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APPRAISAL AND DESIGN OF LANDSCAPE ELEMENTS IN THE FEDERAL COLLEGE OF EDUCATION KONTAGORA, NIGERIA

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ABSTRACT

Campus landscape design, planning, and management have to do with the arrangement of both the natural and artificial features on land for resource conservation for practicable, healthy, and pleasurable functions. The culture of efficient campus landscaping, exhibited in developing countries like Nigeria is not the same with that of the higher institutions of learning in the developed countries. This study aimed at examining the condition of the landscape elements of the Federal College of Education Kontagora, Niger State, with the view to developing a culturally integrated design proposal that would be aesthetically and functionally pleasing to users. Both primary and secondary data were employed in the study. The data required for this study included satellite imageries of the campus, the topographical map of the institution, and information on the existing hard and soft landscape elements and data on users' perception. The data were analysed using descriptive approach, while JASP 0.9.2.0 descriptive software, ArcGIS 10.2, AutoCAD 2018, terra incognita, Global mapper, Sketch Up 2018, Lumion 8.0 were used to prepare the landscape design proposals for the institution. The study shows that there was evidence of present of both hard and soft landscape elements restricted to the clinic area alone, while departmental areas, staff quarters, hostel, the school library are left with little or no functional and aesthetically pleasing landscape. With respect to the condition of the hard landscape elements of the FCE, Kontagora, investigation revealed that the paved path (82.8%), road (66.7%), drainage (85.9%), waste bin (98%), parking area (90.8%) and water fountain (100%) were in poor condition, while the seat out (75.8%), signage (84.2%), and lighting (69.1%) were in good condition. The results of the condition of the soft landscape elements revealed that both the lawn (95.8%) and hedges (77%) are poor, while the trees (63.3%) in good condition. The prevalent challenges affecting landscape development in an FCE Kontagora range from funding (50%) and the management attitude (20%) to landscaping. In such regard, 83% of users are not satisfied with the condition of existing landscape elements of FCE Kontagora. With the aid of Google Earth map of the area, the topography map and the existing based map were extracted and then used in preparing the design proposal plan for FCE Kontagora campus landscaping.

KEY WORDS Campus, Design, Development, Federal, Landscaping, Planning

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1. INTRODUCTION

According to Acquaah (2002) landscaping is an art and science of developing the outdoor environment using ornamental plants, and non-plant objects components for aesthetic and other functional purposes. When it comes to landscaping, the client may choose both the aesthetics and the functionality. Landscape design, planning, and management is the art of arranging both natural and artificial features on land with consideration for resource conservation so that the resulting environment can serve a practical, healthy, and pleasurable function. By organizing places with a sufficient understanding of the fundamental principles of design, it focuses on enhancing and managing the environment (Garrett, 2002). A crucial component of our culture, landscaping contributes to the environment's quality, people's economic well-being, and their physical and mental health. Smith (2009) opined that through preserving the well-being of the biosphere, it is possible to sustain and improve the quality of human existence.

The full scope of landscape design goes beyond where trees and bushes should be placed in a particular area. It alludes to gardens, statues, fountains, water features, rocks, and carvings. Brandt & Aagaard (2012) asserted that city's development is more than just bricks and mortar, it characterized a designed to look beautiful, a large part of this goal is accomplished by blending design made with an effective and visually appealing landscape design. When planning non-residential landscaping, this user requirement should be taken into consideration. In workplaces and other indoor open areas, plants are utilized to enhance the facade of buildings and to provide beauty. The needs of the user are important to the designs usefulness when developing a non-residential landscape (Acquaah, 2009; Brandt & Aagaard, 2012).

Planning for the landscape is one of the requirements for environmental sustainability. It is connected to horticulture, landscape architecture, planning, and environmental management. It is also referred to as site beautification. In order to improve the quality of the environment, the process involves articulating the use of existing open spaces (Abu-Ghazzeh, 1999). Abu-Ghazzeh said that landscaping is a human endeavour that attempts to improve the quality of the environment and promotes harmony between the human mind and body.

Landscape planning, according to Brandt & Aagaard (2012), is concerned with the process of creating a beautiful outdoor place in our immediate surroundings. Forman & Godron, (2001) put landscape design as a tried-and-true method that improves the sustainability of ecosystems. Simply, landscape planning is the art and science of balancing a person's vision of the natural world with his requirements. Landscape design is the systematic and functional arrangement of natural and man-made elements to bring them into harmony and to shape man's natural inhabitants to suit his needs (Brandt & Aagaard, 2012).

Thus, Basorun (2004), agreed that the relevance of plant materials, such as trees, shrubs, ground coverings, and grasses, in landscaping, are easily illustrated using shape, line, texture, and colour. All these are applied based on the needed roles or purposes, such as emphasis, softening, screening, framing, and shading, they are employed in various design contexts. For the enclosure, surfacing, and transmission or circulation inside and between the areas supplied, man-made structural elements are utilized.

The study by Gobster (2007) admitted that human landscape perception, cognition, and values are all closely related processes, which influence human aesthetic experience. Landscape aesthetics value, therefore, has evolved into one of the most significant socio-ecological research issues and has also gained significant respect in the public perception. As such, the functions of landscape design have evolved into a key idea in policymaking. Making the best decisions on the allocation and management of various land use choices and services, involves a number of diverse groups of specialists, including politicians, urban planners, urban managers, and landscape architects (Bills & Gross, 2005).

Different institutions, including universities, colleges, polytechnics, hospitals, research facilities and barracks are known to be well landscaped. Usually, institutional, landscape is meant for all categories of users, that is, the general public of all age categories: children, adolescents, adults, women, men, students, lecturers, and non-academic staff. Institutions landscaping must be different from others because it is not only for recreation purposes or for picnics, but also for instructional purposes (Oduwaye, 2009).

Dober (2012) claims that the process of designing a campus's landscape involves a number of crucial steps, including environmental impact assessments, campus master plans, long-range development plans, and landscape plans. To provide campus-wide physical and aesthetic coherence, a campus landscape master plan offers the general direction for landscaping initiatives. It provides important landscape concepts for the campus design in particular, as well as suitable locations for development. In a nutshell, a master plan offers a strategy for academic institutions' missions, aims, and objectives (Bills & Gross, 2005). The evolution of any campus is profoundly impacted by open space. These areas should be planned in accordance with the diverse activities and interactions that occur amongst visitors, since they contribute significantly to the unique qualities of the campus.

Development of a convenient and suitable environment for a higher institution of learning in most developed countries through the use of landscaping is something of higher interest. A well-organized campus setting, provided with sufficient open spaces and other

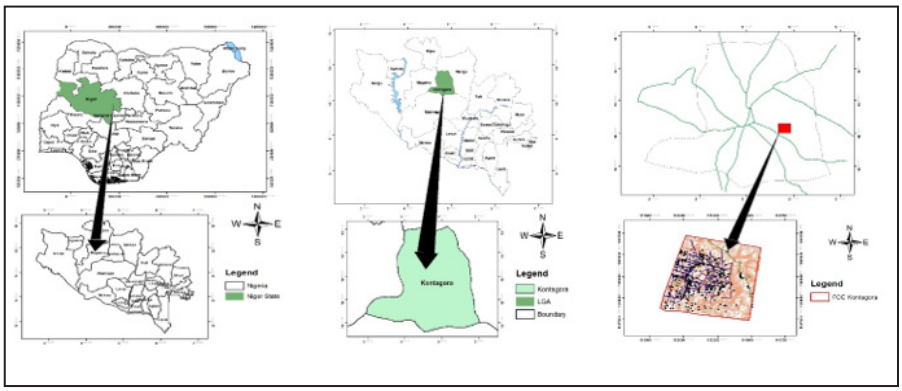
environmental needs is part of the necessary ingredients needed to enhance learning for students. Students realize the physical campus environment first when they visit a school even before enrolled, and the campus setting is remembered as a memorable experience after leaving a certain institution (Smith, 2009).

Campus landscape is the network of external and outdoor areas found on college campuses that organize and link buildings, serve and benefit students, staff, and visitors in various ways, and are generally used for recreational purposes, moreover, to serve as a representative of higher education (Berry, 2012). The culture of efficient campus planning and landscaping that are exhibited in developing countries are not the same with higher institutions of learning in Nigeria, particularly, in the schools in Niger State as an example, as the management of the institutions gives little or no attention to the landscape of their campuses. For this exercise, the existing landscape elements of the Federal College of Education Kontagora, Niger State are considered with the view to developing a culturally integrated proposal that will aesthetically and functionally pleasing to users.

2. STUDY AREA

The Federal College of Education Kontagora is situated in latitude 50E and longitude 100 N of the equator. The institution has a total land area of 447 hectares which is approximately 1020 acres. It is situated in the southern area of Kontagora town, and to the west of Bolo-boo Road. The Bolo-boo water works is 2km away from the college. To the north of the institution is a power station and to the east is a Gwagwara community. Historically, the Federal Advanced Teacher`s College (FATC) at Kontagora which is now referred to as the Federal College of Education was established in 1978.

Figure 1: The study area in context of the country, local government, and the FCE Kontagora campus.



3. METHODOLOGY

Both primary and secondary data were used in this study. The data employed in this study include satellite imageries, existing hard and soft elements of landscape, and existing physical characteristics of the area, users' perception, and topographical map. Table 1 presents the process and methodology for the study. Data collected were analyzed using JASP 0.9.2.0 descriptive software. While ArcGIS 10.2, AutoCAD 2018, terra incognita, Global mapper, Sketch Up 2018, Lumion 8.0 were used to prepare the landscape design proposal for the institution.

Table 1: Methodological Approaches to the Study

Objectives	Description of Data	Instrument
Identification of the appropriate landscape elements.	Existing physical characteristics of the study area on hard and soft elements of landscape.	Field survey and observation
Examination of the existing physical condition of landscape elements.	Data on existing condition hard and soft elements of landscape.	Questionnaire
Assessment of the challenges affecting the development and management of landscape.	Data on existing challenges affecting the progress of landscape in the campus.	Questionnaire
Preparation of proposal for the landscape construction	Satellite imagery Topographical map	Computer Aided Design and GIS

4. DISCUSSION OF RESULTS

This section presents the existing landscape elements, physical state, the user's perception toward the existing landscape as well as the challenges associated with the development and management of landscaping in Federal College of Education Kontagora.

4.1. Existing Landscape Elements

Table 2 reveals that both hard landscape elements (paved roads, drainages, street lights, site furniture's, parking spaces and water fountain) and soft landscape elements (trees, lawns, hedges) that are present in the study area, but it is important to note that these identified landscape elements are not evenly distributed to the entire area, they are restricted to the clinical area, department, staff quarters, hostel, school library are left with little or no functional and aesthetically pleasing landscaping which is important for better relaxation and comfortability after academic activities. This implies that the existing landscaping in the Federal College of Education Kontagora is biased since it restricted to certain areas which is not functional for the functional and aesthetical pleasing working environment the existing landscaping is expected to create for the users (visitors, academic staff, non-academic staff, and student).

Table 2: The Existing Landscape Element in Federal College of Education Kontagora

Type	Names	Description
Soft landscape	Trees	Palm, Mango, Cashew, Neem tree, Shea butter tree, Gmalina, Butterfly Palm, Masquerade tree
	Lawns	Axonopus (grass carpet)
	Hedges	Duranta Goldiana, Duranta Rapens
Hard landscape	Drainages	along paved road and building 0.7m wide
	Paved road	10m collector access, 8m road to provost office, departments, library school clinic, staff quarters and student hostel access to car park respectively covering 0.6 hectares
	Parking area	4 parking areas of different capacity within the school with total area coverage of 0.4 hectares
	Site furniture	include 19 sign boards,64 solar power kind of streetlights were accounted for, 5 sit out and no collective refuse point (drum for refuse dump or public basket)
	Fountain	No fountain was accounted at the study area.
	Path	2.0m walkway within the provost office with total area covered of 0.1 hectare

4.2. Physical Characteristic of the Existing Situation of Campus Landscape

4.2.1. HARD LANDSCAPE ELEMENTS

Table 3 shows the condition of hard landscape design elements in the study area. 65.4% of respondents identified that the paths condition is very poor, 18.3% are in poor condition, 10.0% are in good condition, 5.4% are in very good condition and 0.8% of pathways are in excellent condition. 4.6% of the roads are in very poor condition, 62.1% are in poor condition, 24.6% are in good condition, 6.2% are in very good condition, 2.5% of roads are in excellent condition. A total of 38.8% respondents identified that the drainages are in very poor condition, 47.1% are in poor condition, 7.9% are in good condition, 4.2% are in very good condition, and 2.1% are in excellent condition.

For the hard landscape elements, this implies that the condition of most of the footpath, road, and drainage are poor, while the seating, signage and lighting are considered good. Invariably, the condition of the waste bin, parking area and water fountain are poor.

Table 3: Users' Perception on the Hard Landscape Elements Condition Assessment.

Condition	Path		Road		Drainage		Seating		Signage		Lighting		Waste Bin		Parking		Water Fountain	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
V. Poor	157	64.5	11	4.6	93	38.8	9	3.8	3	1.2	7	2.9	142	59.2	56	23.3	217	90.4
Poor	44	18.3	149	62.1	113	47.1	23	9.6	16	6.7	31	12.9	86	38.8	162	67.5	23	9.6
Good	24	10.0	59	24.6	19	7.9	138	57.5	169	`70.4	92	38.3	9	3.8	12	5.0	-	-
V. Good	13	5.4	15	6.2	10	4.2	44	18.3	33	13.8	74	30.8	3	1.2	6	2.5	-	-
Excellent	2	0.8	6	2.5	5	2.1	26	10.8	19	7.9	36	15.1	-	-	4	1.7	-	-
Total	**240**	**100**	**240**	**100**	**240**	**100**	**240**	**100**	**240**	**100**	**240**	**100**	**240**	**100**	**240**	**100**	**240**	**100**

In addition, 3.8% admitted that the sit-outs are in very poor condition, 9.6% are in poor condition, 57.5% are in good condition, 18.3% are in very good condition and 10.8% are in excellent condition. 1.2% of the existing streetlight are in very poor condition, 6.7% are in poor condition, 70.4% are in good condition, 13.8% are in very good condition and 7.9% are in excellent condition. About 59.2% identified that the waste bins are in very poor in condition, 35.8% are poor, 3.8% are good, 1.2% are very good and no existing waste bin is in excellent condition. Also, 23.3% identified that the parking spaces are in very poor condition, 67.5% are poor, 5.0% are good, and 2.5% are very good and 1.7% are excellent. Over 90.4% users agreed that the water fountain is in poor condition.

4.2.2. SOFT LANDSCAPE ELEMENTS CONDITION

From Table 4, the condition of soft landscape elements of the Federal College of Education Kontagora indicates that over 40% of the respondents asserted that the tree condition is very poor, over 50% are good, and 2.1% are excellent. A total of 90.1% of the respondents accepted that the lawn's condition is poor, 3.4% adjudged it to be good, while. In the case flowerbeds, 77% of the respondents certified that the condition is poor, while 21.3% of respondents agreed it was good.

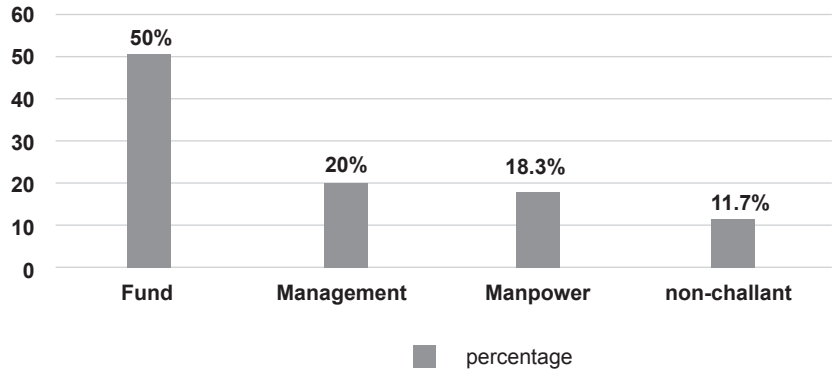
Table 4: Soft Landscape Elements Condition based on users' Perception

Condition	Tree		Lawn		Hedges	
	F	%	F	%	F	%
V. poor	21	8.8	174	72.5	58	24.1
Poor	67	27.9	56	23.3	127	52.9
Good	109	45.4	7	2.9	33	13.8
V. Good	38	15.8	3	1.3	18	7.5
Excellent	5	2.1	-	-	4	1.7
Total	**240**	**100**	**240**	**100**	**240**	**100**

4.2.3. CHALLENGES OF LANDSCAPING IN THE STUDY AREA

Figure 2 revealed that 50%of the respondents opined that funding is a major factor responsible for the setback of landscape development, 20% admitted that management, 18.3% manpower and technical know-how and 11.7% nonchalant attitude of users.

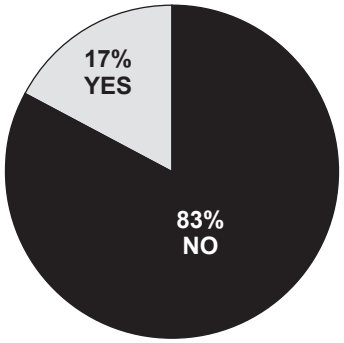
Figure 2: Challenges of landscaping development in FCE, Kontagora.



4.2.4. SATISFACTION OF THE EXISTING LANDSCAPING CONDITION OF THE FCE KONTAGORA CAMPUS

This represents the user's satisfaction of the landscaping condition in the Federal College of Education Kontagora.

Figure 3: The user's satisfaction of the existing condition



5. LANDSCAPE PROPOSAL OF THE FEDERAL COLLEGE OF EDUCATION KONTAGORA

5.1. Existing situation

The existing situation of the institution is presented in Figures 4 – 7.

Figure 4: Satellite Image of the FCE Kontagora

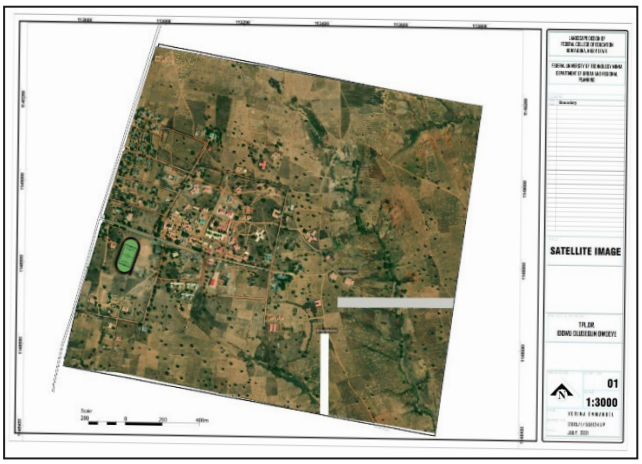


Figure 5: Digitized Map of the FCE Kontagora

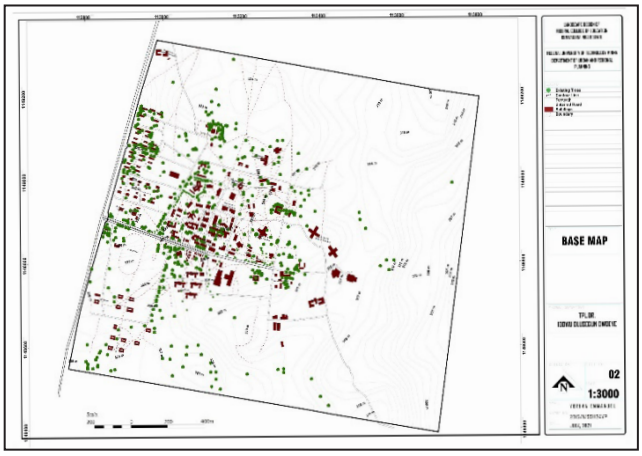


Figure 6: The topo-map of the FCE Kontagora

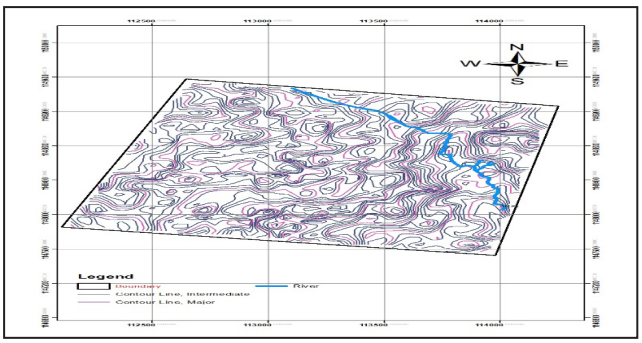
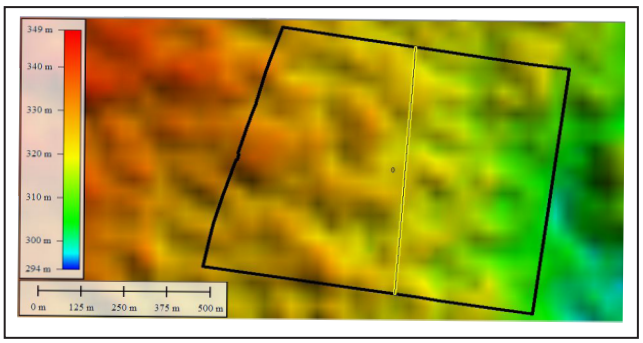


Figure 7: Section of digital elevation model (DEM)



5.2. Proposal Planning and Design Principles

The design proposal considers both the landscape requirements and the basic principles of landscaping that are useful in proposal development and construction.

- User's requirement: The experience and needs of users (visitors, academic staff, non-academic staff, and student) are highly considered to make the view interesting.
- Scale: The size of the elements in the design is directed as appropriate to enhance aesthetic in the environment.
- Balance: The reaching of equilibrium on both sides of a focal point through arranging, placement and distribution of landscape element, that is, colour composition, shape or form.
- Unity: Monotony is to be avoided through the medium contract within the overall unity.

5.3. Soft Landscape Planting Considerations

These following criteria will initiate the planting design at different phases of the proposal:

- Plant material relates to the type, height, growth rate, and physical, botanical characteristics of the plants in design.
- Air quality involves the ability of plant to filter the air that is contaminated as a result of man's activity that pollutes the air.
- Availability of water is essential for the growth of the proposed plants.

The functional aspect of the plant as it relates users' well-being and psychology involves the improvement of the existing environment through the creation of organized open spaces with adequate site furniture's (seating, lighting, waste receptacles, signage etc.) and to also expand mans-nature interaction. Other considerations for proposal development include:

- Condition of the soil
- Availability of sunlight, this criterion is also essential for the growth of plants; therefore the growth of plants in the design will be directly related to sunlight's availability in an organized space which may be partial, complete shade, full sunlight, and predominant shade.
- Planting for shelter and soil conservation
- Maintenance, the success of the planting is directly attached to the growth of the plant over a stipulated period. Therefore, maintenance is a component of the design.

5.4. Tree Planting Arrangement

Basically, three types of trees were proposed (short, medium, and tall), (Table 3). The selection and allocation of these tree species in the proposed landscape plan are based on its function, carbon sequestration and height (short, medium and tall). The arrangement is considered within: A- academic area; B- residential area; C- administrative area; D-; the gardens and E-parking lots.

Table 5: Trees Specification for Various Areas

Scientific Name	English Name	Common Name	Uses	A	B	C	D	E
Azadirachta Indica	**Neem Tree**	15-20m					*	
Cocosnucifera	**Coconut Palm**	5-6m					*	
Syagrus Romanzoffiana	**Queen Palm**	15m		*		*	*	
Magnifera-Indica	**Mango**	13m					*	
Anacardium	**Cashew**	14m					*	
Euphorbia Spp	**Anti-Snake**	2-3		*	*	*	*	
Thuja Occidentallis	**Green Giant**			*	*	*		
Arauca Riaceae	**Christmas**			*	*	*	*	
Terminalia catappa	**Umbrella tree**	India almond	Shade tree in landscaping				*	
Antiaris toxicana	**AntiarisAfricana**	Satellite, Bark cloth tree	Shade tree in landscaping and avenue tree	*				
Delonix regia	**Flame of the forest**	Poinciana, Bark cloth tree	Shade in landscaping, flowering tree	*	*	*	*	
Roystonia regia	**Royal palm**	Cuban royal palm	Spot plant, avenue plant	*			*	*
***Aracaria araucana**	**Alcaria**	Alcaria, monkey puzzle	Spot plant in landscaping					
Ficus elastic	**Rubber plant**	Rubber plant	Shade, spot plant				*	
Syagnis romanzoffiana	**Kings palm**	Cocos palm	Shade, avenue plant	*				
Dypsis decaryi	**Triangle palm**	Palm	Shade, avenue plant				*	
Caesalpinia pulcherrima	**Pride of Barbados**	Ponciana	Shade in landscaping, fragrant flowers	*	*	*	*	*
Plumeria acutifolia	**Frangipanii**	Frangipanii	Spot, shade tree in landscaping	*				
Cassia fistula	**Golden flower**	Golden flower	Shade, tree in landscaping					
Samanea saman	**Rain tree**	Rain tree	Shade, tree in landscaping	*			*	*

Source: Omonhinmin (2012)

5.5. Shrubs/hedges

The spices of hedges proposed as presented in Table 6 are to be planted at the resident frontage and on both sides of the routes, in such a way that their roots have less impact on the routes surface and, they are suitable for the different areas, as mentioned above.

Table 6: Shrubs/hedges specification for various zones

Shrubs/Hedge	English Name	Common Name	Uses	A	B	C	D	E
Durnta Goldiana	**(Durnta Goldiana)**			*	*	*	*	
(Ficus Benjamina)	**Star Light Weeping Fig**				*	*		
Codiaeum variegatum	**Croton Luganda**	Rush foil	It serves as hedge and spot Plant		*			
Duranta repens	**Golden dew drop, sky flowers**	Yellow bush	Hedge, floweringplant					
Casuarina eguisetifolia	**Perdester boom**	Caserina,Australian pine, iron wood	Hedge					
Thuja occidentalis	**Thuja plicata**	Red cedar	Hedge,spot, avenue plant	*	*	*	*	
Acalypha wilkisiama	**India acalypha**	Acalypha	Hedge plant					
Thevethia peniviana	**Milk bush**	Milk bush	Hedge, floweringshrub					
Pllyalthia longifololia	**Masquerade**	Police, False Ashoka tree	Multipurpose plant	*	*	*	*	*
Ixora coccinea	**Ixora Jungle Flame**	Ixora Nora, Grant (Single Ixora)	Hedge plant					
Duranta eracta	**Golden dew drop, sky flower**	Green bush	Hedge, floweringplant	*			*	
Bougainvillea spectabilis	**Bougainvillea**	Bougainvillea	Hedge and flowering climbers for covering trellies, pergolas, fence and spot plant					
Rosa Sinensis	**Hibiscus**	Chinese hibiscus, rose of China	Hedge plant					
Codiaeum variegatum	**Croton Luganda**	Rush foil	It serves as hedge and spot Plant					
Sygrus grandifolia	**Queen of the night**	Queen of the night	Hedge plant, bedding, fragrance		*		*	
Ficus aurea	**Ficus**	Finger ficus	Hedge plant Multipurpose	*	*	*	*	
Murraya exotica	**Orange Jessamine**	Murraya paniculata	Hedge plant					
Ficus aurea	**Ficus**	Green ficus, Togo ficus	Hedge plant Multipurpose	*	*	*	*	
Rosa	**Rose**	Rose	Hedge plant					
Cerus spp	**Cactus**	Cactus	Hedge, spot plant and demarcation of boundaries (Poisonous)					
Hussanada	**Queen of the Philippines**	Queen of the Philippines	Hedge plant					
Actaea pachypoda	**Eyes plant**	Dolls eyes	Hedge plant					
Pinus densiflora	**Pinus**	Japanese red pine	Hedge, spot plant					
Ixora coccinea	**Ixora Jungle Flame**	Double Ixora	Hedge plant					

Source: Omonhinmin (2012).

5.6. Lawn Grasses

These grasses are used in providing a good ground cover in an area (Figure 7). It is fast growing, resists harsh weather condition, and it prevents topsoil from washing out by wind and water. These grasses are to be planted in open spaces and recreational areas of the study area.

Table 7: Grasses Specification for Lawns

Scientific Name	English Name	Common Name	Uses
Poa spp	**Grasses**	Blue grass	Lawns
Axonopus Compresus	**Grasses**	Carpet grasses	Lawns
Festuca spp	**Fescues**	Turf grass	Lawns

Source: Kutama et al., (2015).

5.7. Hard Landscaping Elements Design: Road, Drainage, Walkways and Site furniture

The proposed design makes provision for paved roads of 10m collector and 8m/10m access road. The drainage system will be constructed in accordance with the road hierarchy since some of the existing is faced with the problem of lacks maintenance and poor connectivity. The proposed drainage for the study area should be constructed with a minimum width for access road 0.7m-0.75m and distributor 0.7-0.75m on both sides. For vehicular parking, design proposal is to enable proper shade for vehicles, to absorb air pollution and reduce the noise level, while maintaining aesthetics and quality environment. Materials to be used for parking construction include asphalt and concrete, a total of 3 additional parking spaces were proposed to the study area. With the capacity of accommodating the users and minimum of 2.4m/4.8m was used (time saver for landscape architecture) as parking standard.

The proposed landscape design provides space for 2.0m minimum and 3 m max linking different roads and buildings. Materials such as concrete finishing and pre-cast interlock, fine stone chippings are proposed to be used to organize the walkways. Proposal for concrete seat-outs in gardens, recreational area, and the commercial areas of the institution were considered. Also, street lamps are proposed on the access roads and at designated areas to enhance the aesthetic environment and improve security at night. Also sign boards are proposed at strategic points to lessen the stress of way finding for visitors who are using the study area for the first time. Waste bin is proposed also to be situated at strategic points to help manage and keep the entire environment clean.

5.8. Design Proposal Plans

The design proposed plans for the landscaping of the Federal College of Education Kontagora are presented in Figures 8–17.

Figure 8: Prepared Landscape Design

Figure 9: Provost Office, Academic Zone, and Proposed Car Park Plan Detail

Figure 10: Staff Quarters and proposed campus park

Figure 11: Academic Zone Plan Detail Plan Detail

5.9. Proposed Design

Figure 12: Bird Eye View

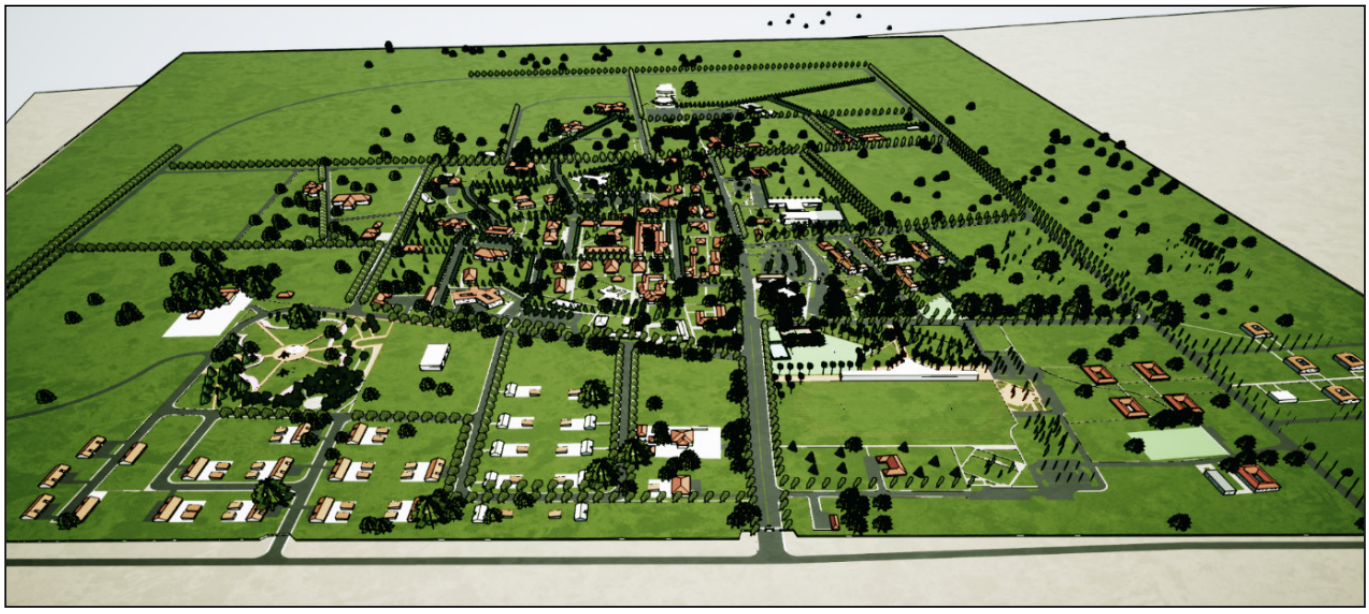


Figure 13: Academic Zone

Figure 14: Propose Car Park Details Plan

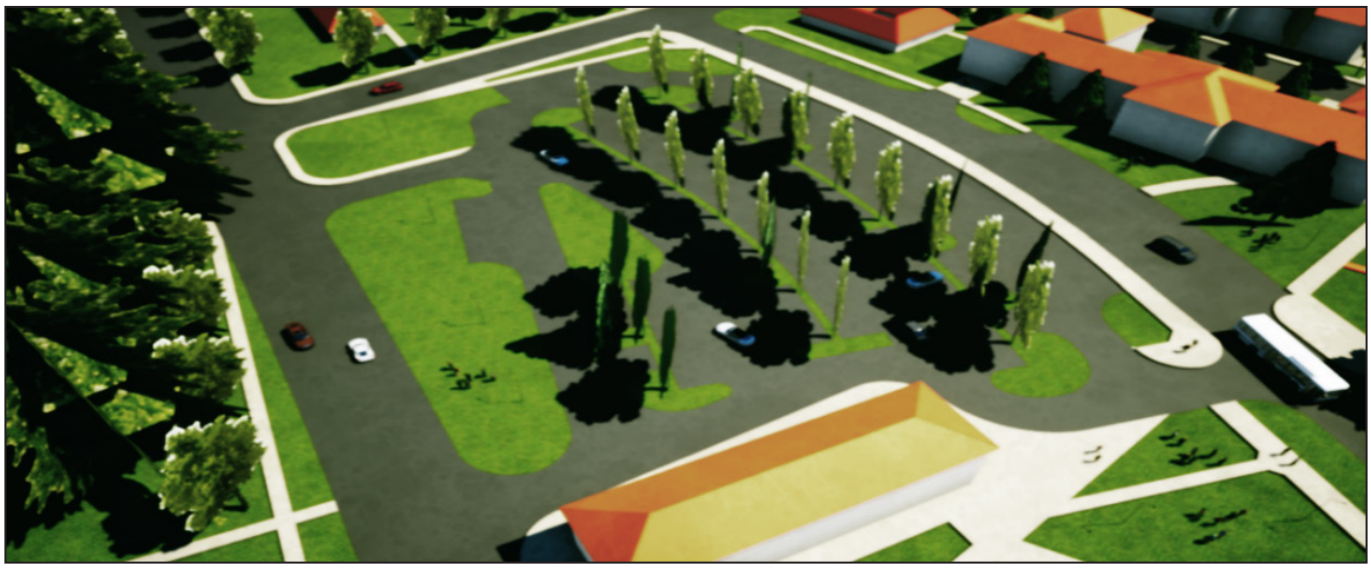


Figure 15: Proposed Garden Detail

Figure 16: Student Hostel and Sport Centre

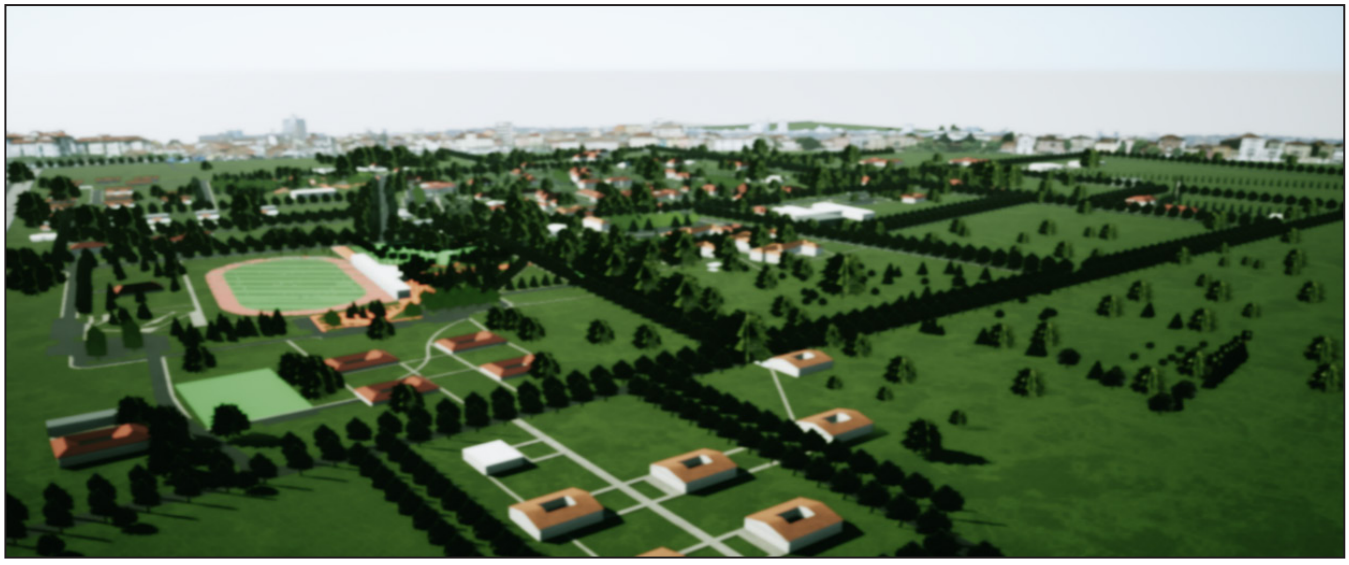


Figure 17: Propose General Car Park, Commercial Shops and Garden Detail Plan

6. IMPLEMENTATION STRATEGY

6.1. Financing

The development of the landscape of the Federal College of Education Kontagora be funded through sponsorship (federal government, institution management, public and private investors and non-governmental organizations and donor agencies).

6.2. Phasing

The proposal is considered to be implemented within a period of five years, depending on when the institution is ready to embark on the project. The phasing is divided into two categories as shown in Table 8. The construction of hard landscape elements which to take place throughout the year, while planting of trees, flowering plants and grasses to take place during the rainy season of May to October.

Table 8: Phasing

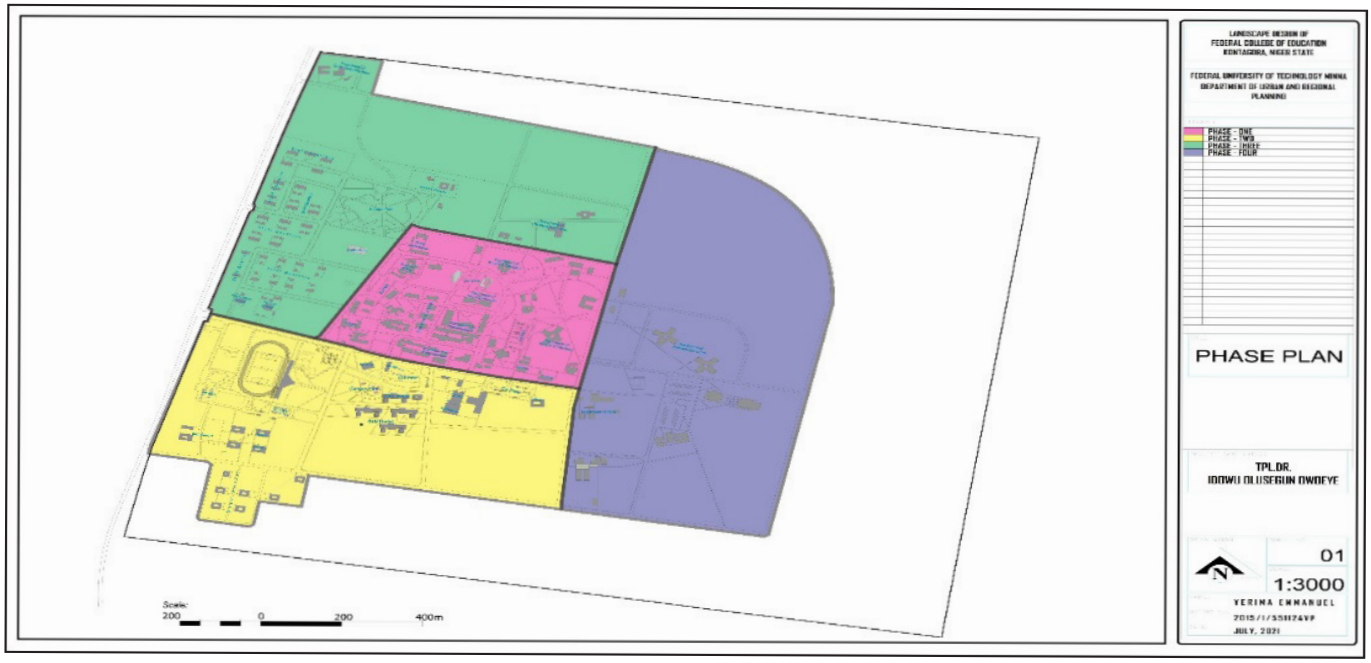
Period of implementation	Activity
January – December	Construction (hard landscape elements and site furniture)
May – October	Planting (soft landscape elements)

In the sequence of activities (Table 9), for full development of the campus landscape development, the implementation envisages a period of 20 years, which are in phases of 4 year interval for different areas of the institution; see Figure 18 for the phase plan of the proposed development.

Table 9: Sequence of Activities Using Gantt Chat

Landscape	P Phase 1 2022-2026	Phase 2 2027-2031	Phase 3 2032-2036	Phase 4 2037-2041
Development of Academic Zone				
Development of Sport Centre, Hostel, Library, Auditorium and Clinic				
Development of Staff Quarters, Garden and Guest House				
Development of Academic zone				

Figure 18: Phase Plan



7. CONCLUSION AND RECOMMENDATIONS

This study is geared towards achieving a functionally efficient and aesthetically pleasing physical environment in a tertiary educational institution. Campus landscape preserves the green environment, which is beneficial, comfortable, and aesthetically pleasing to students and other users. Based on these, the following recommendations are proffered: the proposed plan should be considered in the construction and landscaping of the Federal College of Education Kontagora. Maintenance of the landscape elements should be handled by professionals, with focus on improving landscape elements like plants, trees, walkways and fountains. The students and other users should be sensitized on the use and protection of the landscape elements.

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