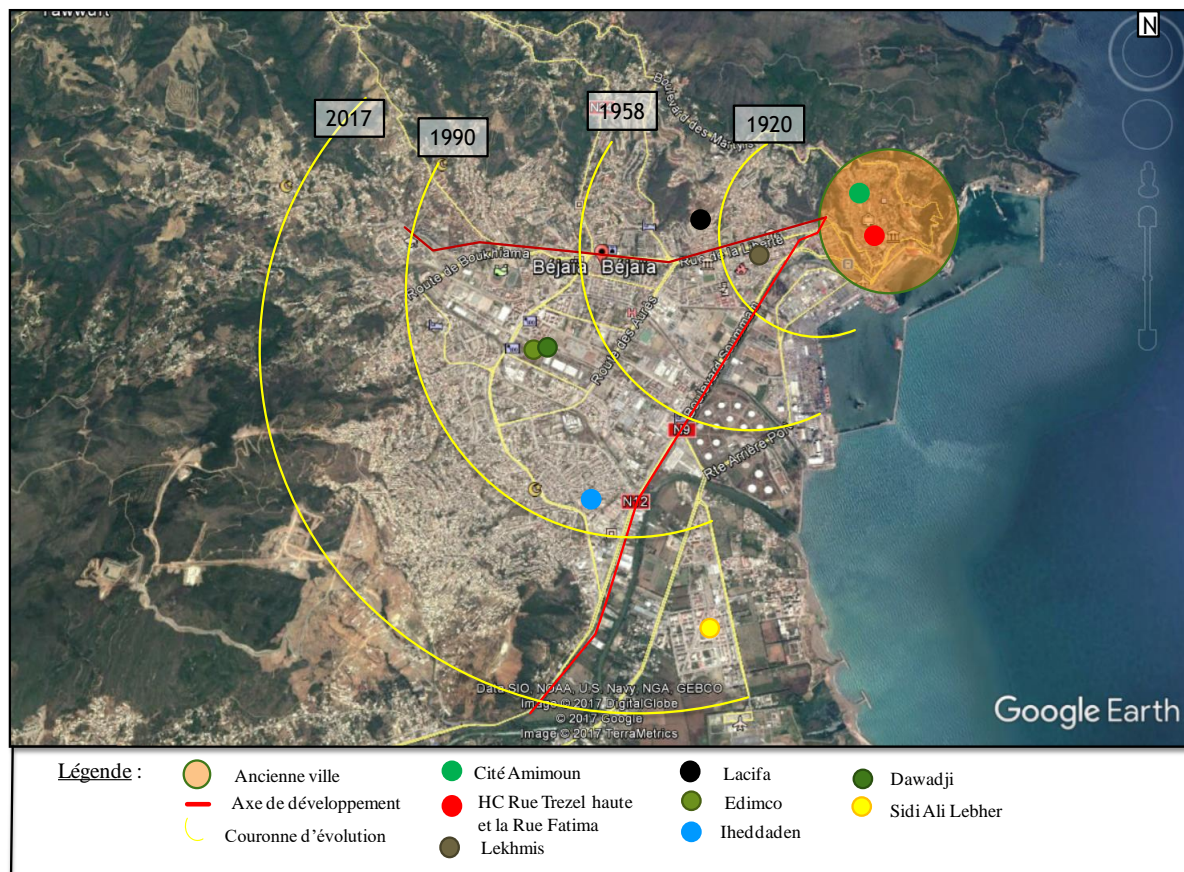


Figure4. Map of the evolution crowns of the city of Béjaia

II- Bejaia French city "Bougie" 1833 -1962 :

II-1-The city Intra-muros :

The appropriation and reinterpretation of place 1833-1871 :

There was mainly the widening of the street TREZEL and FATIMA, as well as a division of the collective residential districts thanks to places such as the place PHILIPPE, ARSENAL, LUMUMBA served by sinuous ways, defining a hierarchy.

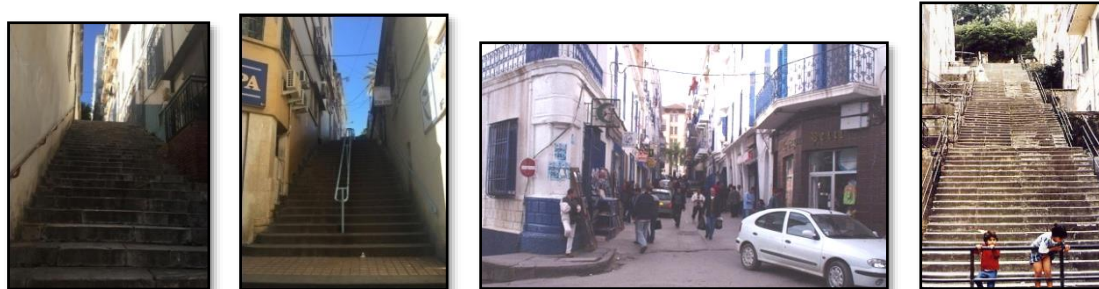
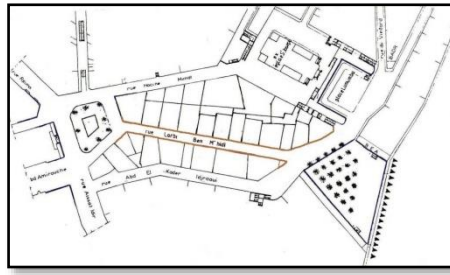


Figure 5 . Vue sur l'habitat collectif donnant sur la rue Trézel haute et la rue Fatima (La rue « escalier »)



Plan of the collective housing
Overlooking Fatima Street



Plan of the collective housing
Overlooking Trézel haute

Figure 6. Plan of collective housing

- The relief indicates the way in which shared spaces are set up and distributed,
- The vegetation and the presence of blue elements mark the beginning and/or the end of the shared route, often materialized by plots,
- Easy identification and orientation,
- The obsolescence of the elements (colors and textures) make it possible to show a weak point for the landscape that offers the spaces and the buildings associated with a lack of arrangement especially of protection and safety and maintenance,
- Use of the "pierced" concept is very dominant offering spectacular views,
- The street "staircase", community space par excellence weaves a link between the building and the urban (course), it allows the inhabitant to walk, discover, enter, go out, stop, arrive has its housing,
- The Alignment ensures the Continuity of spaces offering dynamic, rhythmic and varied visual sequences,
- Animation and dynamism strongly present attributing a value and a character to the space.

II-2- The Extra-Muros City:

The plain, a new pole of growth: Crossing the boundaries 1891-1920 :



Figure 7. View on a type of collective housing (Lekhmis)

The crossing of the boundaries was made by crossing Biziou Boulevard (now Amirouche Boulevard) and Freedom Boulevard, moving away from the two natural barriers (mountain and sea) influencing the trajectory of the establishment of Schulz residential complexes as follows: "the modalities of extension depends on the nature of the terrain, or rather the topographical conditions". There has been a loss of the notion of the street/staircase as a community space or the types of spaces are very varied (gardens, floor terraces, specific "sheep" space, parking spaces respecting a hierarchy (public - intermediate - private - intermediate - private) and a presence of vegetation with primary delimitation.

Densification of the city: 1920-1958

Collective housing in Lacifa:



Figure8. View on a type of collective housing(LACIFA)

The passage from the island to the bar leaving large areas of partition exploited solely for parking, was the marker element of this era with a very narrow delimitation and fence. The return of the shared space "staircase" materializing a hierarchy, with sequential varieties of spaces due to the orientation of the bar have also been resumed with the emergence of a new type of community space "corridor" and a reduced presence of vegetated surfaces,

II-3- Breaking Period: 1958-1962

The city Ammimoun:



Figure 9. Plan of a type of collective housing (Amimoun)

- resumption of the corridor with appropriation of it
- development of a variety of delimited and fenced spaces
- distinction, distribution and management of community spaces
- varied range of functions and activities
- reworking of the "pierced" concept offering a double view (of the sea and Mount Gouraya)



Figure 10 . View on a type of collective housing (Amimoun)

III- Bejaia postcolonial city, the break-up of the city

Bejaia between 1974-1990 :

The latter was called upon to assume important industrial activities, and to drain a large rural population, but its development was not considered as a priority, and consequently causes a dysfunction and a delay of the city, in terms of landscape quality of the community spaces, due to the difficulty to satisfy the demand for housing.



Cité à Iheddaden

cité à Edimco

cité à Dawadji

Figure 11. View on a type of collective housing

- Absence of the concept of the street as a morphological element of social communication, of places as landmarks and absence of horizontal hierarchy.
- Emergence of a new vertical interaction by the esplanade which replaces the front staircase street

Period 1990 to the present:

Despite the natural potential of the site (proximity to the sea and mountains), the community spaces are reduced to simple parking spaces and residual spaces, reinforcing only the "artificial light atmosphere".

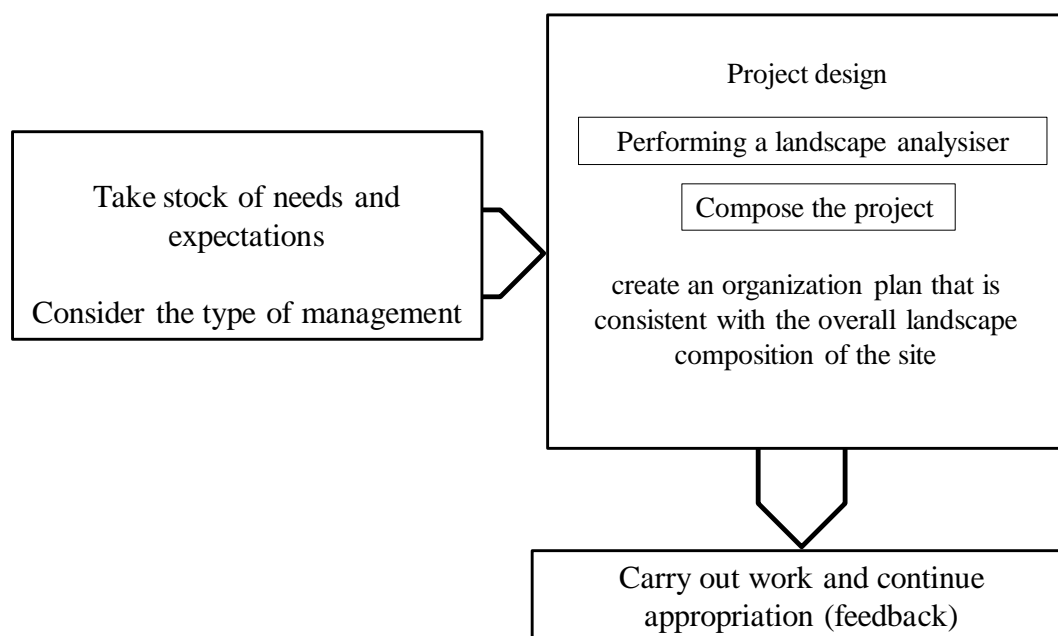
Elements of location and orientation non-existent creating this new Morse city in sidi Ali lebher



Figure 12. View on a type of collective housing

Housing replaces housing, and the inhabitant becomes a simple user of his space. This is combined with dysfunctions in the specific layout for PRM and problems in sanitation.

7. Solutions envisaged (Strategy and recommendations)



Boundaries and fences :

- Enhance visual relationships with the environment through visual breakthroughs or perspectives on elements,
- Take care of the landscaping in order to make the entrance a landscaped showcase ensuring good continuity and visibility, and create a landscaped setting from the entrance (trees, flowers...),

- Design the outer limits in such a way as to reduce the visual impact, and integrate them harmoniously with the surrounding landscape.

Management :

- Manage the separating limits of the sites by avoiding a systematic and repetitive partitioning, and implant the plant by using varied volumes or plant associations (live hedges, coppice, shrub masses...).

Organization :

- Organize the whole around the location elements,
- Particularly care for landscaping using textures and creating paths within community spaces,
- To prefer well delimited spaces in order to better see them and to appropriate them, for a better management,
- Avoid the concentration of residual spaces without function.

Maintenance :

- Integrate harmoniously into the site a plant palette that enhances the spaces and is maintained sustainably,
- To keep a global aspect of green vegetation in a concern of integration into the landscape,
- Choose a vegetable palette according to the climatic conditions of the city.

Travel :

- Structure locations coherently within shared spaces,
- Adapt indoor traffic to usage and make travel safe,
- Establish a traffic plan in order to organize and prioritize the main aisles,

- Create paths that follow gentle slopes that allow easy circulation of PRM and children, as well as runoff water management,
- Separate soft traffic from car traffic while maintaining mutual visibility for safety reasons.

Embellishment :

- Preference should be given to plant separations (e.g. tree hedges); small fencing elements may also be used to create boundaries such as fascines or borders,
- Carefully consider facilities Suitable for various functions and activities,
- Pay particular attention to the choice of colours and materials and the common spaces or the cladding of the façades overlooking these spaces.

Finally, it is also relevant to open up a field of vision by asking oneself; What is one's idea of the landscape quality of the "community spaces" of tomorrow?

As Edgar Morin says, "The gigantic planetary crisis is the crisis of humanity which does not manage to reach humanity". It is in fact this landscape quality of community spaces that will ensure the humanization of shared space.

Acknowledgment

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Visual pollution phenomena and sensitivity of residences in heritage city centers Case of: Old district of Manama city, Kingdom of Bahrain

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Abstract

Image of the ancient cities across the Arab region have been changed. The urbanization progress and their subsequent urban changes are of rapid acceleration, due to the population increase in the named cities; affecting the encompassed old districts in many respects. The mentioned changes are are forked into two main branches; controlled and uncontrolled. On one side, the controlled category abide by the urban regulations in terms of the visual representation of the old districts. On the other side, the uncontrolled counterpart breach these regulations and their logical assumptions ending up in many urban problems in general and visual pollution in particular. These problems unveiled the entire display of the city turning it into a bunch of randomly allocated and overpopulated suburbs violating open spaces for landscape purposes. These turnovers adversely affected the inhabitants deteriorating their life quality and ripping off their identity, taste and sense of inhabitant.

The objective of this research is to tackle those cases of visual pollution. The phenomena is discussed in terms of the grounds of its occurrence in old district of Manama city, the capital of Kingdom of Bahrain. The hypothesis considers the visual design in an attempt to innovate a binding traditional building style putting an end to this prevalent visual pollution. Consequently, conforming to these stipulations would be of positive comeback on the ongoing commercial activities

The research methodology is staked on both of the data collection and theoretical background about old district in Manama City, whereas thorough historic background of the city and analytical studies of the selected data and questionnaire are carried out. The Questionnaire design had been started by September 2017 along with a review of prior planning studies and reports relevant to the long-range growth and development of the City. Questions were designed to survey public opinion on specific visual pollution issues and principles. Although there were a few open-ended questions, the majority were closed-ended taking the form of yes/no, multiple choice, or rating scales. Questions went through several renditions based on intra- and interdepartmental review before being presented. Ending the research by concluding the results and adding recommendation.

Keyword: Building façades – Commercial life- Atheistic and Beautification-Visual discomfort

1. Introduction

Treading along these ancient cities compels any researcher for visual quality analysis purposes. Albeit, touring across their streets is quite sufficient, to observe the devastating alteration within their urban state deforming their urban texture and architectural structure equivocally. It is way facile to track and detect the distinctive architectural set up of the buildings in regard of their affiliation to various decades. In addition, it is easy to the development of these cities and the lifestyle of its residents by examining the adjustments of their building volumes, forms, color, height, and design. (Elghonaimy, Environmental Assessment of Urban Area, 2000).

In Bahrain, old district of Manama city is a witness on the economic, political and social eventuated over the last decade for Manama has been always the heart of civilization and vitality in Bahrain for a long time interval. It is acknowledged that the municipal architecture mirrors the cultural identity, social standard, political conditions and economic status of the homing civilization. Therefore observing the building chronological sequence in Manama indicates the sovereign historical eras of the Bahraini civilization.

It is a worth inspecting issue since the local residences of the ancient cities; Manama rely on their accommodating buildings in all their daily urban routine; living, trading, commercial activities, entertainment and social services in terms of education and health, to name a few. Yet architecture is taken for granted as part and parcel of our existence whereas it is not receiving enough attention nor contemplation. Nevertheless, considering architecture as an intrinsic part of our existence, then it ought to be enhanced regarding the visual quality of cities and counted as a window to its hosting cultural identity and its residents' self-esteem

1.1. Diagnosis of the problem

Many urban problems occur due to malfunctioning treatment of old districts in cities, such as; overpopulated residential areas, infrastructure deficiencies, and indiscriminate distribution of city services deteriorating the life quality right there. The foreign workforce imported utilize the spaces as per their requirement and understanding, thereby altering the prime functions of spaces. Moreover, they are reluctant about the visual display of their place of inhabitation as they do not consider that it belongs to them and they know that their stay is temporary. Visual pollution has been the ultimate repercussion of the haphazard urbanization policy adopted in old district of Manama.

1.2. Significance of studying "Manama city

Manama is the former capital of Bahrain, besides. It is considered as a prime tourist attraction and investment zone. It has been the prime location in the past for activities and still holds its position as an important city of Bahrain. The factual image of Manama incarnates the status of Bahrain in general indicate that of Bahrain. Manama is the considered the hub of the social, economic and environmental issues in Bahrain.

1.3. Motivation of selecting “old district of Manama “as case study

Old district of Manama city is the core business activities and official buildings of Ministries in Bahrain. Moreover, it is rich in archaeological monuments and heritage architecture entities.

Enhancing the visual quality would positively show on residents' life quality, and attract investors to do business activities and tourists to visit the heritage areas, which by turn improves the national economy of Bahrain.

1.4. Research Idea

The unsorted conflict between Bahrain 2030 regarding the enforced regulations and actions amongst local authorities degrades the visual quality in the old district in Manama city. The flow of this conflict should be curbed, to avoid downgrading the visual quality in old district of Manama.

1.5. Aim of the research

To find out the reasons of the deterioration of the visual quality in the old district of Manama, and the forms of the resulted visual pollution then how can we enhance it, which consequently will

- influence positively life quality of residences
- attract capitals of business
- Encourage tourists to visit the heritage areas,

Consequently, will leads to improve the economy of Bahrain

1.6. The research methodology

Research methodology consists of two cardinal sections, where the first compromises the theoretical background figuring out the motif of adjusting the urban texture of Manama followed by a survey interviewing its users, residences, businessmen and municipality officers. The second demonstrates the analytical phase concerning the collected data and the findings of the interview to generate the research guidelines.

2. Visual pollution problem in old cities

2.1. Definitions

In general, visual pollution is an aesthetic issue referring to the impacts of pollution that impair one's ability to enjoy a visit or view. Visual pollution is defined as the whole of irregular formations, which are mostly found in natural and built environments. (Yilmaz, May 2011). It could be also defined as encountering unfavorable sight that flaunts the aesthetic appeal of a specific area. Visual pollution occurs when an individual cannot enjoy the view in a particular area due to the drastic changes taking place in a named natural environment.

2.2. Old districts and Urban Design Defects:

In old districts in cities, life style change affected the physical conditions of the urban plan in general moreover, architectural representation in particular. In Manama, by the oil mining success and modernization, most of the old residences moved out the old districts towards new districts looking for modern and more comfortable and spacious areas. Fascinated by their desire to lodge in the new residencies together with their unawareness of the value of the abandoned ones led to sweeping downfall of the old Manama and its traditional buildings as well. This reality has changed the character of the human settlement in these old areas depending on the variations of circumstances, actions and events such as migration and employment, balance of urban fabrics. (Hamouche, 2009)





In order to reconcile visual quality inside old district efficiency with physical and environmental constraints, the performance of policy and strategies in old cities seeking urban development needs to be monitored and evaluated. Reconciling visual quality inside old district efficiency required improving the quality of life reflect upon visual quality. The key factors of Reconciling coming from clarifying the value of these old districts and avoiding the conflict between policy and action plans. (Elghonaimy, Environmental Management and Economic , 1995). En masse, the planning process has to meet specific goals in terms of users, time and space. Behavior of

the users' forces cannot always be predicted, so feedback information is necessary to reevaluate initial goals and objectives. The main features affected by the deterioration of urban quality are building condition, quality of life and standard of living. (Dalia Hussain El-Dardiry, Islam Hamdi Elghonaimy, 2010) The parallel impacts came in term of visual quality in old Manama city.

In many cases, failing in controlling visual pollution because of facing the economic power of business. For examples, as businesses look for ways to increase the profits, cleanliness; architecture, logic and use of space in archaeological urban areas are suffering from visual clutter. (Morozan, Cristian; Enache, Elena; Purice, Suzan., 29 March 2013)

2.3. Repellent factors in Site Attraction Sceneries

Visual formation is considered one of the significant factors, to get a full visual picture of cities in general. In old districts, traditional buildings are of unique characteristics. The major factors that affect visitors' scene for this area as follows:

-  Site Treatment
-  Study of visual interrelation between the buildings and surrounding outdoor spaces
-  Site Furnishing
-  Artistic element within the urban areas

2.3.1. Site Treatment.

Street furniture plays significant factor in enhancing the visual communication between existing buildings and urban fabric. In old part of cities, visual studies take to embark the site treatment. It could be working on underscoring and preserving its nature, obliterating whatever spoils its homogenous set up. Moreover, it aims at introducing some additives, to highlight its natural composition on the one hand. It may be also an attempt to demolish this set all together or work on amending adjustments on the other.

2.3.2. Study of Visual Interrelation between the Buildings and Surrounding Outdoor Spaces.

It comes second after the treatment process, where the buildings are studied as one block or limited variable ones. Thus, the visual image formation is not hard to handle. Using similar colors, details and materials end up in a homogenous rhythm along the blocks and spaces. It may be apparent in a systematic train of thought in control of the design; hence, the visual interrelation among the constituents of the site especially for those speedy highway travelers, for speed is known for correlating the nearest points to the farthest ones. Therefore, the named goal is realized.

Regarding free designs, they are double-edged weapon for their free block formation though their main problem lies in achieving continual block-space interrelation with variant functional surroundings. The design is termed successful, if it satisfies the spectators visually and psychologically meeting their expectations and satisfying their wants, bearing in mind their individual differences. Reaching out for this continuation and consistency, exaggerated repellent forms and size blocks must be cut down along with setting forth an overall controlling visual theme. This is either achieved by areal categorization; narrow ranged areas must be separated from their wider counterparts, or opting for green areas and foresting for thematic supremacy.

2.3.3. Site Furnishing:

It is a crucial supplementary factor for completing the site scene in archaeological areas. The comprehensive site scene includes plants, fountains, lighting and other artistic factors, ruling out any repellent forms for homogeny purposes. Additives do maintain the color scheme and aesthetic touch necessary for an architectural design, yet they decrease the feeling of heat in high temperature areas, meanwhile they are despised in highly humid zones. Therefore, we can say that Site furniture is not of a sole visual function, but comprehensive seen as well.

Thus, their quantity and types must be allocated according to the homing environment circumstances in days and nights equally. From climatic perspective, regularly Bahrain is overwhelmed by sand storm. Thus site furnishing is also significant in enhancing the visual quality in sand storm attacked zones, for dust deposition areas, where evergreens perfectly fit, for their dropping foliage accumulates no snow. (Chmielewski, Sz., Lee, D., Tompalski, P., Chmielewski, T., J., Wężyk, P, 2016)

2.3.4. Artistic Element within the Urban Areas:

There are other elements that in crucial dense such as statues, sculptures. They connect different spaces and interfere in the curvature of the corridors in directing and clearing probable congestions within the site as well as the grading steps, kiosks, shops and billboards, in respect to the design consistency and the site visual coherence. (Elghonaimy, Historical preservation projects and urban developing plans, Impacts of Successful experiments in historical preservation projects upon Enhancing City urban conditions; Case of Bahrain, 2011)

3. Case Study: Governorate Road, “Bab Al Bahrain”

3.1. Historical Background

Bahrain has a prolonged history that goes back to before the birth of Christ era, where the oldest civilization took place “Delmon”; it was a center of trading from that time, until today. Till the time being, trading background still influences the Bahraini community. Manama is one of the most old cities in Bahrain emerged in 1780s, where Manama is the capital and largest city of Bahrain, it was an important trading center in the Gulf. Traders came to rest and feature their products. It means “the place of rest”, Manama is a cosmopolitan castle embracing multi-ethnic origins within; Jews, Muslims, Christians, Hindus Buddhists, etc. It has been a melting pot for all these ethnic varieties lived door to door since the birth of the peaceful coexistent community. The case of studying locate in the old district Manama, Governorate Road, “Bab Al Bahrain” area. This Avenue is one of the liveliest streets in Bahrain, it is filled with locals and tourist

filling this area, with Bab-AL Bahrain and the gold market is one of the busiest streets in Manama. Visual analysis will for this street to find out the common features of visual pollution then in return, it would be requesting some improvements that may enhance the users' experience. (Hamouche, 2009).



Figure 1: A map of Manama of the early '30s clearly show the morphological structure and the extent of the two fabrics at the beginning of the modernization process (Agriculture, 2007)

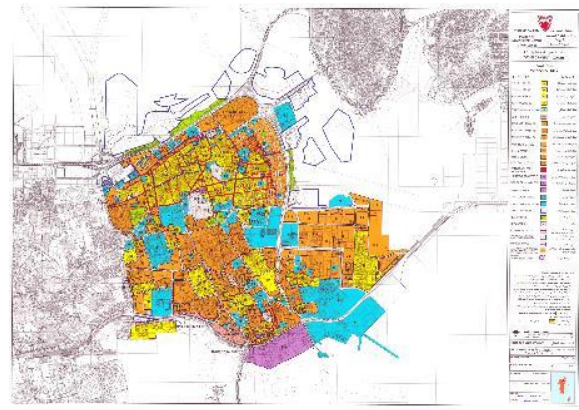


Figure 2: A map of Manama governorate clearly show the old district, Bahrain, in 2016s, Ministry of Municipalities Affairs and Agriculture

A sample of “transitional area” in Manama; the historic pattern is still kept, but some streets have been widened to become commercial through fares. Several transformations have occurred in the built-up fabric as well, especially along the “modernized” streets. The red perimeter show the survey test area.



Figure 3: A portion of Manama city, Bahrain, in 1950s showing the urban fabric and spaces usage in old district. (Hamouche, 2009)



Figure 4: A portion of Manama city, old district 2006, showing more focus the urban fabric and spaces usage in old district (Agriculture, 2007)

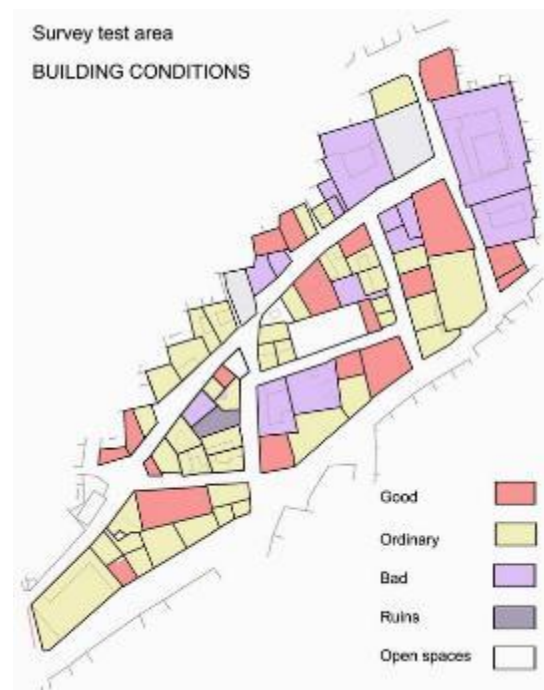
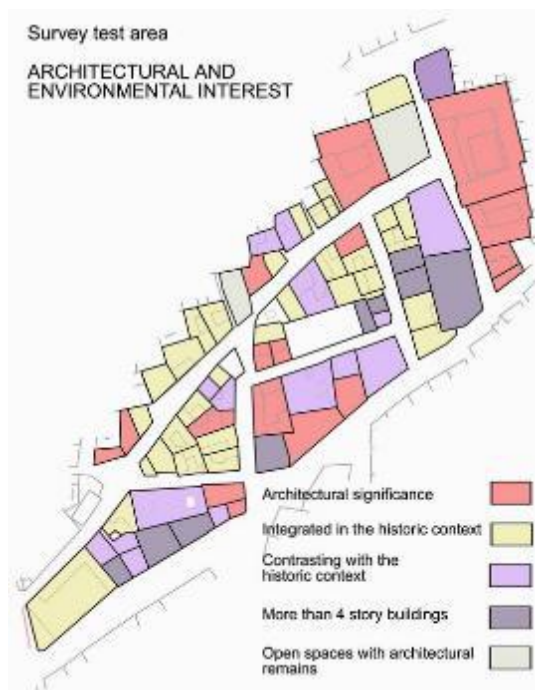


Figure 5: The survey test area in the “transitional” zone (Agriculture, 2007)

The survey test area in the “transitional” zone: a “modernized” commercial street and two “traditional” streets. The bases of the survey data (including ownership, state of occupancy, building typology, construction system, and so forth) the category of the permitted interventions

are identified for each buildings (left). Some “sensitive” areas can also be defined to be possibly submitted to integrated conservation and regeneration projects. (Agricuture, 2007)

4. Pilot study: Government road, Old district, Manama City

4.1. Location of the Pilot study

It is the Avenue that goes through Bab Al-Bahrain into Manama. Bab Al-Bahrain was built in 1949, and it has undergone eminent changes over the years but the Ministry of Culture undertook a project to preserve it as a cultural landmark; thus restored it to its former glory and eventually moved its tourism sector offices and visitor’s center right into the building. Attached to Bab Al Bahrain is the old Manama Marketplace “Souq”. The market is a vibrant collection of number of traditional coffee and shops offering a wide range of goods from gold, textiles, spices, incense, perfumes, handicrafts and souvenirs, as well as more modern products from all over the world. The souq offers a unique shopping experience that brings to mind the style of commerce from days long past (figure 7).

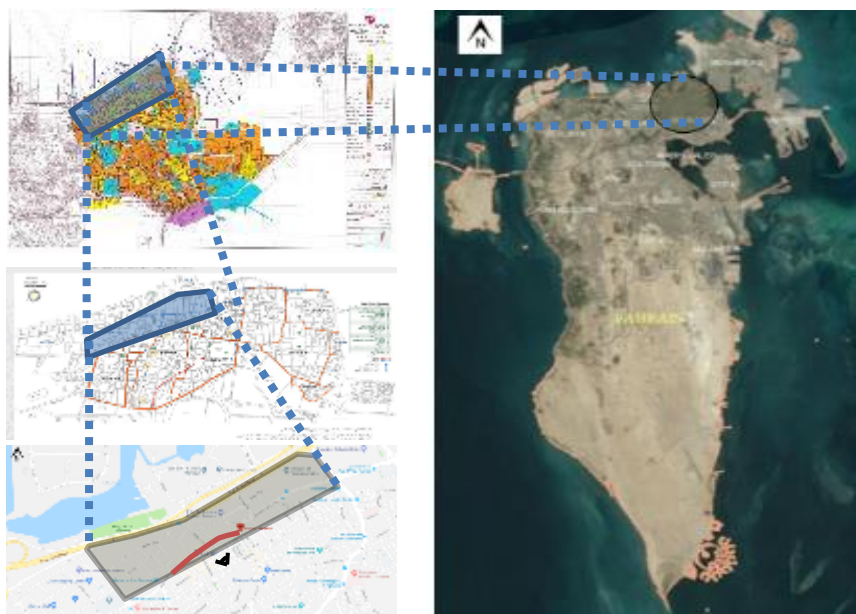


Figure 6: Location of the pilot study of: “Bab Al Bahrain”, Governorate Road, Old Manama, Kingdom of Bahrain

4.2. Historical background of the Area

The whole area had gone through many developments until this day; the first area is relatively the same as before. The second area had gone through major changes; it had been turned into a pedestrian path, which is similar to the international case that has been chosen, by turning a normal street into a pedestrian path.

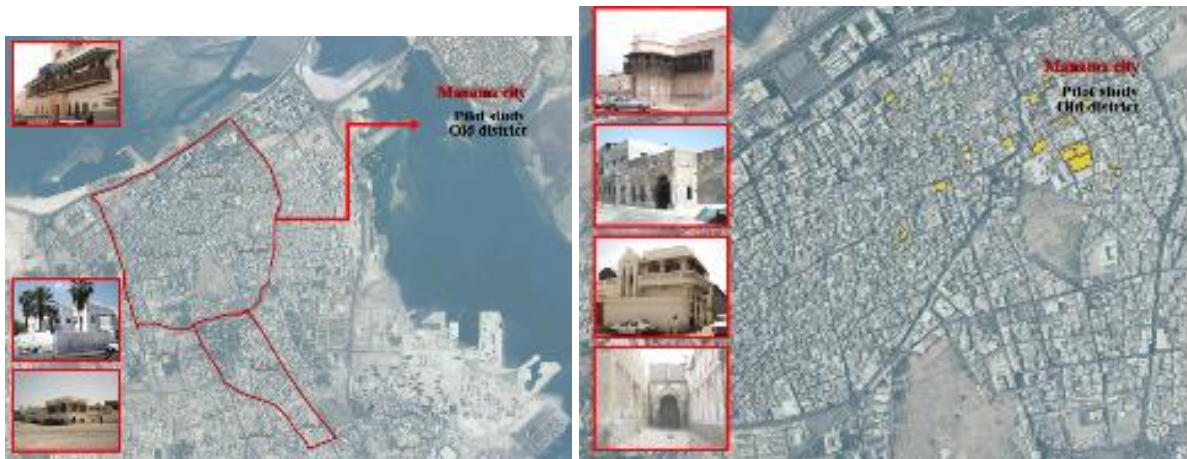


Figure 3: Urban context of the study area, google earth map, 2017

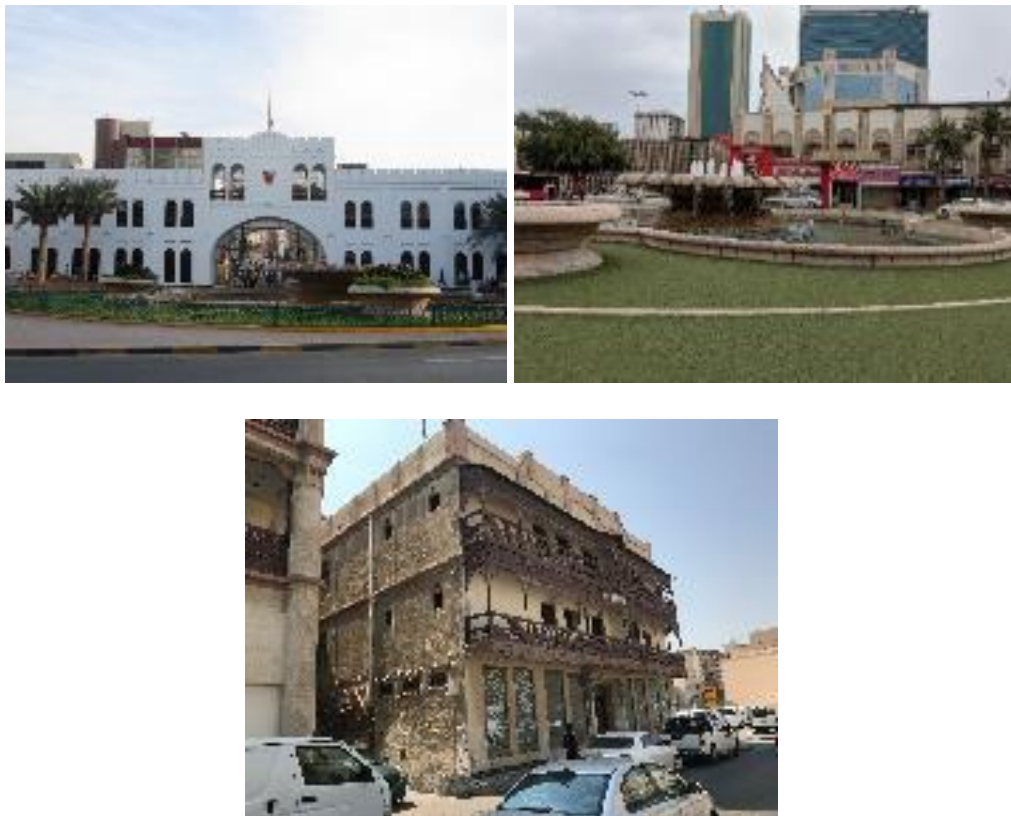


Figure 4: The most famous buildings in the study area.

4.3. Users

Fig 9, illustrates the featured estimation for the use of Bab Al-Bahrain Avenue, where it is highest used twice a day; in the afternoon and evening. It records highest utilization rates in the weekends especially Friday. Both inhabitants and tourist use the street, as it holds a cultural attraction as well an economic attraction

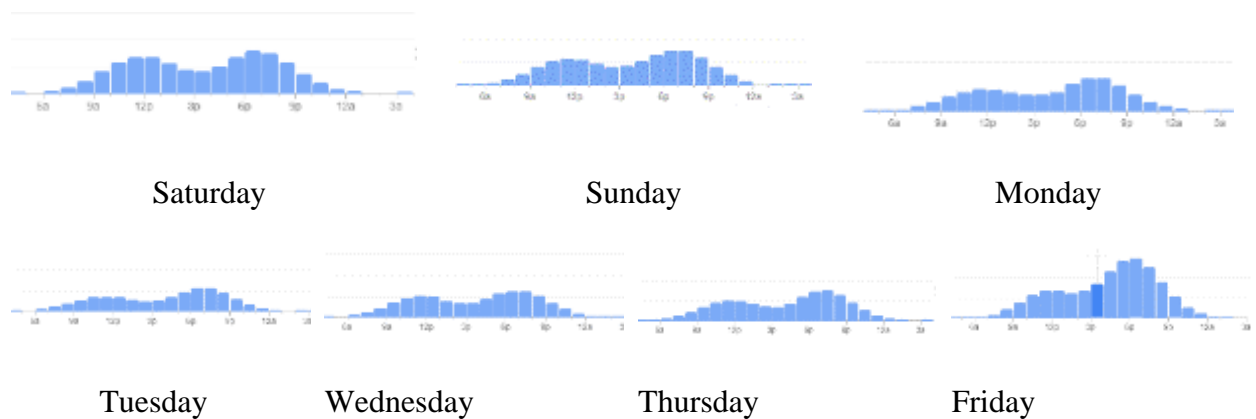


Figure 5: the featured an estimation for the use of Bab Al-Bahrain Avenue (**Popular times in Bab Al Bahrain, 2018**)

4.4. Activities

This area indulges many activities; capturing photos near the (heart) Bahrain structure or near Bab Al-Bahrain or near the hanging coins. For local residences, they can enjoy their time in the cafés they can also sit around and just enjoy the space. While the victors do some shopping and have rest in some traditional cafeterias.





Figure 6: The common social and commercial Activities in the case study area

4.5. Symptoms of visual pollution in “Bab Al Bahrain”, Governorate Road, Old

Manama

Unfortunately, the visual quality is deteriorating, which is but a distortion of the once inviting view propagating psychological unease in many places. In particular, the visual pollution appeared due to improper usage of the monumental and valuable wealth of the area disturbing the visual quality concerning its beholders. Infringing changes of the urban context forcing the seers to accept unaesthetic scenes as normal. Residences used to deal with deteriorated visual quality as normal issues. It is an aesthetic issue and refers to the impacts of pollution that impair one's ability to enjoy a vista or view. Visual pollution disturbs the visual areas of people by creating harmful changes in the natural environment. Therefore, the dealing with phenomena of Visual pollution in Manama Old districts is related to its handling methodology.



Figure 7: Miss use of vacant lands that harmful the urban context

From the inventory and field survey, it is deduced to be lacking the least artistic taste in dealing with building color or adding new one to the surrounding old buildings or disappearance of the aesthetic image of everything that surrounds from buildings to roads or sidewalks and others will provide some examples of this type of pollution:

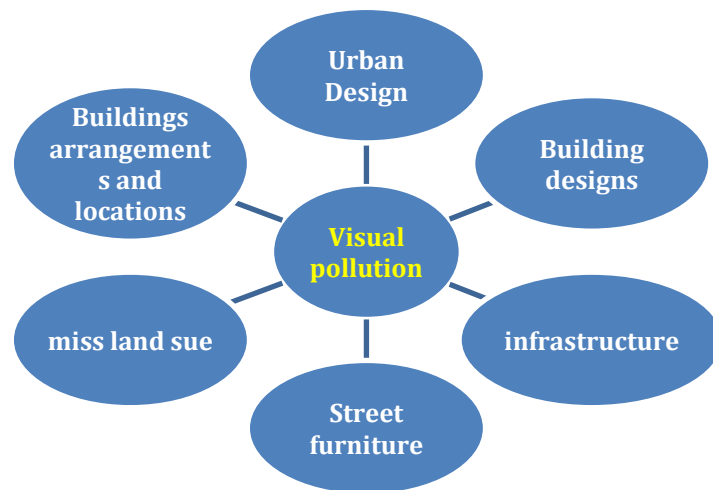


Figure 12: Common causes for visual pollution in study area

a. Urban Design;

- i. Lack of urban controlled: Local managers of old urban areas especially in archaeological places over what is built and assembled in public places.
- ii. Poor urban planning of some buildings, both in terms of spaces or in terms of the form of construction.
- iii. Build buildings in front of beautiful scenery and hide it, for example hiding the sea
- iv. Improper way in hiding waste and countless other examples.

b. Buildings arrangements and locations:

- i. The spread of housing haphazardly in the vacant areas instead of having gardens.

- ii. archaeological projects: Deficiency in dealing with the restoration projects in the archaeological areas in comprehensive level
- c. **Land misuses:** in terms of
 - i. Miss land sue in the old districts in general
 - ii. open storage of trash, and automobiles movements and parking
 - iii. Crashed cars or those loaded with goods asymmetrical appearance.
 - iv. hopheads land use within the area
 - v. Waste disposals: Garbage cans in their forms that give rise to pessimism.
 - vi. Waste from the rubbish in the land space and around the crankshafts different colors of building facades.
- d. **Street Furnishings:**
 - i. Street Lighting: Street lighting poles do not fit the streets while electrical wires are hanging on building' facades deteriorate visual quality of the area.
 - ii. Poor management of Billboards, Trash cans and dumping areas that are exposed,
 - iii. Signboards and billboards hanging in the streets in non-matching colors.



Figure 8: Street furniture: in term of Miss-use Billboards

- i. Missing sitting areas and places for taxi drivers waiting areas.
- ii. Missing shades and landmarks.
- iii. low level of respecting the landmarks for example minor sculpture in the area

- iv. **Garbage bins:** Garbage bins are provided in large numbers (15 or more) and distributed randomly along the street, with different sizes, materials, colors and forms. Pedestrians throw the garbage instead of making the street dirty with wastes.



Figure 9: Street furniture: in term of Miss allocating or designing trashcans and dumping areas

- v. **Fences and Barriers:** Lots of barrier structure are used in the avenue to separate the pedestrian pathways from Vehicles Street using these different material and form barriers, so they prevent vehicles to enter some places. Some of these barriers are made of metal; some are made of concrete but in general are not matching with the traditional style of buildings.



Figure 10: Fences and Barriers are not matching with the traditional style of buildings.

- vi. **Sitting areas:** All visitors of different ages can use sitting areas-the “Basta” sitting area used by adults more. According to time, the using for the areas, all day -used more afternoons and evening as preferable daytime for shopping and using the SOUQ. For taking rest after shopping or for enjoying the photo gallery and the entrance fountain view and for gathering. Shadings in many places are in ugly shape for shading the pathway in the shopping areas and the shading for the police officer.



Figure 11: Sitting areas: more visual pollution sources in term of the clear haphazard in allocating for sitting areas.



Figure 12: mal-allocating for sitting areas

vii. **shading devices**



Figure 13: Shadings in many places are in ugly shape

e. **infrastructure:** in terms of Antennas, electric wires hanging upon building facades



Figure 14: Haphazard car parking with low level of maintenance.



Figure 15: Deteriorating traditional building condition (air conditions are haphazard disrupted).

f. **Building designs:**

- i. **Building heights:** Demolishing the traditional buildings amid to build high-rise buildings leads to miss the homogenous skyline for district buildings. Moreover, the creation of new high rise buildings invaded the visual privacy of older homes.
- ii. **Facades designs:** The use of glass and aluminum finishing, which increases the sensation of heat. Moreover, they are randomly hanged for air conditioners in facades.
- iii. **Colors scheme:** lack of harmony for the new parts with the old
- iv. **Demolishing the traditional** buildings to build high buildings.
- v. **Missing the common style of Architecture** design for building in terms of height, color, or design for buildings,
- vi. **Buildings roofs:** Improper use for roofs in term of Antennas or storage are often considered visual pollution. (Chmielewski, S., Samulowska M., Lupa, M., Lee, D., Zagajewski, B, 2018).



Figure 16: low quality of dealing with building Facades designs

5. Governmental actions considering visual pollution:

5.1. Legislations and regulations

Several legislations were issued to manage dealing with visual aspects while others were issued to deal with the old districts in Bahrain; like the legal codes in the years 1977, 1979, 1981 and 1998 and binding regulations in the years 1979,-1981, 1988, 1998 and 2005. Unfortunately, not all these laws and regulations controlled the visual pollution or the controlling the deteriorating of the old distrust.



Figure 17: Falling of laws and regulations in control the visual quality.

5.2. Bahrain's Master plan 2030 – Overview

Bahrain's Master plan 2030 deals with the Bahrain Strategies and Policies. There were many steps towards treating visual pollution in old districts in Manama as well for example:

- i. Creating one comprehensive master plan for the old district.
 - ii. Built distinct communities.
 - iii. "The National Plan of Bahrain lays out key strategies that coordinate and focus development"
- ✚ Control Land Speculation
 - ✚ Protect resources
 - ✚ Preserve Historical & Ecological important sites

- ✚ Integrate transport & ensure public access to open space Waterfront. (Bahrain, 2007).

5.3. Benefit of analyzing the Master plan & Vision of 2030:

The Master plan & Vision of 2030 that will help in:

- i. “Built distinct communities” and adding greenery to the area
- ii. They want to lessen the sprawl, use the land more effectively, help preserve and keep the traditional Bahraini lifestyle, and the historical landmarks.
- iii. Protection of the heritage, archaeological, & cultural sites
- iv. Help encourage tourism through visual aesthetics to the archeological sites and traditional Bahraini lifestyle

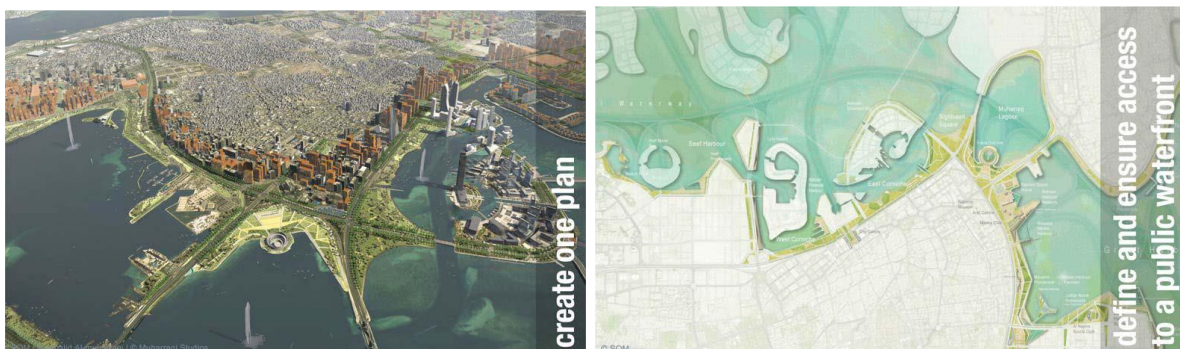


Figure 18: Bahrain's Masterplan 2030 – Overview

6. Conclusion

Visual pollution in the old district leads to loss the aesthetics and the sense of unity and common values for the areas in general in terms of:

- a. The danger of visual pollution lies in its association with the old district of Manama City.

The studied area is a very active pedestrian area, where people constantly use it at all time for the cultural representation it has and the economical center it is, so it is important to have a careful design for the area, which will assure the comfort of the users while using the street.

- b. By contrast, the loss of beauty and the collapse of aesthetic considerations in the area deteriorating the general taste of residences in Bab Al Bahrain area, leads to the acceptance of the ugly image as dominate, and deteriorate the taste of the residences.
- c. Tourists would never find it appealing to visit the old districts, and the investors and businessmen are to look for other beautiful urban context to inaugurate their business. .
The real estate investors tend to invest in the reclaimed area opposite to the Manama souq because of sea view and modern infrastructure development
- d. Unpleasant spread until it became a domineering visual characteristic, where law still exists to detect the sources visual pollution and its manifestations in the streets, roads and neighborhoods of the city tracking some aspects.
- e. Buildings design are characterized by its haphazard and deteriorating building conditions in terms of installations, color, height, building materials, structure systems, general noticeable exterior and leads to a clear truancy of harmony; utilized materials in covering the facades of buildings, the finishing materials
- f. There is a need to be sure of implementation the approved facades design by the municipality .
- g. Absence of respecting traditional architecture style in designing the new building.
- h. miss proper Implementing the relation between the followings elements:

Table 1: Visual pollution elements and forms in the old district

Element	Forms of visual prolusions
Site Treatment and Sitting of buildings	Garaging and parking
	Communal spaces
	Access while health service needed and emergency circumstances.
	Private spaces
surrounding land-use	Disappearing the artisan and the traditional workshops area
	Access to Commercial land-use
	Services (as land-use)
	Access to different buildings types (governmental – nongovernmental)
	Miss allocating the waste collection
	improper Sanitary, electricity, communications

infrastructure grid system and networks	Freedom from local hazards and nuisances Accident hazards.
Site furniture	Aesthetics, street lighting, hard scape and soft scape as well
Open space (recreational uses)	Public safety Public recreational places
Roads and Transportation	effective capacity of roads Access to transportation Access (vehicles and pedestrians)

7. Recommendation: Authoritative contribution in controlling Visual pollution

Urban planning policy level, the flow of the unsorted of the conflict between Bahrain 2030 regarding the enforced regulations and actions amongst local authorities should be curbed, to avoid downgrading the visual quality in old district of Manama city

strategy level, there is a need to revise the points of controlling the visual pollution reasons that mares the beauty of old district of Manama city and gives the viewer an awful display; it should be proposed solutions to mitigate visual pollution. It is worth mentioning, that urban scholars are of authoritative contribution in controlling Visual pollution in Manama Old districts considering the Physical axes, Environmental (context) The social dimension and Economic conditions; (table 1) (El-Ghonaimy, 2013)

Table 1: influences with phenomena of Visual pollution in Manama Old districts

Factor	Description
i- Physical (location)	Considering applying architecture building code, land use, and landscape architecture represents the maximum number of users for a certain period in a place without causing any damage to the environment
ii- Environment	Use a level, which you can tolerate without causing any destruction to the environment and their preservation.
iii- social and Cognition (awareness for users)	Human behavior and resources that Represented by the habits and behaviors, that characterize the users place (sociological psychological approaches)
iv- Economic (Returns)	Activities and management strategies. for example, Accounts for the level of use and consumption of a place for fuedal returns. Paying attention to attract capitals and tourists towards the old district.

Control visual pollution will in term of:

- a. **Urban design**, regulation and coding; there is acute needs to adopt manuals of urban design/architectural guidelines, rules and restoration codes within the protected zones.
- b. **Skills of Urban Scholars:** Raise the technical level of urban designers, landscape architectures and architects responsible to know how to deal with the vernacular buildings in term of Architectural designs, especially façade designs, colors, finishing materials and support section
- c. **Conservation Zone Area;** to adopt temporary visual protection measures including two prime protection perimeters for the traditional core areas of Manama. Moreover, to develop the conservation plan leading to the establishment of the urban conservation zones and their boundaries. And to adopt the policy of demonstrating to investors, businessmen, and residents, the government's commitment to these areas through the implementation of pilot projects.
- d. **Buildings arrangements and locations:** prepare strong action roles in controlling the relation between the contractor and the Municipality. Tightening Supervision by municipalities on contractors and owners of the obligation to implement what has been done.
- e. **Street furniture:** there is a need to reexamine the existing case of:
 - Street Lighting
 - Garbage bins
 - Soft scape and plants species
 - encouraging walkability
 - Fences and Barriers
 - Sitting areas
 - pavement design
 - allocating bicycles parking
- f. **Design codes:** implement design codes to control schemes, facades, and colors setting suitable landscape architecture.
- g. **Modern Technology:** use it in infrastructure and construction.

- h. **Encouraging public participation:** to share in enhancing and developing the old district.
- i. **Building designs: Design codes:** implement design codes to control:
 - schemes and Style of building Architecture design
 - Building Materials
 - Structure system
 - Facades colors and style
 - Buildings roofs
 - landscape architecture

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Understanding the Negative Impacts of Rigid Institutional Framework on Community Development Projects: A Case From Bangladesh

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Abstract

The goal of this article is to analyse the participatory process of development projects. Drawing upon my professional experience in a project called Pre-Poor Slum Intergration Project (PPSIP) which was based in Comilla, Bangladesh - I argue that development projects dominated by rigid power structures inside and in-between institutions inhibits community participation that reflects the actual need of the beneficiary group; and as happened in this case, produce results that do not serve the people in real need but rather only serve the purpose of the institutions that manage the project, more so the institutions having higher degrees of power. In this article I try to combine insights gained from our field experience and literature study on *post-politics* and *power in planning* in order to sketch out the stakeholder institutions' interest, capacity and enrolment in order to understand how socio-relational dynamics as opposed to technical procedures shaped the project. In this project participation from the community was ritualistic- serving only a face-value, the operational team on the field were devoid of power to take important decisions or challenge the institutional framework that they were part of, and at the same time institutions with higher degrees of decision making power were not sufficiently involved with the realities of the field. I conclude that in order to make participatory process really work, involved institutions should not limit their efforts in repetitive consensus building exercises based on pre-conceived ideas and traditional methods of community development.

Keywords: Low-income housing, power in planning, participatory development, institutional framework.

List of Acronyms

ACHR: Asian Coalition for Housing Rights
ACCA: Asian Coalition for Community Action
BID: Brac Institute of Development
NGO: Non-Governmental Organization

NHA: National Housing Authority
PKSF: Palli Karma-Shahayak Foundation
PPSIP: Pro-Poor Slum Integration Project
UPPR: Urban Partnership for Poverty Reduction

1. Introduction

Bangladesh is a densely populated country. Rapid urbanization has put significant strain on cities and towns of Bangladesh. According to a 2009 study, around five million housing units are needed in Bangladesh to address housing shortage, and majority of population without adequate housing are from the low income group (NHA, 2014). Housing is predominantly developed by private market in Bangladeshi cities and the market is driven by profit. A large portion of the population cannot avail good quality housing available in the market; that is when the illegal settlements or slums come in the picture.

There are around 50,000 illegal and low income settlements in Bangladesh's 29 largest municipalities (NHA, 2014). Poor housing materials, high rent, limited access to public services, densely crowded and unsanitary living conditions, lack of tenure security etc. are some characteristic problems of these settlements. The settlements lack healthy living environment that is necessary for well-being of adults and children. By now it is well established that slum eviction is a violation of basic human rights and it involves high social and economic costs. The government is becoming increasingly aware that slum-development/integration efforts can be the appropriate approach.

The government has attempted to perform integrated approaches to slum development with the help of international development organizations such as UNDP, UK Aid etc. Urban Partnership for Poverty Reduction, in short, UPPR is such a project which runs in 21 cities of Bangladesh. In seven years until 2015, UPPR has successfully mobilized and empowered slum communities (especially the women) to develop their own savings, infrastructure etc. With UPPR, some communities have now started to also develop housing (UPPR, 2011).

PPSIP (Pro-Poor Slum Integration Project) started with an intention to expand UPPR's efforts with housing development.

Participatory design/planning is a central element in many contemporary slum integration initiatives as in the case of PPSIP. The main objective of such participatory projects is to assist disadvantaged individuals and groups in changing their own living condition; and to do this by valorizing local knowledge and resources. Participatory design/planning projects bring people from different social-educational-financial backgrounds around the table in negotiating terms. Often the interests and enrolment are too difficult to be determined in preliminary phases. Eventually even the most community-centered/ democratic project might derail from its goals due to obdurate power hierarchy among stakeholders. Through this research I try to understand and decode related stakeholders' and project participants' interest, capacity and enrolment in different projects and explain whether or how structures and dynamics of power relations in these projects serves the beneficiary group.

1.1. Research methods

This is a qualitative research. The main insights of the study is drawn from my professional experiences in the project PPSIP and my involvement in other activities with the architects who were involved in this project. A vital part of empirical understanding comes from active participation in facilitating and participating in workshops, community visits, interviewing locals, architects and NGO representatives etc. Through extensive report writing and journal keeping, I have made observations on how participatory processes are carried out, how the communities and community leaders respond to programs, or how professionals respond to communities' concerns and so on. Active involvement in other slum development projects as community architect have also allowed me to sketch out the problems in a broader scale and also understand ethical positions and interests of different actors in similar projects. A number of research questions which have guided this research:

- 1) How accurately do the project understand the beneficiary community's social reality, needs and resources? How far do the processes and mechanisms of the project resonate with community's needs and aspiration?
- 2) How is power exercised by different actors in the process?

2. Literature review

2.1 Strategic Spatial Planning

The interpretation of planning systems with an actor-structure perspective by Van den Broeck and Servillo in their article, *The Social Construction of Planning Systems: A Strategic-Relational Institutional Approach*, provides with an understanding of dialectic interplay of agency and institutions shaping the specificities of planning systems, and thus influencing external changes (Van Den Broeck & Servillo, 2012). According to the authors, along with its technical role of economic and social development, changed courses of spatial planning also focus on democratic decision-making process, empower weaker groups; changes in actors and social groups and their positions and practices also bring complex changes in relevant institutions and agency. These dynamics can be interpreted as the effect of non-dominant groups challenging the dominant group in planning system. They argue that dialectic among hegemonic and counter-hegemonic groups have transformative power in planning system, because counter-hegemonic groups are able to bring changes in institutional frames through action.

Albrechts in his writings about Strategic Spatial Planning has insisted a shift in planning style which is based on designing “shared futures and the development and promotion of common assets.” The essence of SSP is also to find alternative approaches to “instrumental rationality”. This alternative way refers to value rationality, a method of making dialogues where value based images, which are embedded in specific contexts, are generated collectively, validated by belief, practice and experience. This method is a reaction to the trend of making “future

that extrapolated the past, and maintains the status quo”. This approach includes reaching the ‘other’ part of the population, who are victim of prejudice and exclusion; and giving them the power to create their own image, and to take into account the “unequal balances of power” (Albrechts, 2004).

2.2 Power in planning

In Albrechts’ study of power in planning, he argues that planning is essentially shaped by complicated power relations and because the dominant interests are not necessarily always in line with the “force of better argument”; the process of negotiations among plan-making actors, decision-making actors and implementation actors usually results in a consensus which neutralizes important/ significant opinions.

An important reflection is also built with Albrechts’ view on citizen’s ambivalence on power system; according to him, the citizens are not convinced of the power of informal structures and frameworks in shaping the flow of events in planning field. He establishes that, although dominant power relations are not easy to change, empowerment has the potential to support collective efforts to change such relations. Albrechts argues that spatial planning, with the help of a number of mediating instruments and processes can take steps forward to achieve participative democracy. (Albrechts, 2013)

2.3 Post-Politics

Our experience in PPSIP has inspired us to think about participatory planning in a critical way. Sometime participatory planning becomes a buzzword, something which certifies a project as socially sustainable. Reading on post politics has served us with understanding of why only consensus building is not enough in establishing rights and justice. In his presentation on post-politics, Metzger explains how post-politics refers to a number of aspects of contemporary planning practices that are deficient in many perspectives; these practices have an uncritical attitude towards partnership governance and participatory consensus

building. Although the process of participation is supposed to bring clarity of opinion from different actor groups; participatory planning might instead result in nightmarishly complex governance arrangements, making it difficult to clearly understand, analyze and reproduce the processes with success. Because many different actors are involved and their interest, stake and enrolment is not always clearly sketched out, it becomes difficult to assign authority to actions. The literature on post-politics also highlights how participatory planning might sometimes be used as a mean to suppress dissent on difficult issues; this happens because all actors sitting around a table are not given equal right of say what they have in mind. Thus in reality, participatory process only serve a part of the purpose, not the whole of it- it might bring people who were deprived of right of opinion in the scene, but the agenda of discussion might not allow everyone to properly voice their concern, and at the end of the day, it's the most powerful actor whose interest will be served. This way consensus building only works as a way of social control by reducing the possibility for other actors to oppose the most powerful actor.

An important aspect of the post-political approach is the recognition of this conflict of interest and accepting that the political difference should not be suppressed, rather expressed on public platform, so that they are “explored and articulated in ways that can contribute to “taming” potentially violent antagonism into democratically productive agonism” (Metzger, 2016). Agonism allows for “fundamentally opposed political ideals and interests to play out against each other in democratically acceptable forms based on – if not sympathy or understanding – at least a mutual recognition of legitimacy and respect for difference” (Metzger, 2016).

Irina Velicu and Maria Kaika's paper animates the story of years long anti-mining struggles in Rosia Montana, Romania with a theoretical basis adopted from Jacques Rancière's writings

on postpolitics. Rancière argues about consensual politics that, “within an established framework, disagreement can only be articulated around opinions and values or around best solutions for a contested situation. The situation itself, the framework itself within which this dialogue operates (e.g. Continuous development, neoliberalism, etc.) is not (supposed to be) contested” (Velicu & Kaika, 2014, p.3). So, to make changes that matter, it is important that the framework within which a project operates should remain flexible to some extent.

3. Background of Pro-Poor Slum Integration Project

3.1 Pro-Poor Slum Integration Project

Pro-Poor Slum Integration Project or PPSIP started in 2014 and aims to complete implementation in 2021. The analysis of the case will firstly illustrate the thematic guideline of the project which is extracted from multiple reports (NHA, 2014) and then identify the complexities of implementation in the first several months of the pilot phase of the project.

The objective of Pro-Poor Slum Integration Project is to improve shelter and living conditions in selected low income and informal settlements in a number of municipalities in Bangladesh. The project also aims to develop infrastructure, e.g. road, drainage etc. in these neighborhoods. An additional focus of this project is to introduce collaborative learning in poverty stricken urban areas with the means of Community Support Centers. The beneficiary communities and municipalities are selected through strategic steps and the project aims to scale up the development endeavours to additional municipalities in the future through demonstration.

3.1.1 Integration of policies

The project reflects Bangladesh’s Seventh Five Year Plan. According to this, “specific priorities of housing development are: (i) enabling land markets to work efficiently; (ii) improving the mechanism for financing housing and (iii) encouraging participation of the private sector, community based organizations, and non-government organizations to

participate in service provision, particularly through policies to support inclusion.” (Seventh Five Year Plan (FY16-20) , n.d.) The National Housing Policy (1993/2004) recognizes the rights of the inhabitants in slums and informal settlements. This further focuses on the development of alternative housing supply programs to address the needs of the economically marginalized group.

3.1.2 Community driven approach

This project is designed with a community-driven and people centered approach. It adopts the Asian Coalition for Community Action- ACCA approach practiced in different countries of South-east Asia. The approach is based on building funding capability within the community and empowering community people to improve their own living conditions. ACCA includes a people centered approach to slum upgrading, including tenure and housing rights. The first step is community mobilization and organization- gradually building social cohesion through collective action.

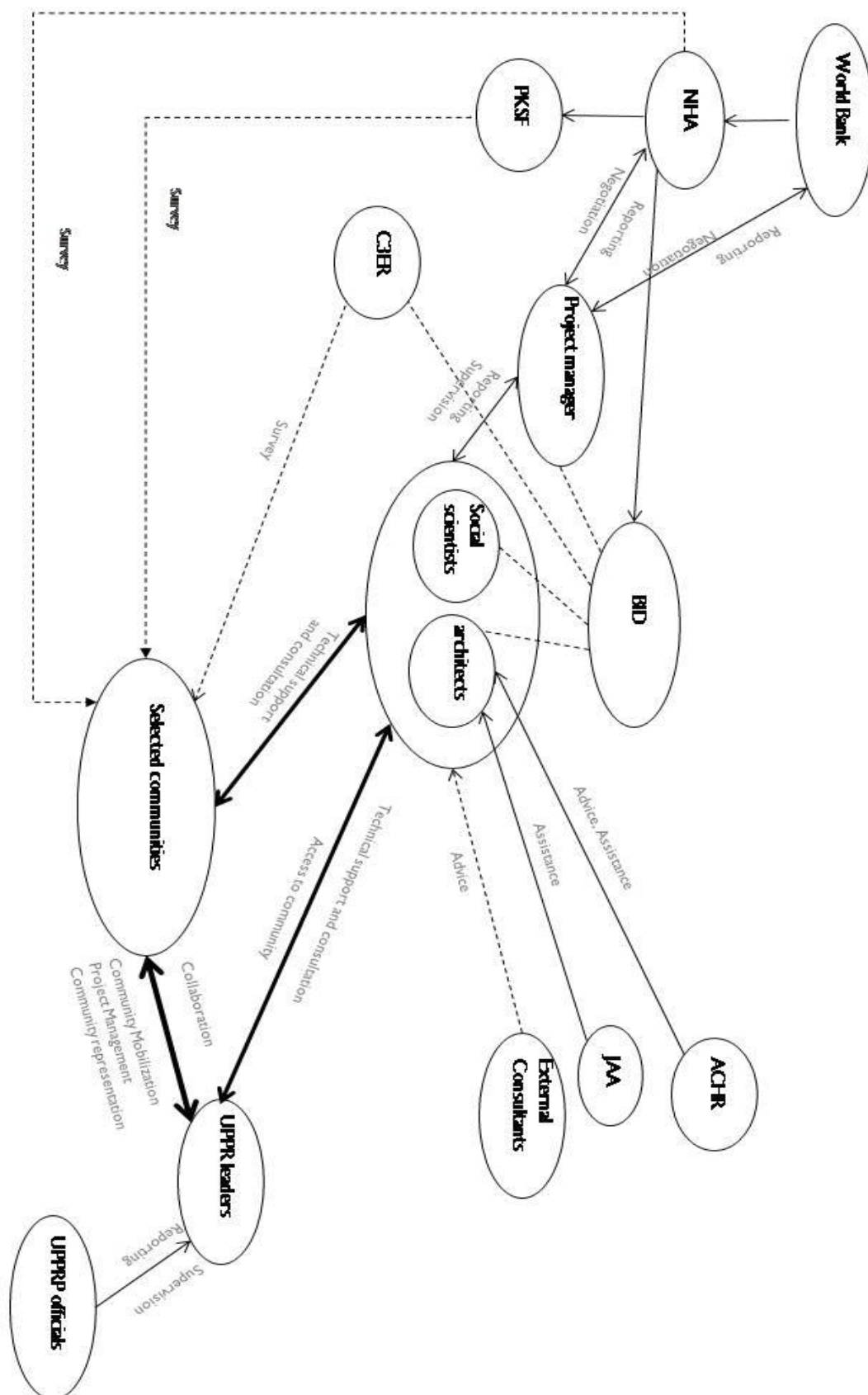


Figure 1: Diagrammatic representation of Actor relationship and enrolment in PPSIP

ACCA then provides loans for larger housing projects and supports communities with architectural and planning assistance for site layout and design. This big and small funds goes to a city as a set of funds in order to make city-wide development. In this mechanism, in order to sustain the process, communities are mobilized to be connected by networks so they can take collaborative action towards common habitat development goals. The solution comes through forming larger- scale revolving funds; all involved communities take part in it – these funds are called community development funds (CDFs) and they may operate at different levels: the district level, city level, provincially or even nationally.

ACCA funds pass through a city level CDF (Community Development Fund) rather than going directly to the community. This CDFs can also be supplemented by a welfare fund and an insurance fund. CDF also serve as the institutionalization of community processes while it incorporates multiple different stakeholders, such as community members, academics, NGOs, and government officials. ACCA supports communities in acquiring formal land title through negotiated purchases, or securing land grants or long term leases through communication with land authorities. ACCA encourages the communities to develop their savings, so they can avail other sources of finance (e.g. Bank loans). Successful communities are linked with other communities on the city level which provides them the opportunity to learn from each other's experiences, links city wide savings efforts and through this, communities feel empowered and connected. (ARCHER, 2012)

3.1.3 Partnership with UPPR

The project is designed to work with cohesive community groups of UPPR, who already has a history of savings, and are experienced in planning and developing small scale infrastructure projects, e.g. neighbourhood road, toilets etc. Urban Partnerships for Poverty Reduction Project (UPPR) started in 2000 with organization and mobilization of the community, savings

and livelihoods programs, and simple infrastructure development through community contracting with awards of small grants. Until now, in 21 different municipalities of the country, UPPR communities manage 30,000 primary groups organized under 2,588 community development committees. With community collaboration, they build community action plans to implement livelihood programs and basic infrastructure development. Up to date, UPPR has over 5 million USD savings rotating among 26,000 community based savings and credit groups. UPPR started in many municipality an effort to control viability of community based lending products for housing, this is called Community Housing Development Funds (CHDF). The PPSIP project aims to broaden these operations with the means of housing and further infrastructure development.

3.1.4 Institutional plurality

The national-scale project draws on expertise and capacities from different institutions. The project fund (a total of USD 50 Million) is lent to Bangladesh Bank by International Development Association (IDA). In this project, the housing finance for the urban poor comes through community based lending models. That requires development of a number of tailored funding products (e.g., personal, joint liability, group guarantee etc.) with which households will get access to credits as qualified borrowers, the financial models are to be developed by Palli Karma Sayahak Foundation (PKSF). National Housing Authority (NHA) is responsible for employing technical consultants for environmental and social assessment and implementation of the project. For the pilot phase of the project, NHA employed a number of institutions affiliated with BRAC University- C3ER (Climate Change and Environmental Research) , a team of architects and a team of social scientists from BID (Brac Institute of Development).

3.2 Selection of communities

The pilot phase started with an aim to test feasibility of the project. This required selecting communities which will help the project to succeed in the pilot phase, so that the efforts can later be more or less replicated for the next communities and next towns.

Through many stages of shortlisting five towns were selected- Sirajgonj, Narayangonj, Comilla, Barisal and Dinajpur. The consultant teams visited the five towns to rank them in an order of 'readiness' of each town, so that they know from in which town the pilot phase should start. The consultant team shared the prospects of the project with local authorities (District commissioner, mayor etc.); ranked prospective communities through meetings with community leaders and visited communities. From this, the consultant team prepared a list of strengths and threats for each town. Both in the cities of Comilla and Sirajgonj, there is good cooperation within communities and among communities and local government. However, in Comilla a new City Corporation masterplan was in the process and starting the PPSIP project in Comilla could mean incorporation of slum development initiative in the masterplan, and that could facilitate in creating a good example of urban planning for other cities with slum problems.

The initial activities which led to selection of the first five communities were meeting with UPPRP cluster leaders, local NGOs and ward councillors. Through meeting these local representatives, 71 communities were shortlisted. After this shortlisting, the selection criteria were revised in order to find communities which could increase the likelihood of success in the pilot phase, these criteria were, in order of importance: availability of land, performance of savings and credit scheme and possibility of demonstration of various housing options (defined by geographical quality, morphological setting of household etc.).

With the revised criteria, 11 high ranked communities were chosen from this list and categorized on the basis of some characteristics or issues- pond-side communities, lake-side

communities, embankment-side communities and socially-disadvantaged communities. This categorization was made with an attempt of forming networks of communities, so that as the project progresses, communities can easily find solutions to their problems with the help of their network.

Eventually, through further revisions of indicators, five communities were chosen for the pilot phase. These communities are: Molobhipara Baburchibari, Shongraish, Hatipukurpar, Shubhopur Gangpar and Uttor Bhatpara.

Though the inclinations of different groups are not explicit, it can be imagined that varying interests in different stakeholders led to a time consuming trial and error process of selection. Regardless of what consultant teams, city representatives and community representatives suggested, a major deciding factor that was set by the design of the program was beneficiary communities' ability to repay loan and their access to legal land. How the deciding power of certain stakeholders played role in the selection process is further elaborated in the next section.

3.3 Reflections on the community selection process

Legal access to land and capacity to repay loan were two major criteria in the community selection process. However, in the communities of Comilla and Sirajgonj, it is rarely the case that a family who has legal and private ownership and are well-off enough to repay the loan easily- are in dire need to build a new house. Comparing to the ultra-poor slum communities, these families have good houses which only need improvements or repairing. According to Islam, the households in communities of Sirajgonj privately owned their lots. The income of the majority of these household is about 30,000 BDT while the target group decided in the project was of families with monthly income of BDT 7000-15000. Those families only needed improvements, such as a good kitchen or a pucca (permanent) roof. (Islam, 2016)

The infrastructural improvement objectives included: 1. Developing access with improved roads 2. Ensuring electricity supply 3. Ensuring gas supply 4. Developing proper waste management 4. Developing drainage for waste-water 5. Ensuring water supply. The first two communities (Shongraish and Moulobhipara) to work with already had basic provision of all these infrastructure, except good drainage and waste disposal system. According to the project design only communities who take part in the housing loan program will receive free of cost infrastructural improvement support. So eventually, the project was practically functioning like a bank housing loan program addressed to lower-middle/middle income families, instead of a slum improvement project. The consultants on field were increasingly uncomfortable with this pattern, but nevertheless, they would continue with the project if the community agreed to the financial scheme that was presented.

A number of communities without land security were highly ranked in the selection process because of cohesion in the community, willingness etc. In spite of being the least developed in terms of infrastructure, housing, land security; those communities were not chosen. It was decided that in the pilot phase the project will work with only communities with legal access to land because the time period for pilot phase (2 years) was too short for any kind of acquisition of land or mitigation addressing land conflict. Another major selection criterion was presence of community cohesiveness and willingness to take part in the project. The communities were always approached through the UPPR leaders and mostly their cooperation and involvement was taken as indicative of the 'readiness' of community. Naturally, UPPR leaders' interest were very much associated with the programs and achievements of UPPR. Through UPPR programs, they have built saving activities and performed infrastructural projects (communal toilets, communal water taps, improves roads etc.). These processes have gradually improved the communities' socio-physical environments, and equally importantly, empowered the community women by capacitating them with leadership roles and so on.

These leaders who worked for the communities for many years seemed to be feeling out of place with the new project when the programs of PPSIP were not in line of UPPR projects.

Although the selection involved local people, eventually it was top-down process. Producing some visible result (as housing) in the pilot phase would be necessary to produce a demonstration effect for the project, and hence the criteria were designed in a way to achieve that goal; but some criterion had a strong focus on the interest of the Bank rather than the communities. In other words, the “community-driven” project could not eventually motivate any community to continue with the project.

3.4 Context of Comilla

Comilla is a district situated in the east of Bangladesh. The urban population of Comilla is 7,07,597 and population density is 1712/ sq. km (BBS, 2014). The landscape of Comilla is defined by water bodies; rivers (Little Feni and Gomoti), natural lakes and man-made ponds of small and large size. While the water bodies served as water source for city neighborhoods in the past, with the introduction of piped water, the developed neighborhoods do not need to use them now. Many ponds are now a days being filled for developing structures. However, for the disadvantaged neighborhoods, the ponds still remain a source of water for household purposes- cleaning clothes, utensils, bathing etc. Locals from slum communities say that, the pond banks serve as gathering spaces for them, especially in summer when power-cuts are frequent and dense slum settlements are difficult to live in. The ponds serve as an important source of water also in case of fire-hazards, especially for neighborhoods which are not easily accessible to fire trucks.

Despite the city’s role in shaping the history of the country (and of the region before the formation of the Republic) over many centuries through its economic and cultural presence; the city has received little urban, infrastructural or technological upgrade in recent decades. Ill equipped to function as a modern city, it now struggles to cope with aggressive urban

development. As with many cities in Bangladesh, whose infrastructural and resource capacities are collapsing under the weight of ever growing demands to deliver economic value and to take in rapidly increasing population, the city of Comilla is being regularly cut and stitched to enhance its economic and industrial production capacity and to accommodate the growing number of migrant inhabitants. These modifications on the cityscape have taken a heavy toll on the quality of life of individuals and entire neighborhoods: more so among those less privileged.



Figure 2: *Skyline of Comilla.*



Figure 3: Moulobhipara Baburchibari community.

3.5 Project activities on the field

Shongraish and Moulobhipara were two of the first communities who participated in the project. Both communities have savings committees with UPPR and have developed their infrastructure (especially communal toilets and roads) over past years with UPPR development projects. The communities were first briefed in detail about the project- its objectives and program. Then, based on discussions with the UPPR leaders, the architects fixed project boundaries for each community, i.e. parts of a community were chosen as defined by their geographical characteristics, or bounded by infrastructures. However, a possible extended area was also decided for future consideration.

With the help of ARCHITECTS' TEAM consultants, the communities then prepared community maps to locate the respective positions of their houses, toilets, kitchens etc., type of houses (permanent/temporary) and ownership of lots. Through informal community

workshop, inhabitants also discussed what improvements they desire in their living environment. These processes were performed in community courtyards or houses. While a part of the team were involved in mapping and collaborating directly with the communities, other parts of the team were involved in extracting and analysing maps from GIS databases, reviewing and appropriating building codes etc.

Along with these activities, land experts from SOCIAL SCIENTISTS' TEAM started to extract and analyze land status of other communities (Shubhopur Gangpar, Uttor Bhatpara etc.) on the list in order to facilitate future negotiations about land. However, in spite of numerous attempts from the SOCIAL SCIENTISTS' TEAM and ARCHITECTS' TEAM, negotiations with the Land Ministry could not be made because local government was not very helpful. It was difficult to make negotiations for land transfer from other ministries to housing ministry. The project applied to the Prime Minister to facilitate land negotiation processes, but didn't receive any response.

During community meetings, the consultant teams shared with the communities about successful community-led slum improvement projects in other South-east Asian countries (Burma, Fiji, Vietnam, India and Philippines). Through sharing about successful examples, architects' team attempted to create dialogue with the community about the importance of combined efforts of professionals and locals in creating cost-effective design solutions.



Figure 4: Community map of Moulobhipara (NHA, 2014)



Figure 5: Consulting design with house owner in Moulobhipara (NHA, 2014)

3.6 Financial mechanism

According to the financial scheme, one household will be granted a maximum amount of BDT 2,00,000 (USD 2548) as loan which they have to repay in 5 years with an interest rate of 15%. A household who takes a BDT 1,00,000 (USD 1274). loan would have to repay a total of BDT 1,42,740 (USD 2379). This fund will be disbursed from World Bank as loans, through Bangladesh Bank and then a local NGO and finally to a saving committee that the communities would form for this project.

In Shongraish, the first response to the numbers was that the interest rate is too high for them. In this project architects and social teams were the only group directly communicating with the community and naturally, because finance is not their core skill, neither of this group had very clear understanding of how the financial mechanism works. PKSf and the finance team from BRAC University only agreed to collaborate from Dhaka. With the absence of a financial team to explain, decode or modify the financial scheme properly, the consultant teams on the field attempted to broaden their skills on this issue with the help of visiting consultants, studying financial models from other projects etc.

Conflict arising on interest rate became a recurrent event during a particular phase in Comilla. Although the project derived its participatory design approaches from ACCA projects, a major difference between this project and any ACCA was the funding mechanism. In ACCA funded projects the fund reaches to a city-wide community network in the form of donation. Therefore, when it is disbursed within community household in the form of loan the interest rate is lower and also because the loan is repaid to their own community-network, the participants are less hesitant to repay the loan with an interest. Islam, one of the community architects says, “We were talking about examples like Baan Mankong, Bang Bua and CODI, we didn’t probably yet realize the biggest difference between PPSIP and those examples were the funding mechanism. In Thailand the communities were receiving grants, and here the

community was offered loan. That makes all the difference. We were too focused on the physical product, the housing.” - (Islam, 2016).

Eventually no productive dialogue took place between the community and PPSIP and the consultant teams decided that before the financial scheme is revised to fit communities' affordability, it was of no use to design/plan further along with the community. However, the architects' team carried on with designing infrastructure, housing prototypes, cost estimation etc. so that they can further consult with the community when and if the conflict is resolved and the social scientists' team would continue with the social awareness program.

The consultant teams didn't have any clear idea about the financial mechanism even when the project moved to the next city Sirajgonj after working in Comilla for almost an year. According to Islam, the architects' team was aware that discussing financial mechanism in detail will only complicate the situation, so they only performed programs on housing and land. Design workshops, community mapping, interviews etc. In order to create dialogue with the families about their aspiration of housing improvement within a cost frame of BDT 200000 (USD 2550) per household.

3.7 Disputes among different stakeholders

One of the reasons why the community lost trust in the project, was because too many stakeholders were involved in this project and they visited the community at different times with different agenda. The values, working method and language of communication were different in all these different teams.

Conflict among consultant teams, community leaders and current UPPR officials proved to be strongest factor for certain disruptions along the project. The UPPR town manager, the official responsible for supervising UPPR efforts in communities, although verbally agreed to collaborate with PPSIP, was not fully convinced of the importance of PPSIP in “his” communities. He complained that he did not feel enough involved in the project. His

dissension proved to be a deciding factor of UPPR leaders' non-cooperation with the project, just as the leaders' non-cooperation with the project closed the line of communication with the communities. When architects' team attempted to bring ACCA fund for housing and infrastructure improvement in communities out of UPPR network, the disagreement from town manager leaders grew even stronger because this effort seemed to him as a token of contesting UPPR's capacity.

The different consultant teams in PPSIP could not fully utilize the potential of a multi-disciplinary professional environment. Only architects' team and social scientists' teams were mainly working in the field. Except periodical meetings and site visits, the other stake holders (representatives and professionals from NHA) were not involved in the field for long periods of time. This resulted in conflicted understanding of the context, goal and therefore compromising of the field professional's capacity.

According to Islam, the leading team on the field was the architects' team, and they were not fully equipped with the vast array of organisational skill that was required for a project like this. The limits of their skills were constantly challenged by cumbersome bureaucratic processes. The mind-set and working method of several groups were very different. The architects' team was mobilized by an ambitious humanistic result, the finance team was too pragmatic to find an alternative mechanism. An integrated approach of socio-technical innovation was missing (Islam, 2016).

4. Conclusion

The design of the project addresses grave issues as housing and infrastructure crisis in urban poor, intends to adopt a community-driven approach in integrated slum development. Yet, in the pilot phase coordination between communities and the project has failed in unfortunate ways. Two main reasons can be sketched out in order to understand why this happened.

a. Participatory design/planning was seen in an uncritical way: The notion of participatory design was accepted as if when the community participates in decision making processes, everything falls in place magically. Even if community always stays in the center of the discussion, the project actually failed to measure their financial capacity, eventually it was made sure that the Banks profit through this project. Not only participation from the community was ritualistic, serving only a face-value, the task force on the field was also put in a complete dead-end situation, they were always under pressure to meet World Bank's criteria. Even though consultant teams were free to take decisions on the field, practically they were merely executives offered with remuneration, devoid of power to make the really important decisions or challenge the institutional framework that they were part of.

b. The interest and enrolment of different stakeholders were not realistically sketched out: The design of the project had foreseen high risk around stakeholder participation and institutional consensus. This risk could not be averted. The unequal power dynamics could be changed if there were less number of stakeholders involved. With repetitive consensus building exercises, it was difficult to assign responsibility to any one actor for an action, the consultant teams on the field were completely perplexed in the process of considering every related stakeholders' interests before and after any activities they carried out on the field. Although World Bank, NHA, PKSf etc. had more power in taking decisions, their enrolment in the project was not sufficient. On the other hand, the task force on the field was responsible for continuously reporting to these stakeholders. Although they could well realize how these dynamics were affecting the project negatively, there weren't any stage available which allowed to flexibly negotiate these inequalities when the project already started; the power inequalities were too strong to mediate and the consultant teams could not deviate the fixed structure, although unlike the niche development projects, the architects did not have to

search for funds etc. and had institutional support, they failed to create any real impact on the field.

It is agreeable that the project deals with urgent planning issues and started as a way forward to incorporate societal changes into the country's planning field, but it certainly will take alternative efforts to bring real change in the field in future.

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Empowering the urban poor through participatory planning process: a case from Jhenaidah, Bangladesh

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List of Acronyms

ACHR: Asian Coalition for Housing Rights

NGO: Non-Governmental Organization

POCAA: Platform of Community Action and Architecture

SAFE: Simple Action for the Environment

Abstract

The paper analyses a community development project based in Jhenaidah, Bangladesh, which evolved through broadening social capital among slum communities and formal institutions in order to bring positive socio-spatial changes in the neighborhoods. Till date, nine disadvantaged communities have formed a network for city-wide community development, have started to build and manage their own funds, built better houses for themselves, and through this process have managed to draw attention and support from the local government. Started by a small group of architects and a local NGO in 2015, and still broadening its scopes, this project can be regarded as a successful example of people-led development initiative, especially in a context where most development projects exercise limited participatory values and are dominated by unequal power dynamics. The positive impacts brought with the project were a result of a continuous dialectic process involving the communities and a small pool of professionals. Active presence, patience, participation and trust in people-led process were important tools, which resulted in transformation of power within the communities. However, we realize that process of growing and maintaining a people-led development project is shaped by a myriad of socio-political issues and can fall apart not only due to the indifference of the local government but also due to self-sabotaging patterns emerging within the communities, sometimes because

the people fail to see the bigger picture or become too cautious out of self-interests and lose faith in cohesiveness. Hence issues like scaling up and economic sustainability still concern those, who can see the community-driven development process with an unbiased attitude. The overarching goal of this article is to sketch out these issues with the help of empirical understandings from the field and theoretical findings from literature on social innovation and power in planning in order to understand how to work balance between local and institutional management of projects in order to avoid perceiving bottom-up and top-down initiatives in a dualistic manner.

Keywords: Community- led development process, socio-economic sustainability, socio-politic dynamics

1. Introduction

Urbanization in Bangladesh is moving at a rapid pace. Between 1961 to 1981, the average urban growth rate was 8%. The present average growth rate is about 4.5%. According to the population census of 2001, the share of urban population was about 23.29% and at present it is approximately 37%. The importance of urban development is emphasized in terms of its role in the national economy. More than 60% of the national GDP is derived from the non-agricultural sectors that are mainly based in urban areas. The expansion of urban economy leads to the growth of urban population and concomitant haphazard urban spatial growth without planning. (District town infrastructure development project (DTIDP, 2015)

The case study is from a city corporation in the western part of Bangladesh, named ‘Jhenaidah’. Jhenaidah is a medium sized municipality of Bangladesh. Jhenaidah Municipality stands on the bank of the Noboganga River. Located on 210 km west to the capital city(Dhaka) Bangladesh. Jhenaidah Municipality was established in 1958. This is a class “A” municipality. The municipality consists of 9 wards and 33 *mahallas* (neighborhoods).

The national focus on economic development has taken Bangladesh a long way, even with some complex problems (overpopulation or natural hazards). In a short period of time, Bangladesh is on the verge of becoming ‘middle income country’ from ‘developing country’. The economic development of the cities is driving people to come to the city for work, and Jhenaidah is no exception. So, when new people are coming to the city everyday, the need of housing is increasing.

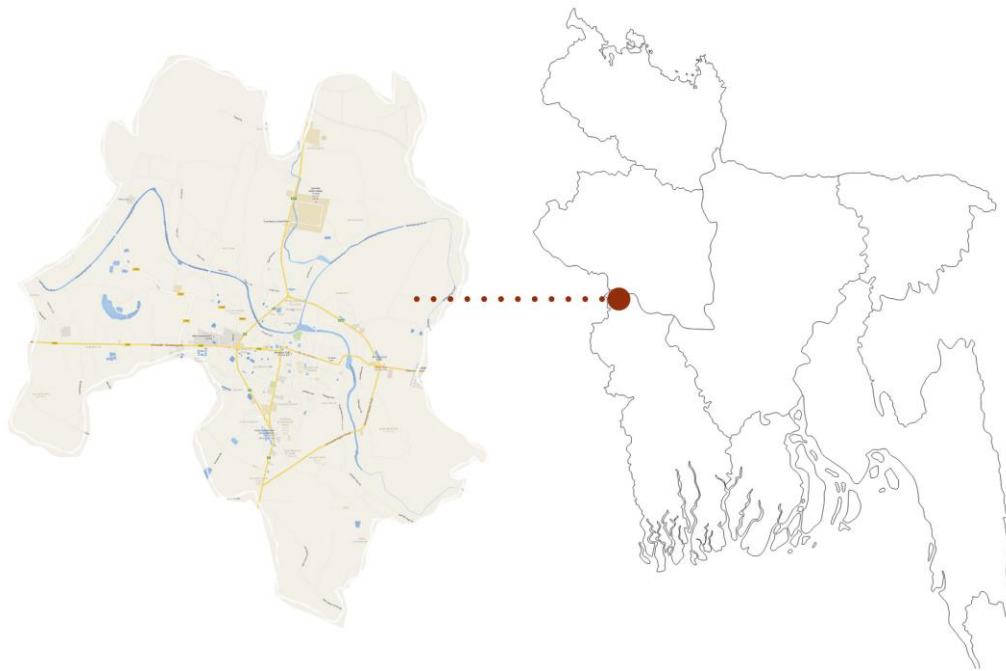


Figure 1: Jhenaidah, on the map of Bangladesh (Google map, 2016)

2. Background of the community-led development project

Initially, five low-income communities had formed a city-wide network. Currently, this network has 9 communities as members and few more as interested. The basis of creating the network was to start saving group within community. The member communities have been saving since 2015. After the communities started saving, they were eligible to apply for a seed fund from ACHR (Asian Coalition for Housing Rights). ACHR usually gives two kinds of fund for city-wide development; fund for building houses and for small infrastructure upgrading, such as waste management, drainage or community space making. City-wide network at

Jhenaidah has received funding from ACHR for two consecutive years. The idea is to include this as seed fund in a revolving loan system. Two beneficiary communities have developed housing with this fund and they will be repaying to city-wide network. Then the next communities in pipeline will receive the fund. The network aims to expand the fund from their own savings along with the external funds. Since 2015, the communities of Jhenaidah have built 45 houses in total. In the first year (2015-2016), Mohishakundu community built 20 houses. In the second year the same community built 8 more houses. In the second year (2016-2017), Vennatola community built 18 houses.



Figure 2: Geographical locations of communities of the city-wide

The city-wide network has received assistance from Co-creation Architects, Platform of Community Action And Architecture (POCAA) and NGO Alive. The initiative also received advice from Jhenaidah municipality, department of Architecture of Brac University, Polytechnic institute of Jhenaidah, Jhenaidah chambers of commerce etc.



Figure 3: the previous and present condition of housing

Co-creation Architects is an architectural firm, which provides services to both low-income and middle-income group of people. POCAA is a platform for group of architects who introduce themselves as ‘community architect’. POCAA began its journey with an intention to work for disadvantaged communities (though not limited) by housing and community development. Alive is a local NGO, active in Jhenaidah and some other cities of Bangladesh. They have collaborated with POCAA for housing development project. They are responsible for mobilizing, skill developing and construction supervision in all communities.



Figure 4: City-wide network and support groups

3. Methodology

The paper has taken qualitative approach for the research. The researchers had spent several months in Jhenaidah as ‘research stay’. During the research stay, a number of activities had been carried out, starting from **community visits, interviews** of architects, NGO personnel and community members. **Focused group discussions** were done with different communities, in presence of community members (mostly women) regarding specific issues or topics. During the research stay, a lot of **informal discussions** with the community members took place, which provided insights and **observations** that usually is unreachable through formal meetings or discussions. **Workshops** can be called one of the important parts of the research stay; a vital part of understanding comes from active participation in facilitating and participating in workshops. Several workshops were organized to recognize the strengths and resources available in the local context. Through extensive report writing and journal keeping, the researchers made observations on how participatory processes is being carried out in this case.

4. Research question

There had been several attempts to address the housing need in past few decades in Bangladesh. Housing units funded by government often see a common scenario, the poor beneficiary rent the new house and leave for a cheaper option in a slum. Then the question arises if the housing project lacks the real socio-economic scenario of the people from whom the projects were aimed to .A pool of experts felt the need of bottom-up approach rather than design a low income housing project in a top-down manner. However, understanding the depth of participation in design and planning still a challenge for development professionals. The research question is formulated as following to address these issues.

1. What does community-led planning process mean and how to ensure participation in planning
2. What changes can be brought in community people’s lives through participation?

5. Findings positive influences of the community-led process

The greatest difference between community-led development and other organization-led development lies in the freedom given to the communities. In the case of Jhenaidah city-wide community development project, the communities exercise freedom in designing and managing finance, decision making. They are equipped with tools to acquire information and to prepare physical planning upgradation. Moreover, they are able to spread the knowledge and sense of community strength through networking. The process of achieving these is elaborated in the following section.

5.1 Empowerment through group saving

Saving as a community build-up tool has various aspects. This is the first step towards participatory action, where the community takes responsibility to manage their saving, create a central fund from it and decide how the fund can be used in different development projects. It is not only about collecting money, it is also about collecting people together. "Saving in a group and expressing opinion is related in communal power dynamics. When a group of people starts to save together, every individual becomes more aware of his/her right in decision making, as they feel their monetary input is valuable for the whole group." (Kabir, 2018). According to Farzana, one of the key architects of the project, saving is becoming community's strength. In her words, "Many communities expressed the feeling that they never had this amount of money what they have today together! It was possible because of group savings." (Farzana, 2016). The dignified part of the process is that the low-income communities do not need to seek aid; rather they express their ability to make change with some external support. In this case, the support was the seed fund that they received from ACHR. This support has accelerated the process in the beginning and people could see physical changes in a short period of time.

Over the time as the saving grows bigger, the community member are also being able to take small loan for emergencies or investing in small entrepreneurship. This has in two positive results: firstly, the community members are becoming independent from outsider micro-financing organizations and trrier loan cycles. Secondly, they can think about economic development through businesses.



Figure 5: Women group is considering to invest their time in craft-based product making (Farzana)

5.2 Financial mechanism design by community

As mentioned before, after continuing saving for several months, Jhenaidah communities received fund from ACHR for housing development. Each of the participant households could receive a loan of maximum 1,00,000 taka (around 1300 USD) to invest in repair/ extend their house. In this funding mechanism, the money comes to the city-wide network as a grant, the city-wide network chooses beneficiary community savings group to provide a no-interest community loan. Individual households then avail the loan. Every household who receives a loan will have to return it to its own community savings committee with a certain percentage

of administrative cost. The community saving groups have the freedom to decide loan repayment conditions as per their capacity. The first community to develop their housing decided the amount of administrative cost (around 2.4%) that each household agreed to pay with each instalment. They also agreed upon the duration (8 years 4 months) to repay the whole loan with weekly instalments. On the other hand, the second community felt the need to pay a small amount (Bdt 100 from each household per month) to the people who would co-ordinate the construction work. This community decided to repay the loan in shorter period of time (5 years). The freedom to decision making in the financial mechanism made the loan payment easier for the community contrary to any other loan system designed by outsider organisation. Usually with so many organisations working in low-income communities with micro-finance, poor people get stuck in the loop of loan payment by taking loan from one organisation, to pay another organisation.

When the seed fund comes back to a committee in the form of loan repayment, they can start to give loans to the next members of their own community or to the city-wide network to start the process in other communities. In this way, the fund revolves within the city. The first community has already built more houses with the repaid money.

5.3 Decision making by community network

The city-wide network was able to take decision about selecting beneficiary communities and the beneficiary households. To make the decision they based on few criteria. 'Community strength' was the first criteria, measured through the saving activities. The more community members trust each other, the more and longer they save together. Another criteria was to assess the vulnerability in terms of finance and situation of living condition. Thus, the communities were ranked to implement housing development project. Two communities has already finished their housing development while third community is being prepared with designing housing option and acquiring right to land.

5.4 Participation in design, planning and construction

At first, the communities prepared existing measured map of their neighborhood with the assistance from community architects. This map includes how they lived by positioning plot boundary and their owners, main houses, service structures such as kitchens, toilets, communal toilets, communal structures such as the temples, shops, infrastructure such as roads, drains, household and communal water taps etc. After mapping, community expressed their aspiration of houses through a ‘dream house’ design workshop, with the help of models. Through a collaborative design process with architects, they designed several options for houses that are affordable, low maintenance, well lit and ventilated and have better spatial arrangements.

Based on these discussions, the architects designed two prototype houses and through repetitive consultations with the community. At construction the prototypes adapted to each household need. As a result, the houses became visually unique to each other. During a discussion, women at Mohishakundu Shordarpara (the first community) have expressed how the process of collaborative design has changed the perception of their own capacities, one woman said: “We feel like now we can make our houses ourselves. The other day we were discussing about the budget to build the first story of our house and my daughter suggested that she could make it with half the money! The way apa (Architect Farzana) has worked with us, we feel like we are architects now!” (Mina, 2016).



Figure 6: House designed at dream house design workshop (Co.creation architects)



Figure 7: Children designing their desired playground

Along with the NGO Alive, the communities assigned 2/3 members as the procurement and construction management team to purchase the material and to supervise the quality of construction. “When we go as a team to source and purchase material, we explain our initiative (low-income housing) to the dealer and can negotiate a great prize for the bulk purchase” said one of the members of the procurement team. (Shorifa, 2016) Each family contributed in terms of labor to reduce the cost. At this moment, the first community is designing a community

center that can also be a school for elderly people. The second community has designed and now building a community center after the housing constructions.

5.5 Tools and information to the community

Mapping is a tool through which the people of the community (ies) visualize resources, problems, opportunities and solutions. The mapmaking process works as the first step to translate each participating households' intangible ideas about housing into something tangible. Gradually, by adding layers of information and understanding, the community collectively creates a representation of their current situation and their future aspiration.



Figure 8: Community mapping, one community teaches another community how to map

After finishing the housing project, the first community mapped existing wastewater drainage system and proposed a tertiary connection to the existing drain. This map has become a negotiating document for the community to request for that particular service from the municipality.

Arappur, a community of the city-wide network without land title, has been using map with community members' information to exercise the possibility to acquire a land. All the nine communities of city-wide network have finished settlement profiling and gathered overwhelming amount of information about each communities. These profiling have helped them to see their neighborhoods beyond its physical arrangement and identify social issues (access to services, literacy, crime against women etc.) The communities are feeling powerful with the information in their hand to negotiate for ensuring rights that they deserve from different authorities.

5.6 Networking and sharing knowledge

Moulaert, Martinelli and Gonzalez points out in a transversal analysis of socially innovative projects that local initiatives have “a symbolic, demonstrative effect on the broader urban scene, showing that change is possible... often the beginning of an interactive social learning process, blurring institutional and scalar boundaries” (Moulaert, Martinelli, & Gonzalez, 2010). We have understood this better from city-wide network of Jhenaidah. Nine communities, who live in different geographical locations of the city, have close communication with each other. The pioneer communities now acts as support group, by teaching other about mapping and saving activities. They helped to audit helped audit other communities' savings accounts and taught bookkeeping. The first community shared their experience of house designing and construction from where the second community found improvement for their houses.

It started when two community leaders from Mohishakundu visited Sri Lanka to learn community saving mechanisms from the Women's Development Bank. According to Masud (2016), this visit was a practical learning opportunity for both the support group and the community. During the construction phase, the support group and some participants from the community visited SAFE, an NGO in Dinajpur to learn about cost-effective bamboo treatment. Now the network grew so much that other communities from other city visit

Jhenaidah to learn about community action. City-wide network of Dinajpur (a municipality from north of Bangladesh), rural communities of Jessore have visited Jhenaidah and got inspired to run saving activities in their own community. Leaders from Jhenaidah communities visited Shatkhira (a municipality from south of Bangladesh) to share experience with local communities, municipality and NGO (Brac). Jhenaidah leaders are preparing to attend Asian hub meeting of in Mumbai, arranged by ACHR and SDI to share their experience about settlement profiling. Thus the city-wide networking is expanding to nation-wide networking and to international platforms by horizontal sharing of knowledge.



Figure 9: Community leader from Mohishakundu helping with book keeping in Shoshanpara community

The connectivity with institutions have continued to grow with the support group's attempt of involving more local academia and professionals in the process such as the students and teachers from the Polytechnic Institute of Jhenaidah. The support group also arranged an academic design studio for housing project with Brac University with one of the disadvantaged

communities in Jhenaidah. To involve students and young graduates is also a way to create interests for local development within academia and eventually in practice.

5.7 Change in socio-politic dynamics

A project/program that is designed to be people-centered can collapse even though participatory techniques are used. This happens when the notion of participatory design is ritualistic, serving only a face-value, people's participation is a just a box to tick in. Involving people in every step of decision making process means when needed, there should be the flexibility to change the institutional framework or financial mechanism of the project to address the beneficiary community's life realities, and if needed the political hegemony of the context should also be questioned.

In a scenario of any development initiative, just as a sense of powerlessness is common in among slum communities, a given sense of power is common among professionals or 'experts'. According to Farzana (2016b) the conducts with community was a transformative process for the support group. Within the support group, professionals helped each other to bypass their professional boundaries to gain the trust of community people. How the NGO officials and architects talked to community people also made a difference; it was about carefully deciding to let go of the sense of power or pride that one gains from becoming a professional or expert. Even something simple like conducting meetings in a local veranda sitting together with local people on a bamboo mat instead of at the NGO office in a formal manner mattered in this process (Farzana, 2016b). Understanding how life is perceived by the community means acting in a flexible manner, where the experts accept the "politics of difference- as opposed to a politics of othering" (Saunders, 2002). Active presence, patience, participation and trust in people-led process were important factors in the process.

The effect of this project on local governance has been spreading in a slow but sure fashion. After the construction of 20 houses in Mohishakundu Shordarpara, the local government has

offered increased assistance to the project. The Mayor, along with the architect from POCAA, presented these achievements in German Habitat Forum held in Berlin. Following this, the Mayor has assured the assistance to form a CDF (City Development Fund) for disadvantaged communities in Jhenaidah. He has also offered the architects with additional technical support from the engineers of the city corporation. If seen under the light of Albrechts' (2003) understanding of power, this is a critical transformation from a scenario where power-ambivalent citizens groups are not convinced of the power of informal structures and frameworks in shaping the flow of events in planning field, to a scenario where dominant relations (socio-political system or market favoring only the privileged) are changed by collective efforts supported by empowerment.

5.8 Power and gender dynamics

In the patriarchal practice of Bangladesh, women are perceived as less capable than men, which was evident in the beginning when men were the main voices in any discussion and community meeting. From the case studies and researches done by ACHR in different countries, it is actually women group who are instrumental in saving activities and community development process. The support group attempted to shift power, role and management responsibility to the women to empower them in the process. As women of the communities were involved in reproductive role inside of their households, it was easier for them to manage time than men would be able to. They have demonstrated excellent capability in physical and social mapping, facilitating design and construction of houses, and managing saving accounts.

The process has been a successful tool in breaking the stubborn barrier of gender inequality, even if in a slow pace and at a small scale. Since 2015, a great change can be noticed in behavior of the women, from being scared to speak at all in front of any male presence (then) to proudly present themselves as 'community leaders' to outside visitors (now). This shift was not easy as the male community leaders felt uncomfortable in transferring leadership in the beginning, as

if that would mean letting go of their sense of control. When the male leader of Mohishakundu was asked to transfer leadership after an instance of mishandling community savings account, he was openly skeptical about leaving responsibility to women, suggesting that women alone are not capable in managing leadership responsibilities (Masud, 2016).

6. Drawbacks found through the research

Jhenaidah city-wide community upgrading process still needs to find solutions to some complex problems. The process had been encouraging for them since there was a money flow from ACHR to realize their dreams. Now that the network needs more time to accumulate money from the repayment of loan, will the communities be able to keep patience and accept the slow process? Even after a long process of mobilizing and building (housing or infrastructure) with a community, it may fall victim of self-sabotaging patterns, sometimes fail to see the bigger picture or become too cautious out of self-interests and lose faith in cohesiveness.

Boonyabacha from ACHR says, "There is a notion going around that the poor are helpless, lazy, ignorant, and untrustworthy that they do not have resources or ideas, and that they cannot think for themselves or manage money. So it follows that they need to be helped, trained, organized, spoken for and made aware. This assumption infects the policies of a great deal of the world's development agencies and of housing-activism, shelter-delivery, and poverty-reduction programs, where solutions are conceived and carried out on the poor's behalf by professionals, bureaucrats, activists and social organizers." (Boonyabancha, 2017). The support group shares this same value. So for them, the leaders from the first few communities should come forward in the process while the support team gradually steps back. This has not fully happened yet in Jhenaidah. Presence of an external support group has been always needed for the communities in staying focused on collective development efforts. This issue calls for another necessary step to take- setting up a separate community fund and creating a program for capacity building. Boonyabancha from ACHR warns in this regard that, "If a community cannot manage money,

it is doomed forever to having its development process determined by someone else” (Boonyabancha, cited Skinner, 2014).

In the case of Jhenaidah, the Mayor has always been supporting citizens and local organizations with logistic and legal help in their efforts in city-wide upgrading of disadvantaged communities. But the upgrading process in Jhenaidah needs more technical support from within the municipality. The slum development programs launched by the municipality must coincide the city-wide upgrading process. The dimension of support that Jhenaidah mayor has offered to the upgrading process does not necessarily reflect the status of other municipalities in Bangladesh. The readiness of local government to support disadvantaged communities is a crucial issue but if local government itself is not empowered enough through decentralization, devolution etc., it cannot do much to help the urban poor in the right scale.

7. Conclusion

Though focused on housing development, this project or to be more accurate, this process has tapped into the potential of communities to establish institutional associations and to utilize those to bring positive changes in their lives. To answer the question of the research, participation needs to engage user group in such manner, which tells that the development organization or professionals trust in people’s capacity. Despite manifold concerns felt by relevant professionals related to this process, City-wide Community Upgrading process in Jhenaidah is a successful beginning to *people-centred planning/ community-driven development*. Once the people fully realise the potential and benefits of this process, they will begin to invest more to the process, not only financially, but also their time and agency. Through more decentralized proposals from the grassroots’ levels, the communities can push for participatory budgeting and come out of established institutional frameworks for a better, sustainable future.

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An Initial Study of Soundscape of Visually Impaired People in Urban Parks

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Abstract

Urban parks in a developing country hardly accommodate people with disability. The objective of this study is to investigate the possibility of improving urban parks using the perception of visually impaired people of urban parks' sonic environment. This study was conducted off-site the urban park using a questionnaire survey with two groups of participants: sighted people (35 participants) and visually impaired people (35 participants). The analysis was conducted using semantic analysis from the word used for explaining the sonic environment. This study shows that the visually impaired participants explained the sonic environment with more terminology (56 terminologies for visually impaired participants and 32 terminologies for sighted participants). It indicates the engagement with the sonic environment is higher for the visually impaired participants compared to the sighted participants. Further analysis using semantic categorization also shows that the visually impaired participants have broader perception compared to the sighted participants. The sighted participants use the terminology related to the perception of comfort, dynamic of the sound source, and other perceptions (visual and thermal). The visually impaired participant answers also represent the same aspect, but with more perception: safety, directivity, and space.

Keyword: Soundscape; urban park; visually impaired people.

1. Introduction

An urban park is ideally a place with relaxing atmosphere surrounded by fresh air and calming environment. It is a place where rainwater is absorbed for water conservation. It is also a place where urban communities may escape from the stressful urban activities, a place where the natural soundscape is present. A study showed that people like to hear the natural soundscape as it comforts and calms heart and mind (Yan and Kang, 2005). In Indonesia, urban population grows rapidly and results in the excessive development of buildings and infrastructures to accommodate the population needs. For movement, Indonesians are now assisted by the ease of ownership of motorized vehicles, which increases the number of motorized vehicles significantly. It directly triggers more noise in the surrounding area. In the end, it creates a totally different urban soundscape compared to that of the earlier decades. The rapid turnover causes a significant degradation of the built environment (Schulte-Fortkamp et al, 2006; Ge, 2009; Semidor, 2006).

A soundscape is a surrounding sound experienced by a person in a particular location. In the early decades, the soundscape was a hi-fi (high fidelity) soundscape. It is when the background sounds around us is at a low-pressure level so that people easily hear the type of sounds around them. In the past, natural soundscape was dominant. Nowadays, the urban soundscape has dramatically changed to lo-fi (low fidelity). In the lo-fi soundscape, the masking of sound is very strong caused by a quite loud background noise. In the lo-fi soundscape, people are difficult to recognize sounds, especially when machinery sounds are dominant. Dubois et al (2006) described that people can tolerate the sound of people activities than machinery sound. The unrecognizable urban soundscape caused by machinery sounds may create an uncomfortable and unsafe environment for people. Visually impaired people may be positioned as the most vulnerable here, due to the inability to see the surrounding. The lo-fi soundscape causes visually impaired people difficult to recognize the surrounding.

This condition happens also in urban public areas such as urban parks, where all urban communities gather for calming and soothing. Surabaya is a second metropolitan city in Indonesia with better quality and more percentage of urban parks compared to other cities in Indonesia. Surabaya's urban parks have become a role model for other Indonesia cities. The rapid development of urban parks in Surabaya started approximately the last 10 years when the current mayor was the head of Cleanliness and Landscape Office Surabaya. From only one to three parks, now it is more than 30 active urban parks in Surabaya. The rigorous development of urban parks in Surabaya was highly appreciated by the communities. However, with so many parks, the ideal condition of urban parks in Surabaya has not been fully perceived. Most urban parks in Surabaya are located adjacent to major streets condensed with motorized vehicles with the potentiality of traffic noise dispersion to the park area. It creates lo-fi soundscape within the parks, where natural sounds are difficult to be perceived.

Sighted people commonly mark and enjoy the surrounding visually. It includes the way how sighted people enjoy the urban parks. We mostly slide aside the need for a community with a visual disability who use hearing sense to mark, locate and enjoy the environment. Apart from the audio features that are barely experienced by the urban park visitors, safe and comfortable access to the parks are also an issue of most Surabaya urban parks. There are parks where safe access is unavailable, especially for those with disabilities. Taman Pelangi Surabaya, for example, is surrounded by streets for U-turn. No bridge or underground pathways for pedestrians to access the parks. Even a city park designed specifically for the elderly, namely Taman Lansia is surrounded by major streets where there is no safe access for people to go into (Figure 1 and Figure 2). The use of the soundscape of the visually impaired is interesting since there was soundscape research, but none of them had particularly examined the soundscape of visually impaired people, not even to utilize visually impaired person's capability in soundscaping. Several related soundscape studies were by Botteldooren, et al, 2006; De

Coensel, et al, 2005; Dubois, et al, 2006; Evensen, et al, 2016; Lynch, et al, 2011; Miller, 2008; Nilsson, et al, 2006; Raimbult and Dubois, 2005.

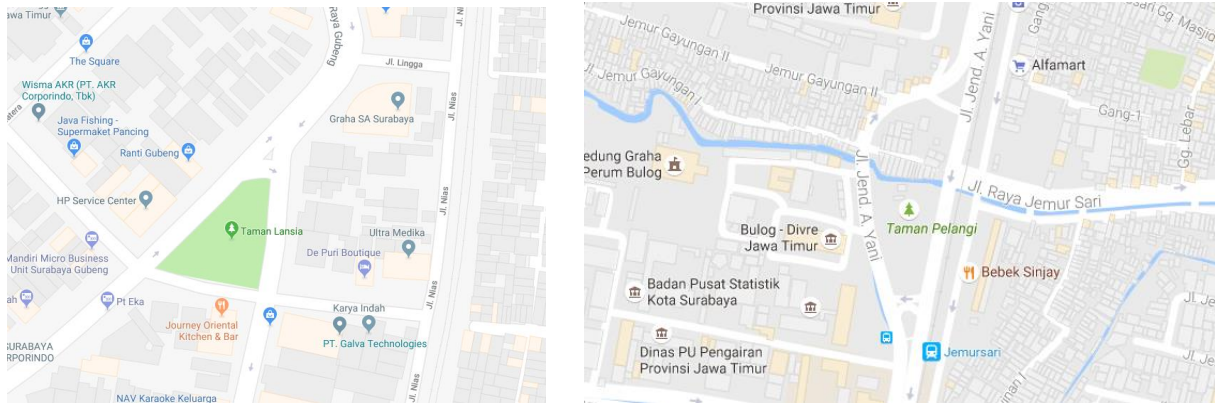


Figure 1. City map of two urban parks in Surabaya namely Taman Lansia (Senior Garden) and Taman Pelangi (Rainbow Garden) that are surrounded by major streets but without appropriate access.



Figure 2. Bird's eye view of Taman Persahabatan (Friendship Garden) surrounded by streets and insufficient access.

Concerning this condition, a project was programmed to invite visually impaired people to participate in soundscape surveys both off-site and on-site (for the later stage). The project focuses on Taman Bungkul, the most popular and most visited park in Surabaya. The soundscape experienced by the visually impaired respondents will be utilized as a tool to map the comfort and safety perception of visually impaired people toward an urban park. The desired environment of an urban park may also be described by their soundscape. Using this approach,

at the end of the project, a recommendation for more habitable urban parks may be borne-out; i.e. a more habitable park for both sighted and visually impaired communities.

2. Methods

At the very first stage, the aim of the project was to collect people's perception of an urban park without necessarily being on-site. This stage was deliberately designed to be off-site to investigate participants' perception of the sonic environment that they have experienced before, for those who already have a chance to visit a park; and to purely collect people's imagination or expectation of an urban park, for those who do not have a chance to visit a park. This stage was conducted using both qualitative and quantitative methods. The qualitative was employed in the first stage using focused group discussion of 2 sighted persons and 2 visually impaired persons. The finding of the focused group discussion was then used as a reference to develop questionnaires for the later quantitative stage. The questionnaire was developed simply in the structure for the ease of the visually impaired to elaborate the question before answering. The visually impaired participants answered the questionnaire assisted by sighted participants who were also respondents in this project (Figure 5). There were two groups of respondents, i.e. group of sighted people and group of visually impaired, and each consists of 35 persons, thus 70 respondents in total. All respondents are within school-age and college-age between 14 to 22 years old. Prior to the questionnaire survey, all respondents were examined of their hearing ability, assuring that they normally perceive sound around them (Figure 3). The hearing test result declared that all respondents are in a normal hearing condition.



Figure 3. Hearing test for both sighted participant (left) and visually impaired participant (right).



Figure 4. The first stage of the project was focused group discussion.

3. Finding and discussion

At the first stage, the focused group discussion was carried out to collect the general perception of urban parks among participants consist of two visually impaired persons and two sighted persons (Figure 4). The focused discussion was led by a question on what comes across the participants' mind when people talk about urban parks. They may describe the park in a word or a sentence or even a paragraph. Both type of participants also expressed the reason for visiting parks or gardens in the city because it is free-entry. They also have a linked activity

prior or after visiting a park, i.e. shopping either for food or other daily needs. From the focused group discussion, some terminologies were borne-out. At this stage, the visually impaired described both “visual” and sonic environment of urban parks with more terminologies that the sighted ones. The findings from the focused group discussion were to be strengthened by the questionnaire stage.



Figure 5. The visually impaired participant (right) was assisted by the sighted participant (left) to describe their perception of urban parks off-site.

At the quantitative stage, the data collected from questionnaires were elaborated using word clouds (Figure 6 and Figure 7). Word clouds were selected due to the capability to identify trends and patterns that would otherwise be unclear or difficult to see in a tabular format.

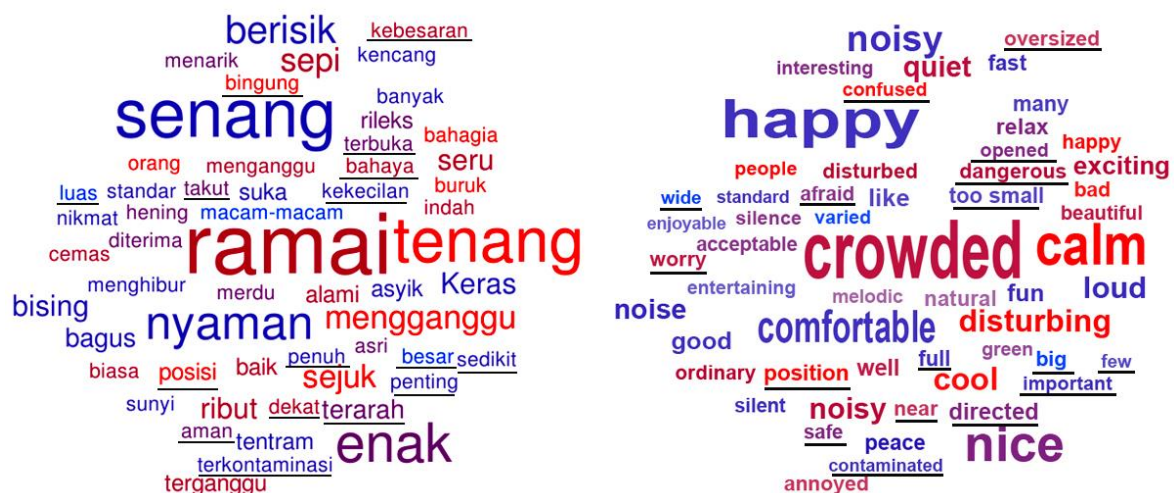


Figure 6. The terminologies of sonic environment of urban parks by the visually impaired participants in Bahasa Indonesia (left) and in English (right).



Figure 7. The terminologies of sonic environment of urban parks by the sighted participants in Bahasa Indonesia (left) and in English (right).

By the word clouds, we may learn that visually impaired participants described the urban parks' soundscape with more terminologies compared to the sighted ones (compare Figure 6 and Figure 7). The visually impaired participants explained the sonic environment with 56 terminologies, whilst the sighted respondents explained it with 32 terminologies. It indicates the engagement with the sonic environment is higher for the visually impaired participants compared to the non-visually impaired participants. More interestingly, there are terminologies

of the visually impaired relates to safety, directivity, and space, which are not borne- out from the sighted participants. The terminologies that relate to safety are confused, afraid, dangerous, safe, and worry (5 terminologies). The terminologies that relate to directivity are position, important, near, directed, and confused (5 terminologies). The terminologies that relate to space are oversized, opened, wide, too small, big, full, and few (7 terminologies). The terminology “confused” may be plotted to the sonic environment of both safety and directivity. Interestingly, there was also terminology of “contaminated” which seems not belong to either safety, directivity, or space.

The nearly equal ratio of terminologies (5:5:7) of safety, space and directivity indicate that for the visually impaired participants, the aspects of safety, space, and directivity in an urban park are equally important. With the safety, space, and directivity aspects are 1/3 of the total terminologies perceived by the visually impaired participants, we ideally consider these aspects while improving urban park facilities.

4. Conclusion and Recommendation

The initial study of the soundscape of visually impaired shown that visually impaired person perceived the sonic environment more detail than the sighted person. They perceived sound surround them as a guide to their activities. It indicates and strengthens the finding of the earlier research that sighted people perceived their surroundings more visually rather than auditory (Nilsson et al., 2012 and Jeon et al., 2012). It is an indication that safety, space, and directivity are all similarly important aspects of an urban park for the visually impaired to explore and enjoy the park. Further research to explore the visually impaired person’s perception of an on-site survey is recommended to obtain more data for detailed design recommendation for urban parks improvement.

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Multifunctionality of the oasis ecosystem. Case study: Biskra Oasis, Algeria

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Abstract

The oasis, this green and ecological entity of the desert, a promise of life and hope in a rather unfriendly environment, has been for a long time a beneficial basis for the ecosystem services provided to human beings, for its socio-economic and urban values, and also for its ecological value.

Today many ideas and concepts are developed in the scientific literature to demonstrate the benefits derived from ecosystems, such as ecosystem services, multifunctionality, and ecosystem values. However, the analyses of multifunctionality or ecosystem services of the oasis lack from the scientific literature. This study uses a literature review and a prior assessment of the oasis ecosystem services in order to create a particular conceptual framework for the oasis in an attempt to create a toolbox of variables or indicators for the evaluation of ecosystem services in the particular case of a desert ecosystem, i.e., the oasis.

Keyword: oasis ecosystem, ecosystem services, oasis multifunction

1. Introduction

The oasis is a small area in the desert where the presence of water allows for cultivation (Larousse, 1982). The oasis is an area of sedentary life, which associates the city [medina] or village [ksar] with its surrounding feeding source, the palm grove, within a relational and circulatory nomadic system (Kouzmine, 2007). The oasis is also a socio-spatial unit in the

middle of the Saharan space, and also a distinctive mark of the cultural identity characteristic to a particular human settlement. It is important to clarify that the oasis is primarily a form of adaptation to the harsh physical conditions of arid environments. For centuries, the oasis has been able to overcome the major obstacles of the desert. The poor quality of the soil, the rise of salt, the problems of silting, the lack of access to water resources and the inclemency of climatic conditions have not stopped the process of creating islands of greenery in the middle of the desert (Kerroumi, 2011). According to Ramad (2002), in the encyclopedic dictionary of ecology and environmental sciences, the oasis is a biotope located in a desert zone around a water point or in depressions where groundwater are close to the surface. According to Bouzaher (2015), the oasis is an ecosystem, traditionally structured by three fundamental elements, water, palm and habitat. Oases have played and continue to play a major role in the organization of space, the maintenance of the population and the economic functioning. This importance comes from the plurality of functions that oases have constantly fulfilled throughout history. The different functions provide to the oases, despite their limited size, a primary role in the development of Saharan and pre-Saharan territories (Kassah, 2010). Despite the importance of this ecosystem and its multiple functions, the oasis today is in a state of degradation. For that, this work aims to provide an answer to the following research question: How could the multiple roles of the oasis be demonstrated in order to challenge the degradation of its ecosystem services?

As the scientific literature lacks indicators of the ecosystem services of the oasis, we are interested in determining the major categories of benefits that the oasis society has derived from this ecosystem.

Much of the research has recognized many benefits of the urban vegetation, and most oasis-related research recognizes the fact that this ecosystem provides many different social, cultural, ecological and economic benefits.

The work of Selmi (2013), who explored the link between the two concepts, ecosystem services and multifunctionality, was used as a guiding frame for this article.

In this context, our study is based on a review of the scientific literature aimed at exposing a state of the art on the concept of multifunctionality and its relationship with the ecosystem services in the particular case of an oasis.

For this reason, we carried out a review of the scientific literature and an exploratory field survey aimed at accomplishing the following objectives:

- Collecting useful and relevant data for understanding the concept of the multifunctionality of the oasis, and ecosystem services.
- Acquire field observations and perform a qualitative assessment of the degradation of the oasis ecosystem.

The first step was to develop a study based on a qualitative approach, consisting of a documentary research, followed by a selective research focused on the contents of relevant documents (Fig. 1).

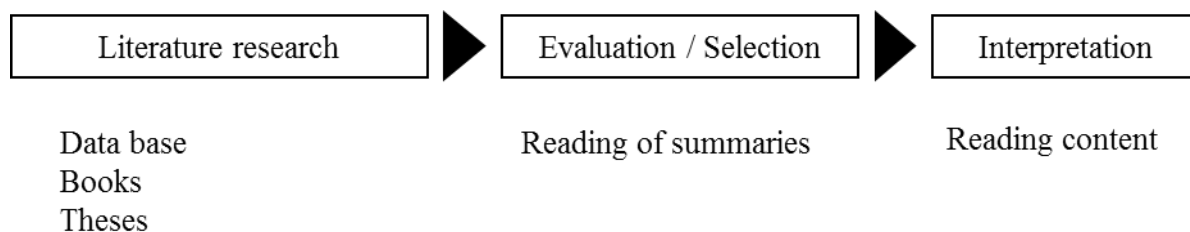


Fig. 1. Workflow of the review.

It is worth remembering that the main objective of this work is to show the link between the multiple functions of the oasis ecosystem and ecosystem services, in order to design a matrix of indicators for their evaluation, which can prove the degradation of the oasis ecosystem by the degradation of its services.

The study is not exhaustive, given the limits of research done on the topic of the oasis. This area is still under development and deserves to be developed. The objective of this work is to consider the different advantages of the oasis in several ways, as an attempt to enrich the theoretical and methodological contribution to this topic.

2. Conceptual frame

It was very necessary to understand, explicitly, the meaning of the notion of ecosystem services and also of the oasis ecosystem, by looking at their definition. Next, we classify the ecosystem services into several categories, and identify the components of the oasis ecosystem.

2.1. Ecosystem services: exploration of the concept

The notion of ecosystem services has become a topic of scientific debate in the international public spaces of biodiversity for some ten years now. Ecosystem services are the benefits that humans derive from the ecosystems. The Millennium Ecosystem Assessment was launched by the United Nations in 2001 to provide policymakers scientific information on the links between ecosystem change and human well-being, in order to define the actions required to strengthen the conservation of ecosystems and their exploitation in a sustainable manner.

The literature review shows that the notion of the benefits of nature for humans produced was forged in the 1960s and 1970s in the United States. The concept of “ecosystem services” was then formalized among conservation biologists since the 1980s in order to draw global attention to biodiversity loss and ecosystem degradation. Then, the concept developed from a market perspective at the beginning of the 1990s through the development of ecological economics and research on payments for ecosystem services (Petrișor, 2016). The notion was publicized in France after the launch of the ecosystem assessment for the millennium between 2001 and 2005. After this time, the notion of “ecosystem services” was developed in the perspective of a very anthropocentric vision of nature (Cardona, 2014; Lamarque, 2012).

The notion of ecosystem services emphasizes first of all the dependence of man on his environment, but is based on finding out that the environment is destroyed on an alarming scale; this process leads to the question about the well-being of the man (Xavier et al, 2014).

2.1.1. A Framework for the Ecosystem Services Analysis

The Millennium Ecosystem Assessment (2005) has proposed a classification of ecosystem services into four broad categories: provisioning services, which represent products and materials obtained from ecosystems such as water, food, fiber etc., regulating services which represent the benefits derived from the regulation of natural processes: climate regulation, watercourse regulation, disease and pest control, support services represent the services needed for the production of other services: soil formation, photosynthesis, nutrient and water recycling and cultural services refer to the non-material benefits provided by ecosystems and landscapes, aesthetics, places recreational activities (Lamarque, 2012).

Other classifications have been proposed subsequently, disrupting other categories according to the type of ecosystem. Groot et al (2002) developed an ecosystem services analysis framework based on the detailed analysis of natural elements and the introduction of value categories (Fig. 2). These authors identified four types of ecosystem functions that constitute a mixture of ecological processes, conservation issues, production and use of ecosystems and biodiversity for socio-cultural activities (Roche et al, 2016) (Fig. 3).

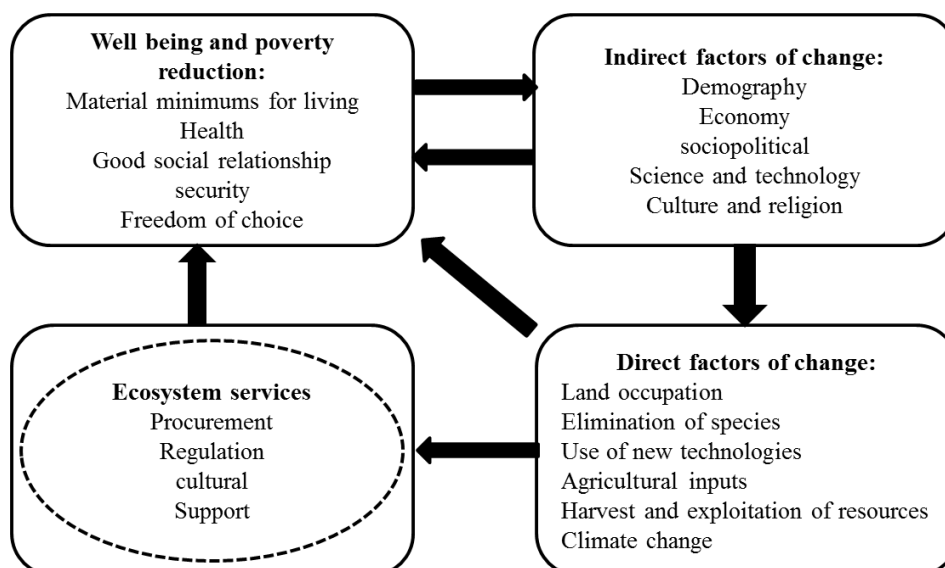


Fig 2. Framework for Ecosystem Services Analysis (Roche et al, 2016)

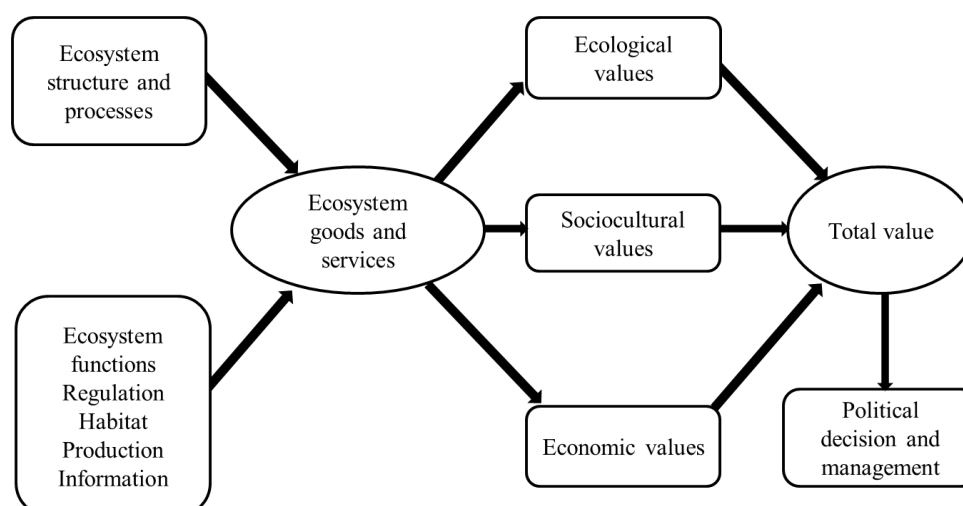


Fig. 3. Ecosystem flows and values, according to Groot et al., 2002 (Roche et al, 2016)

According to Zhang's model for agro-ecosystems (2007), we can distinguish three types of ecosystem services: input services, those that contribute to the supply of resources and the maintenance of physicochemical supports for agricultural production, and which ensure biotic interactions such as soil fertility, production services contributing to agricultural income that concern plant production and animal production, Services produced excluding direct

agricultural income, which include water quality control, carbon sequestration or the aesthetic value of landscapes in particular (Lamarque, 2012) (Fig. 4).

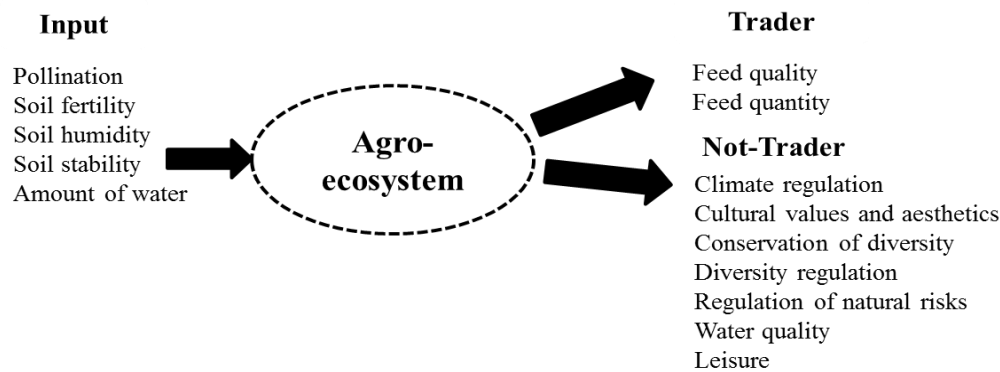


Fig. 4. Conceptual diagram of the services organization for an agro-ecosystem (Lamarque, 2012).

Another model of ecosystem services, which is also the most outstanding and widely used and disseminated in the scientific literature, has been developed by Haines-Young and Potschin (2010), and is referred as ‘the cascade model’ (Fig. 5). The phrase emphasizes the succession of levels that start from the ecosystem to the benefits for individuals and makes a clear distinction between the biophysical ecosystems, the ecological function, the ecosystem service and the benefit considered.

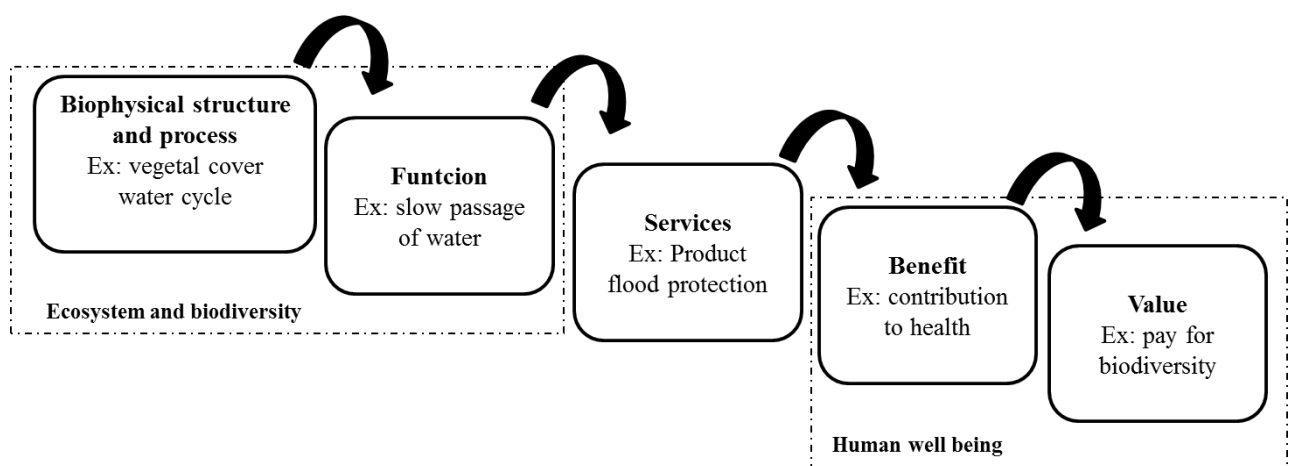


Fig. 5. Cascade model adapted from Haines-Young and Potschin (2010) (Source: Pesche and Méral, 2016).

However, the term ‘ecosystem services’ is a subject to many controversies, with respect to the confusion of the following terms: function, process, service, and benefit. For some authors (De Groot, 2002), ‘function’ refers to the ecological process of the ecosystem, and ‘human well-being’ refers to the benefit of the ecosystem, suggesting that ecosystem services are the result of the ecological functions of the ecosystem (Selmi, 2013).

Balmford and al. (2011) have developed a conceptual framework that extends the Millennium Ecosystem Assessment (MEA) ambition to make its previously developed framework more relevant and consistent with the proposal. The authors have classified ecosystem services in two categories: services that reveal fundamental processes of the ecosystem and those that are more directly useful to humans, by distinguishing between the ecosystem services and function (Fig. 6).

Fisher, Turner, and Morling (2009) distinguished two categories of services: ecosystem-based processes, called intermediate services, and those that are directly useful to humans, called end-services (Pesche and Meral, 2016).

This review shows that the concept of “ecosystem service” has been the object of study of several researchers working in several fields and, there is a strong need for its conceptual development.

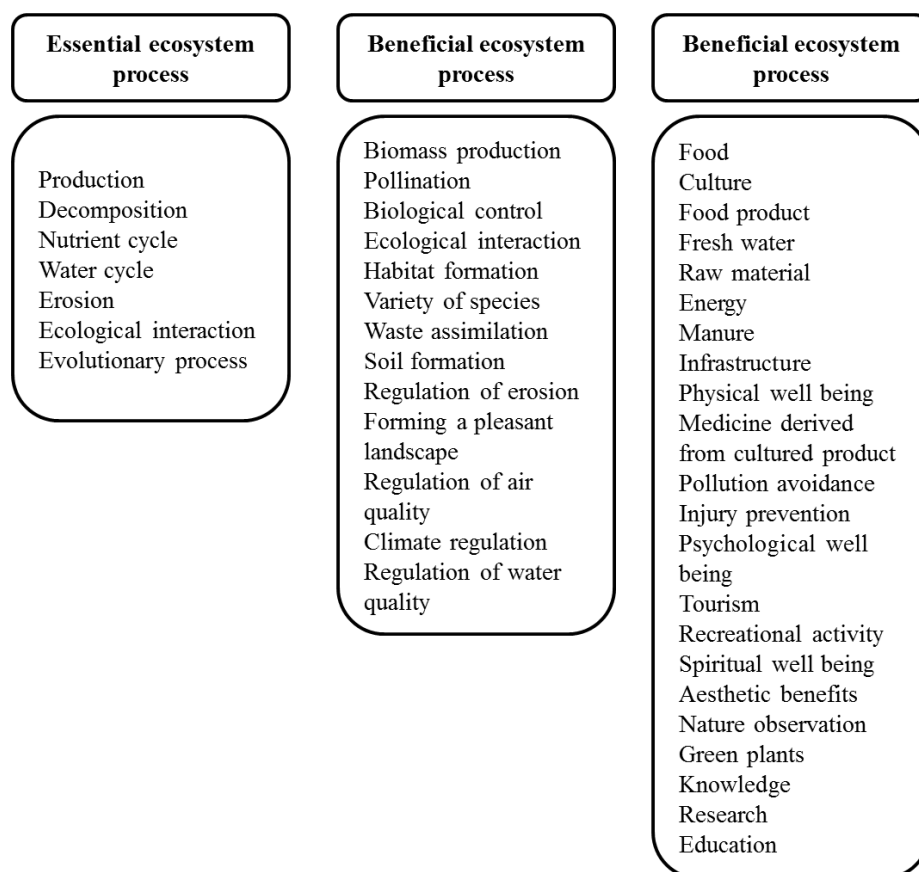


Fig. 6. Framework and typology proposed by Balmford et al (2008) (Source: Pesche and Méral, 2016).

2.1.2. Ecosystem services at the heart of environmental sciences

In general, ecosystem and ecological services are often associated or even confused. They both refer to services that humans obtain from the nature. The concept of ecosystem services was considered more important by some ecologists in the 1970s in order to highlight the dependence of human societies on nature and the urgency of safeguarding the proper functioning of ecosystems.

This is how the social sciences have understood the genesis of the notion of ecosystem services and its dissemination, in order to better understand the changes that the concept could induce in public policies and decision-making.

In the late 1980s, a stream of ecological economics studies has revealed another aspect of the ecosystem services approach, addressing the general idea that the economic system is

embedded into a larger system that has taken several names such as ecosystem, nature, or biosphere. This trend aims to assess biodiversity in a monetary and economic way, the anthropic pressures on biodiversity and the negative impact it has on economic activities and human well-being (Pesche and Méral, 2016).

Based on these results, we have oriented our work towards another perspective that is based on the three pillars of sustainable development and its relationship with the notion of ecosystem services, situated at the crossroads between the contribution of environmental science in the services ecosystem approach, the social and economic sciences and bring them together in a single evaluation grid afterwards.

2.1.3. Sustainable development and ecosystem services

Today, economics is particularly interested in the services provided by biodiversity (or ecosystems), i.e., the benefits that humans derive from nature (Bonnet and Curri, 2012). Sustainable development reconciles man, economy and the environment in a circle of interdependence, and attempts to ensure a sound and reasonable management of resources, without harming the environment and human.

In order for the development to be sustainable, society must use the natural resources at a rate that allows them to recover naturally. The quantity and quality of ecosystem services obviously play a crucial role in this process. The use and sustainable management of ecosystems are also at the heart of poverty reduction actions. Ecosystem services are an integral part of poor people's lives, and their degradation or loss can have a devastating impact on both the well-being of the poorest and on the efforts to reduce the incidence of poverty (Kosmus, Renner, Ulrich, 2013).

In the public debate and scientific literature dealing with environmental issues, the very broad concept of sustainable development has been supported by the notion of ecosystem services, which accounts for the link between humans and the ecosystems around them (Petrișor,

2017). Although this concept is slightly different from ‘sustainable development’, the notion of ecosystem services specifies the form of human-nature relationships, by proposing a detailed nomenclature of the different forms of services provided to the human society by nature. This enables highlighting the links between the urban form and environment: urbanization can have detrimental, but also beneficial effects depending on the type of ecosystem services studied (Regnier, 2017).

It seems clear that the notion of ‘ecosystem services’ has a broad relationship with sustainable development, as the services provided by nature or any kind of ecosystem must be used in a reasonable way in order to maintain the living standards of current generations by turning them into beneficiaries of the natural ecosystems, and also ensure the survival of the future generations by protecting the natural resources in order to meet their needs.

2.1.4. Sustainable planning and ecosystem services

The city offers the best chances to establish a sustainable development approach based on the protection of biodiversity, respect of its rhythm and maintenance of ecosystem services provided by it (Selmi, 2014). The city is the basis of all types of urbanization projects. Recently, in terms of sustainable development, urbanization projects are subject to evaluation by certain tools, in order to verify their sustainability performance and the compliance with the objectives, targets and requirements of sustainability. These tools guide the action, step by step, helping to organize the process of retaining what is important, and providing options for tailored solutions. The implementation of these tools requires understanding and analyzing the phenomenon and then setting sustainability targets. Today many researchers and urban practitioners are building evaluation tools using the ecosystem services approach.

In the context of the worldwide accelerated urbanization, understanding the inter-relational complexity between humans and the urban environment has become a key concern. For this purpose, some studies have recognized the fundamental role that biodiversity plays in the city.

The ecosystem services approach is integrated into urban planning policies in Europe, and this approach is clearly identified as a tool for building good resilience of cities and improving the quality of life (Pesche and Méral, 2016; Petrișor et al., 2016).

According to Bonnet and Curri (2012), understanding the value of ecosystems can lead to more informed and potentially different decisions. Taking into account the fact that this value can lead to a better management, investments in natural capital can be very profitable and sharing the benefits of these actions can generate real benefits for the most disadvantaged.

The analysis of ecosystem services is essentially based on the analysis of the values and benefits of a natural, semi-natural or urban ecosystem. These values are diverse: social, cultural, spiritual, economic or ecological. The choice of the values to be analyzed remains dependent and determined by the researcher who carries out the evaluation of the ecosystem services; in addition, the evaluation methods are also diverse.

According to Breault (2014), the economic valuation of ecosystem services is one of the decision support tools, although it is only one element of an entire toolkit designed to help decision-making. It represents the particular advantage of associating a monetary value with the non-market services provided by urban ecosystems. This value is directly usable for evaluating the costs and benefits of urbanization projects leading to changes in the flow of ecosystem services delivered to the community, and to assess the required compensation if there is a net loss of these.

All of the above demonstrate that even though the ecosystem services approach is recent, many practitioners have put in place attempts related to sustainable management. As an example, Selmi (2014) has tried to develop an approach for evaluating the functioning and ecosystem services provided by the natural components of the city, or more specifically the analysis of urban green spaces based on their ecosystem services. Regnier (2017) has linked the problem of urban sprawl to the ecosystem services rendered by the urban ecosystem, in

order to finally propose an urban form compatible with the preservation of the environment. Breault (2014) has attempted to set up economic evaluation tools and payment programs for the provision of ecological services in urban areas. This indicates the importance and interest in using the approach of ecosystem services in the field of sustainable development.



Fig. 7. Traditional oasis landscape

2.1.5. The oasis and ecosystem services

If there is a place that symbolizes human life in the desert, this is the oasis. The development of the cultivation of several varieties of dates, and, more recently, the cultivation using greenhouses, have favored the marketing of oasis agricultural products. Oases have been integrated more and more into the market economy and international trade.

The oasis systems are characterized by a great diversity and carry multiple functions: agricultural or productive function, strategic or territorial function, recreational or tourist function, symbolic or identity function. Water appears to be an asset and major constraint, and determines the development strategies for the future in the form of technological innovations and bold choices between: a qualitative leap associated with stabilization or a reduction of surfaces (strategy of the hedgehog) and a quantum leap in extension and creation of new oases (bull strategy) (Kassah, 2010).

It is very clear that the oasis is an ecosystem that offers a lot of benefits for man and the maintenance of his life and well-being. This is a perfect model of sustainable development thanks to its ecological peculiarities, its economic function in favor of a society well adapted to the desert context through the services and benefits provided by the oasis.

2.1.6 Cross look at the multifunctionality and services of the oasis ecosystem

Given the scarcity of work done on the roles and benefits of the oasis ecosystem and its services, we have tried to search for writings and documents that have addressed the oasis not only in terms of urban planning, but also in economic and ecological terms, in order to get an idea about its functions and the role it plays at different levels.

According to several researchers (Bouzaher, 2015; Lakhdari and Cote, 2012; Zekri, 2011; Kassah, 2010; Brunel, 2006; Collete and Riou, 1990), the oasis represents a green island in the desert, a symbiosis between humidity, heat and light, a biodiversity reservoir due to its rich flora and fauna, all making together a the system used for shelf culture and breeding practices that maintain the soil fertility. The latter is maintained by cyclic organic inputs of animal origin, but also by the use of the shelf culture system.

In addition, the palm tree, as long as a characteristic oasis species is used for ecological purposes, protects the trees and plants that are positioned on the lower floors, and also acts as a stabilizer and crop regulator. It is also used as an umbrella to protect plant species below

from atmospheric aggressiveness, such as solar rays, and creates favorable conditions for their cultivation. Because of its density, it prevents the drought of soil, improves the water reserve in the dried grounds, allowing for the maintenance of soil moisture, and mitigates the damage of natural hazards such as the sandstorms, leading to the improvement of the climatic conditions of the living environment.

The palm grove, as an ecological unit, can play a windbreak role, limiting the advancement of the desert, acting against desertification, by fixing large amounts of dust. As long as a wetland or water exists either on the surface (visible at the *segua* level) or at the level of the water table, the oasis plays a bioclimatic role due to the presence of water and palm groves, contributing to the evapotranspiration. Measurements taken in different oases have showed that the potential evapotranspiration of the areas was reduced by 30 to 50% within the oasis. This is called “the oasis effect”, and tempers the desert severity inducing a microclimate favorable to crops (wind reduction, shading and evapotranspiration).

The palm grove constitutes the fundamental element of the oasis ecosystem and provides the agricultural character of oasis social life. It is the main source of income and employment in the economy, and improves the incomes of the inhabitants thanks to the production of dates and the development of underlying crops up to 3 stages of vegetation, providing a diverse food production. Secondary crops contribute significantly to the nutritional balance and improvement of family incomes; in all oases, a peasant spot is reserved at the local market for the sale of the palm grove products. Tomatoes, fresh salad and alfalfa can all be found here, as well as aromatic plants, and always these products have an exceptional quality. It should also be noted that this practice is at the origin of a conservation of the agro-biodiversity of local species, acclimated to the conditions of the desert environment. However, this particular biotope is an exotic treasure and encourages tourism, which is its strategic function and also contributes to the economic development of oasis communities.

From a social viewpoint, the palm grove plays a major role in the lives of the inhabitants by ensuring the social stability of the populations living in the oases. This contributes to the conservation of traditional knowledge and know-how that allow for a judicious and sustainable use of natural resources, be it water, irrigation techniques, or biodiversity, with respect to the choice of adapted crops. Thus, it promotes the maintenance of the psychic and psychological balance of the human being by positively influencing their living environment and health.

The palm grove is a natural refuge of pure air where the oasis man finds a positive psychological effect and a favorable response to his need for rest and relaxation. Due to its utilitarian function, the palm grove, like any other green space, plays an ornamental role by contributing to the beautification of the oasis landscape. The palm tree is also a constructive element and often offers planks, poles, beams, lintels and decorative fences. Under the light of all its functions and its services, the oasis, through its palm grove, contributes to the psychological comfort and human well-being.

Table 1. Example of works dealing with the functions and roles of the oasis

Oasis ecosystem roles and functions (work)	
<i>Author</i>	<i>Function and role</i>
● Bouzaher (2015)	<ul style="list-style-type: none"> ● Environmental role ● Social role ● Economic role ● Architectural and urban role
● Kassah (2010)	<ul style="list-style-type: none"> ● Agricultural function ● Strategic function ● Recreational function ● Cultural function
● Colette	<ul style="list-style-type: none"> ● Environmental role ● Economic and social role ● Heritage role
● Zekri (2011)	<ul style="list-style-type: none"> ● Recreational value
● Boudjellal (2009)	<ul style="list-style-type: none"> ● Environmental role
● Zhao (2008)	<ul style="list-style-type: none"> ● Environmental role
● Brunel (2006)	<ul style="list-style-type: none"> ● Ecological role
● Riou (1990)	<ul style="list-style-type: none"> ● Ecological role

The literature review on the oasis was synthesized in Table 1, summarizing the roles and functions of the oasis, and Table 2, based on the ecosystem services classified into four types, ecological, economic, socio-cultural and urban.

Table 2. Oasis ecosystem services board

Oasis ecosystem services	
<i>Type</i>	<i>Service</i>
<ul style="list-style-type: none"> Ecological type 	<ul style="list-style-type: none"> Maintaining soil humidity Wind breeze effect Nutrient recycling Compost production Maintaining soil fertility Limit of the desert advance Solar radiation reduction Temperature control evapotranspiration Resistance to damage caused by storms Fixing the dust by the fins CO2 reduction Maintaining air quality Protection of young plants by the flippers Urban refreshment
<ul style="list-style-type: none"> Economic type 	<ul style="list-style-type: none"> Date production Income contribution Economy and energy conservation
<ul style="list-style-type: none"> Urban and architectural 	<ul style="list-style-type: none"> Aesthetics and landscape Decoration product Construction product Closing effect

3. The establishment of a green oasis frame

The evaluation of ecosystem services provided by the oasis and its multifunctionality may be useful if this evaluation is used to justify the choice of plant and the design criteria in a Saharan context. This operation tends to mobilize certain ecological issues, such as the conservation of oasis biodiversity, and certain socio-cultural issues, such as the conservation of traditional knowledge.

4. Conclusion

The oasis is a natural ecosystem specific to the desert. From an ecological point of view, this ecosystem is multifunctional, given the diversity of services it provides to society.

The ecosystem services of the oasis are in a state of degradation due to several factors. For this reason, this work is only a simple initiative to define the ecosystem services of the oasis, in order to increase the awareness by underlining the losses of oases over time, and also to determine the decision-makers and planners paying attention to the importance of the oasis attributes during design and development operations.

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RENEWABLE ENERGY MANAGEMENT IN URBAN PROJECTS IN ALGERIA

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Abstract

Any urban project cannot be separated from its environmental context; in fact, the development of the constructions and the various operations on a territory involves obligatorily impacts on the environment.

The goal of an energy efficiency management system is to promote quality, protect the environment and meet socio-economic needs.

The objective of this work is to set up an energy management, which must be a administering & running tool that allows the control of the decentralized production and energy consumption in the life cycle of the urban project.

Keywords: energy management, renewable energies, cities, urban projects.

1. INTRODUCTION & PROBLEMATIC

Today is the energy consumed in urban areas, mainly in buildings and transport. Urban development is therefore one of the major challenges of current energy and climate policies.

While the latest report of the Intergovernmental Panel on Climate Change (IPCC) warns of accelerating global warming and the role of cities in combating this destructive process, new ways of producing, distributing and to consume energy in the world¹.

Despite the savings efforts in this area and the growing awareness of the public and specialists, the rise in energy demand is confirmed worldwide for different reasons (leaving homes, heavier

¹ Summary report. (2014). *Rapport du groupe d'experts intergouvernemental Sur l'évolution du climat*. [Under the direction of the main editorial team, R.K. Pachauri and L.A. Meyer]. IPCC. Geneva. Switzerland.

equipment, very consumer appliances, global population growth ...). Faced with this growing, predictable demand, in 2050, only 50% of needs will be met; cities and territories are certainly the key to the ecological transition.

While they occupy only 3% of the surface of the earth, the urbanized territories alone consume three quarters of the resources of this one and are responsible for 75% of greenhouse gas emissions. While the latest report of the Intergovernmental Panel on Climate Change (IPCC) warns of the acceleration of global warming and the role of cities to combat this destructive process, new way to producing, distributing and consuming energy in the world suggest a potential disruption of the territorial organization, at the heart of tomorrow's energy strategy. In this very evolving context, the urban approach remains the poor relation of the energy policies and the diagnosis such action efforts are mainly oriented towards the building and mainly the new building².

For this, energy becomes a new sectoral logic that takes precedence over all the project's issues energy to enter into joint and in collusion with urban and territorial project, it must also interrogate the urban model raises awareness not at work - that of spreading and territorial specializations, which are detrimental logical proximity that is more and more desirable and likeable in terms of both urban functioning and quality of life.

This new dimension of development is also likely to reduce the final user costs and fight against the growing scourge of energy poverty, which is. For the less fortunate, a double or a triple pain in their daily life.

Faced with this observation, three paths must be taken together: the control of energy demand, the improvement of the efficiency of the system (production, distribution, and consumption)

²Ariella Masbouni & Al. (2015). The energy at the heart of the urban project. Release date: March. Publisher: ED. MONITOR.

and the introduction, in a more significant way. Renewable and low-carbon energy sources in the energy mix.

The topics affect the urban in a structural and complex manner, large-scale (the organization and planning, urban planning, freight transport, mobility, activation of economic sectors) on the small scale - the building in particular - passing by that of the urban projects of variable dimensions, with regard to both the physical environment and the socio-economic aspects. The evolution of network management constraints leads to bring the production of consumer places. So to regionalize energy management. Especially since communities are being given increasing responsibility for energy planning and the implementation of a local energy policy.

Effective energy management enables the energy control policy to achieve the stated objectives and commitments set by international standards and to take the necessary measures for continuous improvement. Thus, the goal of an energy efficiency management system is to promote quality, environmental protection and meet socio-economic needs³.

Any development is inevitably correlated with energy consumption, that latter growing steadily is a source of considerable pollution of the environment. The challenge is to see how to reconcile economic and social progress without jeopardizing the natural balance of the planet? The triptych: (energy - development - environment) must be respected. All development must be economically efficient, socially equitable and ecologically tolerable.

The necessity for Renewable Energies

Countries around the world are increasingly aware of the crucial role of renewable energy and energy efficiency in the fight against climate change; the creation of new economic opportunities; and expanding access to energy for the billions of people still deprived of any

³ Bouamama Wahiba. (2011). Magisterium memory *Au sujet de la politique d'efficacité énergétique en Algérie*: systemic approach for sustainable development case of: Eco-bat program building and energy management.

modern energy services . moreover, the development could condition tomorrow the management of the energy, if the new modes of production were integrated with the buildings, if the network management constraints that lead to bringing production closer to the places of consumption favoured a more local action on the energy-city link, or the implementation of smart grids on a good scale and wisely allowed to optimize distribution and consumption on all meshes of the network. These questions will have very important consequences on the organization of the territories as on the modes and the practices of development.

The development of renewable energies has become imperative in the face of the energy problems of the 21st century. Convinced of the need for sustainable development and diversification of the energy mix.

As the national potential for renewable energies is strongly dominated by solar energy, Algeria considers this energy as an opportunity and a lever for economic and social development, particularly through the establishment of industries that create wealth and jobs. Geo-strategically, potential in wind power, biomass, geothermal and hydropower are much less important.

2. STATE OF PLAY

2.1. The national potential in renewable energies

- **Solar**

Due to the geographical location, Algeria has one of the largest solar fields in the world.

The duration of sunstroke on almost the entire national territory exceeds the 2000 hours annually and holds the 3900 hours (highlands and Sahara). The energy received daily on a horizontal surface of 1 m² is of the order of 5 kWh over most of the national territory is nearly 1700KWh / m² / year in the north and 2263KWh / m² / year in the south of the country⁴.

⁴ The renewable energy guide. (2007). Ministry of Energy and Mines, Algeria.

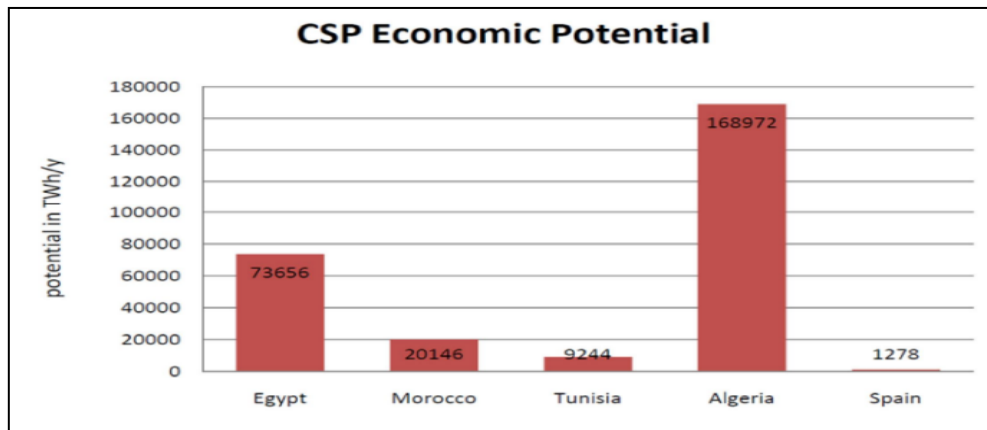


Figure 1. REDC source concentration Solar potential.

- **Eolien potential**

The wind resource in Algeria varies a lot from one place to another. This is mainly due to a very diverse topography and climate. Indeed, our vast country is subdivided into two distinct geographical areas.

The northern Mediterranean is characterized by a coastline of 1200 km and a mountainous terrain, represented by the two chains of the Tellien Atlas and the Saharan Atlas. Between them are interspersed plains and highlands of continental climate. The South, meanwhile, is characterized by a Saharan climate.

The map shown below shows that the South is characterized by higher speeds than the North, especially in the Southwest, with speeds exceeding 4 m / s and exceeding the 6 m / s value in Adrar region. Regarding the North, it is generally noted that the average speed is low. However, there are microclimates on the coastal sites of Oran, Bejaia and Annaba, in the highlands of Tiaret and in the region bounded by Bejaia in the North and Biskra in the South.

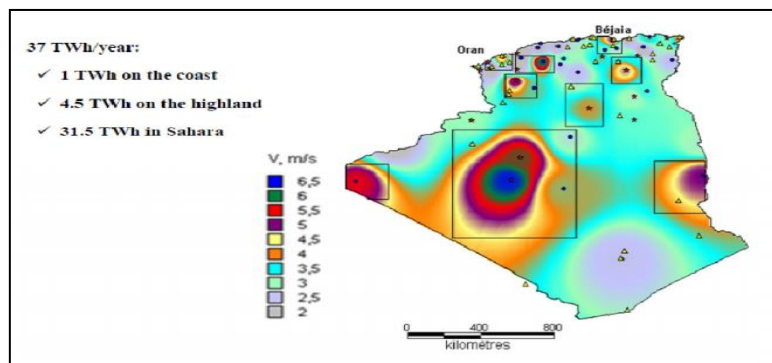


Figure 2. Wind energy source potential REDC.

• Potential géothermique

The Jurassic limestones of northern Algeria, which are important geothermal reservoirs, give birth to more than 200 hot springs located mainly in the northeast and northwest regions of the country. These sources are often in excess of 40 °C warmest temperatures being that of Hammam Maskhoutine (96°C).

These natural emergences, which is generally the leaks of existing reservoirs, alone generates more than 2 m³ / s of hot water. This is only a small part of the reservoir production possibilities. More to the south; the formation of the intercalary continental, constitutes a vast geothermal reservoir which is several 1,000 Km². this reservoir, commonly called "Albian aquifer" is exploited through boreholes with more than 4 m³ / s. the water of this layer is at an average temperature of 57°C.⁵

⁵ M'Hamed BOUGARA. (2005). Memory of magisterium in geophysics Geothermal study of southern Algeria. university Boumerdes.

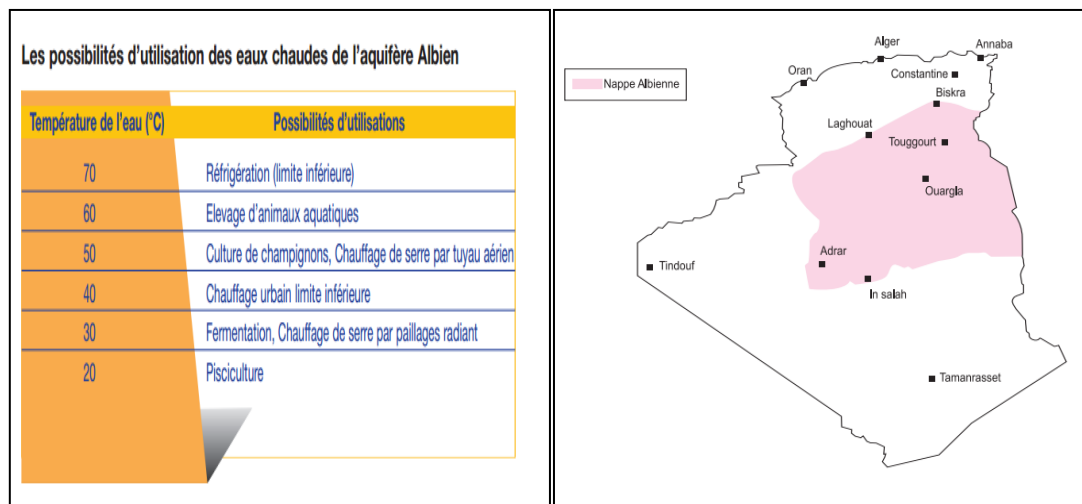


Figure 3. REDC source geothermal potential.

2.2. Renewable energies in Algeria

Algeria is starting a green energy dynamic by launching an ambitious renewable energy development (RE) and energy efficiency program. This vision of the Algerian government is based on a strategy focused on the development of inexhaustible resources such as solar and their use to diversify energy sources and prepare the Algeria of tomorrow. Thanks to the combination of initiatives and intelligence, Algeria is embarking on a new sustainable energy era.

Today, Algeria's energy needs are met, almost exclusively, by hydrocarbons, particularly natural gas, the most available energy. Other forms of energy are only used when the gas cannot be used.

In the long run, the renewal of the current national model of energy consumption can make the supply-demand balance problematic for this energy source.

The massive integration of renewable into the energy mix is, in this sense, a major challenge in order to preserve fossil resources, diversify the electricity production sectors and contribute to sustainable development.

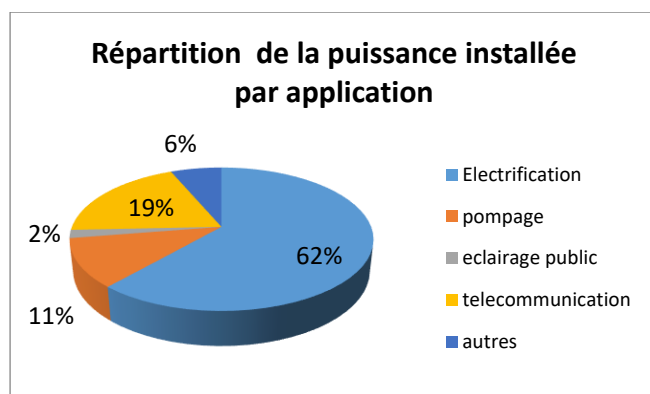
All of these considerations justify the strong integration of renewable energies into the long-term energy supply strategy today, while giving an important role to energy savings and efficiency. This last component allows, through a good control of the rate of growth of the demand, a better planning of the investments necessary to the satisfaction of the energetic needs.

Current situation:

- Electrification with solar energy by Sonelgaz of 18 isolated villages of the great south of Algeria; spread over 4 wilayas of the great South, namely: Tamanrasset, Adrar, Illizi and Tindouf and this as part of the program of electrification (1995-2002) of isolated areas.
- Inauguration in 2011 of the solar / gas hybrid power plant of 150 MW of which 25 MW solar, located in Hassi-R'mel in the wilaya of Laghouat.
- Marking of the road Bordj Badji Mokhtar-Reggane in 1986 and supply of telecommunication relays by photovoltaic
- Pumping of water by wind energy.
- Below are some figures of the low renewable powers engaged in the various applications across the national territory [12].⁶

Table 1. Renewable powers installed.

Application	Puissance installée(KWatt)
électrification	1352.80
pompage	288.40
Eclairage public	48.43
télécommunication	498
autres	165.63
TOTAL	2353.26



⁶ Ministry of Energy and Mines. (2018). www.mem-algeria.dz.

Future situation: ⁷

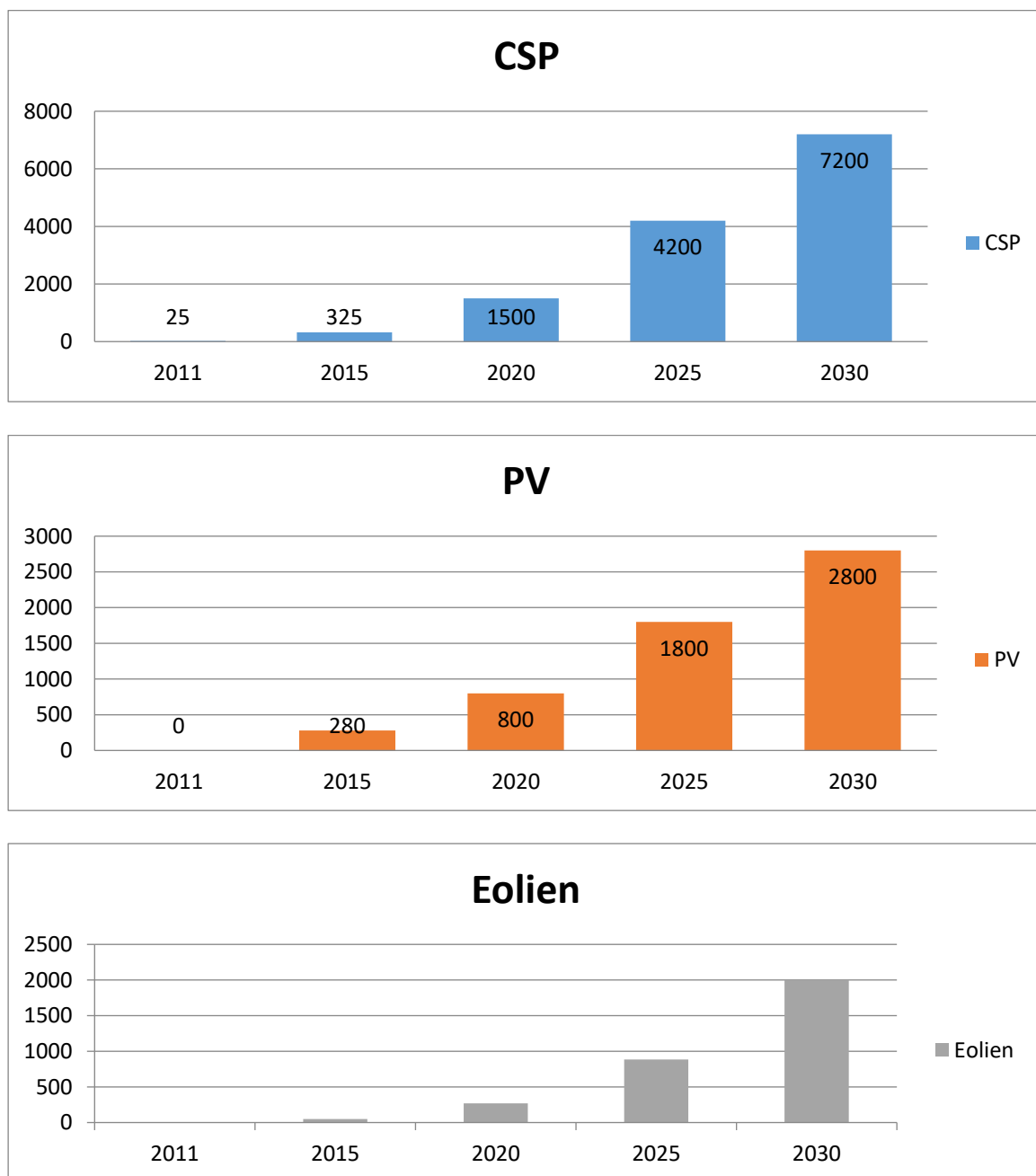


Figure 4. Cumulative power (MW) to be installed by the sector until 2030.

⁷ Algerian Company of Electricity and Gas. (2011). *Programme national de développement des énergies renouvelables et stratégie de mise en œuvre*; conference on the Algero-German partnership in the field of renewable energies. hotel Sofitel. Algiers.

This renewable energy program provides for the installation of a total power of approximately 650 MW in 2015, 2600 MW in 2020, 6900 MW in 2025 and 12000 MW by 2030.

The ratification of the Kyoto Protocol (an international agreement, built on the United Nations Framework Convention on Climate Change, set targets and timelines for reducing greenhouse gas emissions)⁸ and the law on the promotion of renewable energies in the context of sustainable development have confirmed the Algerian political will and the commitment of our country to exploit these renewable and non-polluting natural resources. An ambitious national program for the development of these clean energies has been drawn up for the period 2011-2030, in order to produce by 2030, 40% of national electricity consumption from solar and wind energy. these ambitious renewable energy projects will be conducted in three stages.

- 2011-2013: realization of pilot projects to test various technologies available.
- 2014-2015 : start of program deployment;
- 2016-2030: large-scale deployment.

PV (Photovoltaic):

Planned launch of several solar photovoltaic projects with a total capacity of about 800 MWp by 2020. From 2021 to 2030, other projects will be launched with a capacity of 200 MWp per year.

CSP (Concentrating Solar Power):

Launch in the 2011-2013 period of two pilot projects for a thermal power plant with a total capacity of 150 MW each. These projects will be added to the Hassi R'Mel hybrid power plant with a capacity of 150 MW, including 25 MW in solar, which is already operational from 2011.

- 2016-2020: four thermal power plants with a total capacity of about 1200 MW should be commissioned.

⁸ Kyoto Protocol to the United Nations Framework Convention on Climate Change United Nations 1998

- 2021-2030: installation of 500 MW per year until 2023, then 600 MW per year until 2030.

Wind turbines:

- 2011-2013: installation of the first wind farm with a capacity of 10 MW in Adrar.
- 2014-2015: two wind farms of 20 MW each should be built.
- 2016-2030: other projects will be carried out for a power of about 1700 MW.

In support of this ambitious program, Sonelgaz is working on the development of a photovoltaic panel manufacturing industry, incorporating within it the company Rouiba Lighting, which will initially produce an average of 50 MW / year and will probably start operating during the first half of the year. The year 2013. It is also planned the creation of a silicon manufacturing complex.

2.3. National Renewable Energy (RE) Development Policy

The national policy of promotion and development of renewable energies is framed by laws and regulations. The main texts governing renewable energies are:

- The law of control of energy;
- The law on the promotion of renewable energies in the context of sustainable development
- The law on electricity and public gas distribution, with its corollary executive described the cost of diversification.⁹

This policy is based on a set of organizations and economic enterprises taking, each in its own, the development of renewable energy.

Three bodies in the higher education and scientific research sector have been active since 1998

- Renewable Energy Development Centre (REDC).

⁹ Official Journal of the Algerian Republic No. 23. April 17. 2011.

- Solar Equipment Development Unit (UDES)
- Silicon Technology Development Unit (UDTS)

Within the energy sector, the Ministry of Energy and Mines and the Agency support the activity related to the promotion of renewable energies for Promotion and rationalization of the use of energy. (APRUE) which was founded in 1987 and which has a department dedicated to this activity. In addition, the research and development center for Electricity and Gas (CREDEG), a group subsidiary Sonelgaz, is involved in the construction and maintenance of solar installations carried out under the national program for rural electrification.

At the agricultural sector level, it is worth mentioning the existence of the High Commission for the Development of the Steppe (HCDC), which carries out important programs in the field of pumping water and electrification by energy. Solar energy for the benefit of the steppe regions.

In terms of economic operations, several companies are already more active in the field of renewable energies.

The Ministry of Energy is building a nucleus for this industry around which all research efforts can crystallize and an effective tool for implementing the national renewable energy policy. That the Ministry of Energy has set up a joint venture company between Sonstrach, Sonelgaz and the SIM group. This is the company new energy Algeria (NEAL) founded in 2002 whose mission is the development of renewable energies in Algeria on an industrial scale.

2.4. Establishments and organizations working on renewable energy

Public Institutions

- **Ministry of energy**
- **Algerian Institute for Renewable Energy and Energy Efficiency (IAER)**

Which will play a fundamental role in the training efforts that the country is deploying, thus making it possible to qualitatively ensure the development of renewable energies in Algeria.

The training provided by this institute covers in particular the areas of engineering, safety and security, energy audit and **project management**.

- **The National Agency for Promotion and Rationalization of Energy Use (APRUE)**

The National Agency for the Promotion and Rationalization of the Use of Energy (APRUE) is a public establishment of an industrial and commercial nature created by presidential decree in 1985, under the supervision of the Ministry of Energy and Mines . Its main mission is to implement the national energy management policy through the promotion of energy efficiency. Under Law n ° 99- 09 of July 28, 1999, relating to the control of the Energy, the agency has for missions:

- The coordination and facilitation of the national energy conservation policy;
- Implementation and monitoring of the National Program for Energy Management (PNME);
- Awareness and dissemination of information on energy management towards different targets (general public, professionals, school environment ...);
- The setting up of sectoral programs and projects in partnership with the sectors;
- Concerned (Industry, Building, Transport ...) ¹⁰.

- **The Renewable Energy Development Centre (REDC)** is a Research Centre, resulting from the restructuring of the High Commission for Research, created on March 22, 1988. It is a Public Scientific and Technological Establishment (EPST) responsible for developing and implementing the (...) BP.62 Route of Bouzareah Observatory 16340 Algiers, Algeria

Public companies

- **NEAL New Energy Algeria**

¹⁰The National Agency for the Promotion and Rationalization of the Use of Energy (APRUE). (2018). www.aprue.org.dz.

New Energy Algeria, by abbreviation NEAL, is a joint-stock company created in 2002 by two major players in the Algerian energy sector, namely the Sonatrach and Sonelgaz Groups and the Mitidja (SIM) Industrial Semolina Group.

Missions

NEAL is a player dedicated to the promotion of new and renewable energies that builds its positioning through:

- ▶ The Promotion and development of new and renewable energies,
- ▶ The Identification and realization of high-value-added technological projects new and renewable energies,
- ▶ The creation of a center of excellence dedicated to research and development (R & D) and training in the field of renewable energies,
- ▶ The development of win-win partnership, as part of the technological collaboration,
- ▶ Consulting with national and international companies.

Priority axes

The electricity generation from new and renewable energy in particular via the solar and wind,

- ▶ The creation of an institute dedicated to training in the fields of new and renewable energies and energy efficiency,
- ▶ The creation of a technology park dedicated to new and renewable energies,
- ▶ The contribution to development of an oriented local industry solar concentrators powers (CSP) and photovoltaic (PV).

• CREDEG : Centre for Research and Development of Electricity and Gas

Set up on 1 January 2005 as a joint stock company, a subsidiary of the Sonelgaz group.

The main purpose of CREDEG is applied research, technological development, expertise in industrial equipment and equipment behavior analysis, and materials in operation

and manufacturing phase in the core businesses of the Group's companies. SONELGAZ to know¹¹:

- Production, transmission and distribution of electricity,
- Pipeline transportation and distribution,
- Promotion of new and renewable energies,
- Approval of materials and equipment Electricity and gas.

The targeted objectives are:

- The safety of people and equipment goods,
- The environmental Protection,
- The continuous improvement of the technical performances of the installations by the development of innovative solutions to the technical problems inherent in the development of SONELGAZ's business activities..

Private Companies

2.5. Legal framework

Conscious of the growing interest of renewable energies and their stakes, Algeria has integrated their development into its energy policy by adopting a legal framework favorable to their promotion and the realization of related infrastructure. The development of renewable energies is governed by a set of legislative texts:

- Law No. 99-09 of 28 July 1999 on the control of energy;
- Law No. 02-01 of February, 2002, on Electricity and Public Distribution of Gas by Pipeline;
- Law No. 04-09 of 14 August 2004, on the promotion of renewable energies in the context of sustainable development.¹²

¹¹ The Center Of Development And Renewable Energy. (2018). <https://www.cder.dz>.

¹²Renewable Energy and Energy Efficiency Program. (2011).

2.6. Algeria's position in international organizations in the field of energy

Algeria has joined the Organization of Petroleum Exporting Countries (OPEC) in 1969. During the period from 1974 to 1975, Algeria has assured the Secretary General of OPEC. Through its commitment to OPEC, Algeria contributes to strengthening the mission of OPEC, which consists of:

- Reaffirmed the principle of sovereignty of producing countries over their natural resources.
- Coordinate and unify the oil policies of its member countries
- Ensure the stability of the oil markets in order to secure, in an efficient, economic and regular way, the supply of oil to consumers and a stable income for producers
- Upon accession, Algeria played an active and sometimes decisive role in OPEC's decisions and orientations.
- Algeria is also a member of:
 - International Energy Agency (IEA)
 - The International Atomic Energy Agency (IAEA)
 - The International Renewable Energy Agency (IRENA)
 - The International Association of Oil and Gas Producers (OGP) *

Algeria's commitments at COP 21

The goal of the COP 21 summit is to limit global warming to 2 ° C by 2100.

- Reduce greenhouse gas (GHG) emissions by 7% by 2030
- Reduce by 9% of global energy consumption by 2030 (energy efficiency).
- Increase the share of electricity from renewable energies to 40% in 2030.

3. Results and discussion

3.1. Synthesis of energy flows (M Tep) -Year 2016

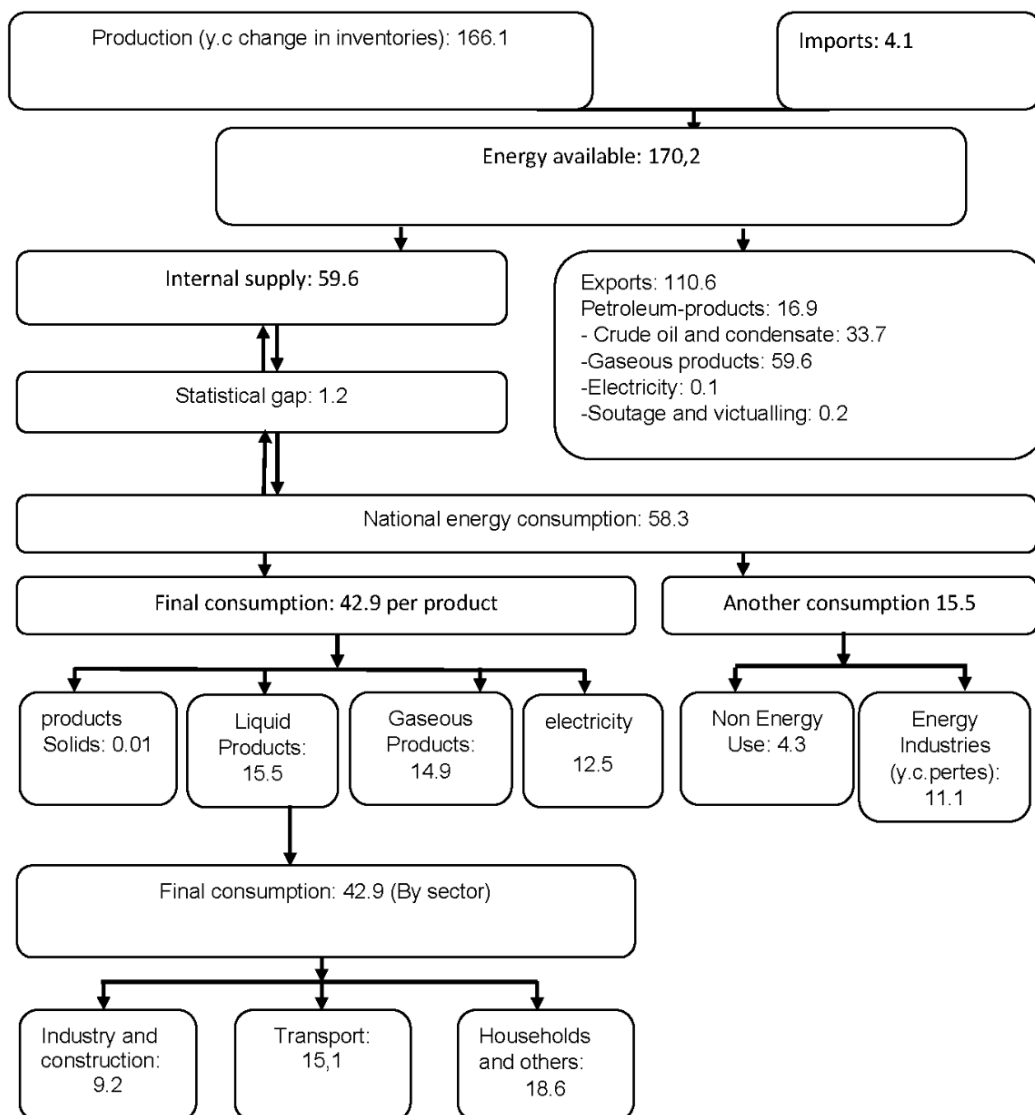



Figure5: Synthesis of energy flows (M Tep) -Year 2016

The main results of the 2016 national energy assessment highlight the following:

- Commercial production of primary energy reached 166.2 million toe, reflecting a strong growth of 11.3 million toe, or + 7.3% compared to the achievements of the year 2015;
- Available energy, sum of production, imports and inventories, reached 170.2MTep, up + 5.9% compared to 2015;

- Imports fell significantly by -13.0%, driven by a 16% drop in fuel prices;
- Exports reached 110.6 M toe, reflecting a strong increase (+ 10.4%) compared to the level recorded in 2015;
- The trade balance shows a net export balance of 106.5 Mtoe, a sharp increase over the year 2015, due to the combined effect of export growth and lower imports;
- National energy consumption reached 58.3 Mtoe in 2016, almost the same level (+ 0.1%) as in 2015. It represents more than one third (35.1%) of total production;
- Final energy consumption rose slightly (+ 1.0%) to reach 42.9 million toe, driven notably by electricity (+ 4.3%) and natural gas (+ 3.3%). By contrast, that of petroleum products experienced a significant decline (-2.8%).

However, Algeria begins to consider ecological solutions by investing in new and renewable energies  **Energetic transition**

The production of several photovoltaic power plants produced under the national renewable energy (RE) program. In 2016, 13 photovoltaic plants with a total capacity of nearly 180 MW were commissioned.; which has increased to increase the share of solar and wind power in the production of primary electricity to nearly of 80% .By contrast, Production of hydroelectricity has dropped sharply (-50%) at 72 GWh, given the low rainfall, bringing its share to less of 20% of primary electricity¹³.

The energy transition is therefore preparing for major changes: Changing the way we produce and consume energy. Sobriety and energy efficiency help to avoid wastage and improve the use of energy. This is explained by:

Evolution of behaviors, avoiding unnecessary or irrational expenses

It's sobriety

¹³ National Energy Balance 2016. (2017). Ministry of Energy.

Reducing the amount of energy needed for the same service rendered, by improving technical (energy production, eco-design apparatus)

It's energy efficiency (EE)

The energy transition is therefore preparing for major changes: Changing the way we produce and consume energy.

To control energy consumption. The ISO 50001 (an international standard on Energy Management Systems is available since June 2011. This is the ISO 50001) sets the framework for defining a suitable and effective energy policy. It is based in particular on the choice of indicators, their monitoring and their continuous improvement.

3.2. Energy management according to ISO 50001 standard

The structure of ISO 50001 has been aligned with that of ISO 14001. **An Energy Management System (EMS) must include the following elements¹⁴:**

1. Senior management commitment.
2. Definition of an energy efficiency policy for the installation by top management.
3. Planning and setting objectives and targets.
4. Implementation and conduct of procedures paying particular attention to the following aspects: organization and responsibilities of staff, training, awareness and competence, communication, staff participation, documentation, good process control, maintenance programs, preparation for emergencies and means of action, compliance with legislation and possible agreements on energy efficiency.
5. Comparative analysis: identification and evaluation of energy indicators over time, regular comparison with equivalent national standards.
6. Verification of performance and taking corrective measures.

¹⁴ Céline Corréard. (2014). *Maîtrise d'Ouvrage et management de patrimoine BATi*. Master 2 University Joseph Fourier -Grenoble. France.

7. EMS Review by senior management to ensure that it remains suitable, adequate and efficient.

8. Taking into account, when designing a new unit, the environmental impact that could have its dismantling.

9. Development of energy-saving technologies and monitoring of progress in energy efficiency technologies.

The integration of "energy management" into urban operations is a recent phenomenon, but one that is becoming increasingly important.

3.3. Structure of the ISO standard

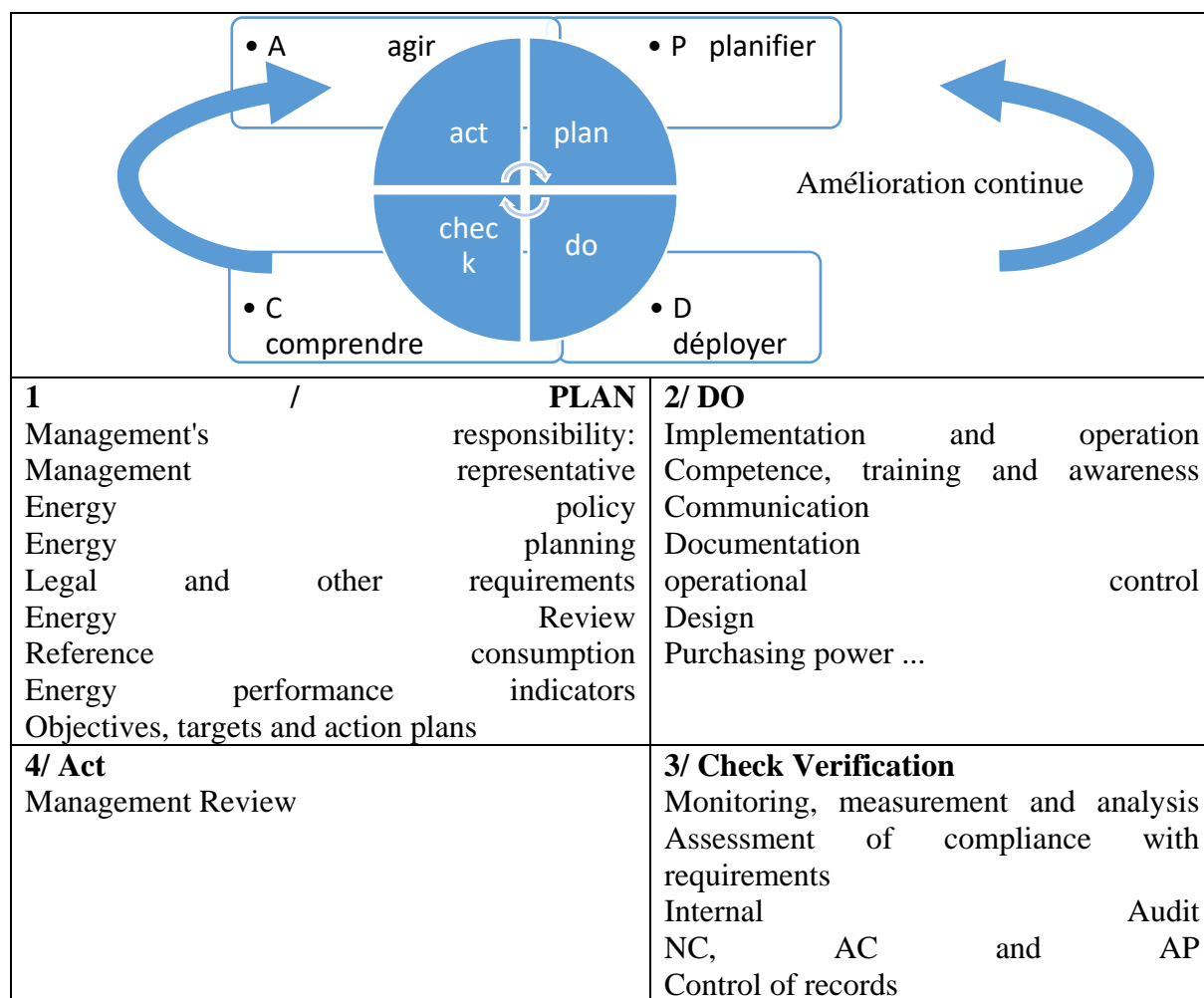


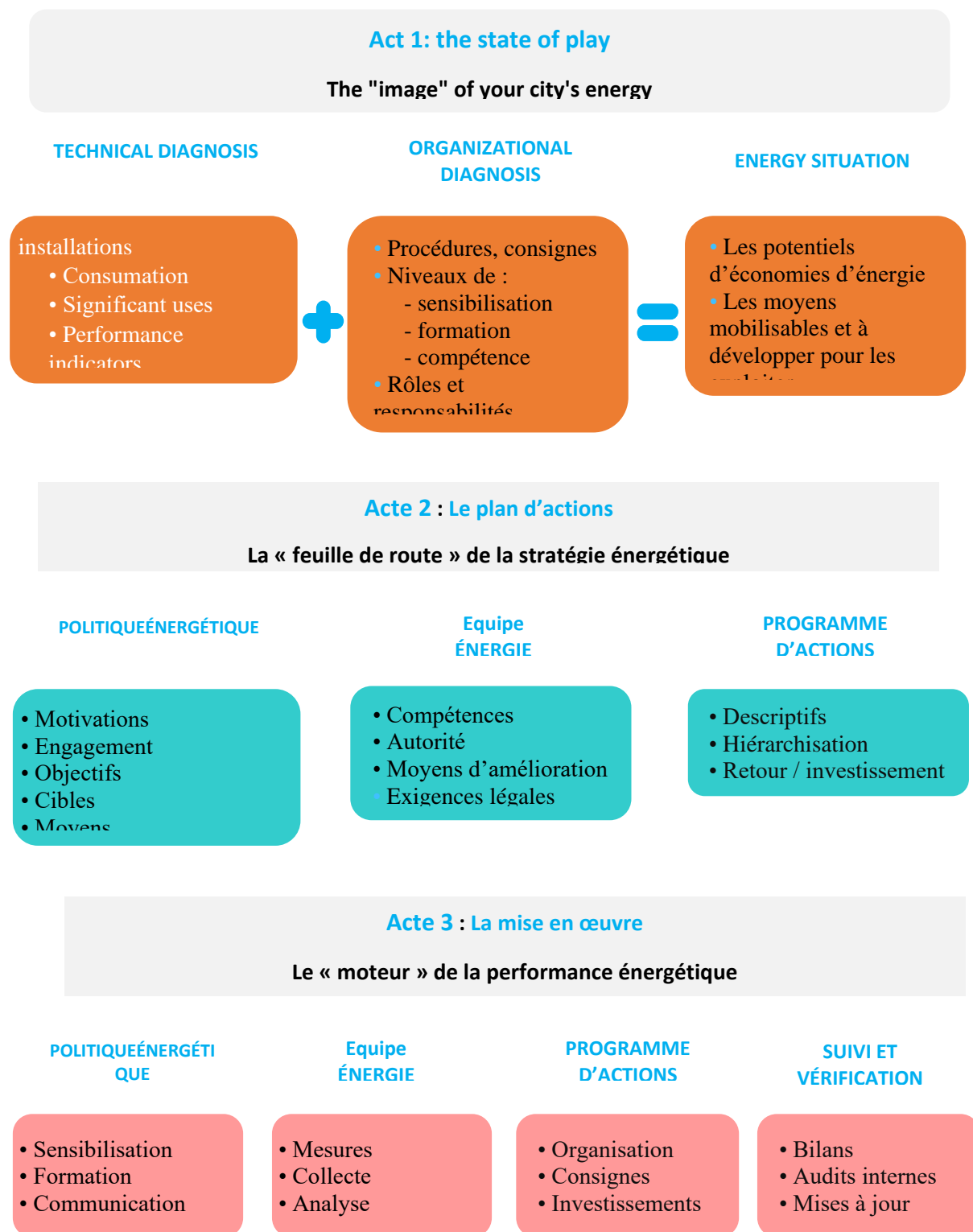
Figure 6. Structure of the ISO standard.

The purpose of this standard is to help organizations develop methodical control management to improve their energy efficiency, thereby reducing their costs and greenhouse gas emissions. ISO 50001 could impact up to 60% of global energy demand, ISO estimates.¹⁵

The energy management system is an essential factor of success it is in the interest of being defined after the inventory of fixtures because it will be increased by the result of the diagnosis the potential of energy and the targets (perimeter of intervention, activities ...) it must contain:

¹⁵ISO Standard 50 001 Energy Management System. (2018).

3.4. The Energy Management System in 3 acts



3.5. Recommendation

In order to concretize this renewable energy policy as well as that of energy efficiency in the context of sustainable development it is imperative that the public authorities decide to:

- Raise awareness and inform the public about energy issues by launching a reflection or debate with media coverage (press, radio, television) and within schools, universities, mosques, associations, political parties, etc.
- Align the prices of electricity, fuel and water at their real cost price and this in a progressive way, so that citizens pay more attention and preserve them. Today we get to pay the difference between the real price and the subsidized price thanks to the oil windfall; maybe in the near future we will not be able to do it anymore.¹⁶
- Require public buildings (Ministries, hospitals, universities ...) to use solar water heaters for heating sanitary water. The use of photovoltaics for public lighting.
- Require an energy audit prior to the construction of new and large buildings (plan audit).

For the implementation of an Energy Management System, actually, it is not the resources that are lacking, nor the technologies. The real challenges lie in our will, our organization and our societies. For renewable energies, as for energy efficiency measures, progress will not come simply from capital investment. This progress will also depend on education and institutional frameworks to promote appropriate behaviors and solutions to prevent rebound effects and additional costs. In reality, there is a relative disinterest of the general public; the topic of energy was not and is not yet part of the major concerns of Algerians to the hot issues of the moment (housing problems and unemployment). The modification of our energy behaviors means changes in our types and lifestyles and poses, simultaneously, a problematic of society:

¹⁶ Ezzedine Khalfallah. (2010). *Maîtriser l'énergie pour lutter contre le réchauffement climatique*, The Institute for Prospective Economics of the Mediterranean World. IPEMED.France.

consumption, transport, habitat, and city. These behavioral changes can bring us a lot more in energy saving, therefore, a money saving.

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A Short Glimpse to the Urban Development of Tabriz during the History

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Abstract

Locating on North West of Iran, Tabriz, the capital of East Azerbaijan Province, is one of the important metropolises of the country. The foundation of this historic city dated back to 1500 B.C. but due to the severe earthquakes, few historic buildings remained from ancient eras. In 2012, Tabriz was selected as the most beautiful city of Iran, and it is nominated as the tourism capital of Islamic countries in 2018. Tabriz used to be the capital of Iran during different dynasties like Ilkhanid, Kara Koyunlu, Ak Koyunlu, and Safavid; it was the residence of the royal family and crown prince during the Qajar Dynasty period. Tabriz is famous as “the city of the firsts”; and the Historic Bazaar Complex of Tabriz is the biggest roofed bazaar in the world, inscribed as a World Heritage Site in 2010. Tabriz experiences the phenomenon of rapid urban growth causing the formation of slum settlements in the border zones of the city. This paper will briefly discuss the urban development of Tabriz during the history. The method used in this theoretical paper is based on literature review. The aim of this paper is to improve the knowledge about the urban development of Tabriz.

Keywords: Tabriz, Iran, Azerbaijan, Urban Development.

1. Introduction

Tabriz is at the elevation of 1351.4 meters (4433.7 ft.) above sea level near Guru River, Aji River, Urmia Lake, Sahand volcanic cone and Eynali Mountain (Moosavi, 2011). Tabriz is the most

populated city in the north-west of Iran (See Figures 1 & 2) with the urban population of 1545491 in 2013. (Census of the Islamic Republic of Iran, 2006). Tabriz is an industrial city especially in automobile, machine tools, refineries and petrochemical, textile and cement production. It is also an academic and cultural city in the north-west of Iran (Results of national 2007 census). In Tabriz native people speak Azerbaijani language and most inhabitants are familiar with the Persian language, which is the official language of Iran and the only language of education (East Azerbaijan Geography). From Atropates era, Tabriz was chosen as the capital by several rulers; since 1265 it was capital of Ilkhanid dynasty and during Ghazan Khan Era, which came into power in 1295, the city reached its highest splendor. During Kara Koyunlu dynasty from 1375 to 1468 and again during Ak Koyunlu dynasty within 1468 – 1501, Tabriz was the capital of Iran. Again in the Safavid period from 1501 until their defeat in 1555 it was the capital of Iran, and during Qajar dynasty from 1794 until 1925 it was the residence of Iranian Crown Prince (Wood and Tucker, 2006, p. 530; Tapper, 1974, p. 324.).



Figure 1. Location of Tabriz in Iran



Figure 2. Location of Tabriz in East Azerbaijan Province (UNESCO, 2009).



Figure 3. A Current Panorama of Tabriz

2. Population of Tabriz

Tabriz was the capital of the huge Mongol state headed by Ghazan Khan in 1295. In 1300 A.D. Tabriz was the fourth most populated city with a population of 125000 after Cairo, Paris, and Fez. In 1350 A.D. Tabriz was the fifth most populated city after Cairo, Paris, Fez, and Sarai. In 1400 A.D. Tabriz was the third most populated city after Cairo and Paris with a population of 150000, up by 50000 since 1350 A.D. despite its capture by Tamerlane. In 1450 A.D. Tabriz was the second most populated city with a population of 200000 after Cairo and again in 1500 A.D. Tabriz with a population of 250000 was the second most populated city after Cairo; Constantinople was third, Paris was fourth and the fifth place was held by Fez (Chase-Dunn and Willard, 1994, p. 104). Population of Tabriz was estimated to be 250000 in 1500 A.D. according to Tertius Chandler's table which is the fifth city among top ten cities of the year after Beijing, Vijayanagar, Cairo, and Hangzhou (Chandler, 1987). Although there are different ideas about being the second or the fifth most populated city in 1500 A.D. both have the same idea about the population of Tabriz. In 2013

urban population of Tabriz was 1545491 which is the third most populated city in Iran (Census – Natayej, 2012) (See Figure 3).

3. Earthquakes Happened in Tabriz

Tabriz is located in a seismically active area of Iran which has a very long history of producing earthquakes; the earliest one is recorded in 858 A.D. “Yahya Zoka” in his book “Earthquakes of Tabriz” mentioned forty historical earthquakes and described them with detail (Zoka, 1980, p. 5). Some of the worst earthquakes damaging Tabriz were the ones happened in 858, 1034, 1272 and 1780 A.D. The extent of the damage of the one happened in 858 A.D. is not known but it was significant. The one happened in 1034 A.D. killed 40000 people at midnight when Tabriz was the capital and the largest city of Azerbaijan. In 1272 A.D. an earthquake happened which was not as severe as the previous ones but still caused considerable damages. The largest and the most devastating earthquake happened in Tabriz was the one in 1780 A.D. on the first day of the New Year which destroyed most of the buildings (UNESCO, 2009).

4. Urban Quarters of Tabriz

Traditionally there are several Urban Quarters in Iranian cities, which do not have the same size and population necessarily. Each of these quarters is an urban-social unit which plays an important role in the organization of the social relations in the city. Some elements like cemeteries, general area and social applications of the quarter identify the quarter and determine political boundaries. There are different quarters in Tabriz because of various social backgrounds, migration and weather differences (UNESCO, 2009). Tabriz was divided into ten municipal districts and old districts are: Ahrab, Akhmagaya, Amragiz, Bahar, Baghmasha, Baghshoumal, Baron Avak (Barnava), Bazaar, Beylanki (Beylankooh), Charandab, Chousdouzan, Davachi, Gajil, Gazran (Renamed as Khayyam), Hokmavar, Imamieh, Kouchebagh, Khatib (Hatib), Khayyam, Khiyavan,

Laklar, Lalah, Manzariya, Maghsoudia, Maralan, Nobar, Qaraghaj, Qaramalik, Rastakucha, Sarlak, Selab, Shanb-e-Ghazan, Shah-goli, Sheshghelan, Sirkhab, Tapalibagh and Vardjibashi (Vidjooya). Modern districts of Tabriz are Abrasan, Elahi Parast, Ferdous, Fereshteh, Golshahr, Marzadaran, Parvaz, Rajai Shahr, Roshdieh, Shahid Yaghchian, Valiye Asr and Zafaranieh (See Figures 4, 5, 6 & 7).

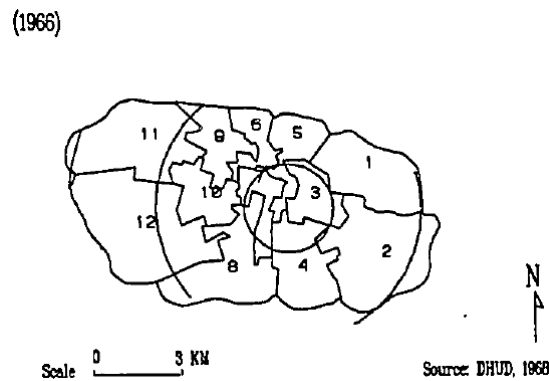


Figure 4. Zone Boundaries in Tabriz (in 1966) (Azimi, 1995, p. 64).

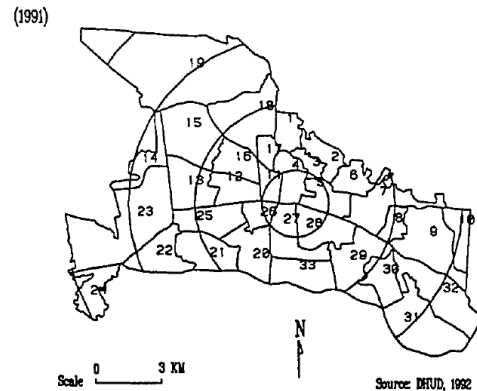


Figure 5. Zone Boundaries in Tabriz (in 1991) (Azimi, 1995, p. 64).

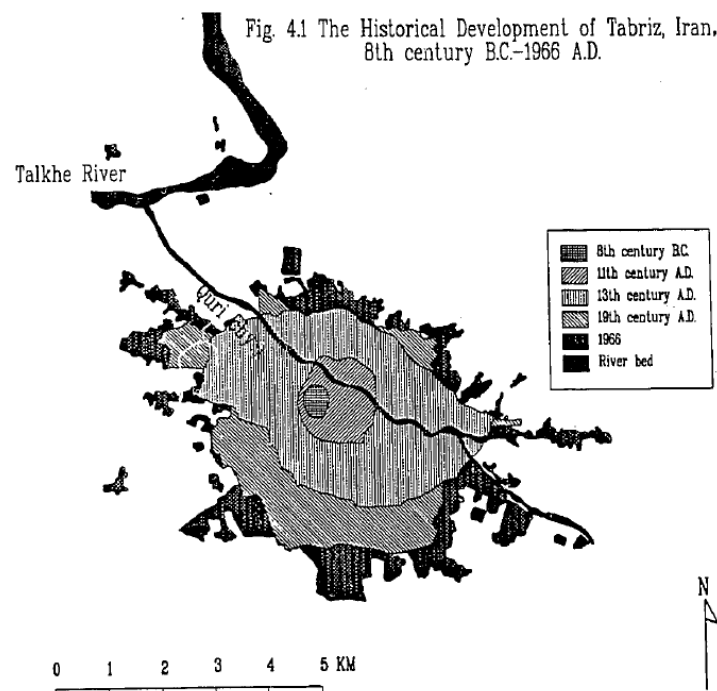


Figure 6. The Historical Development of Tabriz, Iran. 8th century B.C. – 1966 A.D. (Azimi, 1995, p. 70).

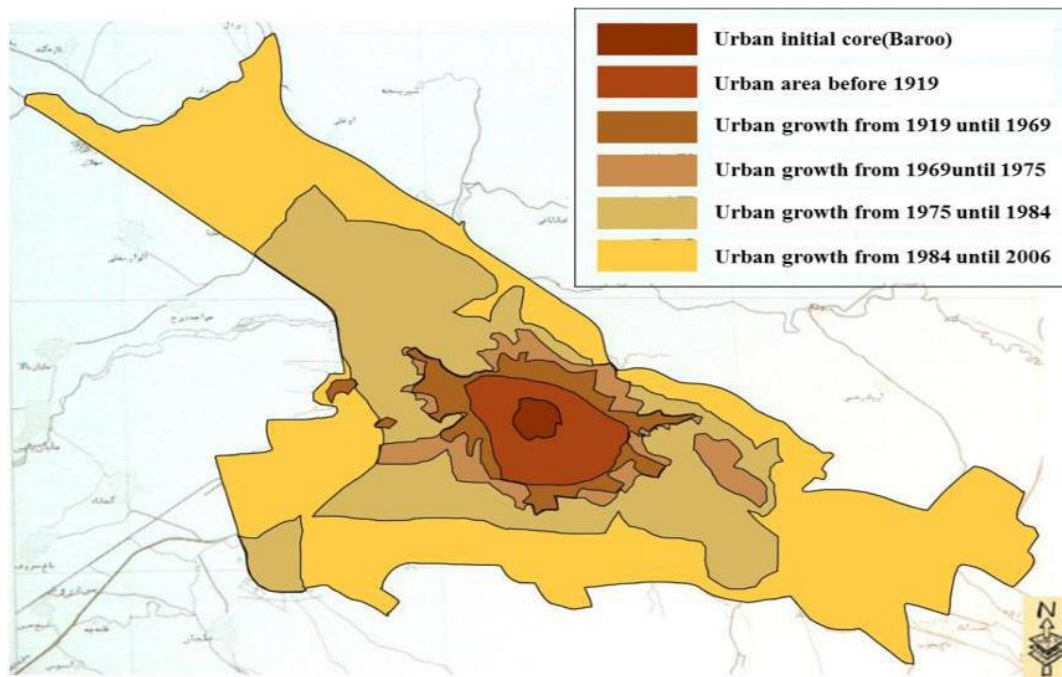


Figure 7. Periodic Growth of Tabriz City since the Formation of Initial Core until 2006 (Kheyroddin, et.al, 2013).

5. The Natural and Climate Characteristic of Tabriz

“Edwards” in his book “The Persian Carpet,” said: Tabriz, like most of other important cities of Iran, is at the junction of several roads where caravans pass. However, its importance is more than a connection center as it is located in the heart of a vast and fertile province of Azerbaijan and guards and protects one of the gates of Iran (Edwards, 1953, p. 62) (See Figure 8).

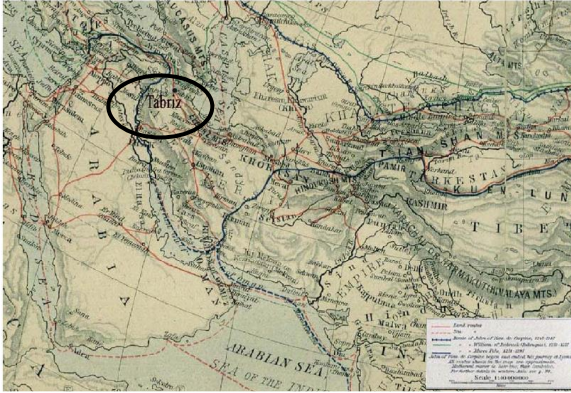


Figure 8. The Map of Iran Plateau's Folds (UNESCO, 2009).

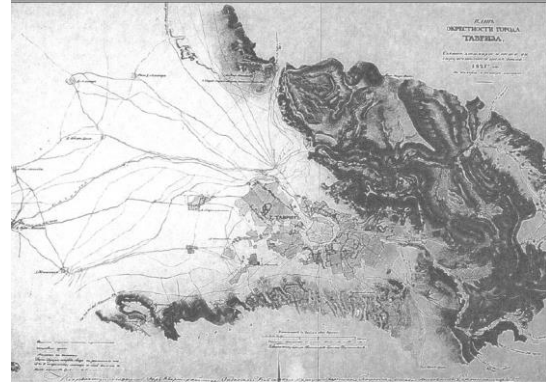


Figure 9. Map of Tabriz Drawn by Russian Engineers in Qajar Dynasty (UNESCO, 2009).

“Chardin” the French explorer who visited Tabriz in the Safavid Period in his book “Chardin Itinerary,” said: The weather of Tabriz is cold and dry, yet so pleasant and healthy that it can work against bad moods and foul behavior. Cold weather exists for most of the year. Since the city is northerly, snow exists on the peaks of its mountains for nine months out of the year. The wind blows during mornings and nights, while rain showers form in all seasons except summer. The weather is relatively cloudy the entire year. Life is joyful and the food is plentiful (Chardin, 1956, p. 409) (See Figure 9).

6. The Formation of Tabriz

“Tamer lane,” said: Tabriz contains such antiquity that nobody knows when it was first established (Brion, 1983, p. 127). Many resources in the middle ages believed that “Zobeide Khaton” wife of “Haroon-al-Rashid” Built Tabriz, other researchers say it goes back to the Median period. “Minoresky” believed the denomination of Tabriz goes before the Sassanid and Arsacid periods (UNESCO, 2009). “Giz”, the ambassador of England says that Tabriz is the same as “Kaza”, an ancient city, and forty years later “Flanden” claims some named Tabriz as “Kaza” (Etemād-olsaltaneh, 1878). “Hartsfield” believes that Tabriz is the same as “Taroni” which is mentioned by

Sargon II (Sharokhin the second of Assyria 722 – 705 B.C.) (UNESCO, 2009). Archeological researches in Tabriz revealed the Grey Pottery Civilization around the eastern gate of Tabriz next to the Blue Mosque (a part of Silk Road) where there are thirteen historical eras such as Iron Age one to three, from Achaemenid to Islam period and beyond. Some parts remain from Bronze Age which proves that the history of Tabriz goes back to ca. 1500 B.C. (Hezhabr Nobari, 1999 – 2000) (See Figures 10, 11 & 12).

7. The History of Tabriz in the Islamic Era

7. 1. 9th Century to 12th Century

The core of the city of Tabriz at this time was a place with a Jame Mosque and a bazaar and the development of the city was due to them and government houses as ruling centers (Morris, 2002, p. 32). “Ravad Ibn-e-Almosanna-alazadi” who became the ruler of Tabriz selected Tabriz as his residence. At that time Tabriz was a small town and then, his son, “Vajna” and his brother built Tabriz and afterward “Ala Ibn-e-Ahmad Ravadi-alazadi” rebuilt Tabriz and made gates. There is a gate named “Ala” which is named after him (Sotoudeh, 1983, p. 92). In the early 9th century there was a solid castle in Tabriz which “Babak” ruled and was an important military standpoint while the city developed gradually. In 858 A.D. a terrible earthquake ruined the city and by the order of “Motavakkel” the caliph (847 – 861 A.D.) Tabriz was rebuilt (Yaqubi, p. 156).



Figure 10. The Location of Tabriz on the Silk Roads in Antiquity from 2nd Century B.C. to 4th Century A.D. (UNESCO, 2009).

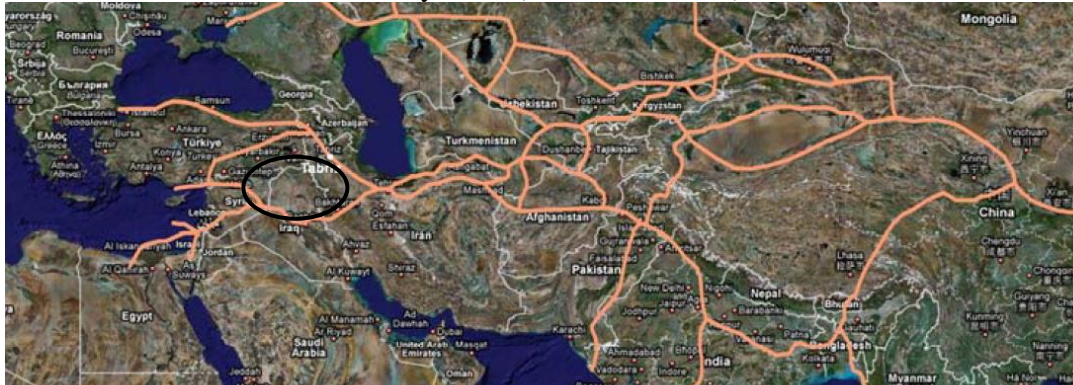


Figure 11. The Location of Tabriz on the Silk Roads from 5th Century A.D. to beginning of 13th Century A.D. (UNESCO, 2009).

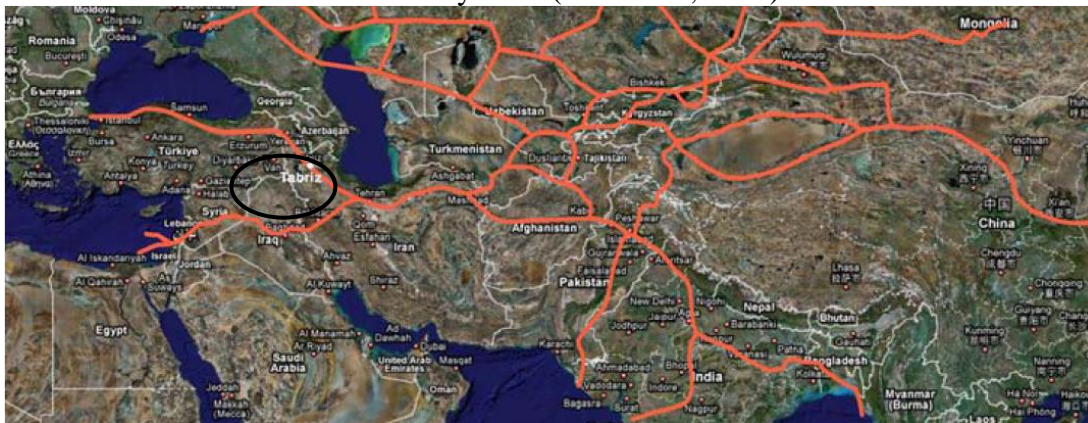


Figure 12. The Location of Tabriz on the Silk Roads from 13th Century A.D. to 16th Century A.D. (UNESCO, 2009).

In the middle of the 9th century the city developed and became famous as “Ebn-e-Maskuye” said Tabriz is a city with numerous gardens and forests and wealthy people (Ebn-e-Maskuye, et al., 1966). Tabriz is among the large cities in the 10th century and “Ibn-e-Hoghel” writes: in this city which has many bazaars, business is thriving and the scarves of Tabriz are unique (Ebne Hooghal, 1966, p.92). “Moghaddasi,” said: Tabriz is stable city and better than Medina and the Jame Mosque is great (Moghaddasi, 1982, p. 561). During “Haroon-al-Rashid Abbasi”, the Abbassid Caliph, a lot of construction and growth happened in Tabriz. But afterward because of several earthquakes happened in Tabriz, the city was destroyed and rebuilt. Tabriz was the capital of Azerbaijan

throughout the reign of the Ravadin Dynasty until the attack of “Togrol Bay” (1038 – 1063) (Kasravi, 1956, p. 205). During the reign of “Shamseddin Eldegaz”, (1136 – 1174 A.D.), Tabriz was the capital of Eldegaz dynasty. It has the most prosperous bazaar in Iran and is the famous capital of Azerbaijan in 1178 – 1186 during the reign of “Qizil Arsalan” (Bahrām, 1970, p. 206). After the power of “Qizil Arsalan” it was the permanent capital of Iran and in the time of “Nosratteddin Abu Jeffare Jahan Pahlavan” (1177 – 1191 A.D.), “Atabak Abubakr” (1191 – 1210 A.D.) and his brother “Uzbek” (1210 – 1225 A.D.) it was the capital of the country. The population of Tabriz was close to 100000 at that time (Bonyādof, 1978, p. 188) (See Figures 13 & 14).

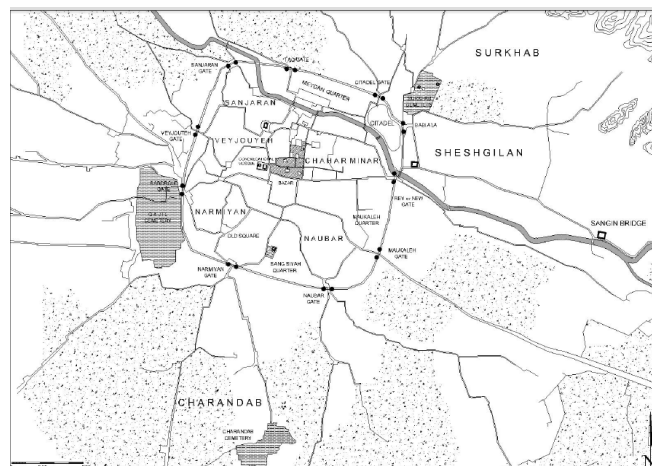


Figure 13. Sketch Map of Tabriz, Pre-Ilkhanid Urban Organization during 12th Century A.D. (Jafarpour Nasser, 2011, p. 4).

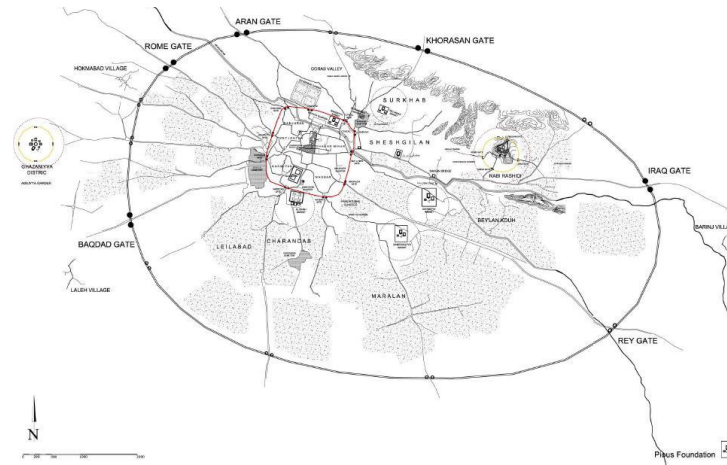


Figure 14. Sketch Map of Tabriz Metropolis, Ghazani wall and Urban Development during Ilkhanid Period (Jafarpour Nasser, 2011, p. 6).

7. 2. 13th Century to 15th Century

Tabriz was one of the most important cities of the world in economic and political issues in this period. In the late 13th and early 14th-century weaving factories of “Rab-e-Rashidi” and “Shamgazan” progressed in Tabriz and fifty weavers came from Antakya and Cyprus to work in Rab-e-Rashidi’s workshops (Hamadāni, 1945, p. 321). Also Paper manufacturing factory was located in Rab-e-Rashidi (See Figures 15 & 16).



Figure 15. Remaining of Rab-e-Rashidi Complex

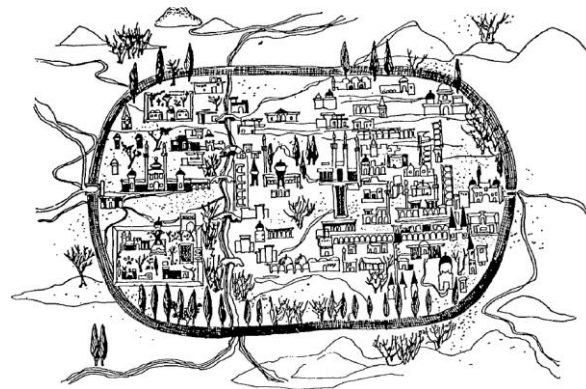


Figure 16. A Drawing of Tabriz by a Turk Traveler, 14th Century A.D. Source: DHUD, 1992 (Azimi, 1995, p. 215).

In 1265, Tabriz was the capital of “Holaku Khan’s” government which ruled from the Amu Darya to Egypt and it was like a climax and turned Tabriz to the central political and economic city of Ilkhanids. Tabriz had a shining economic and social life from the ruling time of “Abaghakhan” to the first years of “Abu Saied’s” ruling (1316 – 1331) which cause the attention of ambassadors from Egypt, India, Europe countries, Byzantium Empires and Pop (Jahn, 1971). The Venetian tourist “Marco Polo” had visited Tabriz from 1294 to 1295 and wrote about its trade in his notes (Tāheri, 1968). “Hamdollah Mostofi” describes the round of barbican around the city which “Ghazan Khan” constructed as 6000 foot with ten main gates (Mostofi, 1957). (See Figures 13 & 14). Also, some caravanserais, baths, and bazaars were built for the convenience of the businessmen who came to Tabriz, they used to take a bath and then enter the city which prevents the entrance of illnesses to Tabriz (Hamadāni, p. 414). In the early 14th century Tabriz roads connected the caravan roads of “Sivas Arzinjan” and “Erzurum” to each other which caused the growth of trade in Tabriz (UNESCO, 2009). Iranian trade roads connected to Tabriz from the south in 14th and 15th century and also the roads of the south and the east started from Tabriz (Estakhri, 1968, p. 161). “Blue Mosque” or “Mozaffarieh building” was built in this period by “Jahanshah Gharagoyunlu” although some say that “Bayim Khatoun”, his wife, and his daughter built it (Tabrizi, 2004, p. 470).

7. 3. 16th Century to 17th Century

In the early 16th century “Ismail” the king chose Tabriz for Safavid dynasty after defeating the last king of “Aghgoyunlu”. This powerful government in Iran was like the “Ottoman” dynasty in Turkey. “Chardin,” said that Tabriz square is larger than Isfahan’s and it is the biggest one he had seen (Chardin, 1956, p. 479). Industry in Tabriz grew faster in the 16th and 17th century, industrial goods of Tabriz sent abroad beyond answering the domestic needs; most of the people in Tabriz

worked in business areas (Monshi, p. 303). According to their job they worked in special bazaars and lived in special boroughs. (See Figure 17).

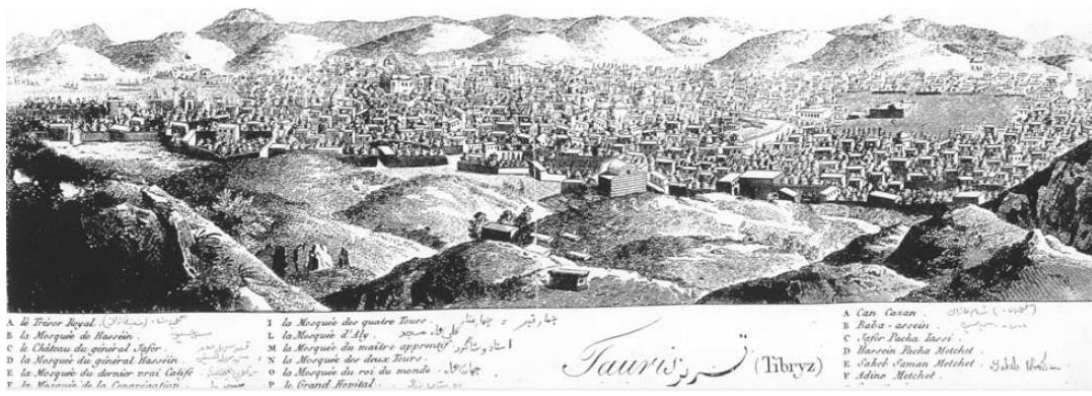


Figure 17. Sketch of Tabriz in Safavid Era; “Chardin Itinerary” (Chardin, 1956, p. 409).

In 1647 there were 200 big and 70 small caravanserais in Tabriz and in 1670 there were 300. Tabriz was the capital of Safavid dynasty for more than half a century and because of its location on the east-west road, played an important role for trading between Russia and Europe; because business with Asia was easier through Russia for western countries (UNESCO, 2009). “Tavernier” considered Tabriz as an important trade bridge between Iran, Turkey, Arabia, Georgia, India, and Russia (Tavernier, 1957, p. 67). In the 16th century the war between Iran and Ottoman made terrible effects on trade of both countries but in 1555 there was a peace treaty between Safavid and Ottomans and during September of 1586 to July of 1603 Tabriz was under occupation of Ottomans and its economic issues were in decline. Even though it was the decline time, Tabriz was still Iran’s industrial and most important trade center at the end of 17th and early 18th century (UNESCO, 2009) (See Figure 18).



Figure 18. Fortification of Tabriz Reconstructed after Destructive Earthquake in 1780 (By Eugène Flandin) (UNESCO, 2009).

7. 4. 18th Century until 20th Century

After Safavid period “Nader Shah” the king of Afshar defeated the Ottomans and reoccupied Tabriz in 1729; after the Zandiyeh period, “Mohammad Khan Qajar” occupied Tabriz in 1756. “Karimkhan Zand” went there in 1759 and was not successful but after one year he occupied it and “Najafgholi Khan Biglarbeygi” became the ruler of Tabriz and upgraded it. At the last night of 1779 and the first day of 1780 a terrible earthquake ruined Tabriz when it was the start of Qajar dynasty and in short time the city was rebuilt. At the beginning of the 19th century, the center of government in Tabriz transferred from “Sahebabad”, at the north of “Mehranroud” River to the behind of the “Aala” gate or “Baghmisheh” gate at the south of “Mehranroud” River. A commercial center constructed as “Sahib-ul-Amr” square in the “Sahebabad” historical area (See Figures 19 & 20). “Jame Mosque” was restored and returned the centrality of Bazaar of Tabriz. In 1850 England was Iran’s greatest trade partner and Tabriz was the biggest trade bazaar in Iran (UNESCO, 2009).



Figure 19. Sketch of Sahebabad Square of Tabriz (UNESCO, 2009).



Figure 20. Bridge on the Southern Side of Sahib-ul-Amr Shrine (Eugène Flandin) (UNESCO, 2009).

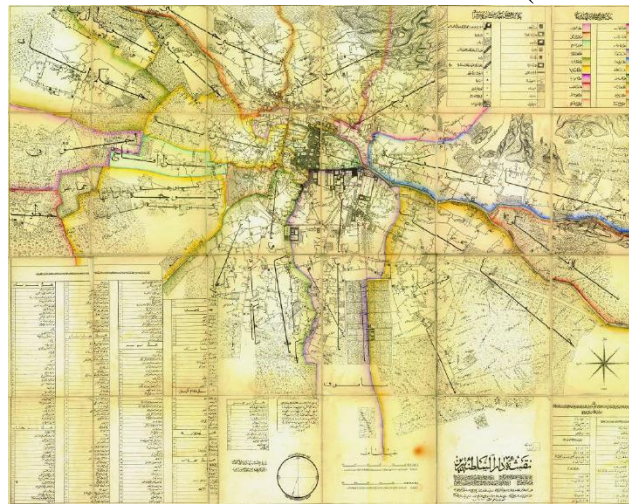


Figure 21. Map of Tabriz Darossaltane Drawn by Sarhang Garajedāghi in 1880 A.D. (UNESCO, 2009).

In 1880 the prince “Abbas Mirza” ordered to prepare the map of Tabriz with urban elements and divisions of the quarters; the name of the houses, mosques, religious places and bazaar are mentioned in this detailed map (UNESCO, 2009) (See Figure 21).

7. 5. Pahlavi Period

On 11th of December, 1925 parliament offered the government of Iran to “Reza” the king and a modern urban system started in Tabriz like the other cities. Because of the entrance of the cars to Iran, wide streets were established; the first street of Tabriz in 1926 was “Pahlavi” which is renamed as “Imam Khomeini” after the revolution. Because of the construction of this street from “Qurd Meydani” to “Qonqa-Bashi” the old street of “Kohne Khiyaban” wasn’t popular anymore

and this new street separated “Alishah Mosque” from the bazaar and the core of the city. The second street of Tabriz was built by the mayor of the city, “Mohammad Ali Tarbiat” in 1928 which was from “Nobar borough” towards bazaar. He also built other streets from 1928 to 1931 which ruined the ancient gates of Tabriz. Due to World War II from 1941 to 1946 urban construction stopped in Tabriz like the other cities and since 1950 new streets were built again (UNESCO, 2009).

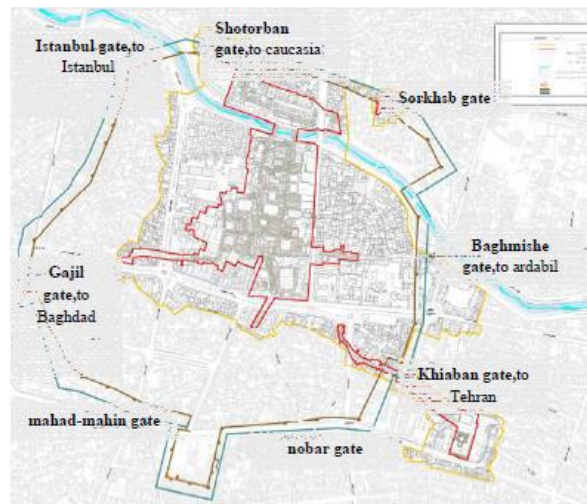


Figure 22. The Location of Historical Gates of Tabriz Old City (UNESCO, 2009).

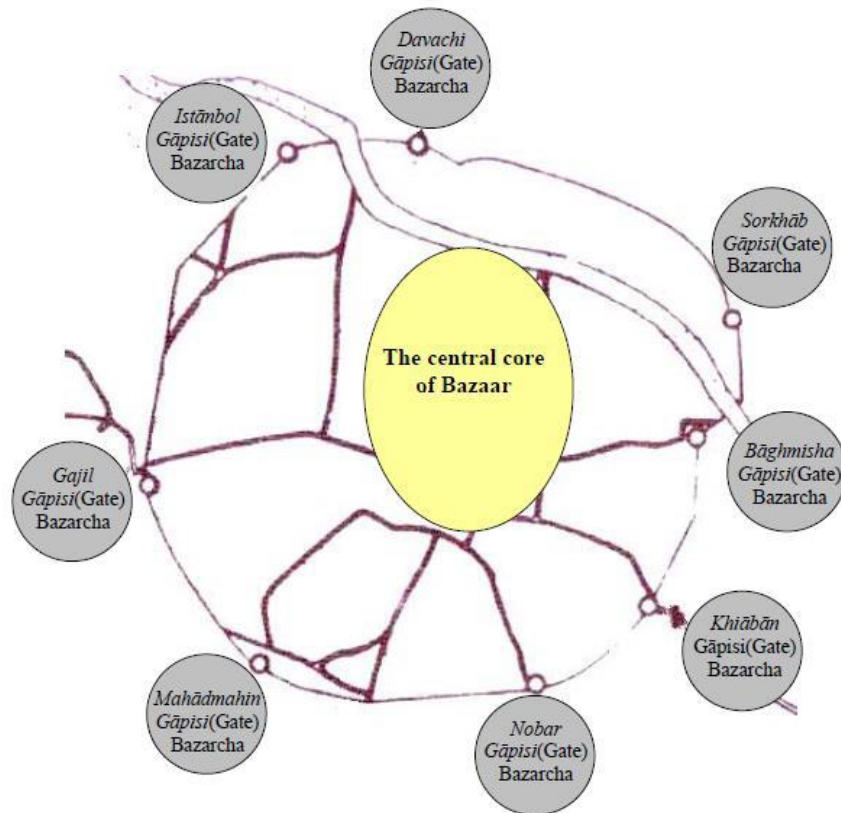


Figure 23. The Situation of Bazaar and Historical Gates of Tabriz Old City (UNESCO, 2009).

Eight gates of Tabriz which connected it to the other cities were: Istanbul gate (to Istanbul and European countries), Davachi or Shotorban gate (to Baku in Azerbaijan), Sorkhab gate, Baghmishe gate (to Ardabil, Rey and East Asia), Khiyaban gate (to Tehran), Nobar gate, Mahadmahin gate and Gajil gate (to Baghdad, Arabia and Africa) (UNESCO, 2009) (See Figures 22 & 23).

8. Urban Green Spaces in Tabriz

The design, management, and protection of the urban green spaces show the quality of a city. As the aim of these green spaces is increasing the contact between human and nature, studies proved that the people living in good quality green spaces behave better and crime is low in those areas. They are also important for improving microclimatic conditions, cleaning the weather, filtering the wind, reducing the sound pollution and tourist attraction with their beauty which influences

the economics by creating employment. In Tabriz most houses had gardens and there were many famous gardens all over the city in ancient days but after 1920 due to capitalism entrance in Iran, land use was changed from green spaces to residential areas. In 2006 Tabriz had 2.6 million m² green space and 2353341 m² parks which indicates a considerable growth compared with previous years. Tabriz had 940,000 m² parks with suburban function, 282,021 m² with regional function, 736,518 m² with local function, 518377 m² with alley function and 127730 m² with neighborhood function in 2006. Urban parks have been created in districts 2, 3, 4, and 6 and regional parks are located in districts 1, 2, 3, 5, and 6. In District 8, there is no park with local and regional functions and in District 6 there are no local parks that show the improper distribution of the parks in Tabriz (Abizadeh and Zali, 2013) (See Figures 24, 25, 26 & 27).

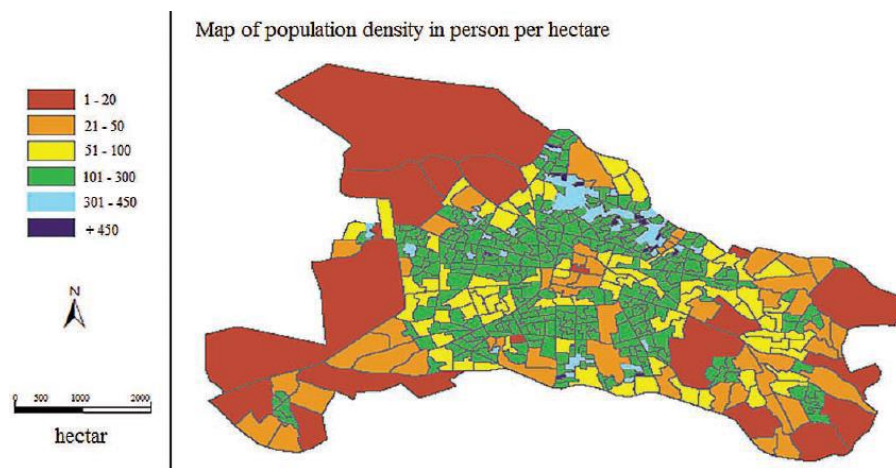


Figure 24. Population Density (Person/ Hectare) in Tabriz (Abizadeh and Zali, 2013).

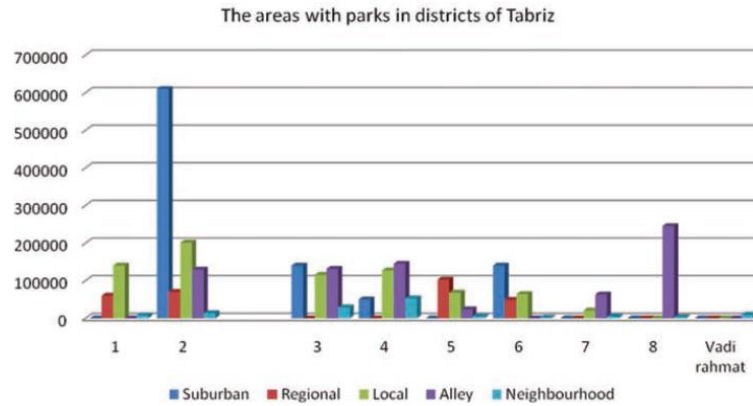


Figure 25. The Areas with Parks in Districts of Tabriz (Abizadeh and Zali, 2013).

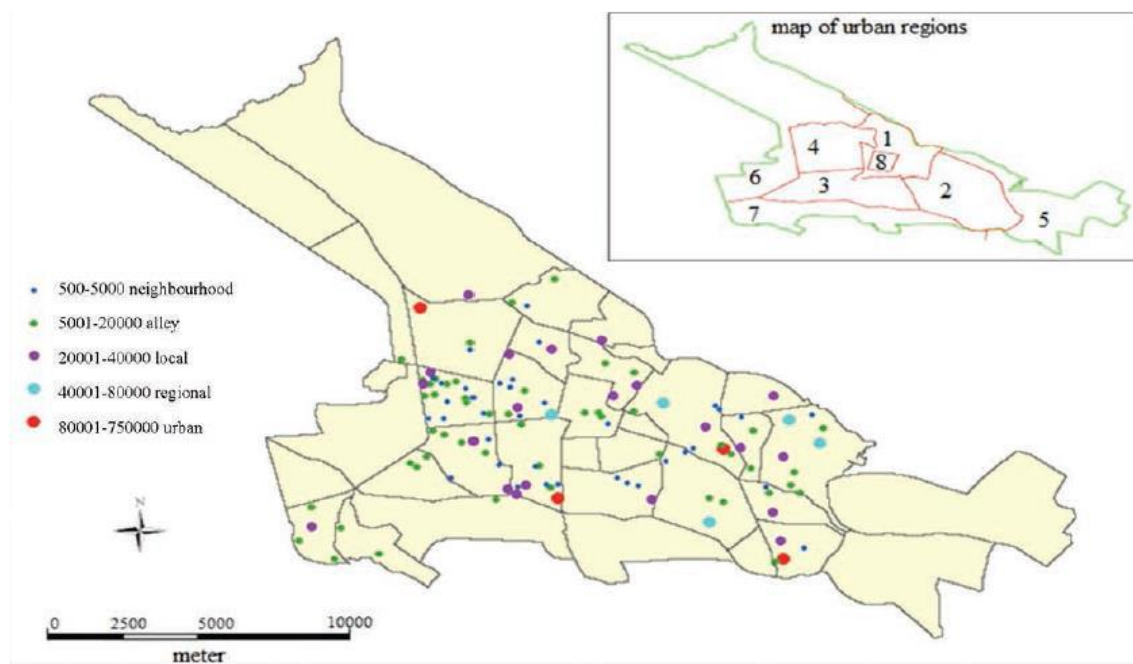


Figure 26. Park Distribution in Different Districts of Tabriz in 2006 (Abizadeh and Zali, 2013).

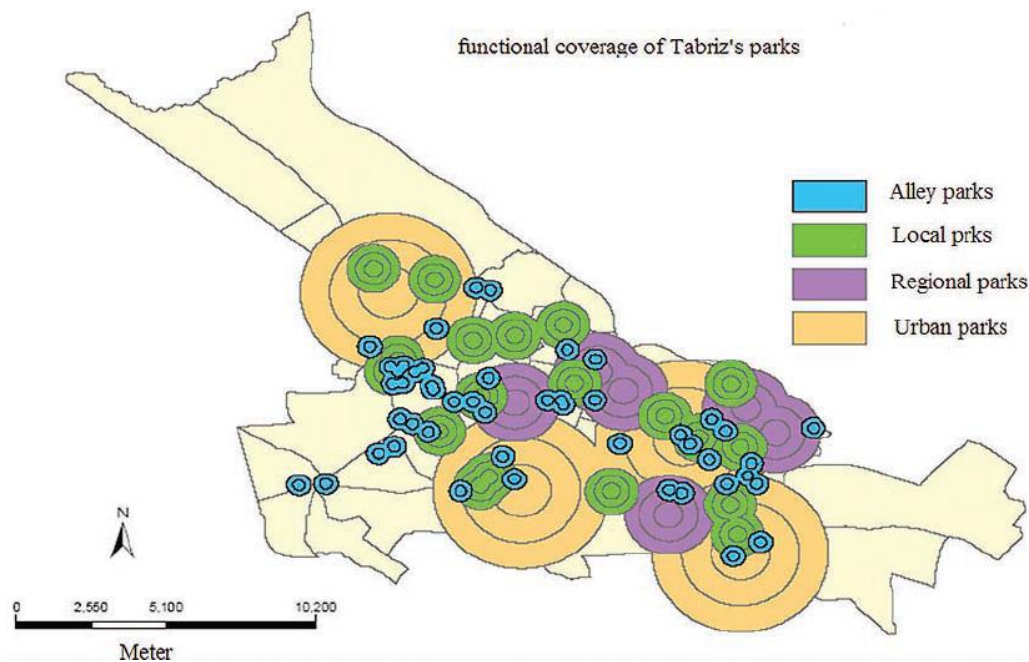


Figure 27. Function Level of Urban Parks in Tabriz (Abizadeh and Zali, 2013).

9. Contemporary Urban Problems in Tabriz

One of the urban systems' common problems is urban growth and physical expansion without a correct design and program which affects different urban components directly or indirectly. Urban sprawl is a kind of urban growth occurred because of inefficient urban plans, urban economic problems, inconsiderately policies and suddenly decisions for urban development. This phenomenon causes various inconvenient environmental, social and economic problems for the cities. For solving such problems there are some solutions like urban consolidation, sustainable city, compact city, new urbanism and smart growth which are about paying attention to existing urban centers rather than spreading in suburbs. Tabriz is experiencing hasty growth in last decades which is not proportional to its needs and capacity. This process is a continuing issue which empties inner city and expands suburban areas causing physical, economic and social problems. Some of the main problems caused by external expansion are: garden and agricultural lands'

demolition, increasing slums, disconnection of physical tissues, vehicles increase due to the expansion of transportation network, city development on dangerous and unstable lands, degradation of historical identity and vacancy of old tissues. When people immigrate from inner city to suburban area, the old tissue is emptied from original inhabitants and new people coming to the inner city do not have the sense of belonging to this tissue so the identity of tissue is threatened. Another problem is social and economic differences of inhabitants of urban regions, some regions are for low-income people but high-quality regions are for rich people, so this causes crimes, crisis and safety problems which threaten the city. Some physical evolutions in Tabriz indicate the rapid expansion of the city in the periphery area in last decades. The area of Tabriz had tripled, increased from 6440 hectares to 19000 hectares in 1986-2011 while its population had increased from 971482 to 1545491 in the same period so its area growth had been more than its population growth (See Figures 7 & 28). Hasty development of Tabriz caused to the structure of 5838 hectares of Tabriz suburban agricultural and garden lands during 1967 – 1992. In last decades connection networks, various recreation-service centers and commercial projects improve the quality of some parts out of the inner city and also the degradation of qualities of central urban tissue (Kheyroddin, et.al, 2013).

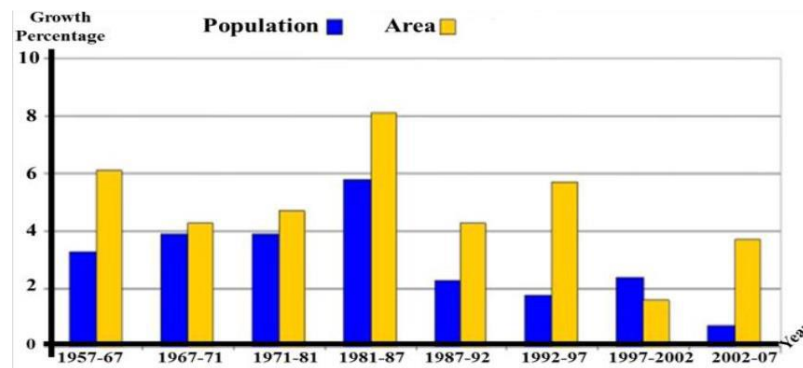


Figure 28. Comparing Population Growth with Area Growth of Tabriz (Kheyroddin, et.al, 2013).

10. Slum Settlements in Tabriz

There are different zones of informal and slum settlements in Tabriz with various ages and origins; the northern zone of the city is more significant among the others because of its history and unique topographic condition. Illegal subdivision and selling of agricultural lands create these kinds of zones but the northern zone of Tabriz has rural bases which have been growing over time and absorbed by the city. The people who live in slums are forced to live in unsafe regions, steep hillsides, flood plains, polluted sites near waste dumps, open drains and sewers or polluting industries; facing high rates of unemployment and addiction. The northern slum area of Tabriz with a population more than 250000 has social, economic, environmental and political problems. The existence of slums in Tabriz is due to rapid urbanization and uneven urban development beyond the steady increase of population. Harsh topography, lack of proper planning for the development, demand for the basic civic services, provision for housing and shelter, water supply, sewage and sanitation, health care services and transportation facilities are the other problems of its inhabitants. Living in this kind of areas creates environmental pollution due to the inhabitants' unorganized and unsystematic waste and sewage disposal, unplanned houses and unethical habits and values (Moosavi, 2011).

11. Conclusion

During the Islamic period, Tabriz with the centrality of Masjed Jame and bazaar gained stronger economic role. Also, geographical location of Tabriz which is in the center of Azerbaijan and on Iran-Europe transit route is a great opportunity to be the main commercial and economic center in Iran during history. Tabriz has benefited from being a political center as a national capital for some periods but suffered from this centrality by being the main target of several invasions by Turks and Russians between 16th and 19th centuries. Natural disasters like floods and especially

earthquakes destroyed Tabriz several times during history which affects city's growth, but each time the city was rebuilt and survived. With the beginning of modernization, mainly after the 1960s, urbanization changed in Tabriz in terms of population size and internal organization. During last decades the urban population of Tabriz increased dramatically but urban physical growth was much more than it. Thus sprawl approach happened which caused forgetting about the central regions of the city and paying extra attention to the suburban areas and horizontal growth. As a result, the inner city faced degradation of qualitative values because of urban sprawl and paying more attention to suburban development areas.

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An Industrial Heritage Case Study in Ayvalık: Ertem Olive Oil Factory

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Abstract

Ayvalık is a pioneer settlement in the West Anatolia with an olive-based industry since its establishment. However, due to fast technological developments and changes in production systems, there is a large stock of derelict industrial buildings within the city center. In addition, few of them are restored under poor conditions as a result of financial profits. This situation puts Ayvalık's olive industrial heritage which constitutes the identity of the town at critical risk of extinction. Ertem Olive Oil Factory is one of the industrial heritage buildings in Ayvalık dating back to 1910 which is a typical well preserved-medium scale 19th-century olive oil factory including both olive oil and soap productions. The aim of this paper is to discuss a conservation approach for the industrial settlement of Ayvalık by assessing the factory and its close environment through values, problems and potentials.

The paper thus begins with brief history of Ayvalık and the effects of industrialization on the city. It continues with theoretical principles of adaptive re-use through contemporary literature and general evaluation of adaptive re-use examples in Ayvalık according to these principles. The third part focuses on the general characteristics of Ertem Olive Oil Factory and its close environment. The final part discusses the conservation approach for the adaptive re-use through values, problems and potentials of the building and Ayvalık.

Keyword: Olive industry; Conservation; Adaptive re-use; Olive Oil Factory; Ayvalık.

Introduction

Industrial heritage places, landscapes, buildings and/or complexes are characterized by a pragmatic value-driven approach due to their construction purposes. They have often been both the reflection of transformation and modernization as a result of the industrial revolution. Industrial buildings usually lost their functions due to the fast technological developments and changes in production systems (Cengizkan, 2006: 9).

"Industrial landscape of Ayvalık" defined by a specific geography, in the Western edge of the Anatolia is accepted on the tentative list of UNESCO in April, 2017 as an outstanding example of social and economic structure of 19th-century industry based on olive-oil production in Western Anatolia (UNESCO, 2017).

This paper focusing on a case study selected from Ayvalık aims to discuss a conservation approach by assessing it and its close environment through values, problems and potentials. In this regard, the first part of this paper comprises a summary of the history and characteristics of Ayvalık as an industrial heritage. The second part contains the comprehensive review of the adaptive re-use principles and interpretation of Ayvalık industrial landscape through adaptive re-use examples. The third part describes the case study -Ertem Olive Oil Factory- and its assessment as an industrial heritage. And the last part provides a conservation approach for the adaptive re-use of the selected case study.

1. Understanding the History & Characteristics of Ayvalık as an Industrial Heritage

Ayvalık is a seaside town on the northern Aegean coast of Anatolia which is a province of Balıkesir. The geographical settings of Ayvalık, that is confined by the sea in the west, is surrounded by Ida Mountains and Gömeç plain; Altınova province in the south and Madra Mountain that stretches from the north-east to the south-east in an arch form in the east (See Figure 1). It is situated on a volcanic peninsula. From the west, Lesbos Island can also be seen; on the north-east, there is Gömeç; on the south, there are Dikili and Bergama.

This unique geography is covered with olive groves that are a component of the natural character of Ayvalık constituting almost 41.3 per cent of the region which is the main source of the industrial landscape of Ayvalık. There are more than two millions olive trees which originate from the wild olive (*olea olester*) that existed as local species among other species and were domesticated and converted genetically endemic species (UNESCO, 2017, para. 4).



Figure 1: Location of Ayvalık (Google Earth, last accessed on September 12, 2016) and its close environment (source: <http://www.thefullwiki.org/Ayvalik#Notes>, last accessed on August 24, 2016)

According to the written sources, there have been settlements in Ayvalık region since the antiquity. However, there are no clearly-defined information about Ayvalık related with the foundation of the settlement because of the uncertain sources. It was known as Kydonia, capital of Eolia in ancient Greek¹ (Yorulmaz, 2000: 34-38; Psarros, 2004; Şahin Güçhan, 2008). Ayvalık has developed in the region where Christians and Muslims lived together since 1580 and the rapid growth of the settlement started after the 18th century with the increase of olive and olive oil productions (Psarros, 2004; UNESCO, 2017).

The late 18th and the beginning of 19th-century was the period of Ayvalık's development of international trade with the help of İzmir as a metropolis. Ayvalık became one of the

¹ Ayvalık was also known as Αἰθάλι, *Ayvali* or Κυθωνίες, *Kidoniyes* in Contemporary Greek and *أيوالق* in the Ottoman Turkish (UNESCO, 2017).

important port cities which consists of Rum² population. The main activities related with the trade was **olive oil and its products** such as soap and olive pomace -pirina- in addition to **flour**. By the help of these developments, the population flourished rapidly. Moreover, in 1803 an important academy that makes Ayvalık an educational center in the Greek world was founded.

In the 19th-century, the north of İzmir region including Ayvalık was defined as '**olive region**'. In that period, due to the weakness of the Empire, Anatolia became an open market for the colonialist powers and Ayvalık was one of the important gates for penetrating to the economy. Thus, it drew the attention of foreign investors such as English R. Hadkinson who was a pioneering entrepreneur of olive-oil trade during the industrialization period by introducing the machines instead of the primitive tools in Ayvalık and İzmir. It is estimated that in 1884, he constituted an olive oil factory in Ayvalık. And it was developed in time at the sea shore within the city center (Bayraktar, 1998: 16-17, 23).

In the 101st issue of Servet-i Fünun, for identifying the socio-economical situation of Ayvalık in 1894, it is written that there were 11 districts (mahalle), 1 mosque, 12 churches, 6 monasteries, **26 soap plants, 78 olive oil plants**, 40 tanneries, 25 wind-mills, 2 hotels, 2 restaurants, **7 olive-oil and flour factories**, 45 furnaces. Moreover, in 104th issue of it, it is mentioned that there were 9 quarries in Sarımsaklı (which gives the name to the stone that used in the buildings in the region 'sarımsak stone'), 14 tile and brick kiln and 7 pitcher kiln. This period contained the industrialization and machine power. When it comes to 1900-1914, according to French commerce annual known as "Annuaire du Commerce 'Didot-Bottin' Etranger 1914, Paris, tome II" , the trade activities in Ayvalık increased rapidly. New factories were added to the old ones by the supports of foreign investors through the industrialization

² 'Rum' is defined as Greeks [Orthodox, East Romans] of Anatolia, Greek speaking- Christians under Ottoman rule. The word 'Rum' is derived from 'Romeus' (Roman_east roman_) (Türkçe Bilgi, n.d.). Throughout the study, it is used as 'Rum' when referring the Greek population under the Ottoman rule.

effects of Europe. Moreover, these trade activities also led to the establishment of consulates in the town such as Greek, England, Italy, France and Norway (Yorulmaz, 2000: 59-61).

In the second half of the 19th-century, the political and demographic situation of Ayvalık changed. By the accordance with the Treaty of Lausanne in 1923, the Rums in Ayvalık were forced to move to different parts of Greece, while the Turks living in Lesbos, Macedonia and Crete were moved to Ayvalık and Cunda. As for the main economic activity of the city that is olive industry was continued by the Turks, especially after 1960s -almost 37 years- (Şahin Güçhan, 2008: 84). After this turning point, it was remarked that the main economic activities were **still same as olive, olive oil and soap production**. In 1923, there were **32 olive-oil mills and 28 soap factories** in Ayvalık (Yorulmaz, 2000: 60).

2. Adaptive Re-use As a Strategy Towards Conservation of Industrial Heritage in Ayvalık

The most profound impact of industrialization on industrial areas in urban settlements was preventing the industrial activities in the city center by closing the traditional factories because of changing technologies and new demands. And they moved the industrial activities to outside the city center. Thus, industrial heritage within the centers became derelict (Föhl, 1995; Köksal, 2005).

The same also happened for Ayvalık's industrial heritage. Through the 1972 Development Plan, prepared by Architect Yavuz Taşçı, it was planned that industrial activities which had been hold in the traditional factories within the city center causing the pollution due to their functions, were moved out of the city center. This decision started to be implemented by the 1980s and the industrial activities started to be continued outside the city, near Çanakkale-İzmir Highway, inside the new buildings.

This inevitable transformation that comes due to the technological developments (modernization of the method), solved some problems in the city. However, it caused the

majority of the industrial buildings within the city center to become abandoned/non-functional. And today, while half of the industrial buildings are abandoned, the other half of them are converted into different functions some of which are done by ignoring the values. This situation leads to a loss in Ayvalık's industrial characteristics which creates a danger of extinction on the identity of the site. To overcome this problem, it is necessary to define principles of adaptive re-use of such buildings.

Nowadays, repairing and restoring existing buildings for sustainable use has become a creative and effective challenge which is often called 'adaptive re-use'. According to Brooker and Stone (2004: 26) 'adaptive re-use' (in other words, re-modeling, retrofitting, conversion, adaptation, re-working, rehabilitation or refurbishment) means that *"the function is the most obvious change, but other alterations may be made to the building itself such as the circulation route, the orientation, the relationships between spaces; additions may be built and other areas may be demolished"*.

Re-using our heritage building stock is one of the most effective strategies to conserve them. And industrial buildings are the most appropriate heritage buildings to re-use them since they offer great opportunities for transformation of the sites. Binney et al (1990) tried to identify four advantages of industrial buildings for adaptive re-use: 1) Their walls are solid and the floors are made to carry massive weight. If they are being well maintained, they have a life of centuries which make them suitable for adaptive re-use. 2) Most of them are laid out open plan and can be refurbished and adapted for variety of uses. 3) Benefits of re-used industrial buildings such as new job opportunities which often give a certain sense of prestige and promote the development of local economy. 4) The setting of industrial buildings such as being close to the water sources and open land surroundings has quite unexpected potentials. Therefore, adaptive re-use of industrial buildings offers great opportunities for large scale regeneration.

A number of publications have been written on what is considered '*good practice*' for adaptive re-use. Among the contemporary literature, 1970s up to the present, three different approaches related with the new design principles were identified on adaptive re-use by considering only the field of heritage conservation and architecture by scholars. These are shortly given below:

A) Programmatic approach (contemporary use)

Dwellings, schools, universities, art centers, museums as well as mixed-used are among the functions located in the former industrial buildings/sites. Trinder and Föhl (1992) stated that there are different areas of new usage for the obsolete industrial structures from classical museum to interactive museum. There are also re-use examples such as concert halls that give the possibility to experience this activity in different ambient. The gas depots converted into diving schools or chimneys reused as the climbing wall are the other examples in that sector.

However, as manufacturing technology, in the case of industrial buildings is a crucial factor that influenced the development of architectural characteristics, except for stylistic, the design principle that unites all the elements into a whole is the '*technological functionalism*'³. Therefore, for the industrial buildings/sites, technological functionalism can be understood as a principle of aesthetic integrity of industrial heritage which also affects the functional integrity in re-use. Understanding the technology of the manufacturing process, from the aspect of industrial archaeology, machines and buildings that represent their physical frame is equally important.

In a post-industrial society, when these buildings can no longer continue their original uses, the problem of conserving the archaeological value of industrial heritage which is defined as technological functionalism, comes to the fore. The characteristics of the industrial

³ For further information about 'Aesthetic Integrity' and 'Technological Functionalism' of Industrial Buildings, see (Rogic, 2009, Chapter 1)

buildings/sites reflect their technological manufacturing process which unfolded in them, or still does. And technological functionalism is limiting factor in adaptive re-use in terms of contemporary use as well as related interventions. Proposing any other function for the former industrial buildings, except of converting into a museum of industry, is contradictory to its archaeological value according to industrial archaeologists (Rogic, 2009: 42).

On the other hand, Föhl (1995) mentioned that the museum as a new function is the first thing coming to mind and preferred method for preserving its archaeological value. However, it should be pointed out that museum as a new function became very common method through increasing number of them in the sector. As a result of that, the necessity of them should be thought for each case.

Nevertheless, it is important that new function should be given to the historic buildings continually and increasingly being adapted for a whole range of functions instead of freezing the history. In each of these functions, the characteristics of the existing building and linking it with the design principles are essential.

B) Design Principles of Interventions

In the contemporary literature, design principles are mainly divided into three categories which the alterations to existing fabric are **low, medium and high**. Brooker and Stone (2004) (intervention-insertion-installation), Feireiss and Klanten (2009) (Add-on, inside-out, change clothes), Jager (2010) (addition-transformation-conversion) and Rogic (2009) (coexistence-imposition-fusion) are the ones among the authors who were dealing with this approach of adaptive re-use. They discussed the design criteria and formulated them according to the good example projects.

Basically, all abovementioned models show us that the main criterion for the definition of design principles is the relationship between the existing building and the new intervention. For each model, one design principle was presented which implies dependence on the existing

building and minimal change. The original building conducts the intervention and decisions. And all characteristics of the new elements derive from characteristics of the existing one.

For instance, according to Brooker and Stone (2004), the *design principle of "Intervention"*, even though it allows for a substantial change, implies the predominance of the old building as all the characteristics of the new elements depend on the character of the existing building. Second design principle, *"Insertion"*, preserves the image of the old building but changes substantially its inner spaces, making both old and new equality present and dominant. The third design concept, *"Installation"*, implies the highest autonomy of the new elements, both materially and structurally,

Consequently, there are several approaches related to design principles for 'good practice' which developed by the scholars as mentioned above. The criteria for the design principles were mainly **material relationship-structural dependence and formal-spatial organizations** in terms of relationship between the old and the new.

C) Technical Aspects of Re-use

This approach indicates fire resistance, thermal performance, acoustic performance, prevention of damp penetration, condensation and timber decay. Energy efficiency is another key point for this approach. It is also important to focus on how to adapt a building so as to ensure it in the best way for the new function's technical requirements. Optimizing the new use requires a detailed assessment of many aspects related to its values, existing condition such as structural layout, building capacity for the new use, its potential to meet standards (Bullen&Love, 2009).

In addition to the above given adaptive re-use approaches, it is necessary to make a critical evaluation of selected adaptive re-use examples in Ayvalık in order to understand the site (See Figure 2).

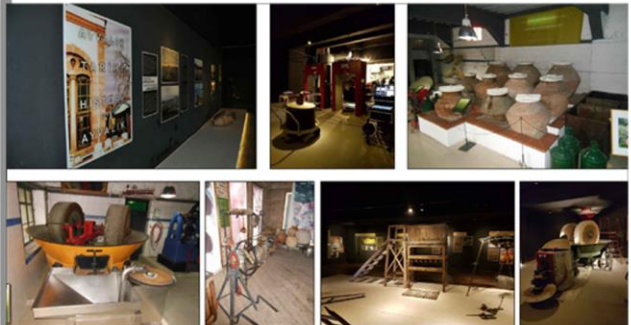
EMİN SÜNER OLIVE OIL FACTORY
SIZMA HAN BOUTIQUE HOTEL(exclusive property)
 1. Programmatic Approach: converted into hotel
 2. Design Principles of Intervention: Alteration to the existing fabric is medium.
 Material Relationship: new is distinguished from the old
 Structural Dependence: Preserve the old, but there is also irreversible interventions
 Formal-Spatial Organizations: Façade organization is preserved, but spatial organization is damaged
 3. Technical Aspect of Re-use: NA
 Architectural Programme:
 *hotel/ *restaurant/ *service units



EMİN KANTARCI OLIVE OIL FACTORY
PİU ROMA CAFE (exclusive property)
 1. Programmatic Approach: converted into cafe
 2. Design Principles of Intervention: Alteration to the existing fabric is medium.
 Material Relationship: new is distinguished from the old, but there is unqualified addition
 Structural Dependence: Preserve the image of existing structure with reversible interventions
 Formal-Spatial Organization: Formal-spatial organization is almost preserved except the inharmonious added mass
 3. Technical Aspect of Re-use: NA
 Architectural Programme:
 *cafe / *service units



VAKIFLAR OLIVE OIL FACTORY
OLIVE HISTORY MUSEUM AND LIBRARY (state owned)
 1. Programmatic Approach: converted into museum and library
 2. Design Principles of Intervention: Alteration to the existing fabric is low.
 *preserved the old in all parameters
 3. Technical Aspect of Re-use: NA
 Architectural Programme:
 *exhibition area / *offices / *service units / * library



AN OLD OLIVE OIL FACTORY
BACACAN HOTEL (exclusive property)
 1. Programmatic Approach: converted into big hotel complex
 2. Design Principles of Intervention: Alteration to the existing fabric is high.
 Material Relationship: new harmed the old
 Structural Dependence: harmed the existing harmony
 Formal-Spatial Organization: Façade organization is partially preserved, but spatial organization is totally damaged
 3. Technical Aspect of Re-use: NA
 Architectural Programme:
 *hotel units (with 56 rooms) / *restaurant / *service units



All photos in the figure have been taken by Gözde Yıldız in 2016.

Figure 2: Selected Ayvalık Adaptive Re-use Examples for the evaluation of the site within the scope of the study

Currently, there are factories with a large program which are more than twenty in number within the building stock in Ayvalık. Some of them are being used for new purposes of which are mostly cultural, touristic and administrative purposes. For instance, state-owned ones, Vakıflar Olive-Oil Factory and Kırlandıç Factory are being used for public interest. While Vakıflar Olive-Oil Factory was converted into Olive History Museum that represents the industrial past of Ayvalık, Kırlandıç Factory Complex was converted into the administrative purpose for Ayvalık Municipality and social center for local people. On the other hand, those owned by a private entity are generally converted into touristic purposes such as hotel, café which is shaped according to the stakeholders.

Within the scope of the study, selected adaptive re-use examples in Ayvalık (See Figure 2) were discussed according to the theoretical principles of good practice, their contribution to the site and their negative effects as well. Here, the intention was how theoretical principles are applied to the practice, specific to Ayvalık. These chosen examples originally constructed as olive-oil and/or soap factories, located in the northern part of the port, close to Ertem Olive Oil Factory. This investigation is important for comprehending the site demands, what should or should not do for Ayvalık when constituting the conservation approach and principles for Ertem Olive-Oil Factory and Ayvalık as well.

For Ayvalık, the continuation of the olive industry as a tradition at the different zone of the town and re-functioning traditional industrial buildings for food culture tourism (gastronomic tourism) or re-functioning as hotels have caused the transformation of the city from an industrial center to a touristic-commercial center.

It is obvious that re-functioning of these industrial buildings for touristic purposes is a way to preserve them for the future of Ayvalık as suggested by the Ministry of Culture and Tourism in 1984 through a research that was made by Tourism Bank. However, while giving a new function regarded with touristic purposes, the capacity of the existing building becomes

essential in order to prevent the negative effects of tourism. As seen on Bacacan Hotel example, the new function is not compatible with the original capacity of the building. And it damaged the old.

From the programmatic point of view, it can be said that most of the examples make a contribution to the site in order to provide the sustainability. Moreover, the intention of giving the museum example (Formerly, Vakıflar Olive-Oil Factory) is to understand the site demands towards developing a conservation approach for Ertem Olive Oil Factory. Because, while giving a function as museum, the necessity of it for the site should be analyzed. Thus, in Ayvalık, there is a museum of olive history that one can see the production processes, primitive and 19th-century processing tools, information about family enterprises. In addition to Olive History Museum, there is also Rahmi Koç Museum in Cunda (Formerly, Taxiarchis Church).

For their conservation approaches, it can be concluded that the successful ones have the acceptable relation between the new and old. Generally, **minimum interventions** provide the success as is seen in the examples of Museum-Library, Piu-Roma Cafè due to their compatible functions. On the other hand, hotel examples have some additions due to their new program's requirements. In that sense, both examples, Sızma Han Boutique Hotel and Bacacan Hotel, have irreversible interventions which damage the existing structures.

Consequently, the new functional requirements can be provided through comprehensive design principles by establishing a good relationship between new and old. And it must be succeeded by analyzing the buildings both technological context and its reflection to the architecture. Generally, when the technological functionalism is used as a guide for constituting the design principles, a good relationship between new and old is achieved for adaptive re-use of industrial buildings.

3. Understanding and Assessment of Ertem Olive Oil Factory as an Industrial Heritage

Ertem Olive Oil Factory (See Figure 3) is one of the industrial heritage buildings in Ayvalık dating back to 1910 constructed before the population exchange -1923- by a Rum named Anastasyos Yorgolos (Efe et al., 2013: 65). The factory was used by several owners for producing olive oil and by-products. In 1952, the ownership of the factory took over to Ertem Brothers who give the name to the factory itself. Ertems who immigrated from Crete in 1924, was settled in Ayvalık after the population exchange. They were one of the important families that come from olive trade originated family and they operated the factory until 2000 (Efe et al., 2013: 65). Today, the ownership of the factory belongs to a Turkish Doctor who lives in the USA. It is abandoned and under the risk of destruction due to the factors of human and nature since 2000.



Figure 3: Ertem Olive Oil Factory, top: view from the sea; bottom left: the most elaborated façade; bottom right: entrance façade (taken by Gözde Yıldız, 2015)

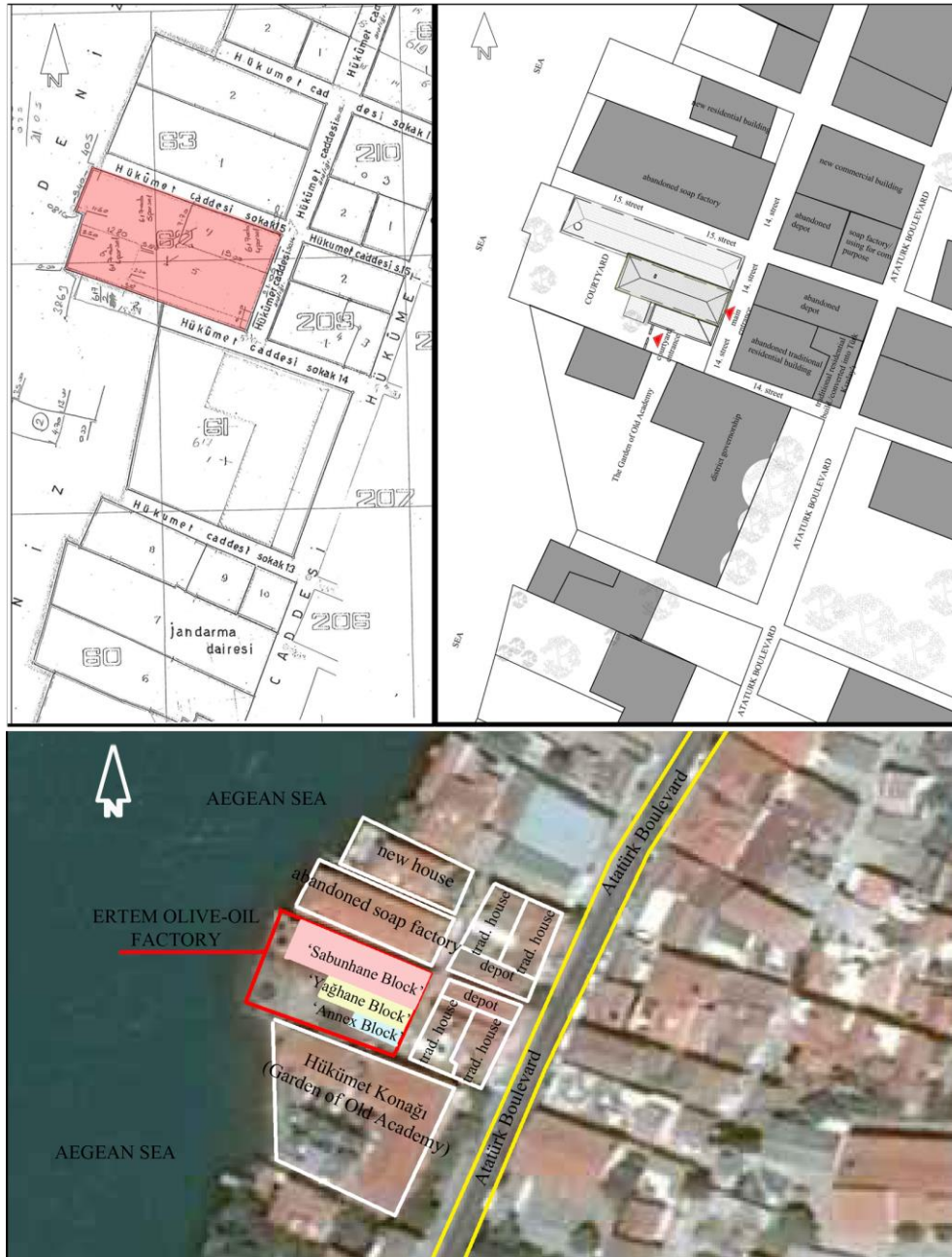


Figure 4: Top Left: cadastral plan (obtained from municipality); Top Right: site plan (prepared by the author, 2016), Bottom: physical layout of the building (Google Earth image, 2016 is digitally manipulated by the author)

The building lot (See Figure 4) which is located on 14. Street, Sakarya District in Ayvalık/Balıkesir-Turkey, covers an area of 1125 m², of 582 m² which is occupied by the factory. The factory is located at the north-east part of the lot.

It is composed of three blocks (See Figure 5) adjacent to each other. The main entrance to the factory is provided from 14. Street, from the middle block named as '2nd Block'. The courtyard entrance is also provided from 14. Street, through a courtyard door that is adjacent to the factory.



Figure 5: Blocks forming the factory, source: Gözde Yıldız, 2016

'1st Block' of the factory named as 'soap production block' (Sabunhane Block), has rectangular plan type located on the northern edge of the lot. It is two-storied block that is measured 8x23.5 m in plan dimensions and 7.5 m high from the ground level. It is constructed with the stone masonry system at the ground floor and brick masonry system at the first floor. The ground floor of this block was arranged with five different spaces for the preparation of the soap production and partially olive oil production. The first floor of this block was arranged as a single large space for the soap production processing unit. The chimney is located at this block which is made out of brick. The entrance is provided from three sides of the block.

'2nd Block' of the factory named as 'olive-oil production block' (Yağhane Block), has rectangular plan type located in the middle of the other blocks. It is also two-storied block that is measure 8x15.9 m in plan dimensions and 7.45 m high from the ground level. It was arranged as a single large space on both floors. While ground floor of this block serves as olive oil processing unit, the first floor of it serves for the preparation. It is constructed with the brick masonry system and cut stones are used at the corners. The main entrance to the factory is provided from this block. There is another entrance from the west part of it which is located on the courtyard. Reaching to the first floor is supplied from this block by the iron stairs that are located inside.

'3rd Block' of the factory named as 'Annex Block', has rectangular plan type which is two-storied block. It is 5.5x14.9 m in plan dimensions and 6.15 high from the ground level. '3rd Block' is the part of the factory that added lately as a storage for productions and resting places for the workers. It is a reinforced concrete structure that was articulated to the '2nd Block'. The entrance is provided to this block from the ground floor of it. Access to the first floor of this block is provided through a concrete stairs located in the courtyard adjacent to '2nd Block'.



Figure 6: Ertem Olive Oil Factory (taken by Gözde Yıldız, 2016)

Accordingly, the factory which housed both olive-oil and soap productions, is two-storied building that was constructed with stone and brick masonry technique in Neo-classical style as similar ones in Ayvalık. Architectural and technical (process) elements of it which form the

architectural characteristics of the structure have still survived as they are or with their traces. Almost all changes throughout the history are because of the developments in production processes and related spatial requirements. Thus the factory still has its originality (See Figure 6). Moreover, one of the important technological elements, the steam engine of the factory, is exhibited in Rahmi Koç Museum in İstanbul today.

3.1. Assessment of the Factory as An Industrial Heritage and Possible Conservation

Proposals

Assessment regarding Ertem Olive Oil Factory can be defined into two contexts considering the building integrated entity within the city. Thus, in order to discuss a conservation approach for the factory; problems, values and potentials should be identified for Ertem Olive Oil Factory and for Ayvalık as well.

To begin with the city scale assessments, Ayvalık has an important silhouette from the sea due to having olive-oil and soap factories lying along the coastline with their chimneys. Courtyards of the buildings and narrow streets are important open areas that have unique vista points as a link with the sea and settlement pattern. However today, the courtyards of the buildings which are the important open areas of the site are being used as car parking area, private spaces for the ones that have been restored for different uses or they are not being used because of abandonment. Hence, it is hard to find a place to connect with the sea as a visitor or an inhabitant.

In addition, one of the important problems for Ayvalık is the transaction of the properties. Today, most of the inhabitants prefer to stay in apartments, thus they sell their houses for purchasing the new one located outside the center. On the other hand, the historical buildings in the city center take the attention of intellectuals, mostly from İstanbul, Ankara and accordingly, prices rise. This situation causes the seasonal usage for the buildings. As a result

of this, the living population within the center decreased. Although this situation creates decreased living population problem within the city center, it also gives a potential to the site in terms of re-functioning abandoned industrial buildings through their use value for artistic purposes by aforementioned intellectuals from Ankara and İstanbul who chose Ayvalık to stay for seasonal artistic activities, workshops, festivals such as Taste Festival, Music Festival that is specific to Ayvalık.

Another problem of the site is the abandonment of the traditional industrial buildings within the center. While few of them are re-used for cultural, commercial and touristic purposes in the northern part of the port, others are mostly abandoned such as Ertem Olive Oil Factory. Thus, negligence creates physical problems such as material, structural decays. For the restored ones, the problem is irreversible interventions that damage the buildings' originality. Those can be considered as physical problems of the city.

Although the original character of the city is damaged with the new interventions and aforementioned problems, the industrial identity of the town is still visible. All characteristics of the city such as existing traditional fabric with natural values of the site, are created potentials for the city. These features of the area also give touristic attractions to the site and to the factory. Existing commercial and cultural activities, touristic services in the city and surroundings of the factory, give economic value and potential to the area and to the factory itself. It can be said that Ayvalık is an important touristic and cultural area with its boutique hotels, museums, festivals and related events. This situation creates a big potential for the site in terms of improving this socio-cultural features.

Furthermore, the strong relation between Lesbos and Ayvalık is also important. It comes from the history, as mentioned by Psarros (2004), Ayvalık was the agricultural hinterland of Lesbos and known as 'Coast of Mytileneans'. In the history, there was always continuous trade between these settlements. And the population exchange in 1923, creates another cultural,

political-social common point for these settlements. And today, these strong relations between Ayvalık and Lesbos is still continuing. The transportation network between Lesbos and Ayvalık as a result of this relationship affects the touristic attraction of each city as a potential.

Accordingly, being located at the very center of the city, near the coast line, gives an important role to the factory. Its specific location that directed to the sea, within the city center is a value and potential. The well-preserved architectural features of the factory such as original plan schema, spatial organizations, are important potentials in order to adapt the building into the new life. Moreover, its big courtyard confined by the sea is another potential for new uses. Accordingly, spatial characteristics, due to serving for special purpose, related production process, which consists of valuable elements or their traces have big potential for exhibition purposes. They constitute specific ambient for new attributed functions. Therefore, the factory has functional and technological value by having specific elements inside of it. In addition to those, the valuable gastronomic culture of Ayvalık has a big potential in order to give the second life to the building with the conservation proposal.

Within this context, Ertem Olive Oil Factory which is one of the well-preserved 19th-century olive oil factories owned by a private entity as an industrial heritage in Ayvalık should respond both public demand and owner needs in terms of programmatic approach. Moreover, there are already industrial museums in Ayvalık and close surroundings that one can see these cultural rituals coming from the history. Thus, in order to avoid the increasing number of museums in the site, the factory can be converted into multi-functional uses by referring the cultural events of Ayvalık. It is a very appropriate place for developing of these cultural backgrounds of the city such as taste festivals, music festivals, historical and cultural discussions, etc. The factory can host all of these events through its originality which behaves like an exhibitiv object due to its technological value that shapes its architecture.

Regarding the originality of the factory which was used for the same purpose -'olive oil and soap factory'- from its construction until its abandonment, all design principles should be highly respected. All actions as a reason for changes should be considered as valuable, even though they may have negative impacts. Thus, all interventions should be kept in minimum and they should be supported with technical specifications without harming the existing structure in order to provide the new function requirements (See Table 1).

Table 1: Conservation Proposal for Ertem Olive Oil Factory

1.PROJECT	Ertem Olive-oil and Soap Factory
AREA	1155 m2 closed area, 565 m2 open area
OWNERSHIP	Owned by private person
2.PROGRAMMATIC APPROACH	Converted into multi-purpose use that housed festivals (cultural purpose)
ARCHITECTURAL PROGRAMME	<ul style="list-style-type: none"> *Cafe *Sales Office *Service Units *Flexible Event Units (Multi-purpose Halls) *Didactic Area (Seminar)
3.DESIGN PRINCIPLES OF INTERVENTION	Alteration to the existing fabric: Low
Material Relationship	All the characteristics of the new elements depend on the character of the existing building. Interventions are in minimum.
Structural Dependence	Preserve the existing structure as it is.
Formal-Spatial Organization	Old formal-spatial organization is preserved.
4. TECHNICAL ASPECTS	-supported with the technical specifications for new program

Conclusion

Industrial buildings such as Ertem Olive Oil Factory are one of the main symbols of the socio-economic past of the towns as being cultural assets with their technological values which

drives their architectural characteristics. They are important icons of our industrial-technological past due to representing the technological developments throughout the time.

Since the main aim of this paper is to discuss a conservation approach for Ertem Olive Oil Factory, the first step is to investigate an accurate conservation method or approach for industrial buildings and re-evaluate Ayvalık industrial heritage through selected adaptive re-use examples according to this developed conservation approach by benefited from the contemporary literature. Accordingly, three main parameters come to the fore for strategies of adaptive re-use of industrial buildings. These are the programmatic approach (new appropriate function), design principles of intervention (principles related to physical problems which are categorized as a material relationship, structural dependence and formal-spatial organization) and technical aspect of re-use (technical requirements for new function). Moreover, ownership statue of the buildings is another important factor while re-functioning them. That's why re-adaptation of industrial buildings is always problematic in the world.

Accordingly, industrial buildings are generally converted into multi-functional uses and/or museums. It is because of their technical values that are production equipments unfolded inside of them which also give 'aesthetic value' to these buildings. They represent a symbolic and commemorative value for the collective memory as being a witness of the industrial-technological history. Thus, in order to conserve these buildings, minimum intervention is essential for the success. And it can be provided by using the technological functionalism as a guide for the design principles which is also the limiting factor for adaptive re-use.

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A Discussion on Affordable Housing Projects; Case Study Mehr Housing, Iran

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Abstract

Housing is one of the basic needs for humans. Families in different countries with various cultures, who have different life styles respond to their individual needs including physical and mental in a safe place that is called house. The world population is increasing day by day. In parallel to this population growth, housing demand increases rapidly. Thus, different countries try to meet the needs of housing by creating multifarious housing policies. Generally, these policies have been developed according to countries' special conditions and the developments in the world. Iran is also a country, which has a rapid population growth and has developed series of policies to solve the housing problems. Affordable housing is one of solution for providing the house by governments. These type of houses is the ways to answer the demand for low-income people or the people that their income is not sufficient to owner a house. Since 2007, government has built new type of affordable housing in different cities of Iran. These houses are named as Mehr Housing, which are generally medium and high-rise buildings for low-income people. In this study, it is intended to make an evaluation about the strengthens and weaknesses of Mehr Housing projects in Iran in terms of housing quality. In order to evaluate the architectural quality of Mehr Housing projects in Sarvestan, Abadeh, Nourabad, Firoozabad, Hashtgerd, Zahedan, Tabriz, Hadishahr, Marand, Zanjan, Yazd and Natanz physical analysis method is used as well as literature review. These analyses are mainly done based on location and accessibility, safety and security, public

open spaces and recreational activities, plan layout of housing units and physical features. By this discussion, it is expected to create a guidance for the policy makers, designers, users and other shareholders.

Keywords: Affordable Housing, Low-income, Iran, Mehr Housing, Architectural Quality.

Introduction

From the ancient time till now, one of the most important needs of human after the food is shelter. Dwelling could protect people from cold and hot weather, risk of animals and in other words a safe place for resting and comfort (Weihe, 1990). Besides, housing meets the psychological and social needs of users (Evans, 2003). Due to increasing population of the cities and suburban areas after the Industrial Revolution, the housing become one of the most important and essential problem of people (Aldrich, 1995).

The most important factors, which help to solve lack of housing is supplying the land, attention to the construction material and powerful management (Mazloom Khorasani, 2011). Housing problem exists in every country. However, it is more serious in third world countries related to political, economic, social and cultural factors (Pour Mohammadi, 2014).

From the other point of view since the adoption of the Universal Declaration of Human Rights in 1948, “the right to adequate housing” was introduced as an important component of “good living standards” (Assembly, 1984). Thus, each government imposed special rules and regulations in field of housing (Schill, 2005). They take action to establish ministries of housing in order to allocate funds and policy formulation, regulation, programs and special projects in the housing sector (Hulchanski, 2002).

As a developing country, Iran also has special effort on housing problem. The first attempt in this way is creation of the Ministry of Prosperity in 1964. After that, the Department of Housing and

Urban Development was established in 1974 (Rasoolimanesh, 2013). Furthermore, according to the agenda of Second Conference on Human Settlements (Habitat 2) United Nations Ally, which was organised in Turkey in 1996. Islamic Republic of Iran as a member accepted some commitments. These can be summarized as regarding the right to adequate housing, enabling all people have access to appropriate shelter. The other factor in this agenda is to provide legal security for land ownership, mobilizing financial resources and credit and other sources of private and government sectors for social development access to efficient technologies and effective practices (Nastaran, 2010). The right of housing in the constitution stated clearly in Iran. According to 31th of the constitution of the Islamic Republic of Iran, it is the right of every person and household in Iran to have a house. Government is responsible for those, whose need according to priority. Workers and villagers are the first ones that can benefit from the implementation of the realization of this principle (Saremi, 2012).

In socialist countries, despite they produced too many houses but based on increasing housing demand, they still have lack in housing. On the other hand, qualitative indicators in the houses are not suitable (Pugh, 2001).

Housing in developing countries also has problems. The fundamental issues of these countries which is the result of use of poor materials in construction, insufficient access to electricity, water and sewage systems (Okpala, 1992). Most of these countries face by the housing illegal production. Sometimes this figure reaches 50 to 75 percent of urban housing units (Azizi, 2004). One of the countries which is faced the housing problem in recent decades is Iran. This problem happened especially after the land reform in 1962 and after the changes in production methods with the growing trend of urbanization (Hesamian, 2004).

With the revolution in Iran in 1979, there is no any control on the spread of the cities. Housing in

the suburbs gets much more flourished and the tenants that renting the house had much more problem with the rent price. The immigrant from the rural part get settled in the suburb areas (Sharifinia, 2012). In that period house is constructing for personal use not for giving to rent. After the Islamic revolution in terms of quantity the construction of the houses increased but the amount of investment decrease. because the size of the houses got smaller. With the imposed war the building activities decrease and investment get lower than before in the years 1982 and 1983 (Ahari, 1996). There are five programs which were developed after the revolution that in first program the goals are related to the changing the composition construction practices to reach the durable buildings, promotion of housing inventory per capita in the country and directing the production of better quality housing with less infrastructure. The goal of second program is clean policy that is consisting of saving, mass construction and miniaturization (Ghanbari, 2010). The goal of third programme are reducing the average floor area of housing and reduce destruction of dwellings. The goal of fourth program are balance to adequate housing among groups and regions of the country, provide housing for low-income households, provide housing for youth and female headed households and industrialization of the houses construction. The goal of fifth program are housing for low-income people, safe and durable housing, market regulation and coordination between housing policies and land use planning and development in policies and reducing regional disparities (URL1).

Provide housing in recent decades, have been one of the most important problems of various segments, especially for low-income families. Population growth and increasing tendency to urbanization and migration from villages to cities after the revolution in Iran, use of less durable materials, the entrance of young age of applicants to mortgage market and optimum combination of investment and regional disparities shows housing problem more acute than ever (Rezaie, 2015).

Due to the conditions, which is mentioned above, caused to raising affordable houses as a solution for this country in the second and third economic development plan which is related to the social and cultural rights. Mehr housing is an affordable type of house which is belong to the fourth development plan (Saeedi, 2011). Base oN this argument, is to analyse Mehr housing projects in terms of safety and security, location and accessibility, plan layout of housing units and physical features, public open spaces and recreational activities. Finally, a discuss is done on the weakness and strengthens in these projects.

Theoretical Background

The best definition for affordable housing is related to the description which is done by the Department of Housing and Urban Development (HUD). It is defined as a type of house that bring ability to the households to bring the opportunity to have a house (O'Neill, 2008). By this opportunity the household shouldn't pay more than 30 percent of the house price (Kutty, 2005). There are different plans for affordable housing that is categorized as: 1. homeownership assistance, 2. rental assistance and 3. Land use and regulatory incentives. In these three models, governments are helping families to have a low-income renting house. Also, it is preparing the low-interest loans to get easier homeownership (Katz, 2003).

There are different studies related to the affordable and low-income housing in the world. Devrim (2016) studied the transformation of Toki houses in last twenty years. These types of houses have a unique demographical distortion of the morphological texture in big contemporary Turkish cities. One of the weaknesses of TOKI houses is the similarities in architecture and urbanity. These projects are governmental profit- oriented. Wang and Murieh (2011) mentioned about the policy

change in China had effect on social housing system. It gets more active and the marketing gets dynamic. However, it has brought problems in characteristic of market economies.

Satisfaction in residents can be used as a key predictor of a person's realization of the "quality of life" and also inadequate in their housing environment and progress to the status quo. It is also key predictor of success of private and public constructors. Finally, it has affect on housing demand and neighbourhood change (Djeburni & Al-Abed, 2000).

The study related to the satisfaction done by A.M.M. Liu in 1999. It was related to the Post occupancy evaluation in satisfaction. The paper study the social and physical factors that influence the satisfaction in housing estate, Hong Kong. The comparison between the private and public housing dissatisfaction were done about the housing occupants.

Abedini (2013) study which is titled as "Assess public housing policies in relation to afford urban low-income households in Iran (Urmia city), is analysed the Mehr housing in relation to the afford of low-income families in the Urmia city. Also, the public housing policies which is applied by the government for low-income people were discussed.

Mehr Housing Projects in Iran

Mehr housing is a kind of project which were started to be designed in 2007. The main goals are to bring equality in between supply and demand for housing by omitting the land price, housing for low-income people and poor people, control and prevent the skyrocketing the prices of lands and housing, housing boost production and increase production volumes of housing and reducing the cost of housing (Rent, mortgage and buy). Also, it is aimed to give solution for the future housing needs, justice in access to adequate housing. Consequently, poverty reduction and housing for youth was raised (Karshenasan, 2013). Mehr housing projects are mainly located in three regions: New cities, Lands around cities and old areas to facilitate modernization and improvement

(Rezaie, 2015).

Mehr housing is a big project that will consist of one million and five thousands of housing units. These amount of units will cover six million population of the country, which is approximately 12% of urban population. Mehr houses are constructed in collaboration with various organizations such as: Ministry of Housing, Housing Foundation, Ministry of Cooperatives, Central Bank, Municipalities and Central Insurance (Shahri, 2015).

Zanjani (2011) in his research mentioned the principles which were considered in Mehr Housing plan. 1. The Mehr houses should be constructed like mass housing production. 2. They are downsizing. 3. Some of them are high rise buildings which help to have more unit. 4. These projects aim to saving construction site and energy. 5. It is aimed to reduce cost by using technical principles. 6. They use public space and common space. 7. They have good views.

The ones that have responsibility of Mehr housing construction projects are members of housing cooperatives and is mainly concerned with their own participation. Besides, the government by giving them free land as well as granting long-term loans plays supporting roles (Isalou, 2014). They try it to do it by mass housing construction in the form of cooperatives housing for 50 to 500 people. 20 percent of primary cost of this type of housing is financed through savings and participation of applicants (Zanjani, 2011).

Methodology

The data for this study is collected based on literature review, observation and physical analysis. The cities of the projects are selected due to their size and location (Table 1). Sarvestan is a rural-city. Hadishahr and Natanz are small cities. Abadeh, Nourabad and Firoozabad are medium size cities. Hashtgerd, Yazd, Zahedan and Zanzan are large cities and Tabriz is categorized as a metropolitan city. However, these cities are belonging to different province from North West to

South East part of Iran. Sarvestan, Abadeh, Nourabad and Firoozabad, are four cities which belong to Fars province. Hashtgerd is from Alborz Province. Zahedan is from Sistan and Baloochestan Province. Tabriz, Hadishahr and Marand, are from Azarbajejane sharghi Province. Zanzan is from Zanzan province. Yazd is from Yazd province and finally Natanz is from Esfahan province (Fig.1).

Table 1: Selected cities (population and size)

Cities	Population	Category
Sarvestan	18.187	Rural-City
Hadishahr	34.346	Small city
Natanz	42.239	Small city
Abadeh	100.831	Medium size city
Nourabad	117.527	Medium size city
Firoozabad	121.417	Medium size city
Marand	156.873	Medium size city
Zanzan	521.302	Large city
Zahedan	587.730	Large city
Hashtgerd	650.000	Large city
yazd	682.582	Large city
Tabriz	1.558.693	Metropolis

This study is intended to define the general weakness and strengthen point of the selected Mehr housing projects. The architectural quality of Mehr housing projects are aimed to be evaluated in terms of location and accessibility, safety and security, public open spaces and recreational activities, plan layout and functions, physical features.



Figure 1: Selected cities on the map of Iran.

A General Discussion on Architectural Quality of Mehr Housing

Location and Accessibility

There are three type of location in Mehr housing Projects as mentioned before in this study. Some of them are located outside of the cities (Fig.3) and some of them are inside the city (Fig. 2).



Figure 2: Semnan Mehr housing inside the city (URL 2)

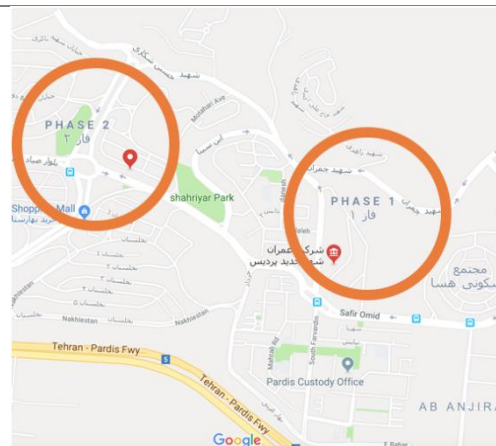


Figure 3: Pardis Mehr housing outside of the city (URL 2)

In Mehr housing projects the ones that locating inside of the cities have much more benefit than the ones that are located outside of the cities. They have better access to transportation facility but Mehr houses that are located in suburbs suffer from the lack in transportation facility. The users are complaining about shortage in different type of transportation system. Most of the tenants in Mehr houses in suburbs are workers in other cities and the big cities next to these suburbs projects. Karimzadeh (2015) study Abadeh and Sarvestan Mehr houses, Droudi (2014) study Pardis Mehr houses and Rafieeyan (2014) also study the Zahedan Mehr houses. All of them mentioned in their studies that the Mehr housing projects which are located in suburbs, the tenants suffer for transportation issue.

Locational Features

Mehr housing projects that are located in the cities have access to different facilities such as educational, entertainment, bazars, sport and health facilities. They have also access to gas, electricity, water, telephone and sewage system. However, the projects which are located in the suburbs suffers from lack of access to entertainment, health, educational, bazars, and sport facilities. Some of the projects have lack in access of gas, water, electricity and telephone. Also, Rafieeyan (2014), Droudi (2014), Ghanbari (2013) and Pour Mohammadi (2014) in different studies on Mehr housing projects out of the city in suburbs was mentioned that the citizens have problem with the lack of facilities in suburban areas . It is better to locate these projects near the big cities to reduce the price that should pay for infrastructure for Mehr housing projects in suburbs. Citizens for satisfying their need they should use urban trips which bring wasting time and money for low-income people. It should be more attention in the selecting of the land. Because in these projects the lands are outside of the city and suddenly the city extended without any programmed plan.

Safety and Security

All of the Mehr housing Projects have governmental insurance. One of the most important factor that should be considered in design is, obey all the rules and regulation to construct a building which is protected from earthquake. Mostly, these houses are not constructed and located based on environmental factors and natural environment. If in theses projects natural disasters happened, they do not have any facilities to support the people who are living in these complexes.

Ghanbari (2013) also stated in his study, the projects in these three cities such as Tabriz, Hadishahr and Marand, were not designed by considering the environment factors. None of the mentioned projects are located due to protecting from earthquake. For example in Neyshaboor earthquake in 2017 all of the housing units were destroyed (Fig. 4). These apartments are not constructed based on earthquake rules and regulations.

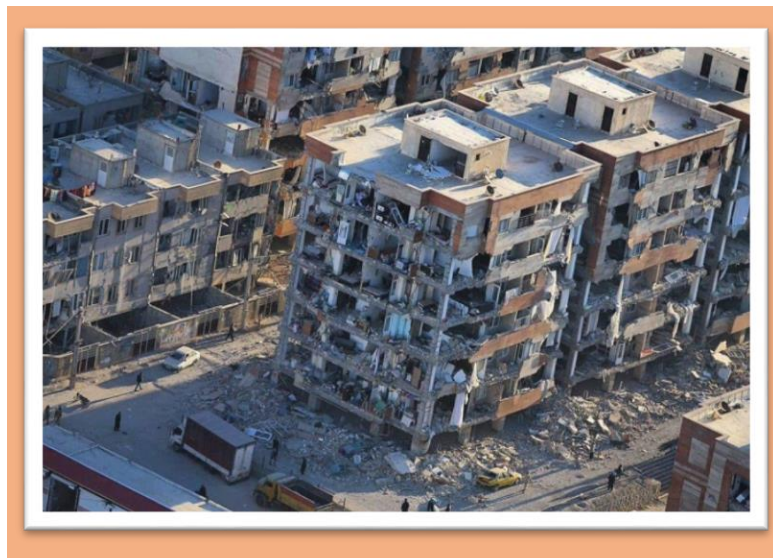


Figure 4: Mehr Housing in Neyshaboor (URL 3).

From other point of view there are too many families with different cultures that caused raise of crime so easily. The projects which are located in suburbs, have more percentage of crime compare

to the ones that are locating in cities. Besides, Mehr housing projects have no any security person and also there is no any security camera.

Public Open Spaces and Recreational Activities

The other factor that is very important in Mehr housing project is, having public spaces and recreational activities around these projects. The projects that are locating in the city have access to park and green areas. Under the influence of the Islamic religion, the way of life is more introverted. Thus recreational areas such as park, open spaces, semi open spaces in these projects provide social communication. This situation cause increasing rate of marriage and decrease the rate of divorce as Pour Mohammadi mentioned in his study in (2014).

However, in projects that are locating in suburb areas, they have lack in public open spaces such as gardens, parks and play ground for children. Rafieeyan (2014) mentioned in his study, the quality of the houses can be improved by the green spaces.

However, in parallel to this issue, the gathering from different cultures in these public areas could raise the crime, specifically among teenage and children. This situation forces the children to spend much more time together and raise the crime among them. From the other view suburb areas have much more potential for existing the crime than the projects that located inside the city. Karimzadeh (2015) by study Sarvestan and Abadeh Mehr houses project and Droudi (2014) by study Pardis Mehr house project also mentioned that the projects they analysed they have cultural problems.



Figure 5: Pardis Mehr housing in suburbs area (URL 4).

Plan Layout and Functions

There are different plan types in Mehr housing project. These apartments are categorized as high rise and medium rise buildings. The plans of Mehr housing projects should be suitable for the population density and also culture of the city. They should be designed by considering the climatic factors of different cities and sun orientation. As Soltani (2014) stated in his study, the citizens are not satisfied with design of their units due to the climatic factors. By constructing these types of houses the number of the detached and semi detached houses are reduced. That also extends the cities without any program. These type of apartment buildings could be beneficial for the use of different number of families that have specific square meter in the same time by constructing in the same land. Also, Pour Mohammadi (2013) stated in his study about this situation in Zanjan city. One of the most important problem related to Mehr houses is that all of them are designed mostly look like each other. There is no any attention to the specific cultural and climatic factors in these houses.

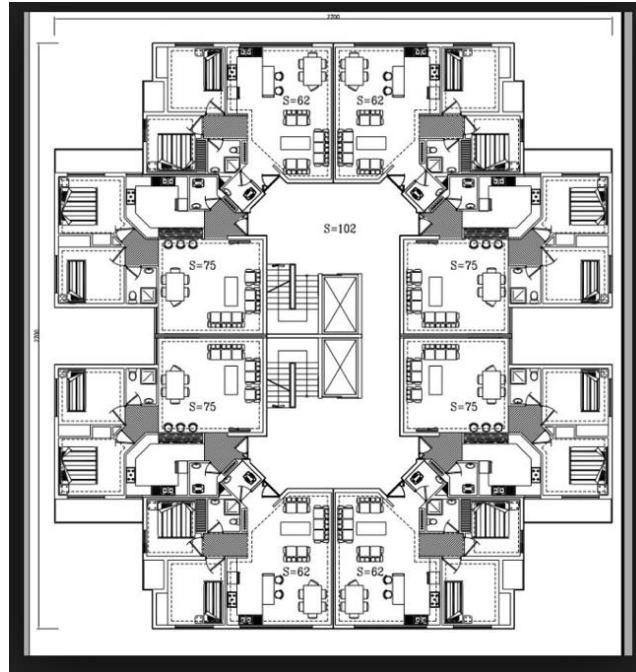


Figure 6: Type of plan for high rise Mehr housing project in Pardis city (URL 5).

In this plan there are two type of units. One of them is 75 square meter. The other one is 62 square meter. Both of them are two bedrooms and they have one toilet and one bathroom. The kitchen belong to these units is an open kitchen. Due to the Iranian culture, this type of kitchen is not suitable. Most of the Mehr housing projects have two bedrooms. Generally, plan schemes of the Mehr Housing projects are same in different cities. Generally, this type of houses (two-bedroom type) are suitable for the small sized families such as with one or two children. However, the families that they have more than two children they need bigger housing units to satisfy their needs and necessities.

Physical Features

These houses should be protected from the earthquake and the isolation system to make the structure gets more durable. The total cost of Mehr house projects are not high. They don't spend too much money in the appearance. Thus, it could be affordable for low-income people. So mostly

contractors choosing to use low quality material. Most of them are look like each other and they have same material in different type of climate in Iran (Fig .7,8). Most of the doors and windows are same type. By this issue they reduce the satisfaction of the citizens. They should give attention to the sewage disposal system. Droudi (2014) also stated that the other important factor is to have good lighting and good view in Mehr housing projects. Generally, in Mehr housing projects there is a semi open balcony for each flat. In parallel to the religion of this country, generally the families have more privacy and they are not using these semi open spaces as a socialising area. They are generally using for storing the staffs or organizing them as a small green area.



Figure 7: Mehr housing project in Alborz city
(author)



Figure 8: Mehr housing project in Semnan city
(author)

Table 2: General weaknesses and strengthens of Mehr houses.

Factors	Weakness	Strengthens
Accessibility	Lack of access to public transportation in suburb projects	Access to public transportation in city centre projects
Locational Features	Lack of access to educational, bazars, entertainment, health, sport, water, telephone, gas and electricity facilities in suburb projects	Access to educational, bazars, entertainment, health, sport, water, telephone, gas and electricity facilities in city centre projects
Safety and Security	Raise of crime in suburbs area projects, no any security person and security camera in both type of city centre and suburbs projects, they don't consider earthquake	All of the projects have governmental insurance
Public Open Spaces and Recreational Activities	Children gathering from different culture make raise the crime in public areas in suburbs project	Access to park and green areas in city centre projects
Plan Layout and Functions	Plans are not suitable for the population density and also the culture of the specific city and not respecting the climatic factors	They answer the average needs of the users
Physical Features	Poor sewage disposal system, low quality in choosing material, have same material in different type of climate	Industrialized construction system

Conclusion

Today having affordable house is an essential need for every type of families, which belong to low-income group. This study analyses the Mehr affordable housing projects in different province with different population. This policy with the aim of creates housing for low-income people by omitting the land price try to solve the housing problem in Iran. However, these projects have some strengthens and weaknesses based on different factors such as location and accessibility, safety and security, public open spaces and recreational activities, plan layout and functions and physical features. Lack of access to public transportation, entertainment, market, educational and health facilities and also raising crime in suburb type Mehr housing projects are some of the weaknesses. By this study on the selected cases, it is obvious that it is no matter how is the density of the population in different cities, they have common problems in general.

The architectural qualities of the Mehr housing projects can be developed by considering cultural aspects such as Iranian life style and appropriate functional spaces in proper sizes. Also, environmental factors need to be analysed during the design process. For the housing groups that are far from the cities, the necessary social, educational, health and recreational activities can be provided. Besides, the architectural identity of these housing groups needs to be considered during the design and construction processes.

Generally, this type of houses (Two-bedroom type) are suitable for the small sized families such as with one or two children. The use of the industrialized construction system which is providing more economical and easy production in a shorter time is one of the strengthen of these Mehr houses projects. Besides, the groups which are located in the cities have an access to the social, educational and entertainment activities.

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The Rise of Crime in Affordable Housing in Suburbs, Case of Iran

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Abstract

Housing is one of the fundamental needs for human to respond their primary needs such as food, rest, cleaning and having family, in other words every thing that related to the needs of body and soul of human. Nowadays by increasing the population in the world the suitable shelter become a real problem. In the point of economic also the prices of the houses increase too much so its not affordable for low-income people to have shelter easily. After the revolution in Iran country there is a huge immigration from the rural part to metropolitan areas. Most of these peoples belong to low-income family, new couples and labors. Governments try to solve this problem by creating some policies. Mehr houses is a kind of affordable housing which is the policy of the 9th and 10th government urban and city program. Most of these type of houses located out of city centers, in suburbs. The location reduces the quality and satisfaction of the citizens about these type of houses. This election of the land cause decreases the success of government about their policy. The aim of this study is to analyzing the crime in affordable houses that located in suburbs area. This research will answer the important factor that cause crime in affordable housing in suburban's. The case study in this research is Mehr houses that created for low-income people in Iran. This research analyzed the factors which may cause to raise the crime in that area based on the literature review and previous analysis by different theories in this field. Data is collected by literature review, news, books, papers. The result of this research confirm the possibility of Mehr affordable houses in suburbs transfer to the area that raise the crime.

Keywords: Affordable housing; Crime; Suburbs; Iran; Mehr houses.

1. Introduction

Shelter is one of the most important essential needs and legal rights of human being. Dwelling could protect the citizens from the cold and hot weather, animals and social harmful factors in the society. According to the United Nations Centre for Human Settlements in 1996 the one fifth of people in the world are suffering from the low quality. Some of the people don't have any house. They live in shanty places that caused important problem for health of family. They also increased the crime in world (Kjellstrom, 2007).

After the industrial revolution, Urbanization process has grown increasingly. Parallel to this issue the lack of housing is grew up (Hardin, 2009). In other view lack of housing is the important problem from the ancient time for human being. In different periods the governments try to find some solution to decrease the deterioration of this problem. In different countries there are some solution for this problem. The lack of housing in under developing countries is much more important and problematic. Iran as an under- developing and third world countries by creating some policies attempt to help the citizens to have the best condition for their houses. One of these policies is Mehr houses project. Beginning of this idea goes back to 2007, from the ninth and tenth housing and urban policy program in Iran (Alipour, 2015). The major typicality of Mehr houses is that the government removed land prices. Due to this policy most of these projects is out of the city centers and in suburban's. This cause an important problem for the citizens (Ivani, 2014). Assistant director of urban and city development in Iran said that the Mehr houses become a modern suburban's. This could be so harmful for urban and city development. He mentioned that to have a better city, we have to focus on physical structure of the city. It is also essential to attention to social quality of the houses. From other view, suburban areas due to their unfavorable environmental situation and elements, and social and cultural heterogeneous tissue, are known as most fertile areas of crime (URL 1).

Most citizens in these houses belong to low-income people. These people categorized as new couples, the ones under the poverty line or a little above. These people their economic life is not easy (Karshenasan, 2013). The other groups that they lived in Mehr houses are immigrants from the rural part or small cities to big cities. They do this immigration to have better job and quality of life.

2. Theoretical Background

In this part of the study, the author gives some theoretical information about the housing and their environment. One of the theorist which is talked about suburban was Robert E Park. Park in the paper “Human migration and marginalized man” Mentioned that suburban is the result of the economical and political operation (Park, 1928). The other study is belonging to Ernest Burgess and Louis Wirth. They stated that the reason caused the suburban is concentration of the poor people in the area that there is no any facility (Pickvance, 2013). In the liberal view, phenomenology of the suburban areas as a reality is acceptable. They try to find some solution to have better quality in these areas. They terminated suburban topic by giving the land in different shape, give the loan and also control the government land (Rogers, 2011).

The forward thinkers were introduced the title that is called “aviary housing” that they are known as un residential functional which located in residential area (Battle-Fisher, 2014). Social relation is one of the essential needs for tenants. These need will be answered by different functional services next to their dwellings. These accommodations are part of the daily life and they should be accessible for every one. Lack of access easily to these facilities cause health problem such as physical and spiritual. These services categorized as therapeutic services, kindergarten, schools, daily bazars, entertainment services. It is advised that the location of these functions in the housing area could be possible while the streets are omitted. Different functions should not exist in the same areas and the houses area should be separated from these functional services (Doroudi, 2014).

There is another view that is belong to health of soul. This theory is against the previous one. Most attention is based on health of soul instead of environmental needs. This theory believes that using the forward thinker's theory in housing and cities make the place non-dynamic, uniform and eerie and caused undesirable attitude from the citizens that could harm to soul health of the citizens. The main idea of this theory is categorized as: 1. emotional dynamics of space and environment, 2. attention to principle of neighborly relations as maintaining the values and traditions, 3. attention to principles of streets as physical solid foundation of city. One of the prominent thinkers in this field is Jane Jacobs. Based on her idea if the urban neighborhoods are more diverse get more attractive. She beliefs that it is better in every district more than two functions exist. She also mentioned, it is better to mix the residential function and commercial function together. The stores located in the ground floors of apartments and the upper floors belong to the residential function (Jacob, 1961). This theory makes the place much more safe than the previous theory.

There is another theory based on the suburban's in non developed countries from the phenomenology view of Peter Liold. He believes that its better to see the suburban's from the immigrant's view and he called these type of houses slums of hope. He did some studies based on these type of houses. He stated that persons who lives in slums houses, most of them are active person. They have positive spirit and they don't give up in their undesirable life. Their attempt to build the temporary shelter shows their positive spirit. Liold and Smith believes that the governments could help these people by using them as a worker to solve housing problem. This may cause that the other rural citizens want to immigrant to big cities. For analyzing this situation, it is better to see from a rural immigrant point of view which doesn't have home in the cities. Due to their opinion its very good that they could have shelter and brings hope for them. From the other view, they don't have better life in rural part because most of them are poor people. Liold believes that its better to study the reason that cause the people immigrate

from rural part to big cities and their expectation from future for their family. Mostly they looking for better life and they try to have better one (McCatty, 2004). From crime view, there is theorist which is named Newman and he wrote a book named “Defensible space theory” in 1972. He described his ideas about the prevention in crime and having safety neighborhood. Another research was done by Committee tasked to study the issue of violence and crime and delinquency in France which is guided by Mr. Alen Perfit. The result confirms that one of the factors which increase the crime in France is population density. The other result of this research is the relation between crime and deviations. the last one result is quality of housing. Population density and living in the large urban complex reduce the sense of security. Nervous people could loose their control and increase the anger in these areas (Babaei, 2016).

3. The concept of marginalization

The experts and scholars in theory related to the urban city have provided different explanation of Suburbia. They believe that the people who live in marginalized area are located in the economical region of the city. but they didn't absorb to the social and economical system. Charles Abrams believe that suburbs are the process of capturing urban areas to provide the housing. Attraction of the city and welfare in the city, makes them to immigrate from their home town and absorb them to the industrial poles and labor market. Most of them are immigrants from the rural part to big cities to have better life (Henderson, 2013). Interpretation which is exist about suburbs categorized as: 1. destruction part of a city or building, 2. lack of therapeutic facilities, 3. population density in housing unit, 4. lack of comfort, 5. face danger of natural causes such as flood, 6. lack of security, 7. suitable place for crime.

4. History of marginalization

Marginalization is a social phenomenon, which its not belong to the current century, it has rout in the previous centuries. This phenomenon is existing in developed countries and under developing countries. The differences between these two is belong to the historical routes and

social and physical behavior. Iran is not immune from this phenomenon. Situation of the other countries such as Brazil, India, Peru and some African countries are much more worst than Iran country (Zebardast, 2006). In Iran before the 1961 the growth of suburbia has slow speed. the percentage of the city population is 33% of the whole country population. By the implementation of land reform in that decade, and increase in oil income in the 70th decade, the population of the cities increase in a more speed. In 1978 the city population is 64% and increased a lot (Fanni, 2006). This population should have the shelter so they moved to suburban. because in these areas the price of the land is cheap. It is possible that step by step they transferred to the cities.

5. The main causes that rise of suburbanization

There are the specific factors that cause the suburbanization based on the theorist. Mieszkowski in 1993 describes them in his paper "The causes of metropolitan suburbanization". These factors are categorized as:

1. head of family is low-income, 2. land price high, 3. official cost of construction high 4. cost of rent is high, 5. high cost of urban life, 6. lack of zoning and inappropriate land use makes the mix of function, 7. big scale land is not affordable for low-income people, 8. immigration from rural part to small and big cities, 9. immigration from the city centres to the suburbs, 10. government and public and private offices has the important impact on the formation of suburbs.

6. General descriptions of marginalized areas

Most important factor that makes the other people get sad for the people who live there is, the poor appearance of this area. Most of the houses are destroyed. They have poor condition. The roads and streets are narrow. Fire stations, emergency car or police car could not pass from these slim areas.

This study categorized the general typicality of the marginalized areas as described beneath based on literature review in this field.

6.1 Low levels of public health

These areas are poor in public and private health. The garbage's are accumulate there. government do not collect them. These areas have problem in sewage disposal, noise pollution and air pollution (Macfarlane, 2000).

6.2 The lack of formal job and sufficient income

Most of the families that live in suburbs they don't have official jobs. The reason of this issue is that they don't have expertise and skills. They have pseudo jobs. Some of them have criminal jobs such as: vendors, retail coupons, begging, stealing trash, dealing drugs and alcohol (Kneebone, 2015).

6.3 Subcultures

They have subcultures that it remains from the previous families which is lived there before. They have suffered from cultural poverty. Its very hard for the citizens to adopted to city culture (Gullestad, 1983).

6.4 Addiction

The main reasons that could addiction happened are categorized as: poverty, unemployment, lack of proper programs to fill leisure, social and economic inequalities and the availability of drugs. In suburbs most of these factors are exist. Addiction is visible in youth. Buy and sell of drug is increase day by day in these areas (Levengood, 1973).

6.5 The impact of social marginalization for security threats

Suburbs are the areas that they are prone to crime. Lack of security monitoring, existence of too many poor people, low level of literacy, lack of adequate lighting and poor environmental

situation bring the opportunity for criminals to take refuge there (Lavrakas, 1982). Young people who lived there with their specific culture, everyday go to city centre to find appropriate job. Because they are not expert or professional in any field, mostly they do Peddlers, hanging stand, cigarette sales, work in the field of vegetable. They become as an unuseful person for the city. These unspecialised jobs bring criminal for them. Most of the addicted persons, they don't have professional jobs. Another problem which has harmful affect on citizens is health problem. These problems are genital disease and Aids.

6.6 The crimes which is belong to suburbs area

Each environment has its identity and crimes which is belong to that specific environment. Robbery, murder, collective disputes, threat to public health and environmental pollution, addiction and trafficking in drugs and alcohol... are the crimes that belongs to suburbs area.

Robbery happens because of the poverty, jobless, addiction and.... In most of the situations they go to the predominantly affluent neighborhoods and medium class areas for robbery (Alba, 1994). In marginalized area its common to have theft in electricity, water, gas and also telephone. The mass housing projects and single houses in this area, from the first step of construction they don't have these facilities. So the citizens try to bring theses facilities by hidden pipes and hidden wires from the nearest area including residential, industrial, commercial and services.

There are some reasons that could cause murder happened such as: Conflict of subcultures, hostility and festering disputes, profiteering, hurting honor, accidental conflicts and addiction. These factors are visible in suburbs area. Most of the murder locating in marginalized area. Also, most of the murderer happened in these areas. Collective disputes is the most common crime for the suburbs area. This happened because most of the citizens are immigrant people from rural part. They live close to each other. When the argument happened it gets big fight and maybe cause somebody murder (Tacoli, 2006). Distribution of the drugs in these areas are

easy. Because they feel safe in suburbs. Lack of education and being jobless bring too much pressure on them. They try to forget these hard situations by using drugs. Some of the youths which live in suburbs are selling drugs.

7. Methodology

In this research based on the literature review such as newspaper, articles, books and observation, analysing the main factors that cause increase crime in Mehr affordable houses projects in suburban area as a case study.

8. Mehr affordable houses project

After the revolution in Iran in 1979 there is a huge amount of migration from rural part to small and big cities. Government in different period try to solve the housing problem by creating some policies. From the other side the economic aspect of dwelling also brings too many problems for the ones who don't have any houses (Kalili, 2015). In the 9th and 10th urban and city development program government create a new program which is called Mehr affordable housing. These projects are located in small and big cities and belong to the low-income people. The main factor of these project is that the government omit the land price. So related to this issue most of the projects are located in suburbs area. The land price over there is cheaper than inside of the city. The citizens of these projects are youth. Most of them are not educated person (Zanjani, 2011).

Based on the government policy in 2007 the applicants for Mehr houses projects are categorized as:

- 1- Lacking in land or housing estate
- 2- No history of using state resources
- 3- Five years of residence in demand
- 4- Married or head of household

5- The priority is with whom the monthly income is less than twice of minimum wage law issue work or employments country (Babaei, 2016).

Mehr houses project with a high population density indicator, Separation and segregation, immigration, distance and lack of facilities are at risk of crime. These factor shows that there is no any deep study in selecting of the land and construction of the building for Mehr houses projects. The government has a weakness in Mehr affordable houses policy. One of the most important problem that caused crime in Mehr affordable houses is that too many people with different cultures in a small public area has a negative impact for the tenants. These can cause to create crime. Most of the citizens in Mehr project are working far from their house. The amount percentage of youth people are much more than the other ages. They need to be under the control of their parents. These young children should spend lots of their time in the way to city centre. These suburb houses cause the reduction in the parents control. Most of the lands around these projects are not constructed yet. They are still arid. There are too many immigrants among the citizens with different cultures. These differences cause raise quarrel among them. The square meter of the houses is very small. It is not adequate even for small families. They used to spend most of their free time in the public open areas close to their houses. The lack of entertainment facilities in suburbs area cause that teen ages spend their times in the street and public areas. They are not close to their family. They can easily learn criminal attitudes. These cause much more separation between families and their children's. It is harmful for family health. In suburb areas far from city center they are living mass of young population which they are under the average of education and economic situation in small place without necessary amenities and services facilities. The whole situation could be harmful for society and increase the crime in that area.

Separation and segregation is another important factor that increase the possibility of crime. The separation happened while some areas have more or less of a group of people with different

social, economical, income classes. Each group selected an area for living or sometimes they forced to live in an area. So each district has its own identity and characteristic. Most of the poor areas and their mass houses suffer from scourge of crime. Mehr houses project could be such a kind of place. Because they are separated from the city centers and all the facilities inside of the city. Mehr houses are called modern ghettos or modern suburbs. Ghettos are represents life and the constraints of a minority among a majority of a big city. Ghetto is the result of ecological segregation, the separation of religious, racial, and sometimes the separation of poverty and socio-economic separation, from the other part of the city. From the physical view ghettos are the same as other areas but in social and cultural characteristic they have some problems. In government projects that build houses for low-income people this problem is possible to happened. But it is against of the government policy that these houses transfer to poor ghettos. Mehr houses projects are separated the citizens from the city centre by selecting the lands in suburbs. These projects separate the social-economical classes. Because these houses belong to poor or low-income people. The children of these families feel baseness when they go to the school. They compare themselves with their friends that they belong to other social-cultural classification in the society.

Immigration is one of the factors that increase the crime. In Mehr houses project there is a rule that the owner should live in that city at least five years. But this rule does not apply to these projects. It means that the government didn't attention to the families' background of living city. Also they create another rule that could cover this rule. Buy and selling in these project is legal. The owner could sell to whom which is not live before in that city. This rule helps the rural people to immigrate easier to the big cities such as Tehran. The combination of different cities citizens and gather together makes the subcultural happened. This issue can increase the cultural differences. By this situation the rate of internal conflicts gets high that crime could have happened more easily.

Mehr houses project are far from the cities. It is bringing too much trouble for the women's and children who lived there. Most of these projects suffer from lack of transportation facility. Traffic between these houses and city center could raised the crime mostly for women and children. They live in poor family so its not affordable for all of the families to have private car for transportation.

The other reason that could raise the crime is the lack of entertainment facilities. These shortages have much more affect in youth. In their free time they should spend their time in street instead going to cinemas, park or other entertainment areas.

9. Conclusion

In this paper two important factors were analyzed related to the housing that is one of the most and essential need for humans. These factors are categorized as suburbanization and crime. Due to immigration from the rural part to city, the head of the family is low-income. The price of land is cheaper. The rents are lower. These factors make the suburbs better than city areas for living for low-income people. But the quality of these areas are not satisfy the citizens. It is bringing some problems for them such as: low level of public health, addiction, lack of formal job and sufficient income and also subcultures. The other problem which is harmful for family in these area is related to the social factor problems such as crime. Poverty, low level of culture is the most important factor that raise the crime in suburbs area. The crimes are containing robbery, murder, trafficking in alcohol and drugs and also addiction. Mehr houses are affordable house in suburbs area. These houses based on literature review which is described deeply in this study, possible to transfer to criminal areas. Government try to solve shortage of houses for low-income people. They should study more deeply. These areas could be so harmful for health of family and health of society. All the families which is living in Mehr houses, belongs to low-income family. Most of them are immigrants from the rural part to city areas with different cultures. All of these factors could help to raise the crime. Finally, it is suggested

to government to study deeply in all factors related to the housing and environment for construction affordable houses to have better and healthy society.

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Gentrification within the Law of Transformation of Areas at Disaster Risks in Turkey Sulukule, Istanbul Example

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Abstract

With coming in force of The Law of Transformation of Areas at Disaster Risks numbered 16.5.2012/6306 by Ministry of Environment and Urbanization, the concept of urban transformation has entered to our life in Turkey. Gentrification as one of the forms of urban transformation brought the existence of liberated zones produced by neo-liberal mentality. Sulukule area (Neslisah Sultan settlement) which is subject to research is counted among “the areas to be renewed and to be put under preservation” by numbered 2006/10299 decision of Council of Ministers. Due to the shortage of lands in the city, it is observed especially in 1980s that the families in high-income group have preferred to live in horizontally expending villa towns far from the center. While these residential areas are deepening the distance from the center in time, the pressure of housing demand of middle-income people and rent circles who are not planning to leave the city center caused to have an eye on these areas which are residential areas of mostly low-income people and appeared in certain regions as they are established without infrastructure and healthy conditions. With this law, the transformation has started in the areas such as Fikirtepe, Dolapdere, Esenler, and Banks of Halic (Golden Horn) where structural life is completed, and floor area ratio has been raised to 4.0 from 2.07. Vertical housing is stimulated by adding the street between the parcels to the blocks, it has been tried to prevent the victimization of local people to unearned income. There are some quarters that, under the name of gentrification, Romany citizens who passed to permanent settlement from nomadic culture at the Ottoman era, and who are engaged in activities such as handicraft,

adornments, shoe making, weaving beside the show business at FatihSulukule district are convicted to lodge in the houses built in suburban if they have title deed, and in jerry-built tents if they don't have deed. Chamber of Architects, Chamber of City Planners Istanbul Branch and Roma Culture Development and Solidarity Association filed "nullity suit" and "stay of execution". Despite the continuing judicial process the demolition started in 2009, and starting the constructing the villas in 2010 breaking the resistance of Romany citizens, the area was victimized to rent.

Keywords: Gentrification; Urban Transformation; Laws; Settlement.

1. Introduction

In our country in recent years, as it has been in the world, intensive population pressure raising especially towards Metropoles has caused to diminish lands in city centers almost minute amount, structuring to start growing away from city centers through urban areas, rent circles to verge central old districts distortedly structured. While this situation shows itself with political and economic pressures, displacement of people comes to a state of social problem and keeps up –to-date.

In the article, gentrification concept that shows itself with urban transformation laws and that, environing dilapidated old areas, causes displacement of people is studied. Within the scope of research the applications realized in Neslisah (Sulukule) district, spatial variability effecting the past and present of district, actors taking place in this variation are addressed in a frame, and a comparison of Istanbul with gentrified regions in three phases.

Face to face interviews are done with displaced and returned people. Internet resources, together with books, journals, newspapers, and thesis and doctorate studies from industrial revolution to present day have been factors to direct the study.

2. Concept of Gentrification

“Soylulaştırma” which corresponds the English word “gentrification”, and which has other usages in Turkish such as “mutenalaştırma, seçkinleştirme, burjuvallaştırma, nezihleştirme, kibarlaştırma, centrikasyon, jantileşme, etc.” is shortly defined as settlement process of middle and high class people to the districts in city centers where low-income people live.

Gentrification is modification process of distorted districts via the raiding of supremacy whose socio-economic condition is high. Gentrification is designing the neighborhood-size areas that started to deteriorate, dilapidated and decadent with an identity, and is quartering middle and high income people into these made out places. This is a social issue with political, economic and cultural dimensions and still discussed today.

From this point of view gentrification is improving the quality of a small or big scale of settlement, at the same time it subverts the permanent settlement of present habitants and push them to live in potentially more sophisticated, of lower cost and quality houses far from city center. While gentrification takes more effect at settlements with racial and ethnic structures, the people of high income level have been provided to settle these high quality and expensive areas (Smith, Williams, 1986).

During the transformation of the districts under the name of gentrification, gentrifiers and gentrifieds prompt habitants to be settled in urban areas, separating them from the houses where their grandfathers, fathers and children lived and will live, taking away their memories. The rent brought by high housing quality, high rental incomes and high contribution fees make it impossible for these people to hold on to these areas.

2.1 Transformation Process Improved With the Industrial Revolution

Gentrification has started to manifest itself as a result of population pressure intensifying through cities from villages at mechanization process started by the invention of steam engines of 18th-19th century industry revolution.

The income raise at middle-income class has started suburbanization at this transition process, and has created living quarters around the cities. This improvement has caused the settlement of low income group people into city centers. Parallel to renovations brought by industrialization, while labor need of mechanization was doubling that intensity, these settlement areas started to deteriorate, dilapidated and decadent in time. Ultimately, orienting need of population with middle and high income conducted toward urban renewal and rehabilitation processes for inner-city areas. This process is evaluated in five kinds of categories under the name of “**Neighborhood Life Circles**” by Knox and McCarthy.

According to this classification, the neighborhood at chosen areas are in a successive alteration and transformation. Social, economic and physical alteration realized in transformation areas has reshaped the pattern.

The first phase of neighborhood life circles is named as “**Suburbanization**” and starts with the settlement of high income people into these areas. Low number of residences and having detached houses is the first and biggest feature of the first phase. “**In-filling**” feature that is composing the second phase makes up the lodgment of multifamily renters. This phase start to destroy the socio-economic structure of the neighborhood it had. The third phase is “**Downgrading**” to cause a reason to make these living quarters a more static areas, and it is the longest lasting phase. At this stage, depreciations and deterioration on the houses start.

At the fourth phase, “**Thinning out**”, the beginning of the end stage starts, that it necessitates the destruction of the outmoded, dilapidated, and transformed houses from in terms of population social and peculiarities (Slum clearance). At the last phase, that is renovation and rehabilitation, the lifecycle of the area is completed by a new housing form under the name of “**Gentrification**” by renovating or destructing and reconstructing of the damaged houses (Figure 1) (Knox, McCarthy 2012).

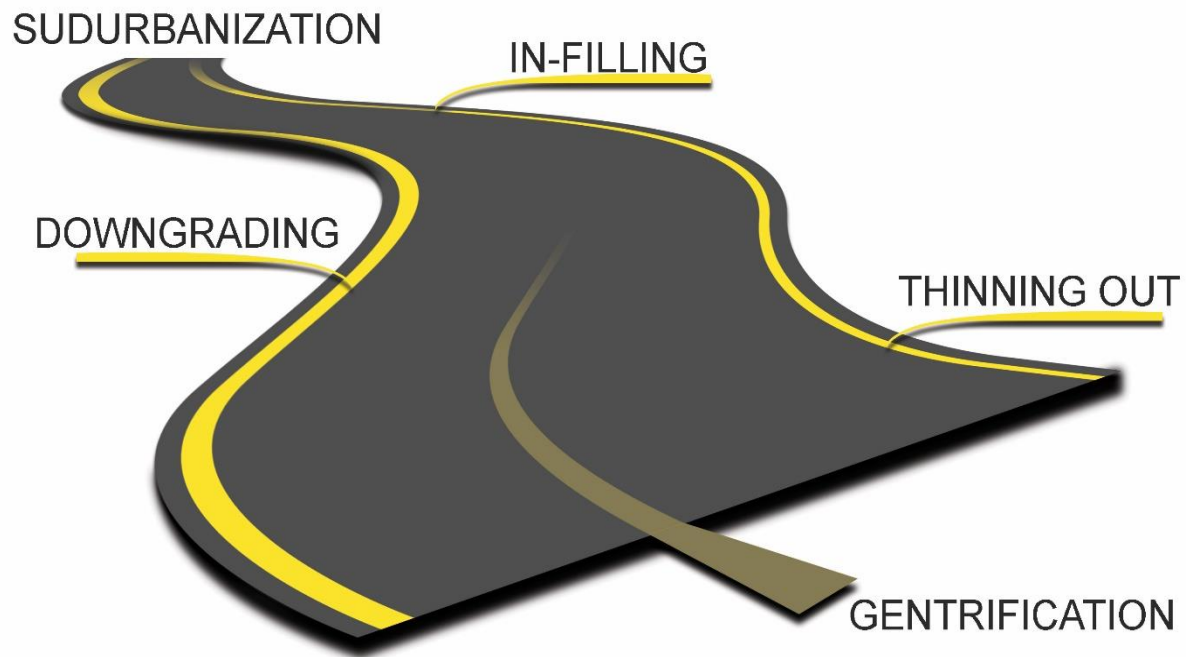


Figure 1. Major Phases of Gentrification According to Knox and McCarthy (Ozbek, I.)

2.2 First Sample Areas of Gentrification Concept

In the industrialization period started by 18th and 19th century, Gentrification was started to be seen in Western Europe and American cities. Together with a 100 years beginning life of that period, it shows a rapid expansion in globalizing world.

Even if this gentrification process shows an expansion tendency in cities such as London and New York, it gained popularity in other American cities like Philadelphia and Minneapolis, and Glasgow and Manchester in England. This process accelerated by 1960, and started to influence large historical cities of Europe, North America and Australia after 1970. Raiding of high income population to city centers in metropole cities in 1980 has created the renovation need of old buildings. Because of the integration of closed economies to globalization process especially from these years, gentrification has constituted a global phenomenon. While gentrification is entering to 21st century, it is seen that city culture and its future has been brought to a new dimension with the power of rent-dependent capital.

In United States of America which is one of the first actors of gentrification period, it is indicated in the researches related with gentrification that gentrification shows a raise in time, approximately %1-%5 part of urban houses are effected, and this covers 900.000 houses in a year. In addition, at the present time gentrification is also seen in Eastern Europe and 3rd World countries along with big cities such as Washington, Vancouver, Adelaide, Amsterdam, Istanbul and Madrid (Ceker, Belge, 2015).

2.3 Cultural and Socio-Economic Dimension of Gentrification

By city centers' becoming attractive to financially powerful middle and high income group people, the rent values of these areas have begun to raise, and rising tendency of the prices day by day has precluded the living of local people previously settled here.

Established culture made that city gained its own identity, thus, intervention of another hand to their world that they have founded for themselves from past to future reveals a social dimension of gentrification concept.

Knox and McCarthy expresses the social aspect of gentrification as follows: "The principal significance of gentrification lies behind the qualitative, symbolic and ideological effects it struck on urban transformation." Knox and McCarthy also emphasis that gentrification pave the way for social conflicts via dramatically changing the social structure of neighborhood (Akalin, 2016).

Some chamber, association and institutions utter that gentrification is aviolation of right via displacing people, and they object gentrification that generate pressure with law. The most significant example of its being so is revealed with Neslisah (Sulukule) neighborhood.

2.4 Reasons Creating Gentrification

The cities are living spaces which are in the grip of a continuous period of change that doesn't like stability, which fulfill the necessitation of change, and which grows with the transforming human.

As a result of rapid globalization of the world, it has become an inevitable part of urban renovations. Gentrification concept shouldn't be perceived as the only mobility indicator in the cities, it should take part in cultural and economic dimensions as seen in Figure 2. Economic dimension, which is the most effective power on this, shouldn't be ignored. Depletion of rapidly decreasing lands around the city has caused to renovate the slummed neighborhoods stayed in the inner parts of the city in time (Akalin, 2016).

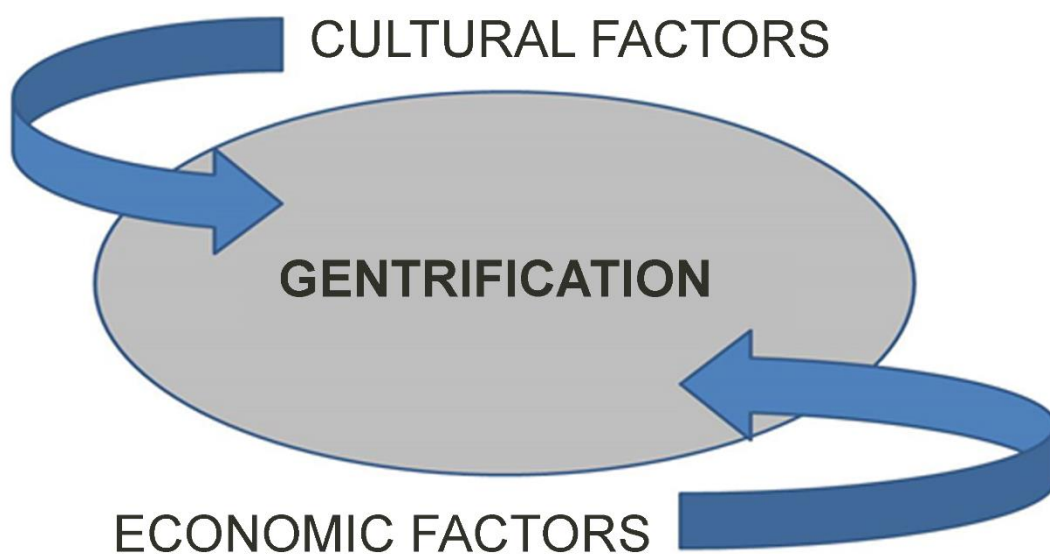


Figure 2. Factors effecting gentrification (Ozbek, I)

Another factor is the distance between urban and center, and length of transportation network increase the time en route; traffic density raises the attraction of city centers. Changing life perception and wishes of the youth introduce another dimension of gentrification.

Local governments may become an important factor to affect the gentrification process in order to renovate some old neighborhood that are close to the historical center of the city, to provide security in those areas, to rehabilitate the social and economic pattern of the city, to protect the historical places.

3. Studies Done Under the Law of Transformation of Areas at Disaster Risks Numbered 6306

Since 1985 to present day urban renewal and transformation projects are realized by being based on laws under several names such as Zoning Law, Zoning Remission Law, North Ankara Entrance Urban Transformation Project Law, etc. Inefficiency of these mentioned laws and destructive effect of 17 August 1999 earthquake have provided The Law of Transformation of Areas at Disaster Risks Numbered 6306 by Ministry of Environment and Urbanization enter in force.

With this law, the transformation started to be actualized incrementally in three stages; Investment (Rent) purposed, Earthquake Focused, and urban transformation oriented to historical sites (Figure 3) (Çevik, Türk, Beygo, Taş, Yaman, 2007)

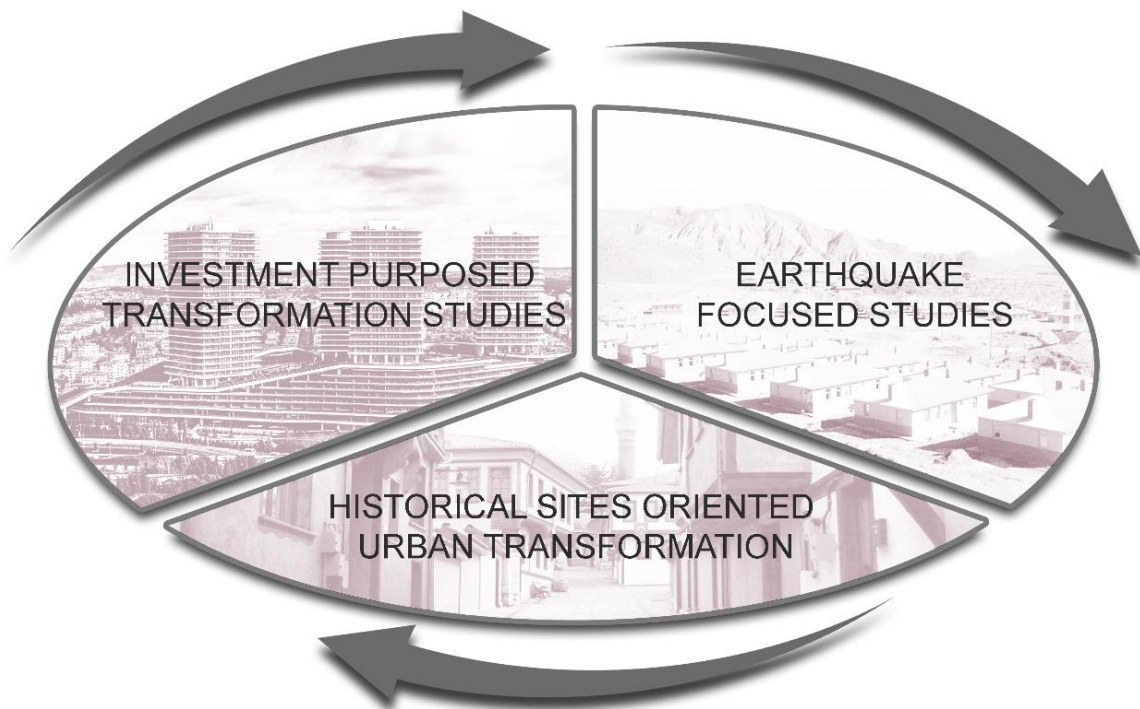


Figure 3. Urban Transformation Studies in Istanbul (Ceker, Belge, 2015).

3.1 Earthquake Focused Studies

After 17 August 1999 earthquake, not to live the same disaster again, earthquake focused urban transformation studies came to start. The goal was thought as removing the buildings at risk and retransforming. For this purpose the risky buildings in Istanbul were determined, and earthquake focused urban transformation areas were identified. In Istanbul there are approximately 15 million habitant (Turkish Statistical Institute, 2017) and 2 million 291 thousand 226 houses. %60 of these houses consist of houses built illegally and out of control. Also, 916.491 houses that correspond to %40 of them have completed their earthquake resistance life. These numbers show that half of the building stock in Istanbul has to be included in transformation.

1106,25 hectare area primarily including 16 districts is identified as urban transformation area. That amount is equal to %27 of the total area. Priority areas for urban transformation identified in consequence of researches done by Ministry of Environment and Urbanization are considered as “Risky Areas”, and included in urban transformation area (Figure 4).

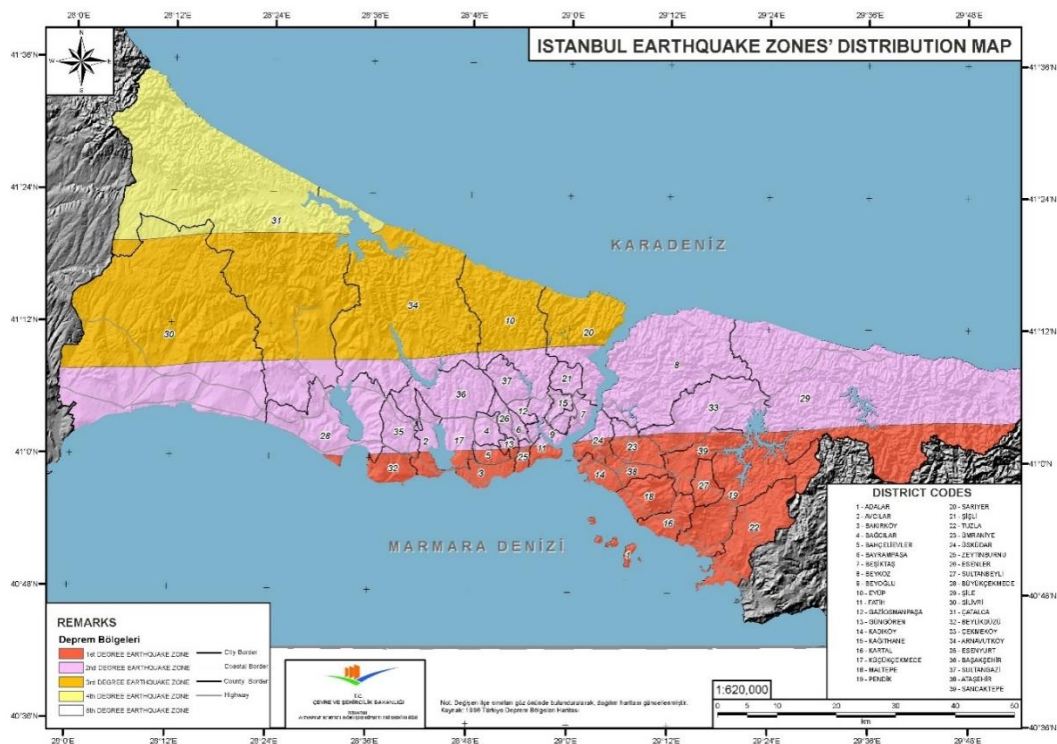


Figure 4. Map of Istanbul Earthquake Zones [Url 1]

Areas that are subject to priority areas for urban transformation are, in order-of-magnitude; Gaziosmanpaşa, Sarıyer, Pendik, Kadıköy, Bağcılar, and Gungören (Chart 1). Percentage distribution of risky areas referring to the districts is shown at Chart 2 (Çevik, Türk, Beygo, Taş, Yaman, 2007).

Chart 1. Percentage distribution of risky areas referring to the districts (Sana, T.)

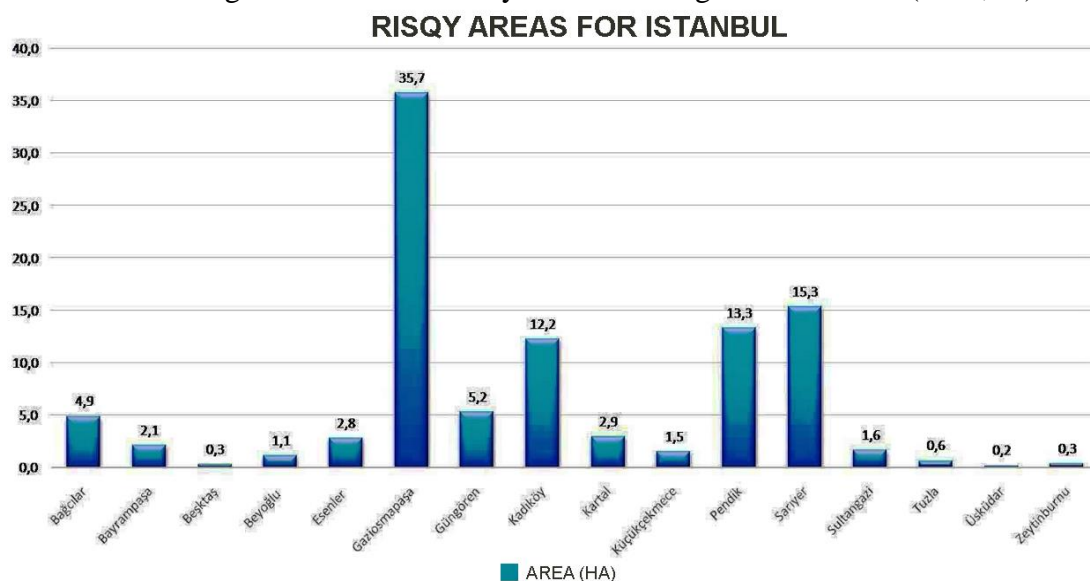


Chart 2. Districts and Neighborhoods Included in Earthquake Focused Urban Transformation Areas in Istanbul (Ministry of Environment and Urbanization, 2015)

DISTRICT	AREA	RISKY NEIGHBORHOODS
Bağcılar	53,4	Çınarlı - İnönü - Sancaktepe - Yavuzselim - Merkez, Demirkapı, Evren, Göztepe, Kemalpaşa
Bayrampaşa	22,7	Bayrampaşa / Vatan
Beşiktaş	3,19	Etiler / Rumelihisarı (Akat)
Beyoğlu	12,24	İstiklal, Örnektepe - Sütlüce
Esenler	30,54	Atışalan Havaalanı, Çiftelhavuzlar, Oruçreis 1,2, Tuna
Gaziosmanpaşa	392,96	Gaziosmanpaşa / Merkez, Yıldıztabya Doğu, Batı, Yeni Mahalle, Sangöl - Merkez, Pazariçi Kuzey, Pazariçi Güney, Mevlana, Kazım Karabekir - Fevzi Çakmak, Barbaros Hayrettin Paşa - Karadeniz - Karayolları, Bağlarbaşı
Güngören	57,71	Güngören / Tozkoparan
Kadıköy	134,18	Kadıköy / Fikirtepe
Kartal	31,84	Yunus, Kordonboyu, Yukan Mahalle
Küçükçekmece	16,64	Fatih, Kanarya
Pendik	146,22	Pendik / Batı, Dumlu Pınar - Orta
Sarıyer	168,8	Çamlitepe (Derbent), Fatih Sultan Mehmet (Armutlu)
Sultangazi	18,08	Sultangazi / Cumhuriyet
Tuzla	6,78	Tuzla / İçmeler
Üsküdar	1,77	Üsküdar / Burhaniye
Zeytinburnu	3,82	Zeytinburnu / Sümer
TOTAL	1106,25	

Urban transformation in Fikirtepe in Istanbul goes on as it is planned. Total 11 blocks on 134,18 ha area is in transformation process. Fikirtepe also is a beautiful example for urban transformation and gentrification. By its location Fikirtepe has become an attraction center. Despite it is under construction, start of the sales with high prices show the interest of wealthy classes to there. That much raise of the prices has compulsorily directed the original Fikirtepe habitants leave the area. Generally nearby areas of Fındıklı, Bulgurlu, Unalan, Fetih, Kayisdagi, Ornek, and Esatpasa have been preferred. %87 of the Fikirtepe people who were living there before the transformation project have stated that they didn't want to reside in Fikirtepe. This situation shows us that people are separated via compulsory spatial transformation (Ceker, Belge, 2015).

3.2 Transformation Studies Including Historical Sites

Historical values of the city are brought to the fore by restoration of historical sites at urban transformation to contribute the development of tourism. For this purpose the idea of "Urban Transformation on Historical Sites" arose. As the best samples to this, Sulukule, Fener-Balat and Suleymaniye in Fatih district can be counted. Another examples are Persembepazarı and Tarlabası in Beyoglu district. Earthquake focused urban transformation is also done in Sutluce-Ornektepe and Kasimpasa in Beyoglu district. Neslisah (Sulukule) in Fatih district, Hatice Sultan neighborhood, Fener neighborhood, Balat neighborhood, Ayvansaray, Atikmustafapasa and TahtaMinare neighborhood are also decided as "Urban Transformation Area" by the decision of İstanbul Metropole Municipality Council. A major urban transformation and renovation studies go on in this area (Ceker, Belge, 2015).

3.3 Investment Purposed Transformation Studies

Another purpose of transformation is to gain rent. Being attractive of such places in Istanbul drew attention of business and finance sectors. This caused the start of investment purposed "Urban Transformation with Strategic Focus". 901,5 ha area came up for this purpose. Of these

areas 330 ha is in Kartal, 310ha in Ayamama Axis Cendere, 230 ha in SilikonVadisi (Silicon Valley), 31,5 ha in Maltepe-Dragos (Figure 6) (Ceker, Belge, 2015).



Figure 6. Fikirtepe Urban Transformation Area [Url 2]

4. Phases that Gentrification Included in Istanbul

4.1 First Phase: Kuzguncuk, Arnavutkoy, Ortakoy

Kuzguncuk is a district situated between Uskudar and Beylerbeyi on Asian side at Bosphorus, shaping a valley from north to south through Bağlarbaşı. It is written in sources that its old name is Khrysokheramos, meaning “Golden Tile”, and this name came from a church with gilded tile roof founded by Iustinos (dp 565-578). The Jews coming to the area by 17th century turned it into a habitat (Uysal, 2006).

At the beginning of 1980s, by settling of architect Cengiz Bektas to Kuzguncuk neighborhood which is one of the oldest settlement areas of Istanbul, the neighborhood rehabilitation study he started raised the interest to the neighborhood. Raising deep interest induced groups such as artists, architects, writers and musicians to settle there, causing the neighborhood become popular.

The intense demand shaped in that way has increased the profitability of the region, the district became a natural movie set, and by shooting popular television serials here the interest have arrived to the highest levels (Figure 7).



Figure 7. Kuzguncuk District Rehabilitation Study [Url 3]

In Kuzguncukdistrict, renovation studies done with CengizBektas'little touches fitting to the project have raised the demand to the neighborhood, and have caused the reviving of property market. Thus, to view the best samples of gentrification without public or profiteer intervention is provided.

Another district, Arnavutkoy, is situated between Kurucesme and Bebek in European side of Istanbul. Being an old Greek village this district was named as Hestai, because limestone-quarries were there in Antique age era (Figure 8).

The region was called as MegaloRevma (Grand Stream) by the Greeks at Ottoman era. There is no precise information about when and with what reason the area had the name of Arnavutkoy. After the big fire happened in 1877, most of the Jews living in the area have left their homes and settled to Ortakoy, Yenikoy, Balat and Kuzguncukdistricts, and Turks have settled to the district that concretion rapidly started (Akalin, 2016).



Figure 8. Arnavutkoy District [Url 4]

After 1960 apartment blocks were started to be built on coastal road. After 1980 “piled road” was built on the sea to enlarge the road, and so that structuring gathered more speed (Akalin, 2016).

Arnavutlukdistrict had a similar renovation process as to Kuzguncuk. While the neighborhood spirit found out in Arnavutkoy, that improved itself, not the hand of the state but the cultural structure of the public, is being affective at the renovation process, it also has been a good example of gentrification [Url 10].

The last district of the first phase of gentrification, Ortakoy, is situated bay the foot of Bosphorus Bridge on European side. The history of Ortakoy, which is an important settlement if Byzantium and Ottoman Empire, reach out until Antique Age. It was named as Arkheon in old ages. Turks who settled to the region during the era of Suleyman the Magnificentbuilt Ortakoy Mosque that later became the symbol of Ortakoy. It is a district where different cultures and religions live together in amity (Figure 9).



Figure 9. Old and New Ortakoy [Url 5] [Url 6]

Even if it doesn't make a direct relation of the subject with industry, gentrification studies done in the region puts forward district's relation with urban policies with its several aspects. The importance of architectural features and physical location of this district in terms of gentrification is its bearing the social dynamics of city centers. This area that has a mixed structure draws attention with its old habitants and newly settled middle class people (Akalin, 2016).

There is an interesting situation for this area; Ortakoydistrict which was gentrified with a similar process have had to experience a second gentrification process because of an intense capital flow in time, and it has been seen that the parts settled here left Ortakoydistrict beginning from the mid of 1990s. The district became an entertainment center with its traffic that appeared especially after the rearrangement of Ortakoy square, with the intensity of entertainment places, and with the noise of hotels and cafes.

4.2 Second Phase: Beyoglu, Cihangir

Transformation of Cihangir and Beyoglu followed a process as a continuing one that goes back to 1980s, that is, the beginning of gentrification. In this period, Cihangir has been a place where travesties and homosexuals were taking shelter in. At the beginning of 1990s it drew interest of gentrifiers. Especially in this period, the first reason of their preference was its central location and architectural style of the buildings were affective.

The people who preferred here because of these reasons were young professional citizens, writers, architects, poets and academicians, as it was seen in Kuzguncuk example. Another reason of this preference is the investors who are of buying the houses there with a low cost and selling them for a more charming prices after the necessary maintenance. Speculative raise on house costs after such acts of investors has resulted in Cihangir's becoming a life place for middle-up class. Artist people's Cihangir preference created a more bohemian life style. This gentrification example experienced in Cihangiris similar to gentrification samples in West (Şatiroğlu, 2011).

4.3 Third Phase: Halic, Balat and Fener

Surrounded with Byzantium city walls on North and Halic city walls on East, Fener and Balat were places where non-Muslims were densely living for Al-Qudspatriarchate of Christian community and Greek patriarchate of Orthodox community were located there. Fener's residents where aristocrats were living until 18th century have started to leave the region at the beginning of 19th century. Rich notables mostly went to districts by Bosphorus such as Tarabya, Kurucesme, Arnavutkoy, remaining Greeks have left the country in masses in 1960s.

Balat was a region where Jews were predominated in population. They have also collectively left Balat and settled around Galata in 19th century. Remaining few Jewish citizens became minority in Balat, and left buildings were settled by low income people came from Black Sea region. Generally artisans and craftspeople were continuing to live in Balat that has lost its old charm in socio-cultural and economic aspects. With its closeness to center and cheapness of old buildings, it has been a hope for people migrated from rural areas. Balat and Fener which are becoming life place of low income people have begun to transform with a project started in 1988 (Akalın, 2016).

Towards the end of 1990s gentrification process has jumped to two neighboring districts within the boundaries of Fatih district and located on the bank of Halic, to Fener and Balat that were

designated among the poorest districts of the city. Gentrification in Fener and Balat begun to be seen after the announcement of ‘Rehabilitation Program of Fener and Balat Districts’ in 1996 which was prepared with cooperation of European Commission and Fatih Municipality and purposed to rehabilitate about 200 houses (almost 1/7 of total house stock) (Figure 10).



Figure 10. Rehabilitation Studies of Fener-Balat District [Url 7]

The project that started in January of 2003 and funded by European Commission has almost 7 million Euro budget. Since “institutive intervention” actualized before gentrification process and gentrifiers were informed about rehabilitation program before they settled to the region in Fener and Balat example, whether their purpose is this or not, the institutions are the main igniters of gentrification process. For this reason, Fener and Balat example are considered as a part of state-based new gentrification wave (Akalin, 2016).

The region where nearly 500 first-degree and second-degree historical monuments are begun to become a culture and entertainment center after restoration, reconstruction and renovation studies. There are 16.000 sq. monumental work, 18.00 sq. new building, 32.000 sq. civil architecture example.

5. Fourth Phase: State-Based New Gentrification Wave, Neslisah (Sulukule) Neighborhood

5.1 Spatial Structure of Neighborhood

Spatial building elements of Sulukule are narrow streets and two-storied attached yard-type buildings shared by two to five houses and surrounding these streets. But the main qualifier of these streets are not their physical features, but the colorful life style. Before the gentrification operation done to the neighborhood, %16 of the houses were below 50 sq. %31 were below 70 sq., neglected and dilapidated. Monthly rental of hovel houses which were qualified as beautiful by neighborhood residents were varying from 60 to 3000 TL. Besides, for most of the buildings there were even no rental contract that means legally assurance (Figure 11) (Guzey, 2009).

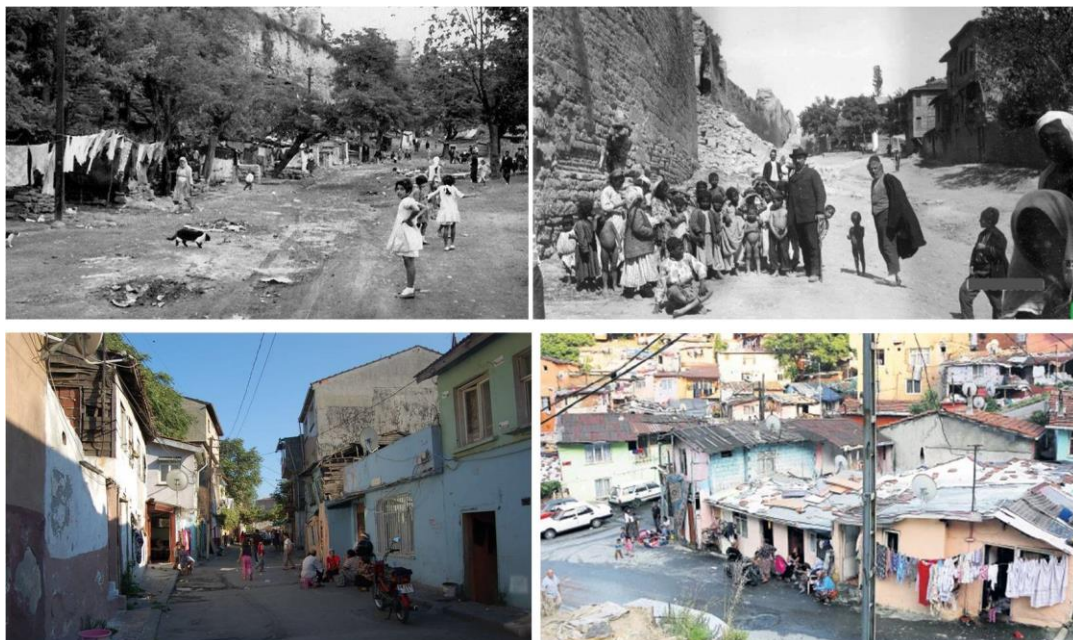


Figure 11. Sulukule from past to present (Commission archive, 1939) [Url 8]

5.2 Economic Structure of Neighborhood

Monthly average income of Sulukule people was varying from per house 300 to 500 TL. & 77 of people have no any income, while %63,5 have no social security. Professional variability in Sulukule is quite low. Men of neighborhood generally deal with musicianship, shoe shining, phaeton riding and hawking. For sustainability of these occupations, easy access to city center has a big importance. As to women, they generally work at textile mills until they get married. While %17 of the families have no children, %13 of children and %8 of women are panhandling (Guzey, 2009).

Closing down of Fun Houses which are important income channel of Sulukule has hauled the region to a big and rapid fall in economic aspect. The region was given in to poverty in this period that artisans couldn't deal with works, 3500 people fell out of work.

5.3 Social Structure of Neighborhood

For locals, this area is perceived as of "inside" where everything is free, everything is comfortable, and out of the neighborhood boundaries is "outside" where are rules and people are not sincere and comfortable. For community dwellers the place they continue their existence is not "the house" but "the neighborhood". All kinds of activities but sleeping and cooking are done in narrow streets. While most of the men are spending their time in coffeehouse, women and children have socializing opportunity in front of their house. Everybody is relative with each other in a way and was born in this neighborhood. They see themselves as "Ottoman kids" and this is an important factor for identity formation (Guzey, 2009).

To exist here since the Ottoman time is very important for community dwellers and it strengthen their connection to the neighborhood. According to a-the questionnaire applied by Fatih Municipality, %74 of community dwellers wanted to continue living in Sulukule. Sulukule was more than a place where ethnic identity is tried to be sustained; it was hosting the people who

were struggling to survive. Separation of Sulukule natives from strangers have increased unity and integrity inside, have obliged them to socialization.

5.4 Targeted Policies in Neslisah (Sulukule) Neighborhood Gentrification Process

The policies targeted during project building process are summarized as follows:

✓ **Protection of Living Culture and World Heritage:**Inland city walls and their extensions such as historical and cultural monumental structures have been completely preserved and surrounding occupations have been purged of, social and cultural pattern areas and infrastructure have been constituted. The target is ensuring the lodgment of all families who are residing here. Thus, sense of belonging to the city will be strengthened with the positive effect of coexistence of different social layers (Figure 12).



Figure 12. Cinarli Fountain. Yesterday (Commission Archive, 1939). Today as it is restored! (Ozbek, I).

✓ **Ensuring sustainability of historical pattern and stopping physical downfall:**The buildings in Sulukule have started to fall because of lack of maintenance, repair and damaging

interferences for years. The area which was occupied by lessees, occupants who do not pay rents and some marginal groups, have been a place of subterranean economy, illegal applications and crime constituting environments, and turned into an unhealthy settlement (Figure 13).



Figure 13. Yesterday and Today of Neslisah (Sulukule) Neighborhood (Hasturk, O.)

✓ **Urban integration and improvement the quality of life while preserving cultural dynamics:**The project also creates important standards together to raise life quality. With this Renovation Project, Sulukule which is situated on an important tourism and culture routing along city walls is going to contain an important tourism and culture axis in itself via the integration and relation it has with the city.

✓ **Encouraging participation:**The project is formed by meetings held twice a week with community leaders, local residents and landholder according to municipality records. The number of residential buildings to be handled with the project are 620. Rent allowances are identified as 400 TL to landholders and 300 TL to lessees. According to project, one third of land holders will again reside in this area, and requestors and lessees will can be a house owner

without advance payment and draw in public housing built by TOKI (Housing Development Administration) in GaziosmanpasaTasoluk which is 30 km far from center. House value to be paid in 180 months (15 years) provided that to start after admission of the houses (Guzey, 2009).

5.5 The Effects of Targeted Policies on Neighborhood's Physical Structure and Neslisah (Sulukule) People in Gentrification Process

5.5.1 Project Developers

With “renovation area” notice on Sulukule (Neslisah and Hatice Sultan neighborhoods) by Cabinet of Ministers on the date 3rd April 2006, the protocol targeting urban renovation was signed among TOKI, Istanbul Metropol Municipality and Fatih Municipality on 13th June 2006. The Renovation Preliminary Project prepared by TOKI was found appropriate by Renovation Committee on 2nd November 2007 (Figure 14). At the end of reconciliation process with beneficiaries, the first destruction on Project Area was done on 11th February 2008.

5.5.2 Project Details

Whilst project area is 9 ha, total construction area is 6ha. There are 620 landholders and 734 lessees in the project scope. Whilst present building block number is 12, in the prepared preliminary project it is increased to 20 and parceling is also changed [Url 8]



Figure 14. Sulukule Renovation Preliminary Project [Url 9]

There have been studies for lessees, as well as for landholders, in the project and they have been ensured to own residences in Tasoluk Housing Estates of TOKİ. %37 of lessees have applied to become house owner. Even if targets such as providing occupation, in-situ transformation, protection of the culture and providing job opportunities are mentioned in project scope, the completed renovation studies have gone to a different dimension. Together with this, annulment actions sued by professional chambers and non-governmental organizations didn't win through.

Negative effects of gentrification process upon Sulukule people

- Solutions are developed by determining preservation principles taking population and housing intensity living in Sulukule into consideration. In reality, zoning alterations on block basis are applied and not obeyed to the typology of roads, streets, houses and historical pattern. Socio-economic structure of Sulukule people and historical structure of the region are pushed into the background, and the marks of 1000 year old Romany culture in the region is cleared away in an unjust way.

- Despite non-governmental organizations' devising appropriate projects to abolish the problems causing poverty as part of the right to life and stay in place, and ignoring shelter need of Sulukule people, the pressure of environments who do not want to be away of rent returns have caused these studies to be excluded [Url 10].

Also, the following plan is prepared by Sulukule Platform, Roma Culture Development and Solidarity Association, and Autonomous Planners without Borders (STOP-Sınır Tanımayan Otonom Plancılar):

- A contemporary, humanitarian approach to be an example in urban gentrification;
- A multi-actored, democratic, transparent planning process to which academicians, public-private and nongovernmental organizations' representatives, and Sulukule people have participated;
- Respect to national and international standards, and sensibilities of public opinion;
- Respect to 1000 year Romany history and culture of Sulukule;
- Opportunity of coming back to the neighborhood for Sulukule residents who were compulsorily displaced;
- Humanitarian and community based programs and solution offers for Sulukule people who are experiencing unjust socio-economic treatments;
- Social reinforcement areas for cultural sustainability and social development beside local employment opportunities;
- A total of 20.500 sq. green space to eliminate the lack of green space in the region.

This plan is ignored, the studies excluded from the planning the municipality prescribed, Sulukule people's culture that survived for 1000 years have been destroyed by the effect of Gentrification Process.

6. Conclusion

Romany citizens constitute 3500 of 5000 citizens living in Sulukule. At the meeting with Sulukule people to apply the demolition decision taken by Fatih Municipality under the name of urban renovation, they said they would give 500 TL value per square meter of houses, and they could hand over the houses to the right owners by charging the cost differentiation in 180 months terminal date. Despite the people told that they couldn't pay these instalments because of income inadequacy, and they could renovate the houses through their own means under the control of municipality, the authorities have pushed them to consent under the pressure of "You either sell them, or we are going to confiscate them!"

In Neslisah (Sulukule) neighborhood all Sulukule people and nongovernmental organizations have taken their position with the slogan "Neighborhood residents should stay in the neighborhood". In spite of this, that request didn't gain acceptance under the pressure of the state and rent environments. By the start of demolition, the interference fell down and the region became unlivable under the dust and dirt. Romany citizens couldn't resist to this condition and completely left the area in 2009.

The citizens who are lessees are placed by lot into the houses built in 30 km out of the city around Tasolukby TOKI, being obliged to pay in 180 months. They failed to pay travel expenses, dues and food by the time, and they started to come back to the neighborhoods near Sulukule.

Rich migrants are started to be placed in luxury houses built in Sulukule in Gentrification process paying 650.000 to 1.500.000 TL sale amount or 2.000-2.500 TL rental. Beside, the Turkman, Afghan and Uzbek refugees who want to use Turkey as an escape route are staying as groups of 8 to 10 people and sleeping on bank beds paying 300 TL per person in public houses which are set aside by the Municipality for itself.

During the field study, when we tried to go into the site using another entrance from a non-transformation area one street ahead, we came across with an iron door with a lock on it. A Romany citizen sitting across the site was shouting as “Forbiddeen!” Once we asked him why he was shouting, he answered that “They say that part of the neighborhood is the clean part, they don’t let us who are of the dirty part, as theyshackledus.” There is a mess around, but it should be hard to understand who is right and who isn’t, once we ask to the parts.

Obviously, to place “a rehabilitation process providing displacement of the people via racial, religious, color and language segregation” definition into the gentrification concept.

Today, while the intensity of Arabic refugees is reminding a small neighborhood of Damascus or Aleppo, it is cannot be said that the sound of spinner suitcases leave a better tone than the Romans’ hand drums and violins.

While this our colorful human community which is composing one of the keystones of Turkey mosaic is continuing their efforts to claim their rights at different levels of government offices despite this unfair pressure done to them, and the tones of their instruments in their hands are leaving nice tones in the ears of the authorities who do not give a value to their words, they bid farewell to their sanctuary in unbearable lightness of depression with their broken hearts.

Whilst the best example of pleased gentrification process developed itself are seen in districts such as Kuzguncuk, Arnavutkoy, Cihangir, the living space of forlorn Romany citizens where is their heaven for 1000 years is taken away by the rent environments with the hand of State.

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Shaping the City that Decreases Overweight and Obesity through Healthy Built Environment

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Abstract

Cities are being built based on the concepts of the comfortable, easy, and fast for the inhabitants. However, what is being constructed is promoting physical inactivity, and people are finding that what was being considered as convenient for daily life is, in fact, harmful to their physical health.

The life of a city relies on the activity of the inhabitants who are the breathing engine of the built environment. Hence, the balance between physical activity and mental activity (e.g., office work) should be maintained because the more people are physically healthy, the more they are productive and the more the city experiences economic growth which all leads to satisfaction and happiness among the city's inhabitants.

Therefore, a city that facilitates the reach to physical activity helps its inhabitants to overcome many physical health issues such as overweight and obesity, the causes of many physical complications that can affect mental health over time.

This study points to the many components of a city that beats overweight issues and especially obesity. One of this healing city's aspects is the presence of green spaces and the green mobility that typically promotes walking and cycling instead of driving cars. Moreover, this city could foster the healing of prolonged stress and overall mental health related to human inactivity. Its analysis is based on in-depth interviews and results of previous empirical research in urban planning, psychology, and neuroarchitecture regarding people's perception of the visual environment they live in.

The case study is the city of Beirut: in-depth interviews were conducted with a representative sample of Beirutis (people whose families come from the Beirut city and who were born in this city and are still living in it). These interviews helped measure these participants' satisfaction with the physical activities and social life that is accessible for all the inhabitants through inclusive urban planning (such as clean open spaces, parks, sidewalks, free or inexpensive public spaces, facilities for green transportation, etc.). The results of the interviews analysis were supported with past data demonstrating the increasing obesity issues in Lebanon and previous data in urban and psychological studies that expound the way the brain processes the urban spaces that increase satisfaction and the urban areas that the city should be offering to its inhabitants for positive health outcomes.

The results uncovered the cycle of physical health, mental health, and social contacts which altogether affect the soul of a city where the aim is first and foremost the right to a healthy lifestyle.

Keywords: Urban planning, Green mobility, Physical activity, Mental health, Obesity

1. Introduction

Hove (as cited in Mudede, 2011), noted:

The city is totally human. The steps in an apartment building are for human feet, the door knobs afford human hands, the bed is for a human back ..., the window is there for you, the streets are paved for your modes of transportation. This urban world didn't fall on you; it sprang from you (para. 2).

While cities' inhabitants are accommodating to the urban conditions, overweight and obesity are affecting a large number of them physically and socially (Lake & Townshend, 2006). In fact, the more the country is economically developed, the more the people from all ages are suffering from increasing obesity (Hong, Trang, Dibley, Sibbritt, Binh, & Hanh, 2010) and health and behavior issues (Cutts, Darby, Boone, & Brewis, 2009). Although genetics may play

a role in overweight and obesity, cases are exceeding the biological heritage condition (Booth, Pinkston, & Poston, 2005; Hong et al., 2010) and are causing cardiovascular diseases, type 2 diabetes, changes in behavior (Hong et al., 2010), and breast cancer (Mehio, Sibai, Hwalla, Adra, & Rahal, 2003). Therefore, other conditions should be observed and analyzed such as the “area of residence, resources, television, walkability, land use, sprawl, and level of deprivation” (Booth et al., 2005, p.2). In fact, these factors affect significantly the motivation of cities’ inhabitants to practice physical activities (Booth et al., 2005) such as walking, relaxing in calm urban areas, and practicing social and familial activities in urban public spaces.

The study tackles the reasons why people living in the city tend to overeat, have a sedentary lifestyle, or suffer from overweight and obesity even though they are choosing a healthy diet and practicing physical activities. These reasons are to be related to urban factors that affect personal and social factors.

To study in detail the physical environment effect on people’s health and notably obesity issues, in-depth interviews were conducted with 50 Beirut inhabitants (Beirutis): 10 children (between 7 and 11 years old), 10 adolescents (between 12 and 17 years old), 10 young adults (between 18 and 39 years old), 10 middle-aged adults (ages between 40 and 65), and 10 older adults (more than 66 years old).

Even though achieving the best urban planning strategy will not eliminate all cases of built environment problems and personal and social disturbances, it will undoubtedly limit and decrease its frequency (Gunder & Hillier, 2007).

The results of this study will help architects understand the urban “obesogenic factors” related to the built environment. This study will also connect the degree of the inhabitants' satisfaction in the city's urban planning regarding public spaces and activities' facilities with the obesity rate. Furthermore, it will give the opportunity for the city’s inhabitants to communicate their suggestions to architects and their perceptions of a healthy city where free activities in public

spaces are available. Accordingly, architects can develop urban planning in a practical direction where the functional and the healthy meet.

2. Obesity and the City

2.1 The 21st Century Worldwide Concern

Nowadays, the contemporary city's symbol of power is the economic supremacy. Accordingly, people are "doing extra work simply to exist" (Sui, 2003, p.77). However, the city is also the place that ensures the inhabitants' well-being through providing all the facilities for physical and mental health (Lake & Townshend, 2006). An imbalance between the hard work for economic profits and the relaxation is reflected through the many disturbances in people's balance such as the case of obesity. In fact, according to the medical news today (MNT) team (2016), obesity is a serious case where the excess of body fat causing a weight that exceeds 20% of the weight that a person should have can harm health.

Even though many campaigns are done to defend the right to be overweight and eliminate physical discriminations and prejudices, obesity is a long-lasting illness (Velásquez-Meléndez, Mendes, & Proença Padez, 2013) that is increasingly spread among cities' inhabitants and affecting people of all ages due to individual conditions, but also due to urban and social conditions imposing a "cliché" physical shape and lifestyle on all the city's inhabitants. Consequently, children and adolescents are developing obesity that are difficult to treat, which threatens young and future generations' physical and social health and even life expectancies (Lake & Townshend, 2006; Dietz, as cited in Cutts et al., 2009).

On the other hand, "the food environment and built environment are closely related" (Lake & Townshend, 2006, p. 265). Cities are by that challenged in tackling all conditions that are affecting people's overweight and obesity. In reality, the efforts on research and application are emphasized whether on people or spaces but are hardly ever combining both simultaneously (Corburn, 2015). For example, the large sidewalks for pedestrian activity reveal the care for

the person's health in the city and reduce the warning signs of isolation (Corburn, 2015). Yet, the developing highways promoting urban sprawl and distances among the population (Corburn, 2015) are "competing" with the human pedestrian factor instead of equally existing in the city.

Many interventions are dealing with the educational and behavioral gaps related to obesity matters (Lake & Townshend, 2006); even physicians are treating obesity through medicines (Corburn, 2015). However, these are physical and cognitive partial treatments as they are not treating "the potential root cause" (Corburn, 2015, p. 50) of the illness such as the urban factors or the built environment conditions that are blocking or slowing down the healing process since the city's inhabitant-patient is going back to live in the conditions that caused him obesity in the first place (Corburn, 2015). Actually, many reasons can hasten obesity besides genes such as the high caloric intake, the sedentary lifestyle, the lack of sleep, and medications (MNT Editorial Team, 2016). These factors are highly related to the urban plan of a city where the opportunities to walk outdoors is limited, the technology is so elevated, and the requirements for economic profits and business competitiveness are raising. In effect, according to Sui (2003), cities with plans for managing urban development have the lowest rates of obesity whereas fast urban sprawling with fast-moving lifestyles expedites cases of obesity. Furthermore, a strong correlation was found between low land use diversity and high obesity (Booth et al., 2005). Thus, the current attempts in urban planning are integrating the human factor, which is taking into consideration the human body physical and emotional needs for better health (Sui, 2003).

As a result, "in relation to the current obesity epidemic, diet and physical activity cannot be examined in isolation" mention Lake and Townshend (2006, p. 262) because being obese does not rely solely on the fact of living in an urban obesogenic environment (Smith & Cummins, 2009). According to Lake and Townshend (2006), the built environment is particularly

composed of the “physical design, land use patterns (residential, commercial, office, industrial, and other activities), [and] transportation systems” (p. 263). Northridge, Sclar, and Biswas (2003) determined the same components of a built environment. Northridge et al. (2003) added that the social components in the city are as well important to take into consideration and specified that they comprise “community investment, public and fiscal policies, and civic participation” (p. 560).

Essentially, the city is composed by the complex network of the built environment, the social frame, values, beliefs, culture, economy, and even driving standards that can cause stress and impact overall health through chronic illnesses (Lake & Townshend, 2006). For example, high-rise buildings increase loneliness (Duhl & Sanchez, 1999). Another example is in the study of Wolf (2013) who demonstrated the importance of having “tree-lined sidewalks and shady parks” (p. 25) in the city to encourage people to be more active outdoors while trees are regulating the temperature and air cleanness of the city which affects health positively and overall life satisfaction. In fact, people feel that open areas with organized green landscape are more pleasant to walk in (Wolf, 2013). These green spaces also prolong life expectancy significantly (Takano, Nakamura, & Watanabe, as cited in Wells et al., 2007). Therefore, ensuring a walking environment should not be considered uniquely as an entertaining activity but also as a serious transportation that is essential to use (Wigan, as cited in Southworth, 2005). Hence, the sensory experience will restore and develop the cognitive and sensory-motor process of the brains of people living in the city, reinforcing the symbolism and meanings of their city’s components, making them feel safer by connecting their city’s dots (Grahn & Stigsdotte, 2010). These logically connected dots will be stored in the people’s unconscious minds helping them perceive the actual outside world in order and hierarchy to reach happiness and gratification through the pleasurable, the beautiful, the satisfactory, and the useful, a concept that Gestalt calls the “depth perception” (Grahn & Stigsdotte, 2010, p. 265).

Therefore, throughout procedures to define the intangible in the city, as the definition of what is good, healthy, beautiful, satisfying, or secure, urban planners would be treating the insufficiencies that the vision spots through the physical environment and the socio-spatial therapy (Gunder & Hillier, 2007).

2.2 The Case of Beirut

2.2.1 Weight Issues

In 2013, the Lebanese population scored the high urbanization rate of 88%, according to the World Health Organization (WHO) and UN partners. Lebanese researchers Sibai et al. (2003) found that the rates of overweight and obesity among Beirutis were concerning when compared to developed countries. In fact, 22.5% of Lebanese children under 19 years of age are overweight or obese, more than half of the Lebanese above 20 years old (53%) are overweight, and 17% of these adults are obese according to the results through body mass index (BMI) standards required by the WHO (Sibai et al., 2003). BMI is a “statistical measurement” using the height and weight of a person (MNT Editorial team, 2016). In Beirut, the cases of overweight or obesity reach 12% of the inhabitants (Sibai et al., 2003). The authors of this study that included 2104 participants of 3 years of age and older found that several factors are contributing to the increase of chronic illnesses in Beirut such as the city’s westernization and lifestyle changes (Sibai et al., 2003).

Children and adults in Beirut are not practicing enough physical activities (Sibai et al., 2003). There is a broad spectrum of reasons. For example, as it is the case worldwide, technology such as insulation and heating and indoor cooling systems hinder the energy consumption of the human body for temperature regulation (Sobal, as cited in Wells, Ashdown, Davies, Cowett, & Yang, 2007). Moreover, the tempting elevators or escalators that are being used more often than the shady stairs (Wells et al., 2007) are unexposed to natural daylight or adequate ventilation. Another factor is the rising of electronic tablets that encourage children to play at home while

sitting (Wells et al., 2007). On a broader frame, the contemporary zoning ordinances that are applied in many developed and developing cities worldwide are contributing to an augmenting sense of isolation and promoting laziness (Duhl & Sanchez, 1999).

However, the mental state is highly contributing to increasing obesity among the city population. Physical inactivity and prolonged untreated stress (factor of survival) leading to depression and other physical illnesses (such as obesity) are the primary contributors to death (Grahn & Stigsdotte, 2010). In fact, contrary to the 1970s belief that obesity keeps away from depression (Crisp & McGuiness, as cited in Jansen, Havermans, Nederkoorn, & Roefs, 2008), it is at the present more evident through research that there is a complex link between overweight or obesity with increased exposure to depression (Jansen et al., 2008). Moreover, scholarly literature confirms that the illegible urban and social frames and the quality of indoor and outdoor built environment increase mental health cases, notably depression (Galea, Ahern, Rudenstine, Wallace, & Vlahov, 2005).

2.2.2 *Urban State*

Beirut is a “metropolitan statistical area”, since this expression defines an urban agglomeration of more than 50,000 inhabitants (Northridge et al., 2003). According to the World Population Review (2018), the city of Beirut comprises approximatively 361,000 inhabitants from around the 2,272,000 inhabitants of the Greater Beirut (which is one third of 6,090,626, the total population in Lebanon), knowing that the city of Beirut that comprises 12 cadastral areas covers 21.47 km² (Kaloustian, 2015) and the Greater Beirut occupies 233 km² (Faour & Mhawej, 2014) of Lebanon’s total area of 10452 km² (World Population Review, 2018). As a result, the urban density is one of the highest in the world (Kaloustian, 2015) and the immediate planning to cover the different aspects of a healthy city is imperative.

While cities in the past were built with the cooperation between urban planners and public health experts, the fast growth of the cities hampered the continuity of this cooperation.

Moreover, the concept of the fast city overrated the need for a car, making it as one of the most important factors in the city to accelerate the flow of the city's movement. At the same time, pedestrianism was perceived as negative due to the belief that pedestrians slow down the city's productivity and the car traffic movement at streets crossings (Southworth, 2005). As a result, the streets privilege cars and dwindle pedestrians' spaces and the continuous paths they use to reach their destination. However, pedestrianism is regaining its importance through recent research interest in public health related to the urban and built environment (Northridge et al., 2003). In fact, the 1980s movement of "Neo-traditional Planning" (Duhl & Sanchez, 1999) or "New Urbanism" envisioned walkable cities and public transport use to achieve a satisfying rate of wellbeing among cities' inhabitants as stated the guidelines of the Charter of New Urbanism (CNU). The CNU has in fact mentioned in its fourth congress in 1996 its encouragement for urban development within the frame of the urban heritage conservation, accessibility, and respect of ecological and human balance (Lake & Townshend, 2006). These guidelines enhance the pleasurable walkability in the city.

Nevertheless, a definition for walkability or walkable city should be precise. A valid interpretation proposed by Southworth (2005) is the following: "walkability is the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network" (p. 247-248). In effect, people rate the quality of their environment (judging by that the quality of their life) according to their visual perception that is the source of information process in the brain along with the individual and collective memories (Grahn & Stigsdotte, 2010). In areas where people consider that their walkable streets are limited in quantity, safety, and light, obesity was found in high rates (Booth et al., 2005). These people considered as well the degree to which the streets designated for walking in the city are rugged (Booth et al., 2005). In fact, an organized

mixed zoning with multiple land use allows the decrease of travel distances which increases the likelihood to walk (Northridge et al., 2003).

Although 22 public parks in Beirut and 2 in the suburbs are detected, these public areas are quite small, having altogether an average area of 0.8 square meters per person, a number that does not meet the WHO requirement of 9 square meters per person minimum (Najib, 2014). While people in urban areas where urban parks are reachable through walking have three times more the opportunity to exercise daily (Giles-Corti et al., as cited in Cutts et al., 2009), it is clear that some regions of Beirut city lack green parks and that there is a lack of walkable connectivity (Figure 1). As a result, the inhabitants have to use the car to reach a green destination. While the natural environment is an urban primary need that enhances positively human health (Northridge et al., 2003) and decreases mental fatigue (Kaplan, as cited in Grahn & Stigsdotte, 2010) and mortality rates (Mitchell & Popham, as cited in Grahn & Stigsdotte, 2010), the “car-centric culture” (Duhl & Sanchez, 1999, p.11) is being prioritized over the human in Beirut. Hence, the chances of physical activity decrease for a large number of the people living in the city and the inhabitants’ segregation increases, advancing social isolation and the illnesses caused by it. Moreover, overcrowded neighborhoods limiting the sense of personal privacy and the lack of green adjacent spaces intensify the psychosocial stress related to depression (Galea et al., 2005), a symptom found in the case of obesity.

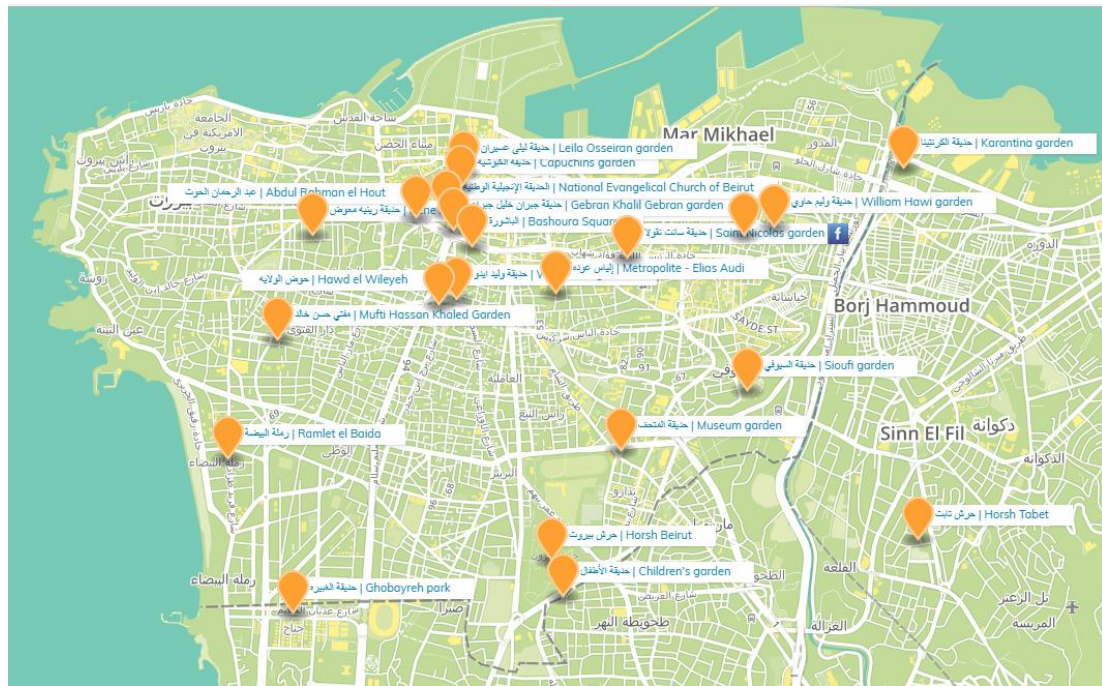


Figure 1. Plan showing the parks in Beirut (map adapted from Beirut green guide; URL: <http://beirutgreenguide.com/>)

3. Research Method

In-depth interviews were conducted with 50 Beirutis: 10 children (between 7 and 11 years old), 10 adolescents (between 12 and 17 years old), 10 young adults (between 18 and 39 years old), 10 middle-aged adults (ages between 40 and 65), and 10 older adults (more than 66 years old). The classification of ages is done according to professor Laura E. Berk (2010) classification of physical and cognitive development through the lifespan. The participants come from the different cadastral areas of Beirut city. They were born and raised in this city and still live there. Half of the participants in each category were also chosen according to their medical diagnose cases (cardiovascular diseases, type 2 diabetes, breast cancer, metabolic disorders, and difficulties moving) caused by obesity. A consent form stating the respect for privacy and anonymity was given to each participant or the under 18 of age participant's parents. According to age, the categorized participants had to answer the following questions related to their lifestyle in Beirut and their ability to do the activities they want and to move according to their free choices of transportation in their city.

The children's questions:

1. Are you playing in the outdoor areas near the house? Why?
2. Are you able to walk as much as you want in Beirut with your parents?
3. Are you going out with your parents? If yes, where do you go?
4. Why do you think children get fat in Beirut?

The adolescents' questions:

1. Are you able to walk as much as you want in Beirut? Why?
2. Are you able to practice your physical activities in outdoor areas of Beirut? Why?
3. Where do you go to for friends' gatherings? Why?
4. Are there missing elements in Beirut to have a pleasant, walkable city? If yes, what are they?
5. What do you think are the reasons for overweight or obesity in Beirut?

The young and middle-aged adults' questions:

1. Are you able to walk as much as you want in Beirut? Why?
2. Are you able to practice your physical activities in outdoor areas of Beirut? Why?
3. Where do you go to for friends' gatherings? Why?
4. How do you describe Beirut with its parks, gardens, squares, and empty plots compared to your childhood experience?
5. Are there missing elements in Beirut to have a pleasant, walkable city? If yes, what are they?
6. What do you think are the reasons for overweight or obesity in Beirut?

The older adults' questions:

1. How easy is it for you to move to Beirut? Why?
2. Are you able to walk as much as you want in Beirut? Why?
3. Are you able to practice your physical activities in outdoor areas of Beirut? Why?
4. Where do you go for friends' gatherings? Why?

5. How do you describe Beirut with its parks, gardens, squares, and empty plots compared to your past experience?
6. Are there missing elements in Beirut to have a pleasant, walkable city? If yes, what are they?
7. What do you think are the reasons for overweight or obesity in Beirut?

Added to the questions, each participant from the adolescent and early, middle, and late adulthood categories was shown the photos of the Corniche Beirut, the Sioufi park, the Horsh Beirut (i.e., the Pine forest) park, the René Mouawad park, the Martyrs' square, and the Nejme (i.e., star) square. All these places are public walkways, gardens, or parks in Beirut. The participants supported their answers with their comments on the following photos (Figures 2, 3, 4, 5, 6, & 7).

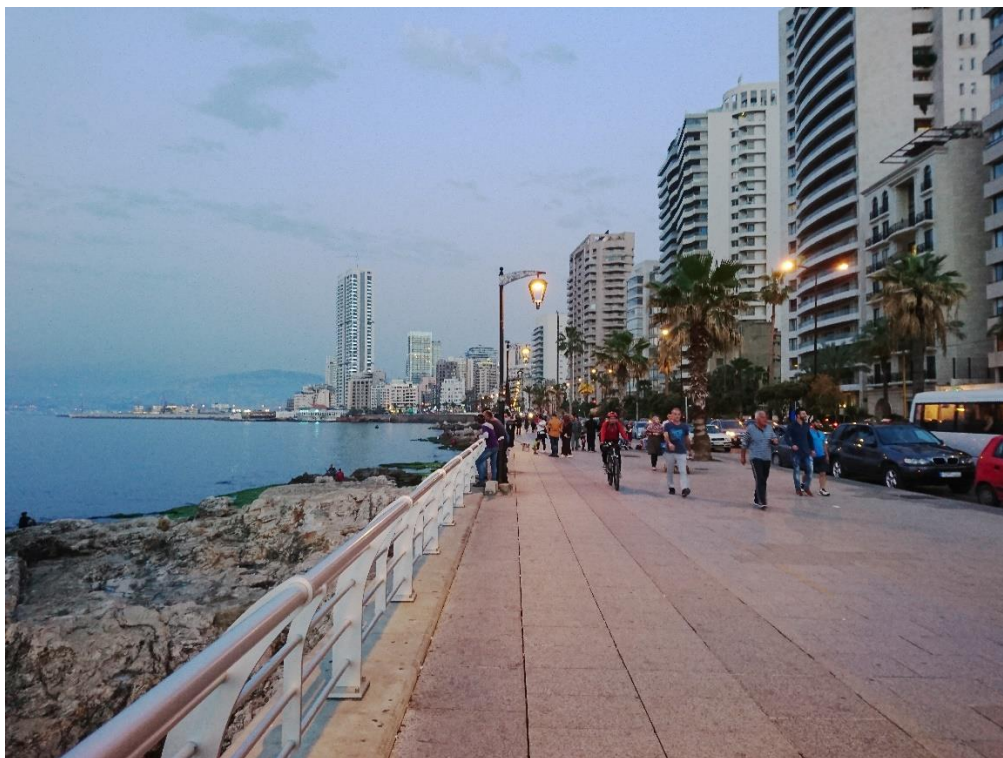


Figure 2. The Corniche Beirut, a seaside public walkway facing high-end buildings (adapted from Maria A. El Helou photo archive)

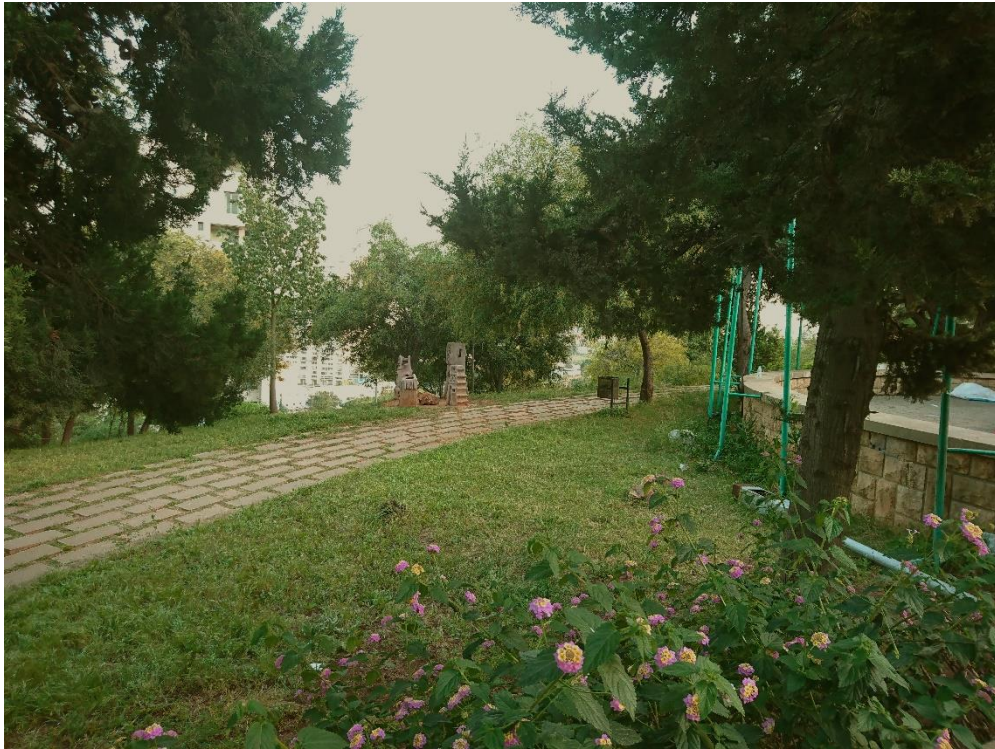


Figure 3. The Sioufi park in Achrafieh district, Beirut (adapted from Maria A. El Helou photo archive)

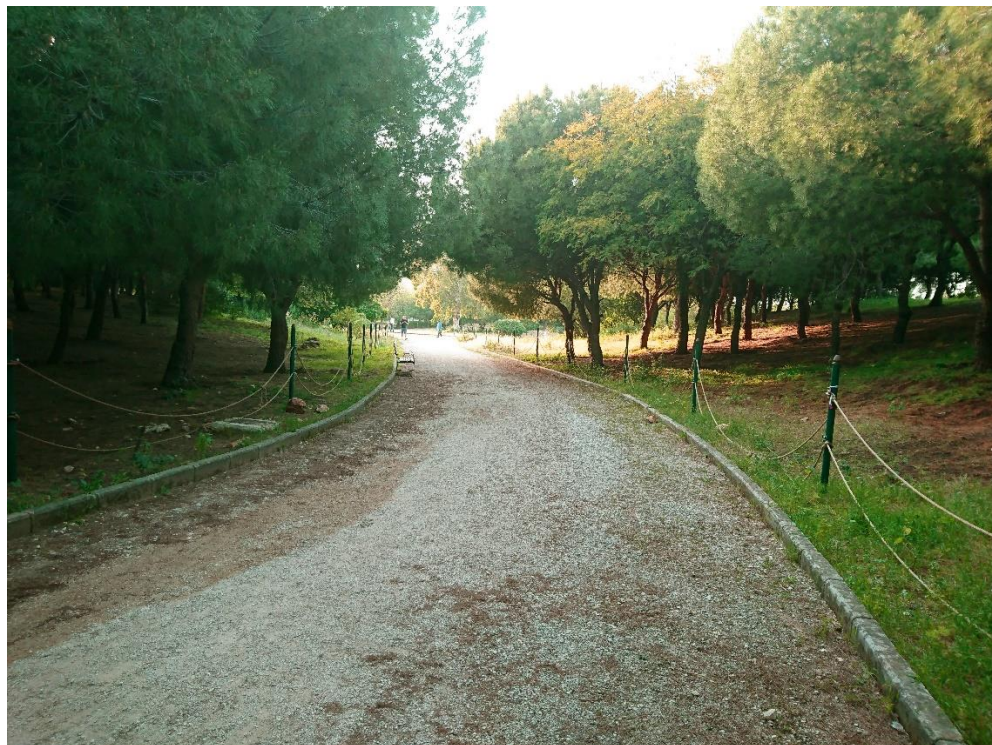


Figure 4. The Horsh Beirut Park, between Badaro, Qasqas, and Barbir areas, Beirut (adapted from Maria A. El Helou photo archive)



Figure 5. The René Mouawad garden, Sanayeh area, Beirut (adapted from Maria A. El Helou photo archive)

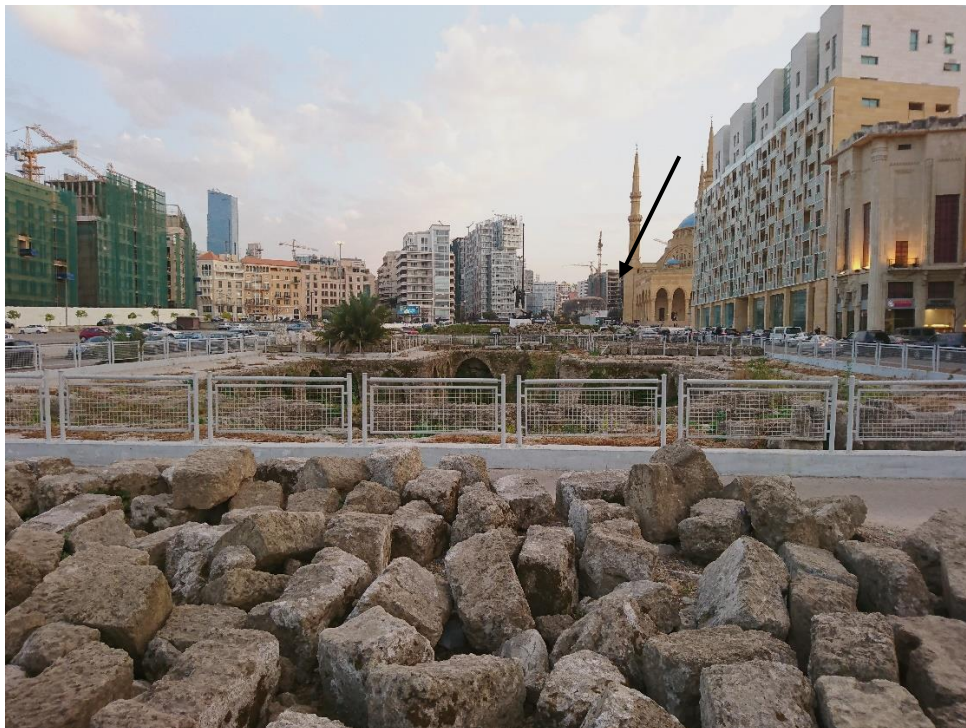


Figure 6. The Martyrs' Square (with the Martyrs' statue where indicated) and Roman ruins, Downtown, Beirut (adapted from Maria A. El Helou photo archive)



Figure 7. The Nejmeh Square, close to the Martyrs' Square, Downtown, Beirut (Maria A. El Helou photo archive)

4. Results

4.1 Answers by age category

Children: 70% of the children said that they are not able to play in the outdoors areas near their houses because their “parents find that the street is narrow and dangerous due to cars traffic” and because there are no more empty plots to play in near the house since high-rise buildings are being constructed. 50% of the children added that their parents would not let them go out for long periods by themselves because they are “concerned about the strangers who are increasing in number.” They defined strangers as people who do not come from families born and raised in the neighborhood they live in and whom they should not talk to. 60% of the children said that they go out with their parents on weekends, mainly to walk in malls and in summer they go to the beach. The other 40% answered that they go on weekdays and weekends to the beach in summer, to a mall, or to the park that is near their houses, always accompanied by one of their parents. 90% considered that children get fat because of candies and fast food

that their “parents do not allow them to eat often” and 10% added that electronic games contribute to overweight.

Adolescents: 50% of the adolescents said that they often walk near the house but prefer not to walk long distances by themselves due to stories they were told about during school awareness or by their parents of “the harassments or thefts done by the strangers”. They also defined strangers as people who do not come from families born and raised in the neighborhood they live in and whom they should not talk to. The other 50% mentioned that they do not mind walking by themselves in different areas in Beirut (20% walk in Rene Mouawad garden, 10% walk in the Sioufi park, 10% in the Corniche Beirut, and 10% in the Horsh Beirut) because this is “our [their] city”; however, they mentioned paying attention while crossing streets because “the walkable streets are not connected, and crossing vehicles’ main roads is sometimes inevitable and highly dangerous”. 70% stated that they cannot practice their activities in outdoor spaces, limiting the movement to just walking, because “people will stare”, 10% of them revealing that they prefer going to classes to meet people “of a certain social class”, whereas 20% said that they could practice their activities outdoors because these activities are not physical and are limited in an electronic tablet. 60% answered that for friends’ gatherings, the mall is the most practical space because they can walk safely and have a large choice of restaurants, 20 % preferred natural areas such as the beach or green space, and 20% asserted that the Corniche Beirut is great because “you get a beautiful natural ambiance of the sea of Beirut for free”. 80% find that Beirut is missing more green parks and gardens and 20% mentioned the lack of bicycle lanes and the narrow sidewalks. 100% considered that the unhealthy food and water are contributing to overweight issues and 40% of these participants added that “the stress to fit in this society having the acceptable standard body measurements is a burden contributing to weight gain.”

Young adults: 50% of the young adults find that walking in Beirut is unsafe because the offices they work in are far from walkable streets. They added that due to the fatigue they feel from long work hours, they prefer to rest at home or in a restaurant with a friend “rather than doing any kind of efforts”. However, the 2 young adults participants who are married said that for their children they just go out for a walk on weekends in the Horsh Beirut park or the Corniche Beirut. 70% added that there are many strangers walking in their neighborhood streets and that driving to reach a walkable area is not something they would like to do “with the traffic congestion of Beirut”. 30% said that they prefer going to indoor areas such as a class in a gym to meet people with the same hobby and have fun together. For gatherings, 70% mentioned restaurants and pubs, 10% talked about educational tours in Beirut “although they are somehow limited”, and 20% preferred the Corniche Beirut. 90% remembered the empty plots they used to play in near their houses, mentioning that “returning home with dirty clothes was pleasurable”, adding that “the new generation would not experience the kind of games we [they] used to play in the past due to limited empty spaces in Beirut”. 60% remembered the Sioufi park very well and the Saint Nicolas garden (also in Achrafieh district) and 40% said that the Corniche Beirut reminded them of very nice memories they cannot experience anymore. 100% find that Beirut is missing more green parks and gardens, 50% mentioned the lack of bicycle lanes, and 70% mentioned the narrow sidewalks. 60% considered that unhealthy fast food is accelerating weight gain. They added that it is nearly impossible not to order these kinds of food when they are all day at work. 40% said that organic food and the healthy Lebanese food is what is helping people maintain a certain level of health and 50% mentioned the high levels of water and air pollution and believed that this pollution increase weight gain. Finally, 70% of the participants are convinced that “high levels of stress due to the economic situation of the country” is impacting physical health and leading to weight issues because of “fast-paced

responsibilities” such as having to pay for “expensive apartments, expensive phone, electricity, and supermarket bills, and the hard challenge to get married under these conditions”.

Middle-aged adults: 80% of the middle-aged adults participants considered that "the streets are not walkable because the sidewalks are not well maintained." 60% said that they would prefer going to the gym to meet new people whereas the other 40% said that they would not mind going outdoor for a walk with their children or grandchildren at the René Mouawad park, the Sioufi park, and the Horsh Beirut park. For friends' gathering, 80% like to meet in restaurants, 30% of them mentioning their preferences for Lebanese food restaurants, whereas 20% prefer home visits because “it reminds me [them] of the Lebanese traditions”. 90% considered that looking at the photos of the study is emotional especially when they were asked to remember the past. All the participants in this category agreed that the Martyrs' square had changed dramatically and that it is impossible to get back its past ambiance, when people used to walk a lot more than now. Again, all these middle-aged adult participants agreed that they would not walk again as much as they used to in the prewar Beirut (before 1975) and that "the new generation would never experience the Beirut we [they] knew," mentioning the walkable downtown with its famous souk. 90% agreed on having larger sidewalks and finding empty plots to turn them into gardens and parks. 70% said that the missing elements in Beirut are the souk, the green plots with fruit trees, and the six-story buildings with a small shared garden and sometimes a fountain; 50% adding that they think that solutions will not cover the whole Beirut due to their “feeling that nothing will change and that the cycle of pollution and crowdedness is worsening”. One participant added that "I [he] think of my friends with disabilities. These friends were injured during the Lebanese civil war (1975-1990). They were defending the right of sovereignty of Lebanon. They deserve to have facilities and accessibility to the different places of Beirut, mainly through well-maintained sidewalks”. Although 50% said that the Lebanese way of eating is healthy, the other 50% said that the trend of ordering food is

hastening weight issues. 90% talked about “stress and responsibility that cause dysfunctionalities in the body according to what we [they] hear or read in the media”. 30% of the participants mentioned emotional eating as a way of distraction "to forget the reality we [they] are living in, leading to weight issues."

Older adults: 80% said that it is not easy to walk in Beirut because crossing the street is frequent and dangerous. They added that they could not walk in the places they used to walk in such as the downtown souk because “the souk spirit has changed.” As for physical activities, 60% considered that there are no spaces designed for people of their age, and therefore, it is quite dangerous to do physical activities outdoors whereas 40% are just scared to do physical activities because of their medical conditions and the lack of knowledge between the activities that are good or bad to their conditions. For friends’ gathering, 50% said that the old cafés were and still are the best choice as “it is a Beiruti habit from the days of the Daoud café and the Hamra cafés and many other cafés from the past until present.” The other 50% said that home gathering around coffee is what reminds them of their past. All the participants in this category agreed that the green spaces are nearly inexistent in Beirut nowadays and that thanks to some shy municipal and individual interventions, these parks and other public spaces are still standing. 80% even added that “the smell of Beirut has changed forever because some trees and flowers no longer exist.” For all the participants in this category, the missing elements are green public spaces and large sidewalks. 80% added that even if they go out, they no longer see the landscapes they used to see before such as the traditional “Beiruti house with the famous three arches and a small private garden with a fountain”, and as a result, they would not enjoy the walk between “very high buildings”. 80% said that the bad lifestyle habits of these days and the pollution are contributing to weight gain and 20% said that the sufferings people are going through to survive are increasing cases of overweight.

4.2 Main keywords

The results of the interview revealed several keywords highly mentioned by the participants:

Crowdedness: 70% of the participants said that “urban spaces are crowded which leaves insufficient spaces for children to play safely.”

Safety: 70% of the participants indicated the lack of pedestrian bridges and having to cross relatively large streets where cars stop on the pedestrian crosswalks. Furthermore, 80% mentioned the high danger of crossing the roads that frame at the Martyrs' square "where in the past (prewar period) it was the trend to meet and walk." 60% criticized the size of the statue compared to the surrounding high-rise buildings, as well as the square's position with traffic congestion on its four sides, and the parking lots, mentioning that “our friends the martyrs would not be happy of the present situation of this square”, whereas 40% said that they are happy that “this place is relatively well-maintained with the Roman ruins.” According to 70% of the participants, the downtown is at present emptier than any other period because “the downtown that was once a place for all people of all social background is today more of a place for rich people and tourists.”

Green Transportation Facilities: 50 % of the participants talked about the issue of the cars who park on sidewalks due to the streets narrowness which lowers the frequency of walking. They also mentioned their wish to have bicycle lanes and organized roads connectivity for pedestrians.

Cars and traffic congestion: 60% of the participants said that “the traffic congestion in Beirut is a sickness,” describing how it can take hours to reach a destination that should take no more than 10 minutes “such as going from Achrafieh to Hamra,” 40% adding that “cars prevail over pedestrians in Beirut.”

Public transportation: 50% of the participants counted with nostalgia “the old days of the tramway and the train,” wishing to have one day “at least organized bus stops,” while 20% said that “it is quite impossible to get back this organized public transportation.”

Pollution: 50% of the participants said that they “prefer driving with closed windows and turning on the air condition than walking or bicycling and inhale polluted air,” 40% of them stating that “the honks alone are the pollution per se.” 40% added that “streams are dry, and fountains we used to gather around and drink our "jallab" (syrup based on date molasses) are destroyed,” and 60% mentioned the “garbage crisis that should be treated as soon as possible.”

Income: “The lifestyle in Beirut is very expensive compared to my salary,” said 40% of the participants. Furthermore, the Nejme Square, close to the Martyrs' Square is, according to 70% of the participants, emptier than ever because "the downtown is more of a place for rich people and tourists."

5. Conclusion

Beirut is a historic city that has historical patterns still discussed and remembered by Beirutis who are highly impacted by the collective memory. In the present time, Beirut is witnessing a growing concern regarding overweight, obesity, metabolic syndrome, and the chronic illnesses that follow. Whether the root causes are genetic or emotional, the factors related to the physical built environment are of great importance. As a result, urban planners are ever more following the “new urbanism” guidelines of the WHO “healthy urban planning” (HUP) initiative that focus on both the physical urban shape and the human needs and factors for a satisfactory lifestyle that diminishes overall illnesses rates (Barton, Grant, Mitcham, & Tsourou, 2009).

In the case of Beirut, such guidelines would include interventions in the visual and practical components of the built environment combined to the natural environment such as urban traffic strategies and the continuous observation and measurement of pollution on a hand and public physical and mental health on the other hand. Suitable urban planning would involve as well

the integration of the urban heritage patterns with the new construction and the social Beirut character adding mix-use interconnections in neighborhoods. Furthermore, mending the scattered neighborhoods, especially the ones developed during the war of 1975-1990, will positively enhance the mobility in the city by organizing bus stops stations, sidewalks, and bicycle lanes. Added to that is the development and application of criteria to delineate the city's green areas that should be accessible for all its inhabitants, especially the ones with low income whose access to private clubs is limited or impossible. Likewise, sidewalks should be large enough to allow the accessibility for wheelchairs and strollers, and they should be well maintained to avoid any injury.

Moreover, developing green streetscapes increases the quality of a neighborhood and allows low-income dwellers to boost their morals because they will perceive that they live in a highly rated area. As a result, the reluctant residents will be more encouraged to get exposed to this healthy outdoor space and will strive for a pleasant experience relaxing in solitude (without feeling isolated), strolling, exercising, or socializing in a public yet undisturbed place. With such strategies, unemployed people, people with disabilities, and the elders will also be able to practice the activities they like to avoid gaining weight since they have already limited access to the daily movement.

In conclusion, the city should ensure diversity and mix use and easy connectivity to public open spaces and overall nonresidential destinations to revitalize the walkability in the city so that the shape of people reflects the shape of the city and vice-versa, which reinforces the local identity. In natural surfaces with uneven levels, appealing stairs should be designed to help people cross specific areas more easily and to invite them to walk in general.

This revitalized identity will strengthen the sense of safety that engenders a healthy attachment to the city, motivating people to get involved in the city's activities and civic duties and in its economic needs and productivity.

Even though consumptive and non-consumptive transportation planning could be limited in the narrow streets surrounded by buildings, and even though empty plots are nowadays limited in Beirut, the application of solutions according to the case should be considered as a pilot study to save the rest of the regions in Lebanon in general.

6. Limitations

Future studies tackling the built environment's impact on obesity in Beirut should include more participants. A conceptual framework is required to perceive the links between obesity cases of Beirutis with the urban sprawl phenomenon in Beirut and rates of low income among the residents. Afterward, the focus should be on the link between the Beirutis obesity cases and their dietary patterns. Moreover, a more in-depth categorization according to precise BMI results based on the WHO standards should be taken into consideration through the cooperation with experts in the fields where weight is measured. Literature regarding the quality of food and water available in high-crowded residential neighborhoods should be analyzed along with the research of the urban planning that treats health issues in Beirut. All these analyses will help get a better picture and draw a lesson regarding the urban planning decisions and the environmental justice to heal all the city's dwellers from the civilization diseases equally through the future urban development results.

As a final point, a thorough work should be completed through teams of practitioners (architects, engineers, psychiatrists, environmental psychologists, economic development experts, experts in the urban legislation field, etc.) with the government and municipality representatives and the inhabitants' cooperation to get precise data about the present urban situation in Beirut.

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Study of Light Pollution in Urban Lighting in Nisantasi Example

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Abstract

To make urban identity forming components visible by making use of technologic improvements, and to make the city livable for everybody by enhancing aesthetic and charming attraction are becoming important for urban designers. Lighting is becoming an important factor to suit cities to livable places for livings in all comfort conditions. By the improvement of science and technology, to organize the life spaces of livings according to today's comfort conditions are considered more and more important. Urban lighting is affecting both the lighting comfort and livings' (humans, animal, and plants) health in many dimensions. The light used on unsuitable spot, unsuitable direction, unsuitable amount and unsuitable time is defined as light pollution. Within the scope of this study, national and international literature research related with urban lighting is done and basing criteria are identified. In the frame of these identified criteria, Nisantasi example is examined in the context of lighting pollution. Important streets and lanes and important historical and religious structures that gained a seat in public memory are identified. Designing criteria of the lighting tools existing in these identified areas and their suitability according to their spot are evaluated, and measuring their illuminance sufficiency, the issues which are detected as light pollution are stated. In conclusion, the studies done in our country are cited and the issues that are to be done to prevent light pollution are introduced as suggestion.

Keywords: Urban lighting; light pollution; urban aesthetic; outer space lighting.

1. Introduction

Even if amateur methods were used in lightings with primitive tools, lighting have been a sector by the improvement of technology, and became a professional team work. In the circumstances that vision health and comfort are disregarded, lighting may become an inconvenience on the contrary of facilitation. In conditions such as wrong lighting apparatus applied in indoor or outdoor spaces, inaccurate adjustment of color, direction and intensity of the light, light pollution problem may occur. The store windows, building lightings, traffic lights and advertising boards especially on thoroughfares where shopping is intense create visual pollution in respect to both sight health and comfort, and aesthetic respect (Meier et al.,2015; Falchi et al. 2011). When the daytime lighting tools to light inside are used also in the night by the stores facing the street, a sudden light burst on the building may happen. The armatures lighting the street may be inefficient or of low intensity, and sometimes one of the two adjacent lamps may give out yellow light and the other white. From an outside sight, a completely dark building may suddenly lightened on one of the middle floors and darkened through the upper floors again. Lightened advertising boards applied sometimes on building surfaces and sometimes on street boards are also a part of light pollution. The boards that suddenly change color and intensity to attract people are sometimes so harsh that even they can cause an instantaneous vision loss. Besides, these systems that do not allow homogeneous light distribution seriously damage the urban aesthetic. Doesn't matter outer or inner, if a space isn't lightened correctly, it's not possible to get far healthily there. Thus, there has to be a criterion and a standard in lighting. By virtue of technological opportunities, there is almost no any unlighted street and lanes. Lighting is a concept that provides the visibility of an object or an environment by sending light on it from a specific light source. It is thought that the principal of lighting concept is light; but the purpose of lighting is visualization of the lightened environment by the light source. These two similar subjects are different concepts from a technical aspect (Sirel, 2001). Lighting has

become a necessity to meet the physiological comfort and aesthetic needs in human life (Boyce, 2003).

Lighting Performance

Not the quantity but the quality of lighting may offer a bigger importance especially in outer space lighting. Reflections and light direction has a big importance in respect to sight comfort. Reflectors of lighting equipment, protection of these reflectors against UV rays, light sources and actuators used in armatures are the factors affecting the lighting (Figure 1). Because of reflectors with low performance and armatures radiating unwanted lights around, difficulties are experienced to catch the required lighting levels beside the energy loss. Because of light sources that cannot shoot properly according to its function, or because direct light beams from bright surfaces will obstruct the sight, the directions and materials of both equipment and vertical and horizontal outer space surfaces (façades, floor coverings, etc.) should be revised in architectural design.

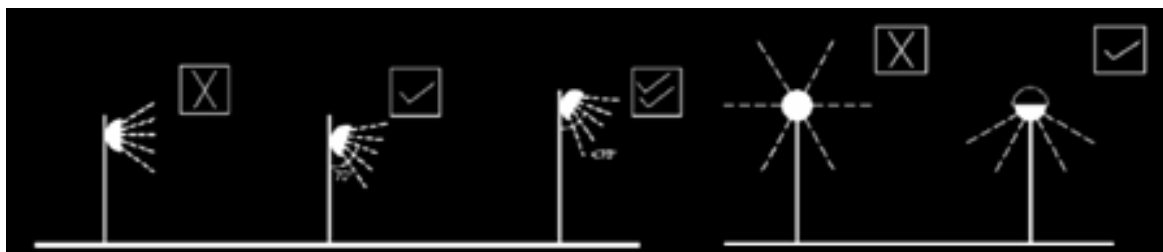


Figure 1. Right and wrong applications of armature (Chamber of Electrical Engineers, 2018)

Light Production

There are two types of light sources that is required for lighting: Hot (incandescent) and cold (luminescent). The difference of these types are light source's giving out light by means of heat (sun, candle light, lamp), and light sources that are giving out light by electrical and magnetic affects (fluorescent lamp, firefly) (Mills, 2008).

Light sources are classified according to light production, its geometrical shape and source and its color (The American Institute of Architects, 2003). Light production is realized by 2 ways: thermic way and discharge of metal vapors and gasses. When it comes to thermic light

production, incandescence of substances is understood. The method giving back the received energy by luminescence is light production depending on discharge. Light sources according to geometric shape are classified as superficial, linear or spotlighting. According to light root it's divided into 2 parts as natural light and artificial light (Phillips, 2004). When it's mentioned as color of light, the hot white, natural white, and daylight white is meant.

Glare

There are some issues that are regarded as a problem in lighting. All inadequacies in lighting in general are gathered under the concept of light pollution. The greatest example of light pollution is glare. Glare is reflection of the light more than adequate, causing brightness and sight limitation. The glare created by overlighting turns the environment into uncomfortable.

Glare occurs by the reflection of the light on horizontal direction. The components of glare is separated to 3 classes itself: Discomfort glare, Inadequacy glare, Blinding glare.

Discomfort glare refers to a glimmer that causes discomfort but doesn't prevent sight; *inadequacy glare* creates a prevention by distribution of radiated glimmer in the eye and obstructs to pick the details; *blinding glare*: It's a type of glare that obstructs picking the details by distribution of radiated glimmer in the eye not instantaneously but for a period of time.

Urban Outer Space Lighting

All spaces that are between residential units and are named as hypethral architecture are qualified as Urban outer space. These spaces are common use areas of all people. These environments create light, color, heat and odor components affecting the people (Onuk, 2008). The lighting issue that has been a binding concept is needed in outer spaces, just like the inner spaces. The need to lighting for the purpose of perceptibility of urban spaces has caused the creation of urban lighting concept. Urban lighting involves both lighting technique, urban designing, and urban aesthetic concepts. Urban value lighting is divided into classes such as

building lighting (historical buildings, mosques, modern buildings, etc.), square lighting, pedestrian areas lighting, park and garden lighting, three lighting, water element lighting.

Subject of urban outer lighting: handled by dividing to providing safety and security, knowing the environment, finding way-direction-place, realizing outdoor activities, forming urban identity, and urban embellishing purposes.

Chart 1. Citation from Guidance Notes for the Reduction of Light Pollution of ILE (The Institution of Lighting Engineers) institution: Outer Space Lighting (Chamber of Electric Engineers, 2018)

Category	Examples
E1:	Intrinsically dark landscapes National Parks, Areas of Outstanding Natural Beauty, etc
E2:	Low district brightness areas Rural, small village, or relatively dark urban locations
E3:	Medium district brightness areas Small town centres or urban locations
E4:	High district brightness areas Town/city centres with high levels of night-time activity

Environmental Zone	Sky Glow ULR [Max %] ⁽¹⁾	Light Trespass (into Windows) Ev [Lux] ⁽²⁾		Source Intensity I [kcd] ⁽³⁾		Building Luminance Pre-curfew ⁽⁴⁾
		Pre- curfew	Post- curfew	Pre- curfew	Post- curfew	Average, L [cd/m ²]
E1	0	2	1*	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1.0	10
E4	15.0	25	5	25	2.5	25

Regional Regulations and Lighting Standards

The requests of urban planners or local authorities on providing compliance with a standard should be taken into consideration at the beginning of the project.

Although TS-EN 1301-1 standards for lighting the squares, boulevards, streets and lanes for general public use, choosing the lighting categories, features of road lightings and calculations, and measures, and TS-EN- 60598-1 standards for general features of lighting armatures and their tests are not binding, TS-EN 12464-2 standards which provides some useful information related to general lighting principles can be utilized. In TS-EN 13201 standard on road lighting, the trace to be followed on road type and lighting type accordingly is as below:

Chart 2. Classification of lighting conditions (Chamber of Electric Engineers, 2018)

Typical speed of main user km/h	User types in the same relevant area			Sets of lighting situations
	Main user	Other allowed user	Excluded user	
> 60	Motorised traffic		Slow moving vehicles Cyclists Pedestrians	A1
		Slow moving vehicles	Cyclists Pedestrians	A2
		Slow moving vehicles Cyclists Pedestrians		A3
> 30 and ≤ 60	Motorised traffic Slow moving vehicles	Cyclists Pedestrians		B1
	Motorised traffic Slow moving vehicles Cyclists	Pedestrians		B2
	Cyclists	Pedestrians	Motorised traffic Slow moving vehicles	C1
> 5 and ≤ 30	Motorised traffic Pedestrian		Slow moving vehicles Cyclists	D1
		Slow moving vehicles Cyclists		D2
	Motorised traffic Cyclists	Slow moving vehicles Pedestrians		D3
	Motorised traffic Slow moving vehicles			D4
Walking speed	Cyclists Pedestrians			
	Pedestrians		Motorised traffic Slow moving vehicles Cyclists	E1
		Motorised traffic Slow moving vehicles Cyclists		E2

2. Light Pollution

By the improvement of urbans, light sources have raised. Unsuitable use of light sources and overlighting have adversely affected the people and the environment. Redundantly used light sources have brought out light pollution problem. Light pollution is described as “the use if light at wrong place, wrong direction, wrong time and wrong amount” (Onuk, 2008).

2.1. Reasons of Light Pollution

Outer lightings are security, entertainment and decoration purposed lightings, but redundantly used outer lighting systems cause light pollution.

Lightings causing light pollution are;

- “Road, street and lane lightings
- Wrong and redundant lighting of parks, gardens and sport areas
- Façade lightings of tourist facilities and buildings
- Advertising boards
- Store window lightings
- Lightings for security purposes” (Ansari, 2013).

Also, wrong armature choice and montage cause light pollution (Figure 2). Wrong choice of armatures and misdirection of them cause glaring for pedestrians and creating unneeded amount of light. Choosing the armature and lamp is important to prevent light pollution. Correct armature should be chosen and applied (Figure 3).

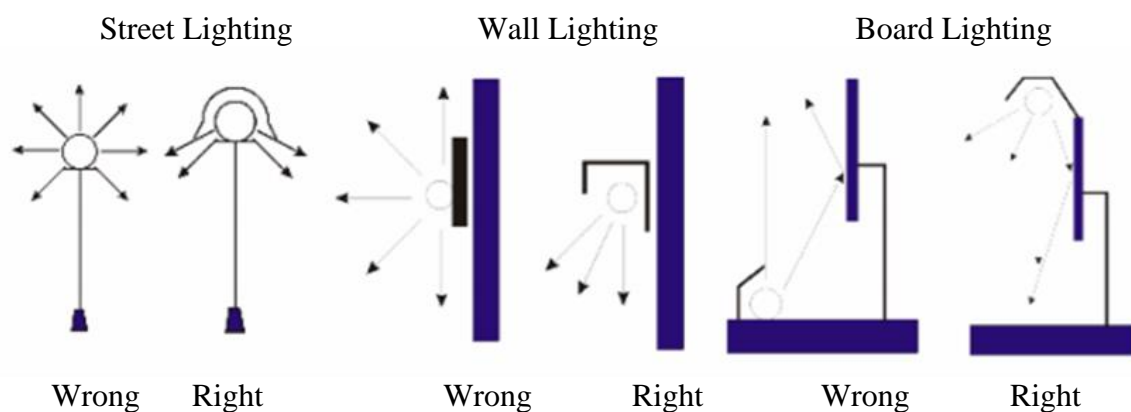


Figure 2. Right and wrong lighting (Dokuzcan, 2006)

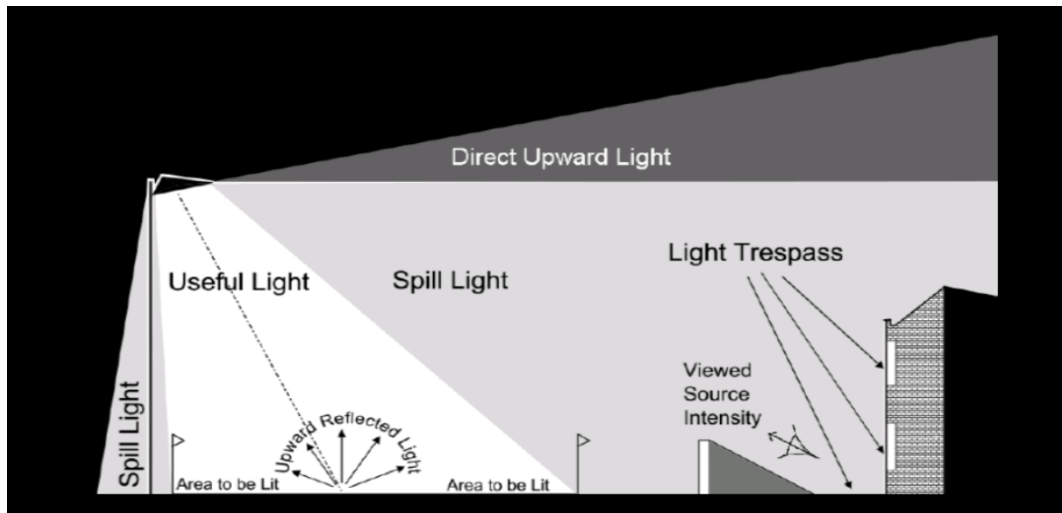


Figure 3. Results of wrong armature application (Onuk, 2008)

2.2. Effect of Light Pollution on Human

There are lots of effects of light pollution in urban life quality (Xiao&Zhang, 2004)

Effects on Local Residents

Wrong armature usage, flash of light reflected from light source on building windows cause brightening of house in the night and make an adverse impact on sleeping people. The most adverse impact of light pollution on human is Melatonin hormone release either not happen, or decrease in bright, lightened environment.

Melatonin is a hormone having protective effect on cells and it adjusts the biological rhythm of the body. Since melatonin release decrease on people who are in bright environments during night, it cause permanent damage in cells in time (Ansari, 2013).

Effects on Pedestrians

Lighting is an important factor on security strategy of the city. One feels him/herself safe while passing through a well-lighted square or park. One wants to perceive the entrance and exit roads of his/her location. Thus, the lighting on areas that are used during night is done according to the night security. But under overlighting, one cannot perceive his/her environment, hence he/she can be monitored. Wrong lighting adversely affect pedestrians for it causes glare.

Effects on Transport System

In case of using wrong lighting armature on road lighting, that may be a reason for losing attention and accidents since it will cause glare and reflection on the driver. Or, while his/her eyes got used to darkness on the road without lighting, sudden reflection on the rear view mirror from the headlamps of the car coming behind may cause glare and transient blindness.

But, as it's mentioned above, the lighting has to be handled as a whole. NisantasiTeskiviye Street, which is Istanbul's one of the most vivid and moving streets with its big store windows and advertising boards, necessitates to be evaluated and criticized in terms of light pollution.

3. Material and Method

In this study, the circumstances causing light pollution are determined by the help of photometer and building scaled and urban scaled photodocumentation method. Conditions such as light bursts, color variations, irregular light distribution that are causing negative conclusions in respect to urban aesthetic and sight comfort are investigated on site and documented. This study which many circumstances such as façade lightings on buildings, parts left in dark or under extreme lighting, advertising boards continuously changing color and intensity, store windows all designed independently from each other, street lighting tools using various colors are examined have the characteristics of a document on light pollution in Nisantasi Teskiviye Street (Figure 4).

3.1. Sample Area



Figure 4.Teşvikiye Street (studied by authors)

In particular, the slope of this section between the Vali Konağı Street and Bronze Street is excessive. Due to this inclination, roadway and pavement pass through the basement of many buildings. At the moment, the lower floors of the buildings on the street are served as shops, restaurants and cafes, while the upper floors are used as residential and residential buildings. The street is different from the first time it was founded, it is the front plan with shopping and entertainment life. Nowadays, not only the Nişantaşı street district community but also high income group of İstanbul residents use the street.

4. Research results

4.1. Examining Tesvikiye Street Lighting in Respect to Light Pollution

Nisantasi Tesvikiye Street, which has a more elite position comparing to other districts in Istanbul, is examined on the basis of light pollution because of both its being old, and people

are spending too much time outside during day and night. The light system at the aforementioned space is evaluated from both its aesthetic contribution to the buildings, and from comfort and health respect to the livings.

First of all, to make a general situation analysis on the area where lighting study to be done and to understand the expectations at the environment will be a healthy start (Figure 5). Zoning the entire area according to different functions and expectations, and defining these zones in many layers such as necessities, purposes, architectural approaches, and social purposes is necessary.

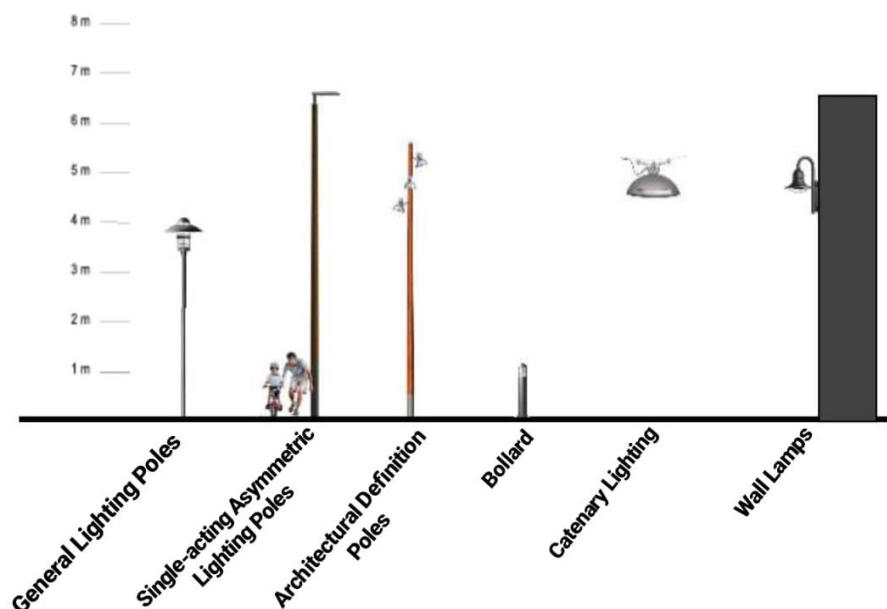


Figure 5. Possible lighting equipment types in the project

4.2 Overlighting

It is detected that lighting system applied at some parts along the street was pretty much over a normal application (Figure 6). And that has provided existence of a poor quality environment, effecting the comfort conditions of people. Human eye is getting tired because of overlighting, and making wondering around or spending time outside less healthy. The visibility of extreme is again disappearing.



Figure 6. Overlighting (photo by authors)

4.3 Storefront Lightings

Vitrified lightings are making up an important amount of light pollution on Tesvikiye Street. Since there are no any legislation or obligatory criteria for storefront lightings, everybody has lightened their storefronts with the colors they wanted as they liked. And that created an important amount of light pollution sourced from storefronts along the street (Figure 7).



Figure 7. Storefront Lighting (photo by authors)

4.4 Façade Lighting

Façade lighting is recently growing in importance, and serious designing projects are being prepared for this. With façade lighting both comfort is provided by lighting the outer spaces,

and aesthetic is provided by making buildings that have specific and historical features visible. It is seen at the examinations made on the street that; while an aesthetic view was provided in some buildings by using façade lighting, there wasn't any lighting provided for some buildings, creating serious light pollution caused by a dark view at those parts (Figure 8).



Figure 8. Façade Lighting (photo by authors)

4.5. Inadequate Lighting

A quality life for living beings is only possible if they live in a well-lighted environment. Inadequate lighting both make the environment it exists unlivable for human beings, and it creates several health problems in time. Again, it blots out the visibility of important aesthetic elements situated at the mentioned space. According to the evaluations made on the street, the light on some areas appeared more than the normal (Figure 9). And this has removed the natural aesthetic elements situated there, and caused visual pollution.



Figure 9. Inadequate Lighting (photo by authors)

4.6. Street and Lane Lightings

In respect to light pollution, Tesvikiye Street contains many elements in itself. Whilst different armature types and different sized poles are required for lighting for people, road lighting, directive lightings and three lightings, a rambling lighting system is used without taking any of the requirements into considerations. Different sized poles are used for the same purpose. Armatures radiating different color light are used. Some of the armatures light, some do not. Since the positioning of armatures isn't appropriate, radiation of the light is blocked by the trees in front of them. Again, the trees on the pavement along the street aren't lightened, and they also blockage the light radiated from the poles (Figure 10).

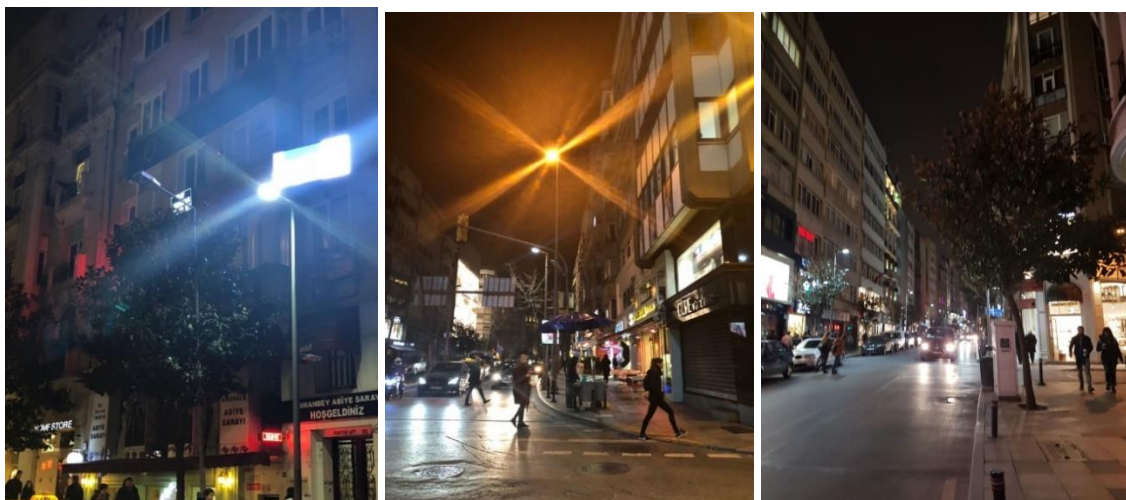


Figure 10. Street and Lane Lightings (photo by authors)

4.7. Advertisement Purposed Lightings

Advertisement purposed lightings are making an important element of light pollution in Tesvikiye Street (Figure 11). Because there is no any obligatory legislation for these lightings, a casual lighting is used. Whilst advertisement purposed lightings should be chosen according to the day and night conditions, the choice is generally done according to daytime conditions. The armature and light amount chosen according to daytime conditions are radiating overlighting in the night. And this destroys the aesthetic by creating light pollution, and prevents a comfort living by damaging the sight quality via overlighting. Again, choosing the lights for this purpose in several colors, and directing them inappropriately are causing glare and over pollution.

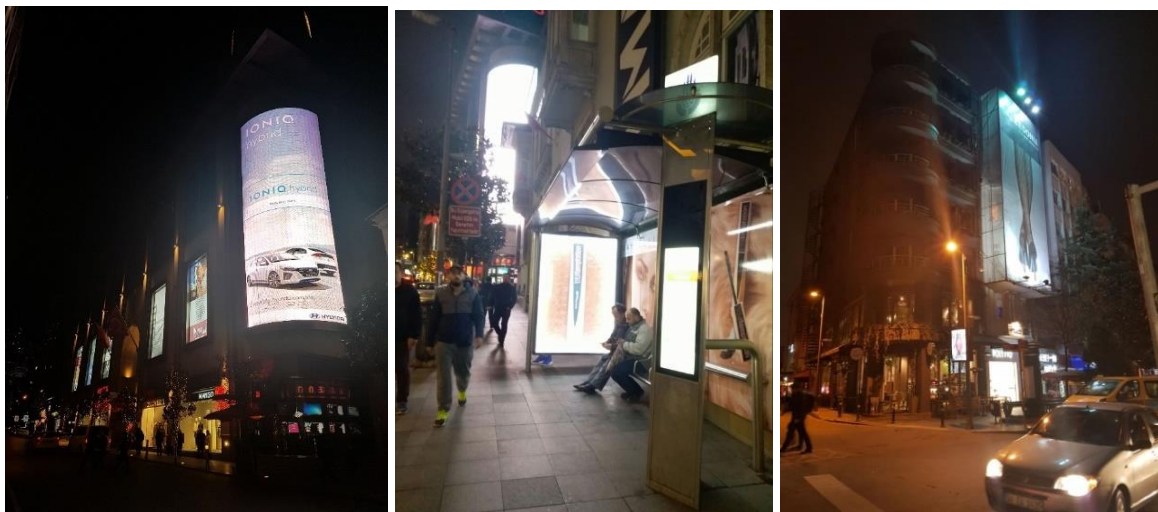


Figure 11. Advertisement Lightings Figure Lightings (photo by authors)

4.8. Light Pollution Measuring Results of Tesvikiye Street Lighting

The values received as a result of measurements done on the street have shown that they are rather low than the aimed luminous level and regulatory values. This situation creates light pollution for both street residents and drivers using vehicle. It has been observed that the brightness level changes at very short intervals in measurements made at certain intervals.

Lighting levels being under or over standart over the area effect negatively users comfort in current situation. The current illumination system made randomly along the street as it was considered non-compliance with any criteria. The street should have a luminous level of 200 lux on average, but it was measured some places 2 lux other places 245 lux, this is very problematic condition (Figure 12, 13).



Figure 12. Measurement results



Figure 13. Measurement results

5. Conclusion

The importance of urban lighting hasn't been understood enough yet in Turkey. It's still found adequate that lighting is a vital need related to eyesight and that's fine if you have it at a level to ensure sight. Because of that understanding, it is not accepted as an important element of lighting in and as a part of urban design. Recently, the lighting of only important buildings and some others who are accepted as a city symbol are considered.

For a truly understanding of importance of lighting in urban design and to ensure improvement at this direction, this subject should be given as a lecture in academic area as a part of design and project should be prepared.

It has been tried to make some buildings visible by lighting in Tesvikiye Street, but these studies are not being done according to a standard or rule. And this doesn't provide that intended aesthetic view. Urban lighting should be addressed as a whole, urban based master plans should be prepared, and obligatory regulations should be prepared by making use of symbolical examples from the world cities in this respect.

At project designing process which is developed by taking urban lighting as part of the design, it should be designed and applied in compliance with urban lighting regulations.

Important buildings situated in Tesvikiye Street disappeared in nightfall, and architectural features of them can't be recognized. It has to be the most important element of urban design to bring into view historical and specific buildings that have important place in urban memory. These lightened buildings should be made a more livable place for living beings in respect to aesthetic and comfort.

To ensure the expected performance in urban lighting, the coatings used on the buildings have a significant importance. Taking outer space lighting into consideration, using appropriate coating material suiting to light at building design should be ensured.

The aim of urban lighting should be making historical, aesthetic and quality features of the subject space visible, and since every city's, district's, neighborhood's, street's human accumulation features are different, different lighting criteria should be formed for these areas and applications should be done according to these criteria.

According to international standards, street lighting intensity should be 100 lux. In the measurements done on Tesvikiye Street, it is detected nonhomogeneous 2 to 245 lux light amount, somewhere overlighted, somewhere inadequate. An adequate lighting should be targeted providing an adequate homogeneous lighting which is appropriate to human health, and taking the present lifestyle and comfort conditions of human beings into consideration, and this status should be assured with legislative regulations.

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Evaluation of Çanakkale Kilitbahir Castle in the Context of Refunctioning

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Abstract

The Dardanelles Strait functions as a bridge between Biga and Gelibolu peninsulas, connecting the Aegean Sea and Marmara Sea. Many defenses have been built on the Dardanelles Strait, which have hosted many civilizations from the past to the present day, in line with the needs of the time. Kilitbahir Castle, which has a three-leaf clover plan and is located on a slope rising on the Gallipoli peninsula in the narrowest part of the Bosphorus after the conquest of Istanbul by Mehmet the Conqueror; manifests itself as a pioneering structure of the military architecture of the era with the developing artillery technology. The castle consists of a heart-shaped seven-storey inner tower in the core, the inner tower in the form of a three-leaf clover and the outer walls surrounding it. The architectural assembly of the castle is among the most aesthetic and unique among the Ottoman Castles. In terms of protecting the physical environment, it is observed that the defensive buildings which survived up to today are not adequately protected, losing their historical and architectural values. In this context, the restoration of Kilitbahir Castle dating back to Ottoman Period defense structures on the Dardanelles Strait was evaluated. Its phases throughout the process along with the current location and architecture were evaluated by using written and visual resources. European Archives, BNF Archives, Topkapı Palace Archives and Istanbul University Archives were utilized for reaching the castle engravings. In accordance with the information obtained in the historical research process, the

exhibition arrangement and environment planning project of the structure, which serves as a museum, were prepared.

Keywords: Kilitbahir Castle; refunctioning; defense structure; museum.

1. Introduction

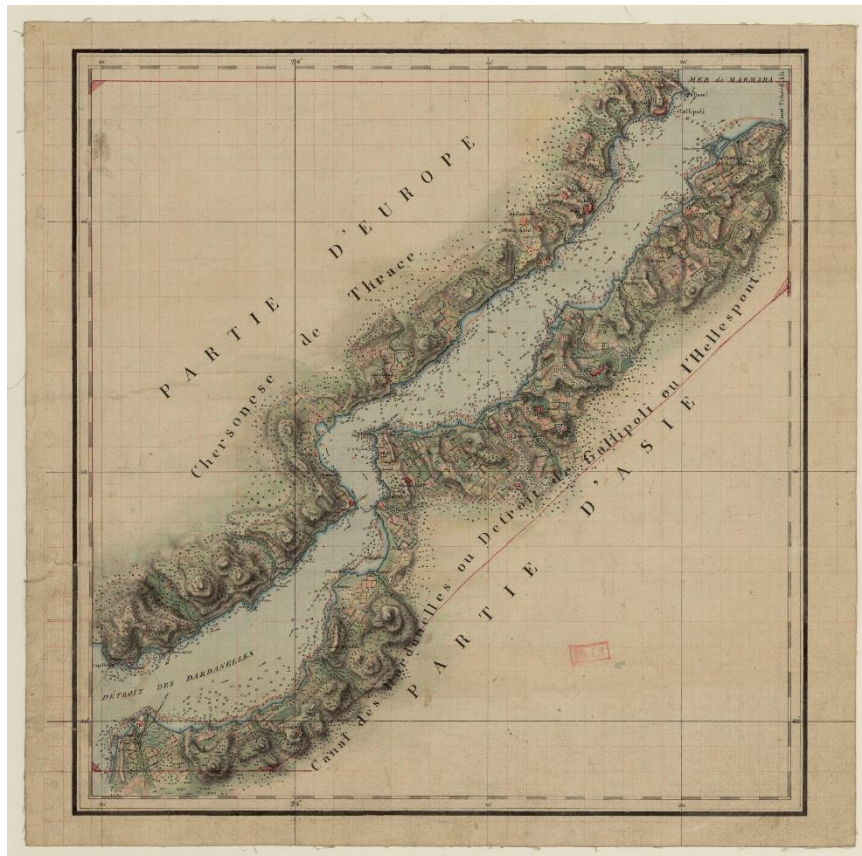
One of the most important actions of human existence is the concept of protection and defense. These actions led to the emergence of defense structures. They needed to be protected in order to prevent any attack from the opposite side and created defenses that they could protect themselves with. Defense structures from the past to the present day are one of the important elements forming the urban texture. The castle buildings were built along the periphery of the cities, on the islands near the straits or on the sea shore and near the shore. In this process, the strategic location of the city and topography also played an important role. In this context, the castles consist of circular, hexagonal or polygonal masses of bastions, or in a regular geometric form, bound together according to the topography of the city. When it comes to defense in the Turkish and Islamic cities, the buildings made up of sections such as Inner castle, Outer castle, Şehristan and Rabat come to mind. The inner castle is the main center of the defense of the area surrounded by the ramparts on the highest slope of the city, the area where the ruler or commander resides. It is the core point of the city. Outer castle surrounds the city. Şehristan is a region in the city with trade, religion, public and residential areas. Rabat is the area where there are trade functions and structures that develop around the fortress doors outside the fortifications.

Kilitbahir Castle, which was ordered to be built by Fatih Sultan Mehmed in the Ottoman Period with its own scheme, is located at the narrowest part of the Dardanelles Strait, directly opposite of the Castle Fortress to control the sea passage at Rumeli Side. Tursun Bey, one of the historians of the period, wrote that two castles facing each other were built in the narrowest part of the Bosphorus (called Eceovasi) after the conquest of Istanbul, that one of them was named

Kilidü'l-bahr and the other was named Sultaniye and these castles were equipped with artillery. (1)

1.1 Kilitbahir Castle Location and History

Kilitbahir Castle is located on the Dardanelles Strait, which connects the Marmara Sea and Aegean Sea, at the edge of Malaz Hill where two opposite shores get closest with each other.

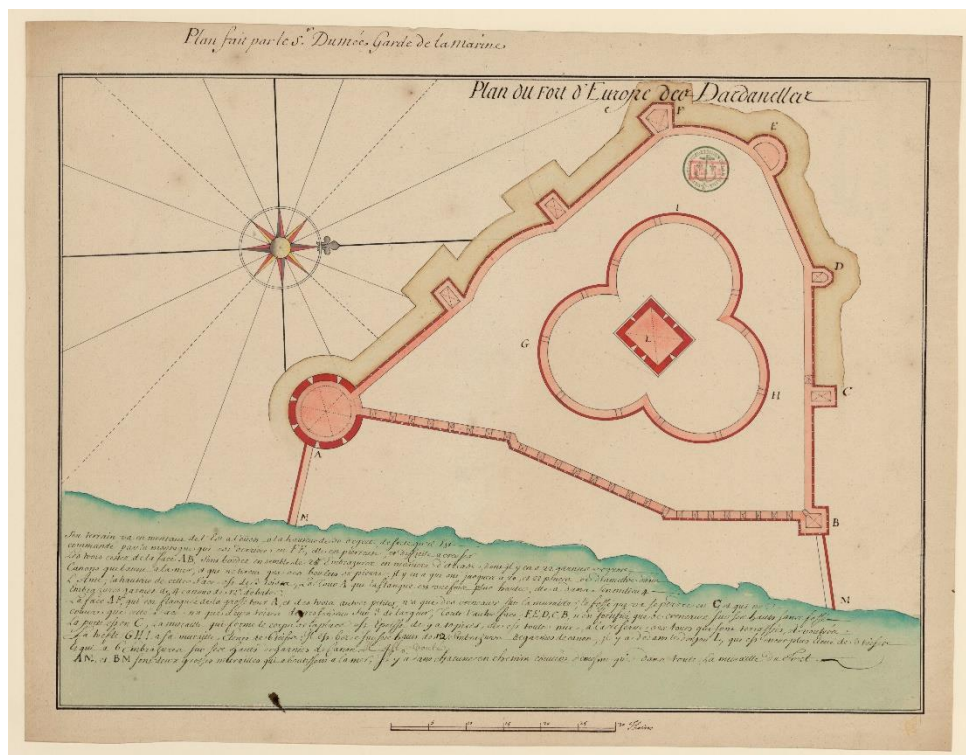


Map 01. 18th Century Dardanelles Strait, National Library of France, Map and Planning Department, GE C-4074.

It was built by Mehmet the Conqueror after the conquest of Istanbul in order to keep the Bosphorus under control between 1461-1462. Having a three-leaf clover plan and located on a slope rising on the Gallipoli peninsula in the narrowest part of the Bosphorus, Kilitbahir Castle manifests itself as a pioneering structure of the military architecture of the era, integrated with the developing artillery technology.

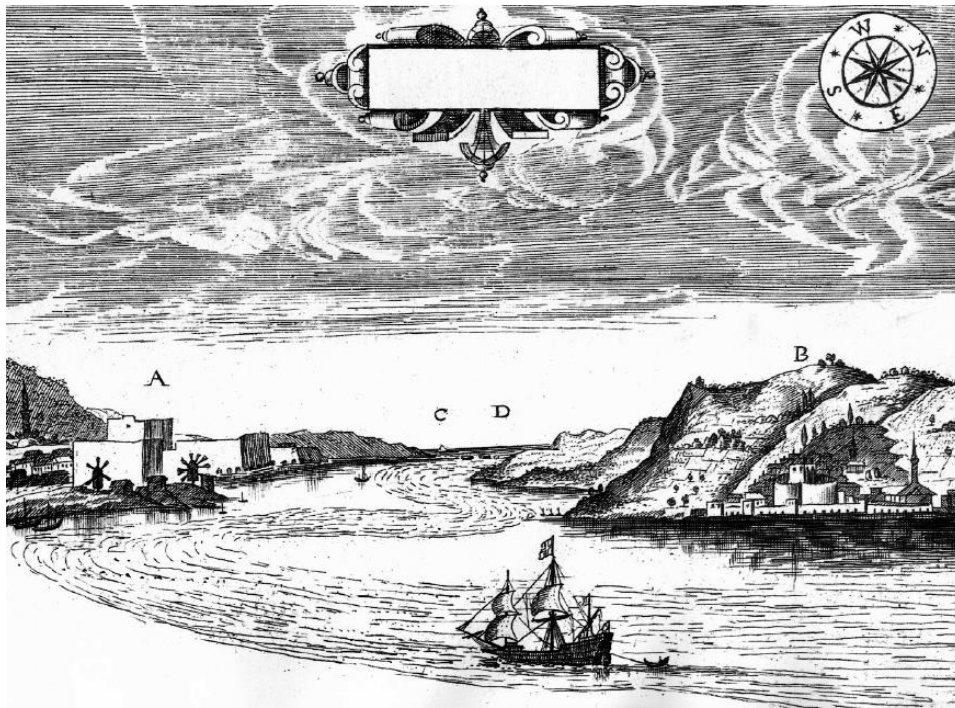
The castle consists of a heart-shaped seven-storey inner tower in the core, the inner tower in the form of a three-leaf clover and the outer walls surrounding it. The sea-side part of the arc-shaped outer walls did not survive. There are ten bastions on the outer walls. Two of the bastions are circular, four are triangular and four are square. There are three gates on the outer walls, two on the land and one on the sea side.

The inner castle form of a clover plan formed by the joining of three circular shaped walls. The courtyards inside the walls are separated by a door. It was aimed to separate the courtyards from each other by closing the doors at the time of the attack. The inner castle has two gates, one at the sea and one at the land side. Inside the clover-shaped inner castle walls are seven-story inner towers reflecting the same geometry. The inner tower is connected to the inner castle walls with arches separating the courtyards.



Gravure 01. Sr Berquin's Kilitbahir Castle Plan; National Library of France, Map and Planning Department, GE SH 18 PF 98 DIV 5 P 2

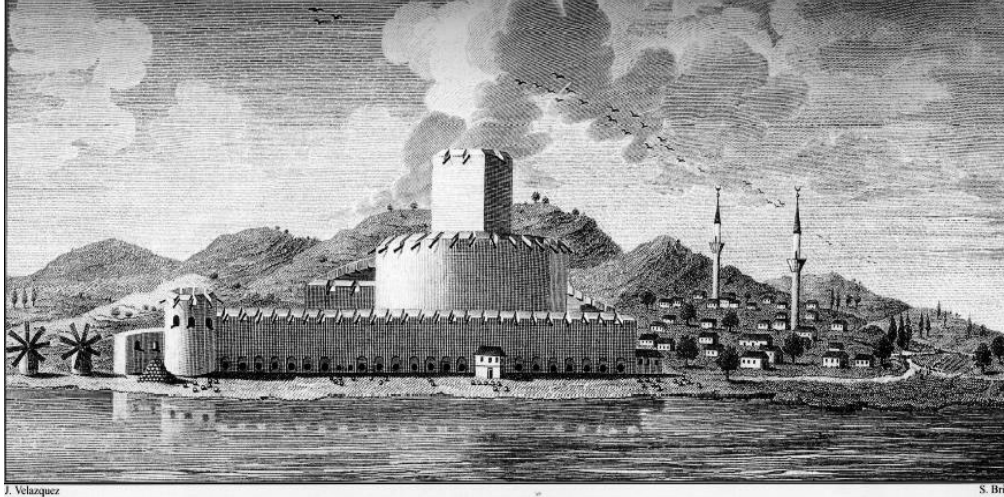
Evliya Çelebi talks about Kilitbahir Castle, which he saw in 1659, a neighborhood of tiled houses and a mosque that he named Hünkar Mosque. Furthermore, after saying that there are wheat warehouses and arsenals here, he states that there are no inns, baths and bazaars, and some artillery shells from Mora and other shells belonging to the Kanuni era are placed on the shore.



Gravure 02: George Sandys' Gravure dated 1621 (Ministry of Culture and Tourism - Anatolian Gravure Album)

According to Evliya Çelebi, Suleiman the Magnificent extended the Kilitbahir Castle by repairing it with the spoils taken from the Conquest of Rhodes and adding walls with the Kanuni Tower (Yellow Tower). The Dardanelles Strait, Kilitbahir and Laimenlik Castles, where George Sandys visited and engraved during his Egypt trip in 1610, behind which appears Istanbul. In the travel book published by George Sandys in 1621, titled “*A relation of a journey begun An: Dom: 1610. Fovre bookes. Containing a description of the Turkish Empire, of Egypt, of the Holy Land, of the remote parts of Italy, and ilands adioyning*”, the inner castle from the

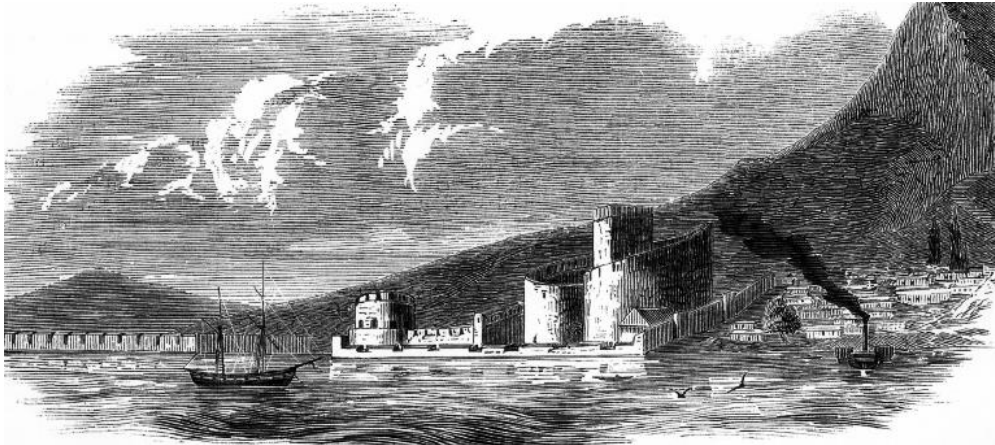
era of Mehmet the Conqueror and walls and Kanuni Tower built in the era of Suleiman the Magnificent can be observed in the Kilitbahir Castle, marked as "B".



Gravure 03: Joseph Moreno's Gravure dated 1790 (Ministry of Culture and Tourism - Anatolian Gravure Album)

Kilitbahir gravures inside the tower, the inner castle and the Kanuni Tower (Yellow Tower) and the outer walls are found in the work "Viage á Constantinopla, en el año de 1784 (journey to Istanbul in 1784)" prepared by José María Moreno (Joseph Moreno).

The last architectural formation of Kilitbahir Castle reached to the day-time was completed when the Namazgah Redoubt was rebuilt between 1893-1894. In the works carried out on this date, the door and the wall located on the sea shore in the east direction of the castle, the wall, the shrine, the headquarters building and the door were added to the south side of the bay, surrounding Namazgah Redoubt. The wall of the inner castle in the sea direction and the port gate were destroyed during this period. Namazgah Redoubt, walls and castle gates were added to the Kilitbahir Castle during the reign of Abdülhamit II, finalizing the shape of it.



Gravure 04: Gravure of Kilitbahir Castle and Namazgah Redoubt dated 1853 titled "L'Illustration: Journal universel".

Kilitbahir Castle was depicted close to its present appearance. The walls in front of the inner castle were not drawn first in this gravure. From the building traces reaching today around the inner castle, the building at the shore to the north are observed in this gravure.

2. Material and Method

Kilitbahir Castle has an important place among the defense structures in Çanakkale the period of its construction, its strategic location, and its architecture. The fact that location of the Historical Gallipoli Peninsula is within the trip route has caused the Castle to increase the number of tourists day by day. The castle has undergone many repairs until reaching today, but it has not been able to gain a function together with its architectural texture and its surroundings and that caused it to have a structure that only exhibits its own architecture. Due to these reasons, environmental planning and exhibition were needed.

European Archives, BNF Archives, Topkapı Palace Archives and Istanbul University Archives were utilized for the researches conducted to draw the project. In accordance with the information obtained in the historical research process, the exhibition arrangement and environment planning project of the structure, which serves as "Ottoman Castle Museum", were prepared.

2.1 Sampling Area

The castle is situated on a slope in the narrowest part of the Dardanelles Strait. It is located opposite the Çimenlik Castle on the strait, which was built during the same period.

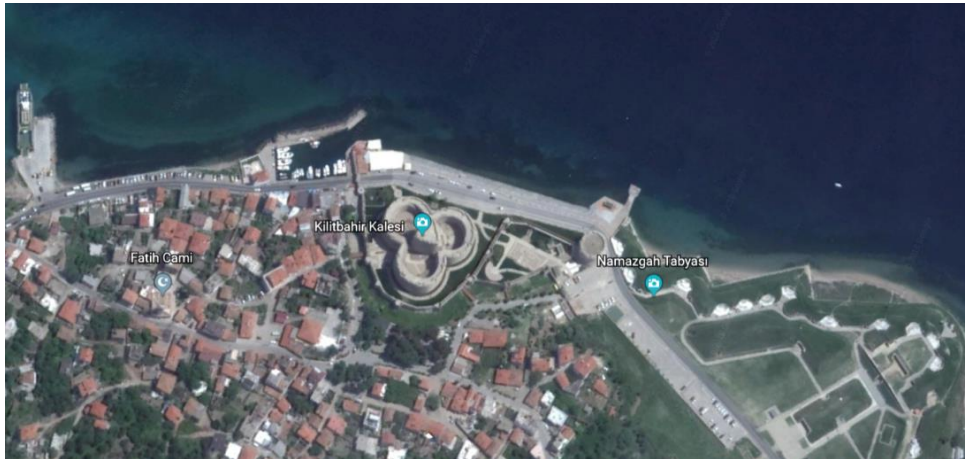


Photo 01: Kilitbahir Castle, 40.15 ° N, 26.38 ° E coordinates

The refunctioning of Kilitbahir Castle considered altogether with the inner tower built during the reign of Mehmed the Conqueror, the Yellow Tower built by Suleiman the Magnificent, the Late Period Courtyard and the additions made in Abdülhamit Era.

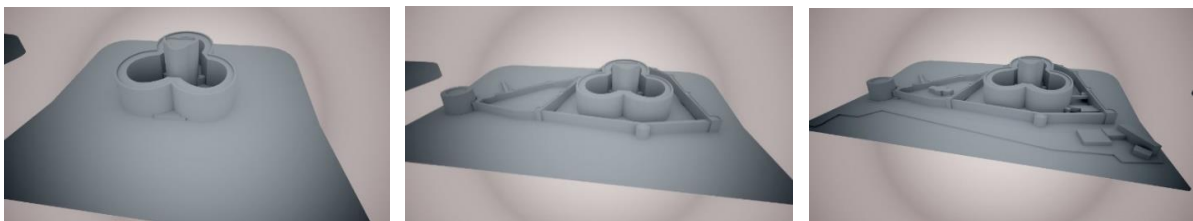


Photo 02: Era of the Conqueror (Inner Tower) - Era of Suleiman the Magnificent (Yellow Tower, Late Period Courtyard) - Era of Abdülhamit (Military Factory, Shrine), K. Duyar.

2.2 Method

European Archives, BNF Archives, Topkapı Palace Archives and Istanbul University Archives were utilized for reaching the castle engravings in the historical researches conducted during the refunctioning process of Kilitbahir Castle. In accordance with the information obtained, it

is envisaged that the castle museum function will be re-functioned together with a script describing Castle Life in the Era of Mehmet the Conqueror.

3. Refunctioning the Kilitbahir Castle

In the entrance to the castle, the circulation is planned as two separate tours, short and long.

Short Tour:

- Yellow Tower / General Museum Presentation,
- Demo Museum / Disabled, Old, Sick, Tired Visitors,
- Amphitheater / Greeting and Museum Activity Area,

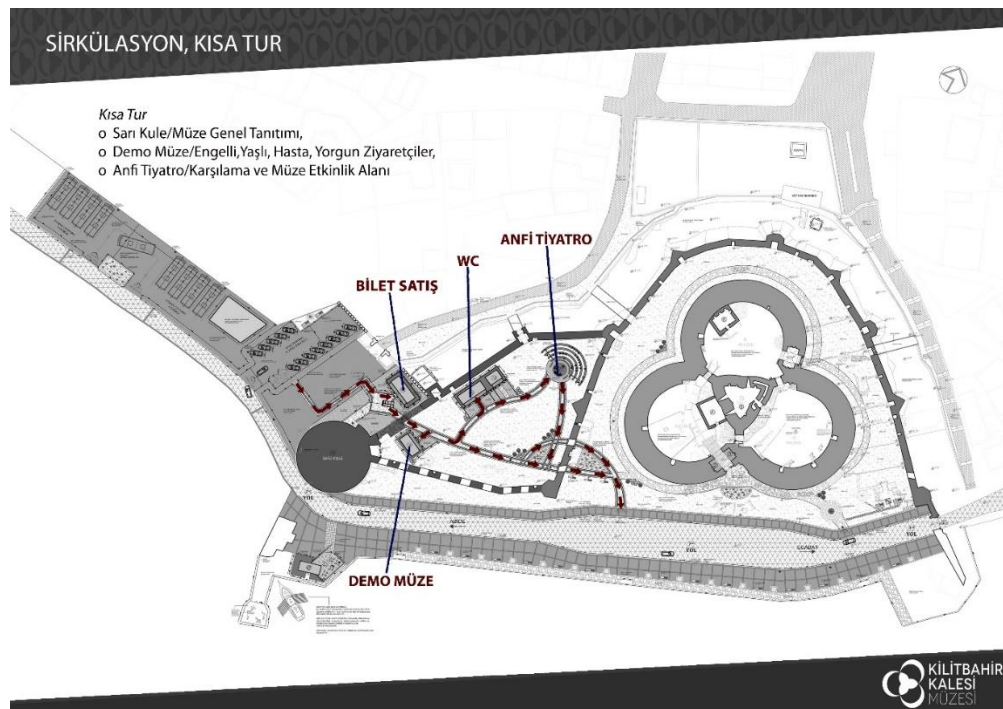


Photo 03: Kilitbahir Castle Site Plan-Short Tour Route, K. Duyar.

Long Tour:

- Yellow Tower / General Museum Presentation,
- Demo Museum / Disabled, Old, Sick, Tired Visitors,
- Amphitheater / Greeting and Museum Activity Area,

- Piri Reis Section,
- Multivision Section,
- Temporary Exhibition Section,
- Tower Museum

2 separate tours as specified above were offered where visitors would be able to visit the outdoor and exhibition spaces without leaving the script, to easily participate in museum activities along the route, and to avoid unrestrained travels within the area.

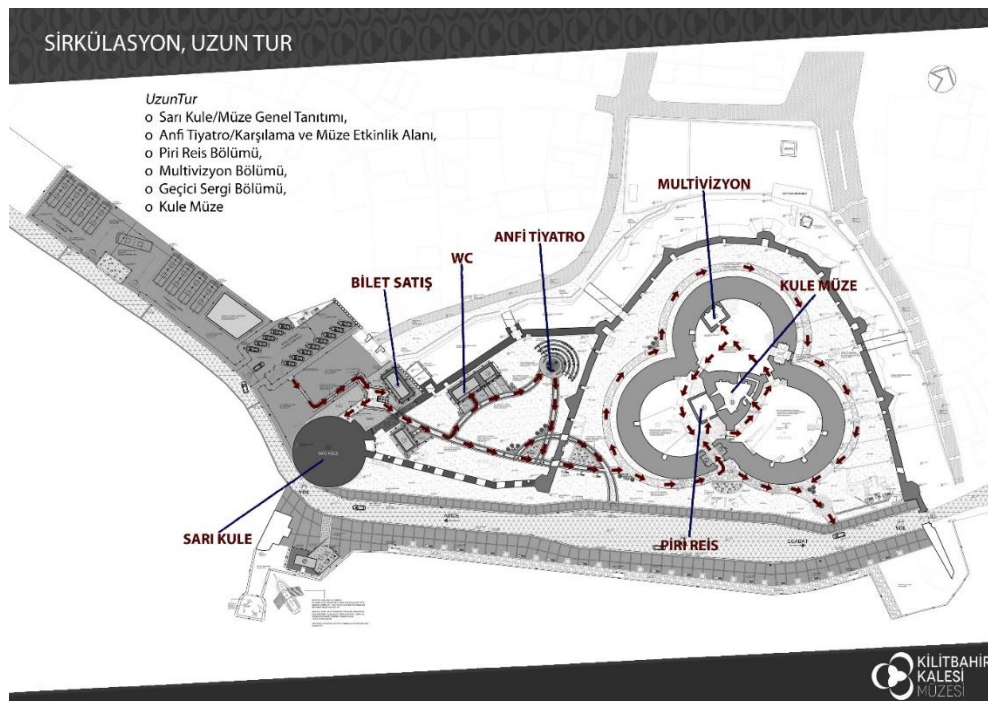


Photo 04: Kilitbahir Castle Site Plan-Long Tour Route, K. Duyar.

3.1 Entrance Area (Parking Lot, Museum Entrance, Ticket Sales)

By taking the visitor from a single point with "1C Entrance" close to the car park area and in line with the exhibition arrangement scenario; 2 separate tours, Long Tour and Short Tour, were offered where visitors would be able to visit the outdoor and exhibition spaces without leaving the script, to easily participate in museum activities along the route, and to avoid unrestrained travels within the area.

3.2 Yellow Tower

The Yellow Tower is the first place of the trip route. For this reason, the exhibition project is planned as the "General Presentation Area of the Ottoman Calendars", which is important for the visitor's perception of the museum concept and scenario in a complete and accurate way. In this place, a brief introduction of the visit is offered in a thematic order about the general presentation of Ottoman monuments, architectural structures, castle structure, castle equipment, organizational structure, commercial life effects and defense strategies.

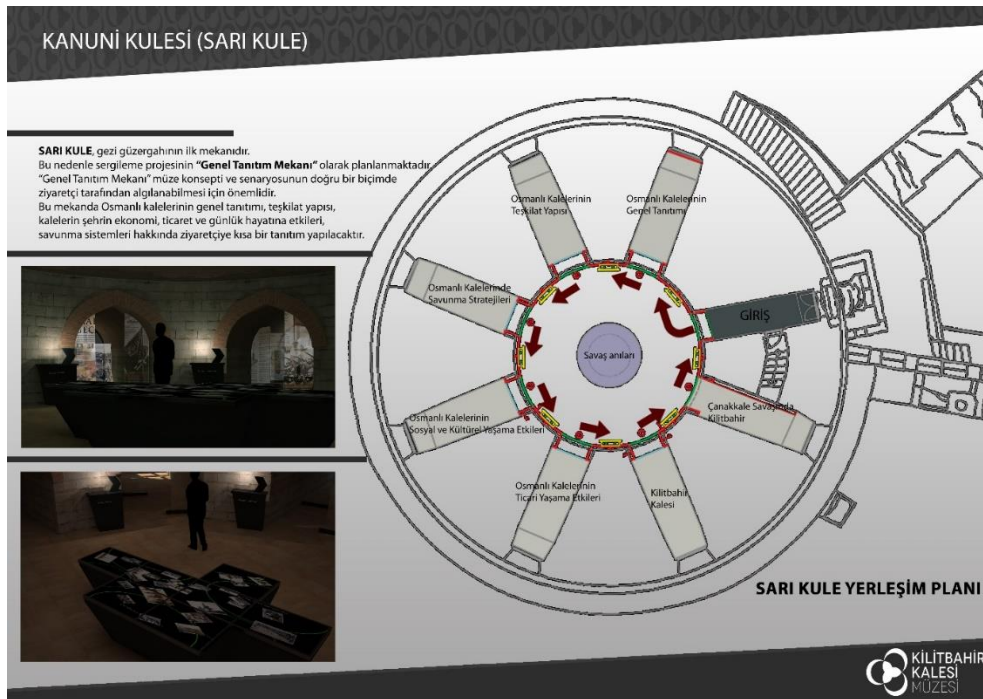


Photo 05: Yellow Tower Plan, K. Duyar.

In the Yellow Tower, in addition to interactive presentations within a thematic order about the general presentation of Ottoman monuments, architectural structures, castle structure, castle equipment, organizational structure, commercial life effects and defense strategies, the subject is depicted with niche transparent projection curtains and impersonations on the subject.

3.3 Demo Museum

The physical conditions and historical texture of the Tower Museum and the Yellow Tower, two of the most important places of the exhibition arrangement project, make it impossible for the handicapped, elderly, sick and young children to easily complete the sightseeing tour. Since it will not be possible to remove the negative consequences of the physical obstacles at all times in the registered structures, Demo Museum will be prepared in order to present the exhibited works and the scenario to the disabled visitors who cannot visit the museum. The demo museum features virtual tour, diorama and touchscreen table. One of the most important elements of the Demo Museum is the capability of the visitors whose health and physical condition do not allow them to tour the museum to see the museum and its surroundings in a virtual environment with virtual headings and in 360 degrees while sitting. The visitors will be informed with the embossed writings on the walls for the visually handicapped visitors and they will be able to touch and examine the identical replica of several works to be exhibited in the museum. Demo Museum is prepared to serve visitors who have to leave without seeing the building which is kept closed due to restoration and repair. Demo Museum is especially important as it is a first-time application that will be carried out for the museums that are compulsory kept closed.

3.4 Museum Management / Administration

When scrutinized in a museological perspective, it is vitally important to have a control over the museum area and to be accessible all the time for an effective museum management. Therefore, the "Museum Management / Administration" structure is positioned in front of the walls at the entrance of the area to ensure museum visitors and visitors coming for any business easily and conveniently reach the management unit and that the security of the area can be maintained quickly and efficiently in emergency or routine controls.

3.5 Piri Reis Section

Right next to the tower inside the castle is the exhibition of Piri Reis's life and its most important work, Kitab-ı Bahriye and world map, according to modern museology. In the section, the 3D silicon sculpture animation area, the video display area, the same edition of the original of the Kitab-ı Bahriye as well as the Turkish version, the exhibition of astrolabe, compass and divider reproductions and the map installation showing the similarities between the world map of Piri Reis and today's world map that utilizes the enhanced reality software.



Photo 06: Piri Reis Section Plan, K. Duyar.

3.6 Multivision (Bath Structure) and Temporary Exhibition Area

The "Multivision Section" located in the bath structure of the project has been used as a Temporary Exhibition Area on special days as well as the stated function. Our greatest goal should be to bring our renewed and developing museums to international museum standards with the understanding of contemporary museology. In this context, the exhibition arrangement project should not be considered independent of museum planning. All sections and functions,

which should be included for an accurate, scientific and contemporary museum, must be included in the planning.

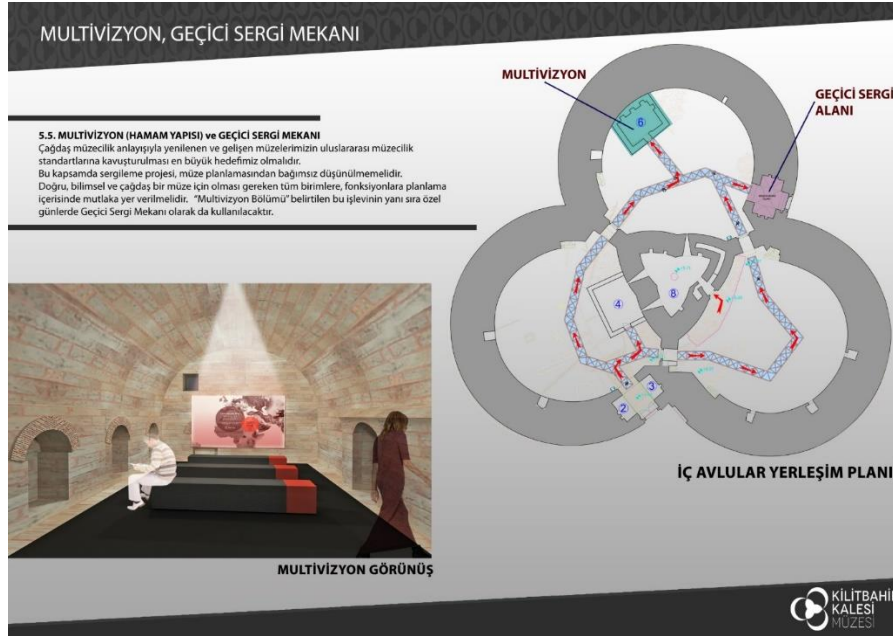


Photo 07: Multivision-Temporary Exhibition Area Plan, K. Duyar.

3.6 Tower Museum

In the scope of the exhibition arrangement project of the 6-storey tower structure which is functioned as a Tower Museum, life in Kilitbahir Castle is explained. In the ground floor, the space is divided to three different eras since the construction of the Castle, namely Era of Mehmet the Conqueror, Era of Suleiman the Magnificent and Era of Abdülhamit. Defense, catering, commerce and worship are depicted in Floors 1, 2, 3 and 4. On the 5th floor, it is stipulated to exhibit the works that were excavated during the excavation in the Castle.

4. Conclusion

Kilitbahir Castle is a very important place in terms of architecture and art history among the castles in the Era of Mehmed the Conqueror. Having a planned structure of a three-leafed clover, the castle consists of a seven-storey inner tower in the core, the inner tower in the form

of a three-leaf clover and the outer walls surrounding it. The architectural assembly of the castle is among the most aesthetic and unique among the Ottoman Castles. The sea-side part of the arc-shaped outer walls did not survive. There are ten bastions on the outer walls. Two of the bastions are circular, four are triangular and four are square. There are three gates on the outer walls, two on the land and one on the sea side.

The Castle is one of the important defenses in terms of both its period and its strategic position. The Historical Gallipoli Peninsula is among the travel routes that increase the number of tourists every day. The structure, which is a center of attention with its history and culture, should be refunctioned and should survive. For this purpose, the structural equipment has been functioned without damaging the present structure of the castle, and support has been provided with the demounting structures in areas where it is not sufficient. The original architectural texture of the castle and the areas that have been rendered functional by its surroundings will be taken for a longer period of preservation and transfer of the past to future generations.

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Representing Iranian-Islamic Identity in Iranian Contemporary Cities Structure

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Abstract

Urban identity could be considered as the result of interaction between social identity system and urbanism system. The term “Islamic City” is defined only by considering the physics of the city and reducing the concept of city to physical elements. Current researches are carried out without considering the relationships between elements and parts of Islamic city. The main objective in this research, is to focus on the principles governing Islamic city which have their roots in Iranian identity and govern aspects of urban life, such as social, political, economic and physical space of the city.

Studying concepts of center, periphery and communications as the main elements of urban identity and matching each of the physical elements in aforementioned arenas could help with understanding the Islamic city structure and its organization and relations governing it. The significance of religious, social, and economic elements in Islamic city match the Contemporary urbanism identity in Iran and the concept of center-periphery theory.

Keyword: Contemporary Iran; urban identity; identity components; city structure; Contemporary Iranian-Islamic-city.

1. Introduction

Urban identity is one of the complex concepts in urbanism. It is a multidimensional phenomenon which presents various fundamentals and meanings from various aspects. In a general view, urban identity could be considered as a result of organized interaction of social,

cultural, economic, religious systems and urbanism system; an approach which has focused on identity along with alterity and as a result, emphasizes the unit of analysis of itself and others in the field of identity. However, when urban identity is mentioned, the relationship between identity and complex concepts such as culture and nationality, a complex concept is emerged which confronts urban identity with various theoretical approaches. This meaning is of a considerable significance in Iranian urbanism, for any source of Iranian-Islamic urban identity has impacted the urban identity structure in each era and in a certain way and formed the urban cultural identity. The Iranian-Islamic urban identity has always been evolving and Maalaa has categorized it in a triangle of identity sources of Iranian, Islamic and urbanism system.

The focus on urbanism system in studying urban identity in Iran indicates that it has been based on dividing city into three certain concepts since the ancient times; Center, surroundings and communication. The surrounding part in Iranian-Islamic city which includes the main element of neighborhood with its specific structure, not only does not have privileges in various parts of the city, but also along with including ethnic diversity, it includes the poor and the rich. And concepts of north, south, up and down were not common as they are considered today. Also, each of the neighborhoods, due to being located in directions which had the best and nearest paths with the villages of the same tribe, in addition to preserving and improving their collective identity, would affect the family relationship which are considered important by Islam.

Physical system of the establishment of the outer shell of cities is affected and representation of the social and cultural system of the society. The rich Islamic culture was mixed with the Iranian social ideology after entering Iran and it was presented in new physical elements by explaining the current concept and defined the new overview of Iranian-Islamic human towards city and urban communities. Studying and restoring the smart system governing the traditional structure of Iranian-Islamic cities is a proper solution in understanding the principles of success in these cities in the expression of Iranian-Islamic urban identity.

Due to immortality and comprehensiveness and universality of Islam, Islamic principles are constant principles which are interpreted in certain ways in various locations and times considering the intellectual and objective resources, while its results is emerged as a unity in diversity in the Islamic geography in Iranian culture.

2. Statement of the Problem

Iran includes cities with a great cultural-historical significance and full of unique fields with physical and social representations that provide a context for Iranian-Islamic identity. These field are generally ignored by the researchers or the researches have lacked a comprehensive view of their Iranian identity values. However, by reviving, studying and analyzing an identity based approach, these values and concepts could be preserved and improved.

The term “Islamic city” was first coined in the nineteenth century by the orientalist, and later expanded by them. (Naqizade (b), 2010; Falahat, 2011) The approach orientalist have undertaken in regards to Islamic cities in Iran is a one-sided view ad related to the Islamic approach as the only basis for the analysis. However, based on methodology, this type of analysis is generally a descriptive analysis of the physical representation of the city without analyzing the construction process and the principles governing them. (Hakim, 2002; cited by Danesh, 2010) The majority of these studies tried to compare what is called Islamic cities in isolation from the Iranian social and cultural context through a comparative method with a negative attitude. Such descriptions are based on presupposed criteria which have their roots in social culture and their western approach; this leads to presupposing principles as the criteria of ideal city and roll-calling these criteria in their studied cities. (Falahat, 2011).

3. Research Question

Considering the improper copying in historical analyses of Islamic urbanism in Iran, studying Iranian-Islamic identity in studying Islamic cities is neglected. In order to reach research data,

the content is arranged in the main question so that the question is led the main answer through this.

How has the role of Iranian-Islamic identity represented in the culture of Islamic urbanism in Iranian geography period?

4. The Theoretical Framework of Understanding Iranian-Islamic City

In analyzing the Iranian urban elements, elements are divided into categories such as space, time, economics, power, culture, sign and expression. (Fakuhi, 2010) After the entrance of Islam into Iran, an interpretation of individual and society is provided and its instances are implemented in urban space with the current physique. The Islamic-Iranian culture led to dynamicity of the civil society and people in the society with the mottos such as equality, brotherhood and horizontal and vertical movements, so that there was a close relationship between the concept of city and Islamic-Iranian culture, initially. (Ziyari, 2003) that is, after the entrance of Islam, the concept of city in Iran reaches a certain organization which is based on the physical format of the city in the Sassanid with a new representation. The Sassanid urbanism system has found a regular shape based on urban crowd control. The mechanism for Sassanid cities is designed in order to fulfill the hidden objectives of government policies in Sassanid cities and in accordance with social stratification institution of Sassanid era which is completely in line with Sassanid urban crowd control. (Khaza'i, 2015) During the Islamic era, these cities served as a basis for social justice school of thought in Islamic city and flourishes by the residence and social life in Iranian-Islamic cities.

What is being discussed here as the Islamic identity of Iranian-Islamic city is not limited to any special physical structure, since in order to identify and introduce the Islamic background of a phenomenon (city, art, clothing, food, etc.), a certain physical shape, or a unique physical pattern for all times and location, for it is in conflict with the universality of Islamic principles. (Naqizade, 2010)

Islamic city is a constant nature which has its own physical representation in any special environment and time; that is, Islamic city is a potential nature which has its own special exemplification considering the culture and identity of each region, technology and available material under the light of the era's sciences and art (that are not in conflict with Islamic principles and values). (Naqizade, 2010) Through this view a new analysis could be presented and with an identity-oriented approach, a proper structure could be reached for Iranian-Islamic city.

Any principle and concept (mental and spiritual) in the core of the city retains a physical tone. Physical elements which are produced in this process will have two dimensions like humans; one is the physical dimension and the other is the spiritual aspect which is the nature and spirit of these elements. Considering these, this question arises that whether the physical arrangement of the elements or the spirit governing these structures and spatial system which leads to Iranian unity and identity in Islamic city. The other question is whether by understanding this identity, an innovative form of physical structure could be reached which is compatible with time, or the same forms have to be maintained. Some believe that the Islamic city concept does not have a special format; that is, a city could not be Islamized through presenting a shape. By considering humans as the most important members of traditional Islamic cities, they express that the physical shape of Islamic cities is not reached through Muslim people. The derived shape is unique and it could not be replicated in other spaces and times. (AhamdiDisfani and 'Ali Abadi, 2011)

On the other hand, some, such as the orientalist, try to prepare a constant physical model for Islamic-Iranian city, the majority of the descriptions of the Islamic city is limited to a handful of elements. For instance, elements such as mosque, bazaar, the shape of the routes, neighborhoods, etc. These elements stay in one conceptual level; a level which is rather physical and has a little tendency towards conceptual analysis. The designs prepared by German

geographers clearly presents this attitude. Among their designs, Dettman schematic design, which was prepared in 1969, presents an Islamic-Iranian city.

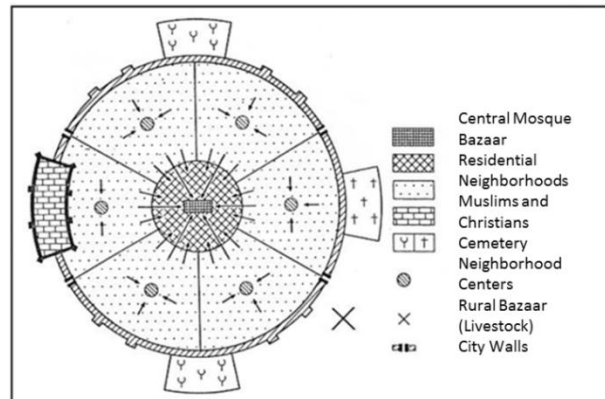


Figure 1.Islamic City Model (Source: Dettmann 1969, Cited by Shafaqi 2008).

There is another model of Islamic cities designed by another German Geographer, Wirth, which is similar to one of Dettmansn's. Wirth not only considers bazaar as the core of the city, but also he considers it as the differentiating factor of Islamic-Iranian cities, from other cities of cultural properties. It is in fact considered as the main index of these cities. In Wirth's model, bazaars are developed radially from the downtown and the main routes are developed from downtown and along with the bazaar centers towards the gates. These routes are called "Gozaar", and had a considerable width which included neighborhood centers.

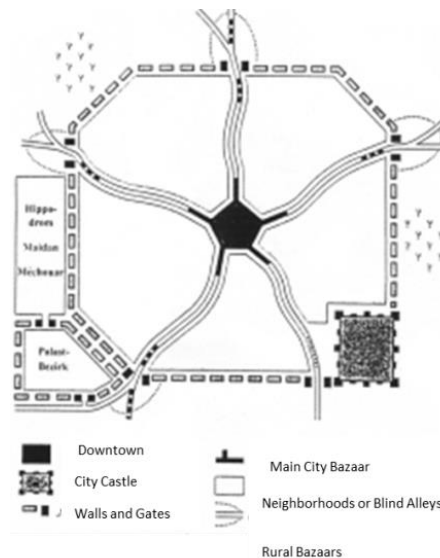


Figure 2.Islamic City Model (Source: Wirth 2000, Cited by Shafaqi 2008).

The third design for Islamic-Iranian cities is from another German geographer, Ehlers, who was a professor at Bonn University in 1991. In comparing the Ehlers model with the aforementioned designs, two new properties are stumbled upon:

1. Newly constructed streets which cut the old urban texture in bazaar part and disturb the integrity of the bazaar.
2. The new outer belt of the city which is formed by the checkered order and in accordance with the surroundings, out of the city walls. (Shafaqi, 2008)

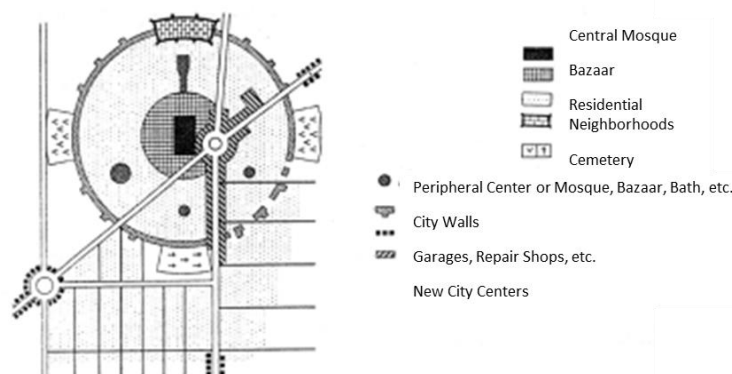


Figure 3.Islamic City Model (Source: Ehlers 1991, Cited by Shafaqi 2008).

Through comparing these three designs, it is concluded that some of common physical elements include mosque, bazaar, neighborhood, cemetery, castle, and city walls and there is a common organization among them. The castle is connected to the city walls in all of them and bazaar has surrounded the downtown which mosque and the neighborhoods with their peripheral centers build the later layers. These designs and the majority of similar designs and descriptions belong to the early centuries of the entrance of Islam and generally to the certain regions Islamic geography including the Middle East and Iran (Falahat, 2011) which have some cultural, climatic and geographic commonalities. What is concluded from studying the three designs above is that they share the same organization which is observed in representation of Islamic city and cities before entrance of Islam to Iran. The designs overview aside, the details, especially the descriptions which are provided for neighborhoods and neighborhood relationships (Morteza, 2006), the required integrity for such schemas could not be reached and some violations could be provided by extensive study of them.

5. Research Findings; Concepts in Contemporary Iranian-Islamic City Structure

Although the components of a city are formed based on materialistic and spiritual needs of the city residents, some of these components are necessary for the residents of all cities; such as buildings, roads and bazaar. Experts express that some of these elements are specific to Islamic cities and attribute the impact of Islamic culture in emergence of city and the method of its organization to these elements:

The central mosque, bazaar, neighborhood mosques, schools, monasteries, shrines, religious site, sect type, endowments (waqf), encouraging people to construct buildings and facilities. Four elements of mosque, bazaar, neighborhood and school are common among the majority of experts. (Ziyari, 2003; Rabbani, 2008; Ayazi, 2008) Iranian identity of sacred spaces in Iranian-Islamic city is presented in the center of the city. This component – sacred space – was in the form of temples or fire temples in the center of the city.

Considering these elements present themselves in objective views is presented in widespread reductions happening in Islamic city definition. They have summarized the city in a limited set of elements or limited set of form properties and this issue has led to emergence of schematic defections of “Islamic city” (without considering their Iranian identity; definitions which are solely derived from its shape without considering its background and informal structures of the cities). (Falahat, 2011) Apart from the physical issues, other effective factors in forming Iranian-Islamic cities and the factors governing it could be listed as below:

1. Religious factors 2. Climatic Factors 3. Economic Factors 4. Communication Factors 5. Governmental Factors 6. Health Factors 7. Waqf Factors (Islamic and Sassanid) (Shekui, 1994)

On the other hand, the effective factors in the architecture of Iranian-Islamic cities elements are four main determining factors: Climate, local materials, traditional forms, and Islamic and social lifestyles and values. (Zarabi, Qolami Bimorq and Hajbande Ofusi, 2008) The physical shape of Iranian-Islamic cities change in accordance with nature and under the impact of any of the abovementioned factors, while the spirit of the city goes through its developmental processes. (Ahmadi Disfani and ‘Aliabadi, 2011)

Apart from the categorizations which are presented for Islamic cities so far, three general parts in Iranian city could be distinguished which are compatible with its Iranian identity. The main components of each set could be expressed as the parts of center, surrounding, and the relationship between these two and other elements of the set. In the city, which could be considered as a set of relations, elements and activities, these three could be distinguished. The properties of these three fields are explained in the following.

5.1 Center

Some orientalists, who studied Islamic cities based on the theories of Max Weber, believe that there is no such entity as city in Islamic world, but Islamic cities are generally a set of peripheral and separate communities and not united communities. Without independent urban associations

and syndicates (similar to the ones in the cities in the Middle Ages), cities would be divided into neighborhoods or parts and each part had its own homogenous communities and bazaars. (Turner 1976, cited by Danesh, 2010)

Regardless of Weber's theories, which are mostly exaggerated and neglected the identity merged with current backgrounds such as Iranian-Islamic identity in their categorization, the presence of neighborhoods based on ethnic and tribal divisions could be interpreted closely related to preservation of Iranian culture identity and independence in Islam. (Morteza, 2006)

The fluid and variable aspect of Iranian identity, which includes various levels of personal identity as the properties, characteristics and thoughts of a person and the collective identity which included various social, economic, cultural, ethnic, and even political groups, any of the personal and collective identities is required for preserving the formation of person's personality and in higher levels the personality of the society. In such an ideology, emergence of a phenomenon called neighborhood with its own characteristics and properties is completely in accordance with the teachings of this religion and also human nature. However, the resulted diversity is dissolved in a space called center and urban society reunion place, and this proves the unity and constructs urban identity in higher levels of ethnicity and a link between various tribes.

However, elements which are related to the Iranian-Islamic city center, either the center of the city or more peripheral centers, include certain elements called public benefit functions such as mosque, bath, cistern, etc.

4.1.1 Religious Sites (Mosque)

Mosque functions as the main element of Muslim cities and the center of all activities of the citizens. Many of the educational, judicial, and political activities of the society which would be carried out in mosque initially, are placed adjacent to the mosque, even after development and expansion and emergence of various professions which would the separation from the

environment of mosque, and they have preserved their relationship with mosque and its spiritual space. (Naqizade, 2010 a)

Since religious beliefs are the core of the Iranian cultural identity, temple or mosque had a significant role in institutional and local arrangements, due to the various functions they could have, such as holding religious rituals, and it is placed in a focal point so that the public access is provided. Naqizade considers submission of city center as a religious elements and material adaptation and control of life as one of the properties of Iranian-Islamic cities.

The function of mosque in early Islam was not limited to religious function, but it was a center for political, ethical, educational and social discussions. During early Islam, regulation of Islamic government affairs with other governments, negotiation with foreign panels, addressing the people, declaring the legitimacy of the caliph, discussing the military and political affairs, distribution of public funds, etc., were carried out in the mosque. (Amini and Montazerolqa'em, 2008)

4.1.2 School

During early Islam, religious sciences were taught in mosques. Hence, the early mosques were in fact the first center of Islamic taught which was quite common in Iran and other Islamic countries. Gradually, by the development of Islamic sciences (Kiyani, 2000) and from the third century AH, schools with educational functions of teaching religious sciences, and guiding people, managing the religious affairs and interpreting jurisprudence, were constructed. Generally, subsequent to construction of schools, waqf would be dedicated to them which would be spent on the accommodation of students and teachers. In various Islamic books, the subject of science and its uses and benefits among Muslims are addressed and the status of scholars is emphasized. Measures undertaken to accommodate religious scholars and scientists would provide sacredness for a city; that is, these scholars would guarantee the perpetuation and propagation of rationality and religiosity among the citizens. (Ayazi, 2008)

Before Islam, educational centers were located near castles, governmental centers or fire temples and spots far from trace centers. In ancient communities, administrative, religious, and commercial institutions were among the most important educational environments. Hence, educational centers would educate their staff along with administrative, religious, and commercial institutions. (Kiyani, 2000)

After Islam, the spaces dedicated to education would stay in the center and emerge in religious spaces. Gradually, along with expansion and improvement of religious sciences and elongation of education period and necessity for accommodation of the students, the grounds for emergence of schools were provided. The location of these school was generally around central mosques, bazaars, residential neighborhoods and sometimes squares. (Soltanzade, 1985) Presence of schools in the center of neighborhoods and bazaar which were considered as the foundation of Iranian cities, shows the significance of education Islamic teachings. (Gudarzi, Soroushm Aminzade, Goharrizi and Naqizade, 2012) Through preserving the relationship of educational centers with governmental and religious centers, the scheme of Iranian-Islamic culture identity is continued.

5.2 Surroundings

In Iranian-Islamic cities, surroundings are not considered as inferior, margin or even hierarchy, but it has a new meaning. Surroundings is a center among various parts, among villages of the same race and city. It is a unity factor among the contrast of city and village. In comparison, the emergence of the concept of neighborhood and the alternative concept of surroundings in Iranian-Islamic cities as mentioned before, crystalizes the spatial justice in its true concept in city. Sassanid city is consisted in the physical system in Iranian-Islamic city. The physiquess of Sassanid city which was designed to protect the city enforcements. However, here in Iranian-Islamic city, the physiquess would be presented without the need for excessive enforcement in the city and also the lack of the need for controlling the citizens (on comparison with the control

power considered in Sassanid government). The current city became an element of spatial justice in Islamic city due to its physical properties and considering this type of physiques being borrowed from Sassanid city, which could be said that in Iranian-Islamic city the north and south does not have any meaning, the concept of up and down did not have any meaning either. Neighborhoods had their own specifications and facilities and they were independent. Some general details on neighborhood are mentioned in the following.

4.2.1 Neighborhood

The residential district of the city is usually located in the outer belt of bazaar and any social-economical group creates a special neighborhood for itself, which is created based on religions, jobs, race, language, ethnicity and even social groups. (Shafaqi, 2008)

Establishment of public elements such as cistern, bath, small markets (at the center of neighborhoods), small squares, and sometimes religious sites would create a complex which could function as the identity factor of the neighborhood and the city, along with fulfilling the neighborhood needs as the center of the neighborhood or center of the city. (Naqizade, 2010 a)

The components of the neighborhood included residential buildings, blind alleys, alleys and public facilities of the neighborhood center such as mosques, temples, small markets, baths, cisterns and sometime coffeehouses. (Naqizade, 2010 a)

5.3 Communications

Presence of main roads in the neighborhood and their relation with the center of the city which had the city-sized services, was a reason for access of all neighborhood to the city privileges. The principle of justice, as one of the principles of Islam, is present in all its aspects. Hence, the observance of this principle could be clearly observed in the accesses. Accessing public centers and urban and neighborhood services, the access type inside the neighborhoods to fulfill security, the proportions of roads in order to observe the climatic issues is one of the access of

the roads which would branch from the bazaar and would continue to the core of the neighborhoods.

4.3.1 Bazaar

The second main factor in formation of Iranian-Islamic cities is the bazaar (Ziyari, 2003) which is the economic heart and the backbone of the city and not only a place for trading goods, but a place for various professions. (Shafaqi, 2008) In most Islamic cities, bazaar is in the form of the core of the traditional and old texture and it is located as the reviving component in the urban area.

Commercial, production and workshop activities which were organized in the bazaar and various passages, would surround the mosque and would smooth its partialism with the presence of mosque. (Naqizade, 2010 a) Along with this commercial complex, there are other public places such as baths, schools, religious sites, Saqqakhanehs, coffeehouses and in Iran and some Shi'ite countries shrines, gymnasium, etc. and they have created a texture all together and they could meet the needs of the people in relating various parts of life and economic, social, political, and religious activities. (Biglari, 1976) In fact, bazaar was initially formed for producing and trading good, but subsequently, it found other cultural and social functions. (Kiyani, 2000) This social function of bazaar let it to be the center of the city for the ease of access for the people. (Sarai, 2010)

It should be considered that the significance of bazaar is not the main element of Islamic era in Iran, but the element of bazaar was around since the Achaemenid era and it has transformed in shape during time. However, what is considered as important in bazaars of the Islamic era are two major points. During this time: 1. Bazaar is categorized no based on class, but based on professions, and 2. The passages of the new bazaars are formed by the professions which are new and were not available at the time. (Sarai, 2010).

6. Conclusion

Urban identity is a multidimensional phenomenon which is based on the distinction between self and others and it includes a range from culture to various levels of urbanism system; hence, based on the interaction of the conceptual system, the social and cultural system of the surroundings is formed which is always changing and developing; that is, in a descriptive approach, Iranian-Islamic urban identity has found its identity among the three corners of Islamic, ancient or ethnic and urbanism system identity sources during the historical development of the city in the proportion which it has created among historical and Islamic cities. It should be considered that Iranian urbanism has had a physical system during history due to its geographic situation that is located among various ethnicities and nationalities, that could have a social control. Urban order is a subjective and inferential issue which indicates the relation type between elements.

What is inferred from studying Islamic city in retrieving Iranian-Islamic identity is a common organization which appears in presentation of Islamic city and cities before it. The structure of center, surroundings and the relationship between the components, are considered as three main elements of Iranian-Islamic city spatial system and their identification is carried out beyond the shape properties of Islamic city.

The general physical design of Islamic city is formed based on the materialistic and spiritual needs of people's culture. Hence, the components of Islamic city were designed based on the spatial system of Sassanid era city which was mainly designed to protect the city enforcements. Yet, it is emerged in Iranian-Islamic city without the need for social control (on comparison with the control power considered in Sassanid government). The current city became an element of spatial justice in Islamic city due to its physical properties and considering this type of physiques being borrowed from Sassanid city, which could be said that in Iranian-Islamic city the north and south does not have any meaning, the concept of up and down did not have any

meaning either. Neighborhoods had their own specifications and facilities and they were independent. This system is considered as a set of semi-independent components whose elements transform the complex to a united whole in a goal-oriented order.

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Evaluating Gender Based Behavior in Historical Urban Public Place

Case study: Grand Bazaar, Kerman, Iran

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Abstract

The study evaluates the spatial behaviors of women in urban public place through ‘fear of crime’ and ‘public place functionality’ factors; by using direct observations and questionnaire within the Grand Bazaar as a historical urban public place in the center of Kerman, which is located in the Southwest part of Iran. The study provides a particular perspective to the analysis and understanding of how women make decisions and behave in a spatial setting based on environmental psychology studies. This study applies combinational research methods including qualitative and quantitative approach, including analytical, descriptive, correlation, and logical reasoning methods. This study also conducts direct observation in order to search the strengths and weaknesses of Grand Bazaar as a public place. The results of the study reveal that there is a significant correlation between fear of crime and women’s environmental perception of Grand Bazaar. Furthermore, the research findings indicate that the anxiety of being in less crowded parts of Bazaar is more tangible among women than men. On the other hand, the results show there is a significant correlation between time periods and women’s activities in Grand Bazaar.

Keywords: public place, spatial behavior, fear of crime, Environmental psychology, public place functionality.

Introduction

Altman & Zube in (1989) refer to the three critical human dimensions that every public space should provide; “the user’s spatial rights”, “their essential needs” and the meanings they seek. Regarding the equal spatial rights and fulfilling user’s needs, Franck & Paxson (1989) mentioned that with considering the women presence and usages of public spaces, there are visible discriminations on women’s rights and their satisfaction within public spaces. On the other side looking to the spatial behavior patterns of human, it shows that women behaviors in public spaces are affected by very deeply rooted psychological, social, and cultural environmental factors, which are created and nourished by societies. Although, the recent consideration of gender issues in designing new public spaces and places increased, and more women are using them frequently and freely, but still in some cases it seems there is an obvious difference between men and women spatial behavior in public spaces; and it requires more detailed investigation in order to conduct gender-based behaviors. Furthermore, systematic observations, applying questionnaires in case study indicate that there is a significant difference between women and men spatial behavior within the historic urban public place of Grand Bazaar in Kerman province.

1. Public Places and Spatial Behaviors

According to (Carr, Francis, Rivlin, & Stone, 1992) public spaces and places offering “an image of accessible urban, suburban, rural, and wilderness landscapes. The term “public” connotes the idea that these settings are accessible to everyone-people of a community, state, or nation, regardless of age, gender, ethnicity, physical handicap, or other characteristics.” Public spaces can stay as a common ground, a place where people can build their communities by carrying out their functional and ritual activities. These activities can take place as daily routines or in periodic festivals. Public spaces are also hosting more “private” activities as well;

such as selling and buying things, exercising, gardening, or simply finding a place to exist. (Altman & Zube, 1989)

The notion of public spaces is based on “daily interactions and activities” between people, and physical structure of public spaces. However, these activities and usages can be restricted by economic, social, cultural, and other constraints. Each one of these factors is defined as “hidden” structures of public spaces; therefore, there is a need to examine and elaborate them as a contextual dimension of behavior. (Golledge & Stimson, 1997).

furthermore, each public place should be defined according to first, which type of behavior is associated with or it may happen on that place, second how the physical parameters of that place are organized, and third “the descriptions, or conception which people hold of that behavior in that physical environment.” (Canter, 1977) In this vein Dovey (1985) also specified that space holds ideas of “the interaction between people and a physical setting together with a set of meanings that both emerge from and inform this experience and interaction. (p. 94)”

Public place by definition is part of “public realm”; and public realm itself is considered as a set of behavior settings (Lang, 1987). According to behavior settings, public places consisting of a recurring (or standing) behavior pattern, a milieu (pattern of built form) and a time period. This “milieu” has the affordances to let the behaviors to occur. Each and every public place have their own patterns of behavior settings, it means that what will happen in each place depends on motivations, predispositions, competencies and knowledge of people involved. Therefore, the same set of build form (environment) may produce different behavioral patterns due to different users, different times of a day, week, or a year; also may some of them be occurring often time on a daily basis or even throughout the day or year, while others may occur only on special occasions (Lang J. , 2007).

Generally, in order to examine human – environmental settings, there is a need to consider all applicable variables and their functional relationships. These variables can consist of the

physical and the built aspects of the environment, culture, social, and political systems of societies; also the other variable which is affecting spatial behavior is, “environmental psychology”, this factor intervening and affecting the process, a human perceives the environment and acts within it.

However, these variables and process of their effectiveness are varied in each case due to different types of users in place. Therefore, it is necessary to narrow down the type of users and the context that these interactions take place. The study concern to focus on What are the hidden parameters that are defining and coding women’s certain behavioral settings in public spaces, in an Islamic historical context.

In this manner, Franck & Paxson (1989) refer to the importance of understanding the context within which women do (or do not) use public spaces. Many of these contexts, do restrict women activities and do confine potentially positive aspects of their experiences. Women can use and enjoy public spaces alone without being accompanied by men, only if they overcome different obstacles and following specific restrictions. Men also may have some limitations, but this situation is different for women as it is more concern about fear of crime, in particular places and times. Still, women don’t have the same “freedom of street” as men have significantly. In order to increase that freedom, it is required to understand and specify the ways in which women are restricted and the reasons behind them.

For the most parts of the world, girls (then women) have been raised in a different manner, they have been expected to act differently, to have different responsibilities, and hold different attitudes than boys and (then men) in their societies. These and the other reasons cause women and men gain different attitudes, actions, and experiences toward build environments. Although knowing precisely what these differences are, they vary culturally and historically, also according to class, age, and many other environmental conditions but, the existence of powerful gender differences is universal. In order to understand any built environment, it is important to

recognize how these gender differences perceive the space, how much they have enacted the space, and how they create different needs in the built environment. The first priority of any improvement in women's lives is to examine the existence gender difference's assumptions and see whether they show the women and men's everyday lives and whether the built environments do meet women's needs. (Franck K. A., 2002).

2. Identifying Gender Differences and Women's Needs

Looking closely to the key differences between men and women, it shows men and women through their lives gain different spatial behavior in built environments. The major motives behind these differences come through first, a different process of socialization they have, second, their male and female self-identity development, and third through the labor division process. As Franck & Paxson (1989) stated how girls from an early age have been encouraged to be more physically active, to be less exploratory and more fearful than boys. On the other study, Susan Saegert and Roger Hart (1978) shows that in united states the range of girls' spatial activities beyond the home is smaller than boys' spatial activities, and girls' play is less tending to manipulate the environment. Girls also being taught to occupy less space and cross their legs (Henley, 1977). Iris Marion Young discuss that generally women control their behavior in their bodily occupation of space, keeping their arms and legs closer to their body when they are moving. Also to put less effort and less movement in their engagement with activities which require lifting, pulling, pushing, or throwing. "Feminine existence appears to posit an existential enclosure between herself and the space surrounding her, in such a way that the space that belongs to her and is available to her grasp and manipulation is constricted and space beyond is not available to her movement" (Young, 1990, p. 151). It is important to specify that, in a lifetime these apparently come "rules" are applying to the behavior of adult women in their use of public spaces.

From a wider perspective, women's restricted movement and their constriction mobility, outside a home in public spaces do not just belong to western industrialized countries, but also in some other societies. Fenster (1999) and Moser (1984) noted, that This issue even is harsher in Muslim countries where they are expected to cover themselves with veil and limit their travels outside the local neighborhood unless to have a male accompany.

The kind of actions women and men value is also related to their self-identity as men and women. Male self-identity is defined to have a tendency to disregard domestic sphere and everyday life, and instead to give value to the abstraction, business, and the public world. Nancy Hartsock (1983) argues that men see the world in two dualism oppositions – abstract/ concrete, culture/ nature, mind/ body, wherein each one of the pairs, the first member refers to the male and the second one to the female. In opposite sphere, female self-identity is defined within the context of home and family and embrace everyday life with a wide range of domestic connections and continuities (Hartsick, 1983).

2.1. “Domestic” and “Public” Realm

Gender differences have got interesting terminologies of “domestic” and “public” realm in the field of ‘environmental psychology’. Accordingly, women have been defined as domestic part of the society where they have been located at the house and being separated from the rest of the society, while men have been considering as public sphere of society where they have more chance to be integrated with the public realm of the city. Referring to Franck K. A. (2002) “The social and spatial organization of these two realms, the activities pursued, the meanings they have, and the degree to which women's movements are restricted all differ culturally and historically”, But the willing of having divided sexual environment in two asymmetrical realms of the domestic and public is not specified for certain regions on the world. It seems, this tendency has been rooted throughout the history and continues today all around the world in different forms, from many Muslim countries, to Greek villages (Hirschon, 1981), to U.S. cities

and suburbs (Franck & Paxson, 1989), and to Bedouin settlements in Israel (Fenster, 1999). This division prevents women to be present fully in the society in their high performance and their mobility in public spaces. (Franck K. A., 2002) it is also possible to say, public spaces have been planned and designed by men's public realm, therefore public spaces despite of evident present of women couldn't fully address the needs of women (Franck K. A., 2002). The specific roles have been specified for women in societies are developed and strengthened by gender base division of labor in past and present. However, women accept the responsibility for house care, child care, and elder care. In a study that William Michelson (1985) conduct on employed women and their families in Toronto, he realized, that when all the duties of being an employed woman, taking the house care, child care, commuting, and shopping together; women become a full-time worker, without any "off work" who is spending 11 hours per day around her domestic responsibilities. She will have very restricted free times for herself and her individual activities. However, this issue also affects their usage of public spaces and places; either they spent less time compare to the men in public spaces for leisure activities, or their most activities in public spaces will be specified to meet the needs of house like grocery shopping or taking their children to play or shop for them and so on. In a same line, Wilson (1991) state: "since women's 'proper' place has historically been in or near home, they generally not been welcome in public space as men, particularly when their reason for being there is not related to their homemaker role".

2.2. Fear of crime and Vulnerability

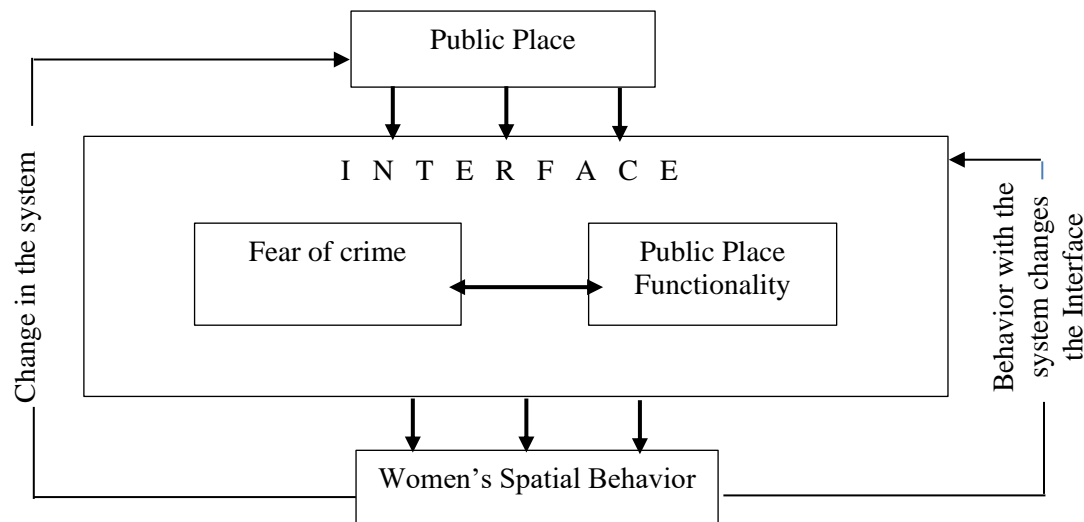
The other critical assumption in majority of studies which focused on women's usage of public spaces is "fear of crime and vulnerability" in physical environment. The studies show women's spatial behavior in public spaces are highly related to their perceptions of safety on that space. It is well defined in the sociology and criminology literatures of gender studies, that women adopt more fear of crime, and this is mostly related to their sense of physical vulnerability to

men, especially to raping and sexual murder ((Baumer, 1978); Waar 1985; and Gordon et al. 1980). On the other studies which were conducted in United State and Canada, they reveal, women have significantly more fear of crime than men (Office of Solicitor General of Canada, 1985; Riger & Gordon, (1981)) however in the real-life women are less frequently victimized of crime (except of sexual assault) than are men.

The perception of male violence in certain contexts, cause great effect on many women's use of space, in this way women accept two kinds of precautions to defense against probable dangerous situations: isolation or avoiding situations perceived as unsafe, and "street savvy" as judging carefully, and where to sit on a bus ((Altman & Zube, 1989); (Valentine, 1989)). altogether the factor of 'fear of crime and vulnerability' and in its consequence the precautionary behaviors cause women to restrict when, where, and how they move in public space ((Franck & Paxson, 1989); (Day, 1995), (Day, 2000)).

3. Study Framework

This study has shown earlier that how psychological variables are intervening between women and built environment; and their importance in expanding the behavioral outcomes of these interactions in public spaces. Conducting the spatial behavioral patterns of women in an old commercial public place (Grand Bazaar), is the main goal of this research. Among all those factors which were discussed in the literature review, this study tries to draw women spatial behavior based on two factors of "fear of crime", and "public place functionality" (Figure. 1).



The behavioral interface is in the frame, within which women shape the image of their world. Framework for investigating the behavioral patterns is based on each one of those relationships that manifest themselves as spatial movements and location decisions.

3.1. Materials and methods

The study applies combinational research methods with a qualitative and quantitative approach which include, analytical, descriptive, correlation and logical reasoning methods. The study also uses direct observations and questionnaire in fieldwork within the context of study and desk study. Accordingly, the study evaluates the spatial behaviors of women within the historical urban context of Kerman, which includes the Grand Bazaar as an urban public place. The study conducts the questionnaire data analysis, in order to measure ‘Fear of Crime’ and ‘Public Space Functionality’ factors; within the case study through which it is possible to evaluate men and women’s spatial behavior.

3.2. Data Collection and Field Study

In the field study, 40 randomly men and women have participated voluntarily; in order to have equal analysis, 20 men and 20 women were selected. All of the participants were users of Grand Bazaar, and there was not any limitation for their age, race, and their occupations. As it was

mentioned in the former section, this study utilizes the questionnaire data analysis in order to measure factors of fear of crime and functionality in public space.

The survey conducts the questionnaire data analysis to measure the fear of crime in the physical environment of Grand Bazaar, which are anxiety towards the physical and social environment, and indirect places for crime victimization. As Valentine (1989), referred to some women's 'fear of crime' measures: avoidance and isolation which involved a sense of restriction in use and occupancy of a public place. Subsequently, some of the questionnaire items were as: (1) *"Do you feel Bazaar, is a safe place for you"*, (2) *"Have you ever faced the verbal or physical harassment in Bazaar"*, (3) *"Are you more cautious while you are walking in Bazaar environment"*, (4) *"Are you feel anxious in less crowded districts of Bazaar"*, and *"I prefer to ignore the shops on dead-end paths of the Bazaar"*.

On the other side, the questionnaire tries to measures how Bazaar as a public place is successful to meet its user's social, commercial and recreational needs. In this way, some of the questionnaire items were as: (1) *"I come to Bazaar just for shopping"*, (2) *"I come Bazaar just for having a good time"*, (3) *"Are you using cafes and restaurants in the Bazaar if you were alone"*, (4) *"Are you using mosques inside the Bazaar"*, (5) *"Is Bazaar one of your meeting place with your friends"*, (5) *"Are you participating in community programs such as ,periodical festivals, matches, exhibitions, and ceremonies inside the Bazaar"*, and *"Are you spending any time in Bazaar for setting, reading, sun bathing, playing, or chatting with your friends"*.

This study uses 5 – point Likert scale (1. All the time, 2. Usually, 3. In average, 4. Rarely, 5. Almost never). Moreover, the study utilizes 'cross-tab analysis' in order to measure the mentioned factors in the questionnaire.

4. The Case Study of Grand Bazaar

Kerman is one of the Greatest cities in Iran, and it is located near the central desert of Iran. This city has a historical central core, which includes Grand Bazaar as one of its urban public

places (Figure. 2). The Grand Bazaar has two main East-West and North-South Axis. The main entrance portal of the East-West axis is located in the Arg Square (figure. 3). The East-West axis connects the Arg Square to the Moshtagh Square.

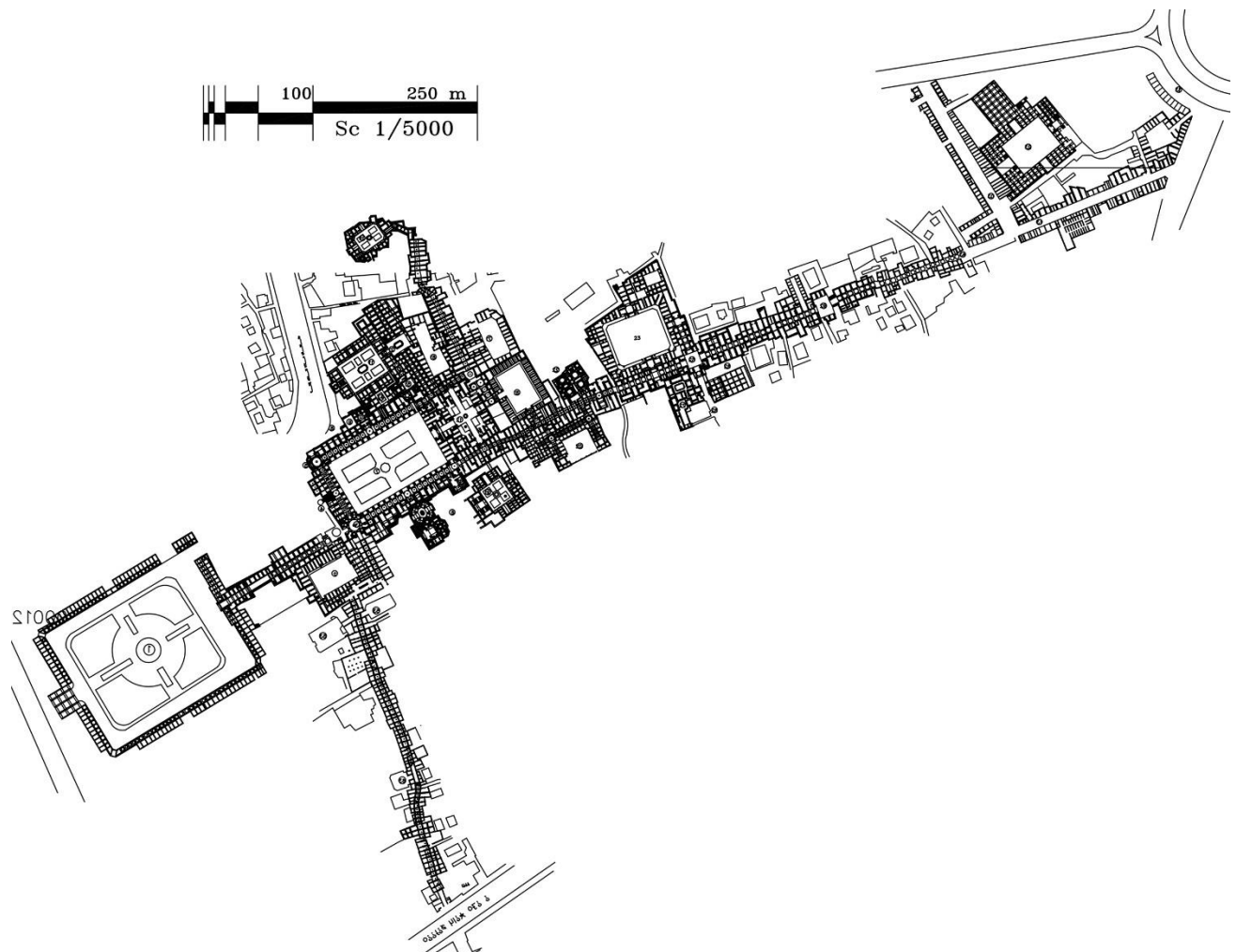


Figure 2. The map of the main of Grand Bazaar and its open public spaces



Areal image of the grand bazaar



Figure 3. Main open public spaces in the Bazaar

This Bazaar is considering the second biggest and longest Historical Bazaar in Iran after Tabriz's Bazaar. This complex in its design has all the required facilities, such as traditional Baths, traditional schools, mosques, public squares, and most importantly its commercial Axes (figures 4, 5, 6). This complex is still active and crowded today and it is representing a well-defined public place in Kerman province.



Figure 4-5. the main axis of Bazaar, including the shops and smaller sections

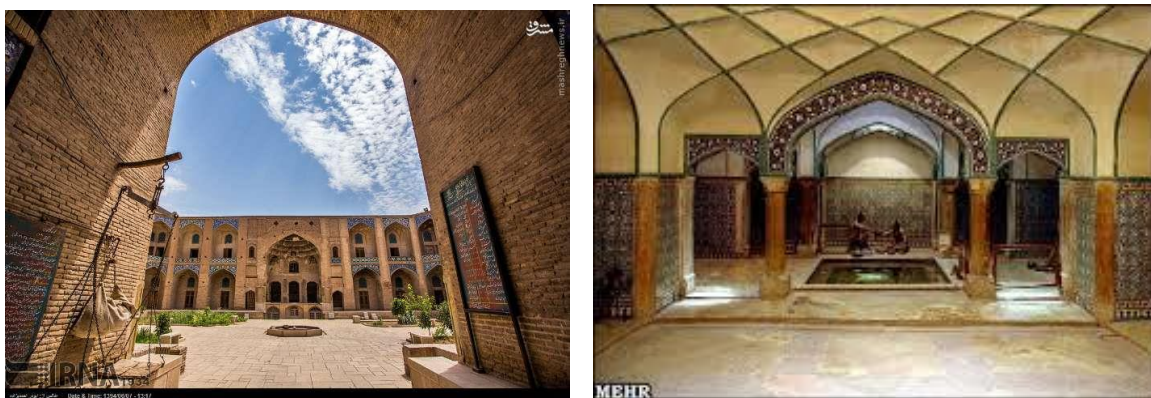


Figure 6. Public functions like the historic school and bath along the Bazar

Direct observation in Grand Bazaar indicates the strengths and weakness of the case study. Conducting direct observation in the field make it possible to extract the strength and weakness of Grand Bazaar as a historical public place; table 1 indicates the strength and weakness in terms of functional dimension, social, perceptual, and physical dimensions.

Table 1. Strengths and weaknesses of functional, perceptual, Social, and physical dimensions

	Strengths	Weaknesses
Functional Dimension	<ul style="list-style-type: none"> • Mixed- used axis of the Grand Bazaar • Multifunctional facilities • Tourism attraction for its historical monuments • Active religion centers within the Grand Bazaar 	<ul style="list-style-type: none"> • Deterioration and lack of maintenance in some neglected parts • Some parts of the Bazaar are completely abandoned
Perceptual Dimension	<ul style="list-style-type: none"> • Presence of historical buildings • The Grand Bazaar, itself as a strong path in the cognitive map of users. • Legibility, connection, and continuity of signs in the Grand Bazaar 	<ul style="list-style-type: none"> • Fear of crime within the historical context • Visual deterioration as a result of poor maintenance in some parts of Bazaar • Lack of adequate lighting in some parts of Bazaar during afternoon and night time
Social Dimension	<ul style="list-style-type: none"> • Active commercial axis • Active mosques within the Bazaar • Active schools in Bazaar • Active traditional restaurants and cafes in the Bazaar • Active community programs related to the religious ceremonies in Bazaar • Diversity of users 	<ul style="list-style-type: none"> • Immigration and newcomers in nearby neighborhoods • Lack of people participation • Lack of other social communities except for religious one • Lack of inclusive spaces for children
Physical Dimension	<ul style="list-style-type: none"> • Simple organic forms • Rhythmic and oriented axis • In closing two big public squares, and several smaller open areas 	<ul style="list-style-type: none"> • Physical deterioration within historical buildings and axis in Bazaar • inadequate seating areas in its public squares and other open spaces. • inadequate green areas in its public squares

5. Results and Discussion

As it was mentioned, the study uses 5 – point Likert scale for questionnaire data analysis; therefore, in this study in order to analyses the Likert scale type data, Spearman correlation coefficient was conducted. Table 1 shows the existing relationship among the data. First raw (A1) expresses the correlation between Genders as the main goal of this study. The other row (A3) is showing the general relations between the time of using the space and other variables. Due to the goal of this research, the data entry was conducted by giving the value 1 to female, and 0 to male participants. Accordingly, any positive correlation in the first row shows the women's agreement with the statement. And any negative correlation in the first row shows a stronger disagreement in female participant in comparison with male participant replies. Thus, if the correlation is closer to 0, it shows that the answers are very similar between male and female participates (there is no significant relationship between the given Question and gender).

In the first section of the analysis which is presented in Table 2, shows the correlations between the 'fear of crime' according to gender (A1 row).

Table 2. Spearman Correlation between Gender, time of Usage and Fear of crime

	a1	A3	A4	A5	A7	A8	A9	A10
A1 Correlation Coefficient Sig. (2-tailed)	1.000	-.098	.366**	.458**	.210	.540**	.196	-.244
		.435	.003	.000	.094	.000	.117	.050
A3 Correlation Coefficient Sig. (2-tailed)q		1.000	-.243*	.120	.142	.069	.119	-.027
			.047	.334	.256	.583	.340	.829

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

A1- Gender

A3- Time of usage (ranges from early morning to late afternoon)

A4- Do you feel Bazaar, is a safe place for you

A5- Have you ever faced the verbal or physical harassment in Bazaar

A7- Are you more cautious while you are walking in Bazaar environment

A8- Are you feel anxious in less crowded districts of Bazaar

A9- I prefer to ignore the shops on dead-end paths of the Bazaar

A10- Do use the mosques in the Grand Bazaar

The data shows a significant discrimination of female users as they report more feeling unsafe in compare with male users (A1*A4). Also, there is a strong correlation between gender and verbal and physical harassment according to this study (A1*A5), female users have reported being faced with such behavior repeatedly; as a consequence, this fear will cause their avoidance to use and participate in Bazaar as an urban public place. The female participants also feel more anxious in the less crowded axis of the grand bazaar (A1*A8); which can be another reason for them to feel uncomfortable and terrified in a public place. The A3 row shows how the time of usage affects the other variables. Interestingly, the data shows all participants feel more vulnerable as night approaches regardless of their gender.

In the second section of the analysis which is presented in Table 3, shows the Spearman Correlation between -Gender, time of Usage- and Public Place Functionality.

Table 3. Spearman Correlation between -Gender, time of Usage- and Public Place Functionality

	a1	A3	B1	B2	B3	B4	B5	B6
a1 Correlation Coefficient	1.000	-.098	.262*	-.282*	-.081	-.160	-.050	-.380**
Sig. (2-tailed)		.435	.037	.023	.523	.204	.695	.002
A3 Correlation Coefficient		1.000	-.044	-.110	-.203	-.190	.011	-.295*
Sig. (2-tailed)			.729	.378	.102	.128	.927	.016
N		67	65	66	66	66	66	66

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

A1- Gender

A3- Time of usage (ranges from early morning to late afternoon)

B1-I come to Bazaar just for shopping

B2-I come to Bazaar just for having a good time

B3- Are you using cafes and restaurants in the bazaar

B4-Is Bazaar one of your meeting place with your friends”

B5-Are you participating in community programs such as periodical festivals, matches, exhibitions, and ceremonies inside the Bazaar

B6- Are you spending any time in Bazaar for setting, reading, sunbathing, playing, or chatting with your friends

The result shows that women do not identify the grand bazaar as a place for public leisure activities (A1*B2 & A1*B6). It seems that the place feels more relative to male usage. The analysis shows no gender-related differences in using the space as a place for community, meetings, using cafes and restaurants, attending religious ceremonies, and public exhibitions, therefore, it seems that both men and women use the Bazaar in those aspects similarly. As it was mentioned in the literature review women usually use public spaces as a place for their daily outdoor activities such as shopping, the analysis shows similar results, it shows that they put less time for leisure activities and more for the functional approach of shopping. In case of time, the analysis shows that people use the space as a place for setting, reading, sunbathing, playing, or chatting with their friends in the morning, and as the night approaches people start to evacuate the place.

6. Conclusion

The overall analysis in the case study of Grand Bazaar as a public place indicates that in most parts, there is an apparent discrepancy between two genders of male and female's environmental perception and public place usages. The study shows women's fear of crime puts significant effects on their spatial behavior in public place, this issue makes them avoid and restrict their movements within Bazaar public places at specific times during the day. it should be noted that Islamic local culture of the environment also affects the self-identity of women as they are not feeling quite comfortable to reveal their expressions, feelings, and their bodily movement in urban open public places.

The other part of analysis 'public place functionality' provides an explanation for differences between two types of usage in Grand Bazaar. Women mostly as it was discussed in literature

review devote their times in public spaces to provide their house or their children's requirements, and they spent less time in public spaces for individual purposes such as chatting with their friends, seating, reading or participating in any leisure activities. However, men as analysis suggest, use the Grand Bazaar facilities more for recreational activities compared to the women's activates in this place.

Throughout the analysis, it is possible to extract patterns of spatial behavior which actually has a significant effect on women's lives formation. Therefore, this research concludes that any proposing public place design alternatives, should see women's needs in that context and decoding hidden socio-cultural parameters which makes them behave in certain patterns in urban public spaces. Meanwhile, awareness about the importance of women's usage and activities in public spaces should become the priority of urban designers and urban planners because women make up 50% of the population in each society; and good public space should be supportive and democratic to all its users.

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