

A REVIEW OF PROCUREMENT STRATEGIES TO ENHANCE SUSTAINABLE HOUSING PROJECT DELIVERY IN ABUJA

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ABSTRACT

Procurement strategies for project delivery are considered to be key to performance improvement in the construction industry. Clients, through their bargaining power, can provide incentives and rewards to encourage good performance. The need for sustainable construction, research and development in sustainability and procurement is emerging, as the bridge between design and construction, the building procurement system therefore is critical to deliver sustainability in practice. It is crucial for the successful implementation of sustainability within conventional construction processes. This paper reviews the concept of sustainability in construction and explores the internal relationship between sustainability and building procurement system, Analysis of findings from the literature revealed that, the key project parameters are; project cost, time and quality and involved construction stakeholder satisfaction. It also revealed that traditional and design and build with their variants contract procurement strategies are cost effective, time efficient and improve quality and stakeholder satisfaction. It was concluded that the perceived contract procurement approaches are effective and satisfy all the key project parameters. It is recommended that, critical understanding of clients' needs and expectations for particular construction project objectives requires a careful selection of an appropriate contract procurement strategy; thus, the adoption of a contract procurement system that best addresses project objectives must be implemented. By adopting an appropriate contract procurement method, clients can expect to achieve best value-for-money outcomes, as risks could be most effectively minimised and the occurrence of contractual disputes and cost and time overruns, would also be eliminated.

Keywords: Building procurement systems, construction, Housing delivery, stakeholders, sustainability.

INTRODUCTION

Currently, there are two common presumptions accepted by most clients and suppliers in the construction industry, globally. First, a project may be regarded as successful if the building is delivered in the right time, at the appropriate price and quality standards, and provides the client with a high level of satisfaction (Love *et al.*, 1998). Second, selecting an appropriate procurement system is key in achieving such client satisfaction and project success (Tookey *et al.*, 2001). Masterman (1992) opine that, an in appropriate procurement system may lead to cost and time overruns, claims and disputes on projects.

Contract procurement strategies have been described as organised methods or processes and procedures for clients to obtain or acquire construction products (Rashid, 2006). Apart from the traditional approach, there are now other "fast-tracking" (as the name being called) or innovative procurement systems used by the construction industry worldwide. The different procurement strategies differ from each other in terms of allocation of responsibilities, activities sequencing, process and procedure and organizational approach towards affordable housing delivery. These differences invariably have impacts on the delivery of a sustainable housing. However, the dart of uncompleted and abandoned projects occurrences requires effective contract procurement strategy to deliver projects, as buttressed by (Woodward, 2001).

In an effort to improve contract procurement performance, many new procurement systems emerged during the 1980's and 1990's, that provide better selections and flexibility. Seeley (1986) and it is crucial that clients make the right choice of project procurement method in a progressively complex condition with an extensive array of objectives and procurement systems. The construction industry is a service rendering industry in which design and production are carried out by more than one entity outside the project site. In most other industries, designs, schemes, modelling, production, fabrication, quality assurance and marketing deeds are mostly embarked on within the same organisation and site although, by diverse experts or units (Sanvido *et al.*, 1992). Under this delivery method, construction projects follow a traditional approach in which the client engages an Architect, and other construction professionals, to be in charge of the design and specification of his project. Under a dispersed bid contract, the client appoints an independent general contractor to construct the project.

Moreover, Ashworth (2006) opines that for organizations with massive, continuing volumes of project, design and build services may be delivered by public sector design expertise, rather than consulting designers, as the designers frequently serve as project managers and construction managers as the project moves through its life cycle. It is therefore vital to integrate design and construction being treated as separate entities under the traditional procurement method. Noteworthy, the different contract procurement systems contribute to the successful delivery of sustainable housings in terms of allocation of risks (environmental, economic, social – sustainability concerns), activities sequence (management integration), process and procedure and organisational approach in project delivery. Hence, an effective procurement system has to be established in order to satisfy clients and stakeholders' needs, taking cognizance of price certainty (cost – affordability), time schedule (delivering housing to scheduled time towards meeting clients' housing demands), complexity of design and many other factors.

The construction industry has a quite high rate of abandoned projects while so many completed ones have time and cost overruns (Aibinu and Odeyinka, 2006). The impacts of these in term of the delivery of a sustainable housing are quite enormous. However, several thousands of projects have been constructed and many more are still in the pipeline but the problem still seems far from being over (Kumaraswamy and Dissanayaka, 1998). Noteworthy, the contract procurement strategies adopted for construction has relationship with the delivery of a sustainable housing. In recent years, a number of alternative procurement methods have emerged so as to counter the shortfalls of the traditional system. Therefore, the researcher's interest is drawn on non-traditional methods in particular, being the alternative procurement methods gaining a lot of popularity in the construction industry. The distinctive nature of construction projects is that each project is unique; hence, there is a need for integration and coordination of all the activities involved in the construction process, before and during construction (Kumaraswamy & Dissanayaka, 1998). The significance of this study is the examination of various contract procurement strategies adopted in the construction industry for housing construction projects and to examine the impact of each of these strategies on the delivery of a sustainable housing while taking into consideration, the cost, time and quality, so as to ascertain the effective option suited, for the delivery of a housing particular project type, with a view to establish the effective strategies to procure sustainable housing delivery.

LITERATURE SEARCH

Contract Procurement Strategies for Housing Projects

The environmental, social and economic value of housings cannot be underestimated, particularly, housings that has been specially designed to improve the livability of the immediate environment is essential to building communities, improving social wellbeing and sustaining high standards of living into the future (Sutton, 2000). A well planned and managed investment in housing projects plays a vital role in supporting economic, environmental and social growth and providing capacity to meet the increasing demand for services that accompanies strong housing development (Casey *et al.*, 2014). Stressing further, an appropriate procurement strategy that establishes careful consideration and analysis of all available options will enable clients to identify the delivery model and procurement method most suitable for the project in question. By adopting an appropriate procurement method, clients can expect to achieve best value-for-money outcomes as risks will be most effectively managed and the occurrence of contractual disputes, cost and time overruns is possible to be minimized.

Hughes *et al.* (2006) posit that within the construction sector, procurement has become a complex issue, because it refers not only to what is bought, but also to a diverse array of methods for acquiring a vast range of construction products. Before developing a general view of the difference in contract procurement methods, it is advantageous to identify the main features of existing procurement approaches. Contract procurement practices in construction, are quite diverse and complex in the sense that it is quite challenging to outline the various arrangements available (Akram *et al.*, 2012). A contract is a key component of a procurement system and it is a crucial element necessary between two parties teaming up for a project. Davis *et al.*, (2008) defined a contract as “an agreement between two parties, whereby one party commits itself to deliver goods or services to a second party within a certain delivery time and for an agreed price”. Procurement is derived from the word procure, which literally means “to obtain by care or effort”. Contract procurement strategies have been described as organized methods or processes and procedures to obtain or acquire construction products (Rashid *et al.*, 2006). Contract procurement strategies identify the best way of achieving the objectives of a construction project and value for money, taking cognisance of the risks and constraints, leading to decisions about the funding mechanism and asset ownership for the project. The aim of a contract procurement strategy is to achieve the optimum balance of risk, control and funding for a particular project (Thomson and Jackson, 2007). Masterman (2003), describes contract procurement as the organizational structure needed to design and build construction projects for specific clients. An appropriate contract procurement strategy, which is typically developed during the ‘evaluation’ or ‘definition’ phases of a project, is a key determinant of successful project delivery as it is more than just a high-level plan, it details practically, the recommended delivery model to be deployed in delivering a project and it also provides clear justification for use on a value-for-money basis (Casey & Bamford, 2014).

Project delivery, as described by the Austroads Guide to Project Delivery is “the process by which the aim or goal of a project is realised or achieved” (Casey and Bamford, 2014). Successful project delivery must be supported by an appropriate contract procurement strategy to ensure the essential works and/or services are not delayed or otherwise poorly executed. Programming the development of a contract procurement strategy is thus extremely important from a project management viewpoint. To achieve optimum timing, the procurement strategy

development process should commence as early as possible in the project lifecycle, as an element of the project's 'evaluation' and 'definition' phases (Casey and Bamford, 2014).

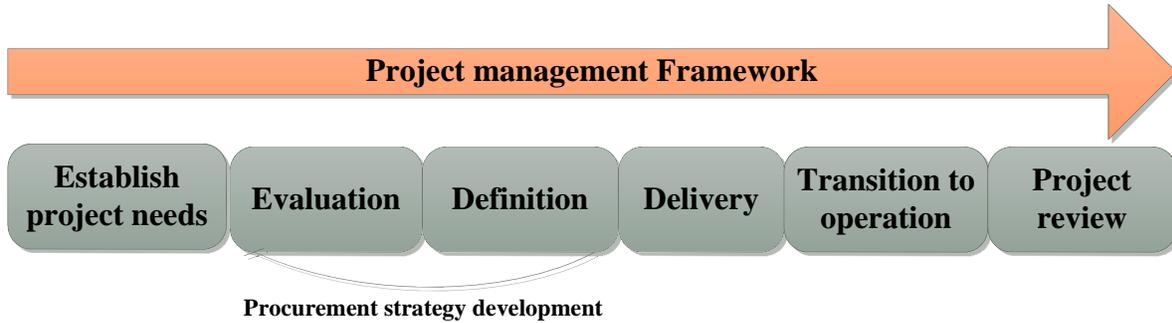


Figure 1: Procurement strategy development.

Adapted from Casey and Bamford (2014).

Furthermore, from a project management viewpoint, implementation of the recommended procurement strategy mostly begins in the project 'definition' stage, and continues through the 'delivery' stage and potentially also the 'transition to operation' phase, depending on the chosen delivery model (Casey & Bamford, 2014). Implementation of a contract procurement strategy should therefore be programmed to occur during these phases, as shown in Figure 2.

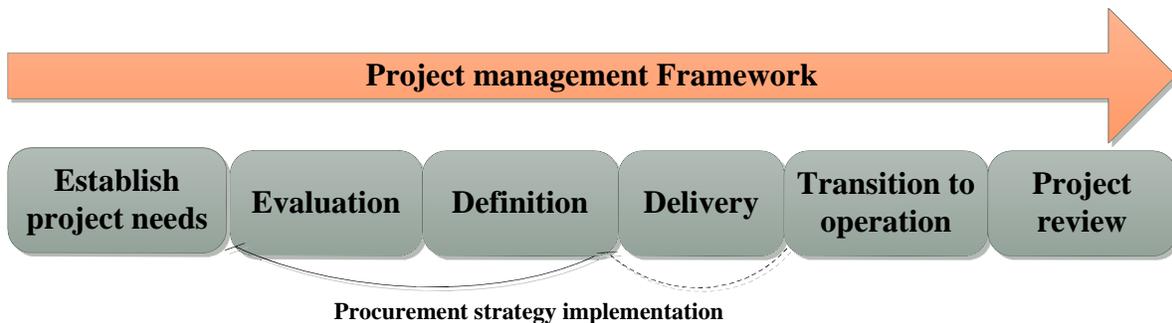


Figure 2: Procurement strategy implementation

Source: Casey and Bamford (2014).

Contract Procurement methods Effectiveness on Housing Projects.

Before developing a general view of how contract procurement approaches differ, it is vital to articulate the main features, the effectiveness and the distinguishing characteristics of different contract procurement approaches. According to Ashworth (2006), the following are the contract procurement strategies adopted in delivering housing projects in the construction sector:

- Traditional procurement method
- Design and Build procurement method
- Management contracting procurement method

- Construction management procurement method
- Project management procurement method
- Direct labour procurement method
- Labour only procurement method
- Public-Private-Partnership (BOT, DBOT, DBFO, ROT, BOOT, LROT, *et cetera*) procurement method.

Influence of Contract Procurement Strategies on the Delivery of Sustainable Housing

The influence of contract procurement strategies on the delivery of a sustainable housing is hereby analysed based on the key project parameters – cost (affordability), time and quality.

Traditional Procurement Method

Cost

Rashid *et al.* (2006), posit that traditional method of contract procurement provides cost certainty to clients at the early stage of the project; also, traditional procurement method gives clients stable price in the sense that the design and complete working drawings of the project have been fully developed and detailed out prior to tendering. Rashid *et al.* (2006), stressed further that the traditional procurement method eliminates design and construction vagueness that could make contractors inflate construction sum pointlessly.

Time

Traditional procurement method has the slowest delivery approach due to the linear or sequential process of activities (Olabode, 2012). However, Rashid *et al.* (2006), claims that the traditional procurement strategy is preferable to the other alternative strategies in the sense that it provides accountability and better design and construction control by the client, that is, there is ample time for the client and the project team to examine and evaluate the design before construction.

Quality

Ogunsanmi *et al.* (2003) is of the opinion that the traditional procurement method provides a high standard of quality, as it creates an opportunity for the client to syndicate the best design and management expertise between professional consultants and the contractor.

Design and Build Procurement Method

Cost

Masterman (2002) notes that although the construction cost is fixed at the tender stage and subject to design changes, the cost incurred in construction while adopting design and build procurement method is often higher compared to the cost incurred using the traditional procurement method. Rashid *et al.* (2006) posit that lack of design and specification details during tender has made the contractors inflate the construction sum to cover for all uncertainties

that could arise during the execution of the project unless there are variations instructed by the client.

Time

According to Griffith and Watson (2004), design and build procurement method is mostly called “build-it-fast” project delivery system as the design and construction phases are integrated. Design and build method allow design and construction process to run in parallel, thus, reducing the overall construction period considerably (Rashid, *et al.*, 2006).

Quality

The integration of design and construction allows the contractor to utilize his knowledge and experience to develop a more efficient design and construction control programme, as a result, it allows the contractor to be innovative in improving the construction process and techniques, hence, provides a good quality standard (Turner, 1997).

MANAGEMENT CONTRACTING PROCUREMENT METHOD

Cost

Ramus *et al.* (2006) stressed it that the cost incurred in executing construction projects with the adoption of management contracting method tends to be lower than using other procurement approaches as this is due to the fact that the cost of the project is actually the sum of prices quoted by the work contractors.

Time

Management contracting procurement method allows early commencement of construction work at the same time improves constructability in the sense that the management contractor has d knowledge, experience and competency to effectively manage the design and construction of the project (Masterman, 2000). According to Turner (1997), management contracting procurement method allows for effective and efficient coordination of construction works, construction resources – materials, manpower and machinery, thus, considerably reducing construction period compared to other procurement methods.

Quality

The management contractor is more concerned with the standard and quality of work carried out by various work contractors as the proficiency of the management contractor in selecting durable materials ensures efficient quality on the project and as such, provides better project quality (Ramus *et al.*, 2006).

Construction / Project Management Procurement Method

Cost

Ramus *et al.* (2006) opines that there is typically no fixed cost at the commencement of the project except a cost plan prepared by the Quantity Surveyor and during project execution phase, the cost plan could increase or decrease in the anticipated trajectory, thus, close cost monitoring must be ensured so as to prevent cost overrun.

Time

The whole construction work is divided into a number of smaller work packages, tendered for and constructed in accordance with the project programme, hence, construction work can

commence as early as design information is available takes off as early as design information is available, taking cognisance of project duration (Masterman, 2003).

Quality

Construction / project management procurement method allows design change fairly late into the programme and as such, enhances better work quality, provided the design change does not affect that which had already been built (Ramus *et al.*, 2006).

Direct Labour / Labour only Procurement Method

Cost

Olabode, (2013) claims that direct labour and labour only procurement method is a cost saving strategy, as the client purchases all the necessary construction materials from inception to completion and pays all labour employed and there is usually no contractual obligation.

Time

Tendering and negotiation process is not necessary as the procedure for carrying out construction works is majorly simplified, thus, reduces construction period substantially (Adenuga, 2013).

Quality

Iyagba *et al.* (1995) and Kadiri and Ogunsanmi (2003) posit that labour employed directly by clients eases client's communication problem, thereby promotes effective working relationship and environment, thus, controls quality.

PUBLIC-PRIVATE PARTNERSHIP

Cost

The close collaboration of the design and construction team results in more excogitative and less expensive designs, hence, the total costs of services rendered by construction professionals such as supervision and reviews and contract management activities, can be abridged (Sydney, *et al.*, 2014); Edwards & Hardcastle, 2000). Private partners utilize economies of scale, excogitative technologies, procurements and compensation that are more pliant, thus, reduce overhead, facilities maintenance or operating costs (Sydney *et al.*, 2014; Li *et al.*, 2005).

Time

PPP model offers both the public client and private contractor freedom to choose excogitative methods in the provision of assets and services and this leads to time saving because it accelerates project development by avoiding unnecessary delay in project delivery (Hall, 1998).

Quality

PPP model provides better quality standards on projects through improved operational efficiency and excogitation (Sydney *et al.*, 2001; Li *et al.*, 2005).

Benefits and Shortfalls of Contract Procurement Methods on Housing Project Resources (Materials, Manpower and Machinery).

Traditional Procurement Strategy

BENEFITS

The following are the benefits of traditional procurement strategy according to (Olabode 2012; Ogunsanmi *et al.*, 2003; Ramus *et al.*, 2006);

- the employer controls the design team.
- the contractor is not asked to embark on significant design management risk; he is simply requested to build, hence, there is little or no premium as the price is competitively tried and tested.
- there is a single point of responsibility and the client has a direct relationship with the contractor as it facilitates a high level of material, manpower and machinery functionality and improves the quality in the overall design.
- traditional procurement method is a tried and test method of procurement that the construction market is very familiar with, thus, provides price certainty regarding materials and machinery acquisition.
- variations (alterations or modifications) to the contract are relatively easy to arrange and manage and has no significant influence on construction materials, manpower and machinery.

SHORTFALLS

The following are the shortfalls of traditional procurement strategy according to (Davis, et al., 2008; Adenuga, 2013; Siyabonga, 2003; Akram, *et al.*, 2012);

- design consultants are often not selected from a competitive tender, thus, results in overly conservative design specifications and increased cost of materials and machinery.
- separation of design and construction often times lead to contractual disputes on defects in design (for which the client is responsible) and/or in materials and manpower (for which the contractor is responsible).
- design is finalised before construction contract is let, thus, could be difficult and time consuming for the client to make and implement later design changes on the project.
- overall project duration is usually longer than other procurement methods as the strategy is sequential and construction cannot commence prior to the completion of the design.

DESIGN AND BUILD PROCUREMENT STRATEGY

BENEFITS

The following are the benefits of design and build procurement strategy according to (Gordon 1994; Clamp, et al., 2009; Kumaraswamy & Dissanayaka, 1998; Turner, 1997).

- overlap of design and construction activities can cause a reduction in project time and improved constructability due to the contractor's input into the design.

- use of a guaranteed maximum price (GMP) with a savings option split can stimulate excogitation and reduce time (project duration) and project cost associated with construction materials, manpower and machinery.
- the financial commitment of the client is made from the outset, hence, price certainty is obtained before construction starts, as client's requirements are stated and changes in design are not introduced.
- single point of responsibility is provided, that is, client has to deal with one firm, thus, reduces the necessity to project duration, commit materials, manpower and machinery to contracting designers and contractors separately.
- close inter-communication between the contractor's design and construction team promotes cooperation in achieving smooth execution of the contract and prompt resolution of site problems.

SHORTFALLS

The following are the shortfalls of design and build procurement strategy according to Hughes *et al.* (2006); Ramus *et al.* (2006); Robinson (1987), Turner (1997) and Akram *et al.* (2012):

- difficulties can be experienced by client in preparing an adequate and appropriately comprehensive brief as client's changes to project scope and construction resources can be expensive.
- if the contractor's organisation is relatively small, it is unlikely he is an expert on design as he is on construction, and as such, the resulting building could be aesthetically less acceptable.
- the client has no means of knowing if he is getting value for money on the project and associated construction resources unless he employs his independent advisers, thus, increases project costs.

MANAGEMENT CONTRACTING PROCUREMENT STRATEGY

BENEFITS

The following are the benefits of management contracting procurement strategy identified by (Ashworth, 2006; Hughes, *et al.*, 2006; Davis *et al.*, 2008):

- the client deals with a single entity and that enhances improved coordination and collaboration between designers and constructors and effective utilisation of construction materials and machinery.
- there is high time-saving potential on the overall project duration, as design and construction activities are overlapped.
- works packages can be let competitively at current market prices.
- roles, risks and responsibilities of all parties are clear and quality can only be controlled by the design team.
- design changes are flexible as management contracting strategy allows great scope for client changes.

- the preliminaries (machinery) and management fee can be fixed, thus, allows a degree of price certainty.

SHORTFALLS

The following are the shortfalls of management contracting procurement strategy identified by (CWMF 2008; Hughes *et al.*, 2006; Davis *et al.*, 2008):

- management contracting procurement strategy is a low risk strategy for the management contractor as there is little responsibility for package contractor default, bankruptcy, et cetera.
- although guaranteed maximum price (GMP) can be achieved on construction resources, management contracting procurement is still prime cost in nature as it is an approach that most contractors usually prefer.
- there can be substantial cost increase as there is often times a tendency for the initial cost plan to be adjusted upwards.
- close collaboration and information control is required as client must provide a good quality brief to the design team as the design will not be complete until total construction resources (materials, manpower and machinery) have been committed to the project.

CONSTRUCTION / PROJECT MANAGEMENT PROCUREMENT STRATEGY

BENEFITS

The following are the benefits of construction / project management procurement strategy stated by (Ashworth, 2006; Walker, 2015; and Masterman, 2002):

- there is reduced confrontation between the design team and the construction team.
- detailed design runs in parallel with construction, thus, shortening project duration.
- privity of contract between the client and each of the trade contractors provide the client with a readier means of redress in events of delays arising.
- client has ownership of tendering and contractual arrangement.
- there is full opportunity to package the work to suit the capability of the trade contractors and to manage on-site interfaces including construction materials, manpower and machinery.
- client has the authority to identify and act upon poor trade contractor performance.
- construction / project manager focuses more on construction programme, sequencing and buildability.

SHORTFALLS

The following are the shortfalls of construction / project management procurement strategy stated by Rawlinson (1999); Walker (2015) and Masterman (2002):

- close cost monitoring and management are crucial as there is typically no fixed cost at the start of the project except a cost plan prepared by the Quantity Surveyor, hence, as the tenders come in during the course of construction, the project cost may move above or below an anticipated trajectory.

- client bears the highest risk associated with design including impacts of late or incomplete and uncoordinated design.
- the client's financial commitment is uncertain until the last of the works contract is signed.
- the client has more numbers of contractors to deal with instead of one main contractor only.

Direct Labour / Labour only Procurement Strategy

BENEFITS

The following are the benefits of direct labour / labour only procurement strategy highlighted by Opadiran (1987); Adenuga (2013); Hardie (2007) and Kadiri, *et al.* (2003):

- there is huge financial savings on construction materials and manpower and on the project as a whole.
- project rules, conditions and effective utilisation of construction resources are set by the client.
- work hours are clearly defined.
- quality control is closely tracked.
- the labour employed provides positive input, knowing the client's specific needs.

SHORTFALLS

The following are the shortfalls of direct labour / labour only procurement strategy highlighted by (Adenuga *et al.*, 2013),

- it is time consuming and extremely stressful.
- it serves as a minefield for the inexperienced.
- materials, manpower and machinery must be provided by the client.
- control of productivity by the client is difficult.

PUBLIC-PRIVATE PARTNERSHIP PROCUREMENT STRATEGY

BENEFITS

The following are the benefits of public-private procurement strategy highlighted by Hall & Watermeyer (2015); Li, *et al.* (2005),

- PPP procurement strategy improves buildability and maintainability.
- it accelerates project development, hence, saves time in delivering the project.
- PPP benefits local economic development through the transfers of technology to local enterprises.
- PPP facilitates creative and innovative approaches, thereby enhances government integrated solution capacity.
- PPP reduces public money tied up in capital investment by solving the problem of public sector budget restraint.

SHORTFALLS

The following are the shortfalls of public-private procurement strategy highlighted by (Li *et al.*, 2005).

- much management time is consumed in contract transaction, thus, reduces project accountability.
- it imposes an excessive restriction on participation as high participation costs are incurred.
- there could be confusion on government objectives and evaluation criteria may lead to high project costs.
- the private sector bears the highest risk.

METHODOLOGY

This paper adopts a desktop review of information to examine and establish the contract procurement strategies for housing project towards the enhancement of housing sustainability. The approach aided the exploration of the perceptions of construction professionals through published expression of previous researchers on procurement strategy that best addresses project objectives. Although, this paper is an extract from an ongoing Master of Technology research, which is aimed at examining the contract procurement strategies for project delivery implemented in the construction industry and uses the results in enhancing housing sustainability, the stakeholders' satisfaction in terms of cost, time and quality is put into consideration.

PRESENTATION OF FINDINGS

The study is designed to establish the most effective contract procurement strategy for project delivery towards enhancement of housing sustainability in Abuja. From the findings, the effectiveness of the contract procurement strategies used for housing project, factors influencing the selection of a contract procurement method for housing project delivery, the influence of the contract procurement strategies on project key parameters (cost, time and quality) and the benefits of the contract procurement methods used in housing project resources (materials, manpower and machinery) are presented.

CONCLUSION

One of the objectives designed to achieve the aim of the study is the examination of the contract procurement strategies used for housing projects. This objective was achieved through the review of literature, the analysis of findings from the literature revealed that, the key project parameters are; project cost, time and quality and involved construction stakeholder satisfaction.

It also revealed that traditional and design and build (with their variants) contract procurement strategies are cost effective, time efficient and improve quality and stakeholder satisfaction. It could therefore be concluded that the perceived contract procurement approaches are effective and satisfy all the key project parameters. Findings reveal that traditional and design and build contract procurement systems are primarily used in delivering construction projects in Abuja.

RECOMMENDATIONS

The supply of housing products that are durable, obtained at optimum cost and available within the shortest time possible is described as sustainable housing; hence, the enhancement of sustainable housing delivery requires the integration of a number of factors such as project management skills (on the part of construction professionals), effective integration of construction project resources (construction material, manpower and machinery), adequate and unambiguous project briefings from the client and client team, and effective communication and feedback capabilities between the design and construction teams. Failure to effectively integrate these factors will likely result in unsuccessful project delivery in terms of time and cost overruns, leaving involved construction stakeholders dissatisfied.

Contract procurement systems in Abuja are been regulated in all facets of government by the adoption of the basic processes, the standard usual procedures and strategies for procurement systems that are fair, equitable, transparent, competitive and cost-effective when executing construction projects within the construction industry. The critical understanding of clients' needs and expectations for particular construction project objectives requires a careful selection of an appropriate contract procurement strategy; thus, the adoption of a contract procurement system that best addresses project objectives must be implemented. By adopting an appropriate contract procurement method, clients can expect to achieve best value-for-money outcomes, as risks could be most effectively minimised and the occurrence of contractual disputes, and cost and time overruns, would also be eliminated.

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