Evaluation of Green Space Utilization Pattern in Private Universities in South Western Nigeria

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Being a PhD Thesis Submitted to the Department of Architecture, Faculty of Environmental Design & Management, Lead City University, Ibadan, Oyo State, Nigeria

In Partial Fulfilment of the Requirements for the Award of Doctor of Philosophy Degree (PhD) in Architecture

2024

Certification

This is to certify that Babajide Sunday ASEYAN with matriculation number LCU/PG/002887 carried out this research work titled 'Evaluation of Green Space Utilization Pattern in Private

Universities in South West Nigeria' in the Department of Architecture, Faculty of Environmental Design and Management, Lead City University, Ibadan, Oyo State, Nigeria for the Award of Doctor of Philosophy Degree (PhD) in Architecture and that this has not been previously submitted.

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Dedication

This research work is dedicated to God Almighty, my wonderful parents, beautiful wife and children.

Acknowledgement

My sincere appreciation and thanks go to Lead City University for the opportunity given to carry out my research, the university library Lead City University, Afe Babalola Univerity, Ajayi Crowther University, Caleb University, Covenant University, Elizade University and Redeemers University for their invaluable support throughout the data collection period and the opportunity to use their respective universities.

Furthermore, my appreciation also goes to the department of Architecture Lead City University, My supervisors; Prof. H.A. Ayoola and Dr. Oluwatosin. O. Ayanleke for ceaseless mentorship throughout the programme I say thank you. Also, my gratitude goes the head of department architecture Dr. O.J Obaleye for his leadership in ensuring timely completion of this thesis. I cannot but appreciate all other lecturers whose knowledge was invaluable which includes, Prof. O.A Alagbe, Prof. R.O Oyinloye, Dr. Oluwafemi Akande, Dr. Adesola Adediran, Dr. Segun Falola and Dr. Samuel Tongo for their assistance at every stage of this work.

My profound thanks go to my most loved family members my father, Mr. Isha, Alfa Aseyan, who doubles as my first mentor in the academics; and my ever-supportive mother, Mrs. Janet Gbeke Aseyan. Also, my deepest appreciation to my beloved and loving wife Mrs. Oluwabunmi Aseyan for her prayers, supports, tolerance and understanding throughout the programme, and my wonderful children; Desire, Modebare and Iremide Aseyan for their everavailable shoulders to lean on. I love them unreservedly.

Lastly, even though the above institutions, persons have assisted in the process of this research work, I alone stand responsible for the errors, if any, that may be found in this work.

Abstract

Green Space (GS) is any open piece of land developed, undeveloped and is accessible to the public, it is a common feature noticeable in any university community; providing a sense of direction, integrating and organizing places and elements. However, empirical studies on GS utilization pattern in the Nigerian universities are underrepresented in literature. Therefore, the study was designed to evaluate the pattern of green space utilization across private universities in Southwest Nigeria with a view to identifying its impact on campus scape/image. The study was a cross-sectional survey conducted in six states and universities in southwest Nigeria, namely Redeemer (Osun State), Afe Babalola (Ekiti State), Covenant (Ogun State), Elizade (Ondo State), Caleb (Lagos State) and Ajayi Crowther (Oyo State) university. The data used for the study were sourced through questionnaire administration from selected case studies involving 397 respondents. Descriptive statistics, factor and synchronic (GIS) analyses were used to analyze the data. The result showed that green space availability is relatively high in the selected private universities in Southwest Nigeria, thus, this selected university have provided conducive physical environment for their students. Furthermore, majority of the respondents indicated that the physical condition of available GS is also very high. Thus, it was discovered that the pattern of GS utilization was majorly passive as respondents' duration of stay are usually very short across the study area. The most critical factors to the utilization of university GS were identified to be social and design factors. Furthermore, the study revealed that availability and utilization contributed to the outlook of the university in terms of form and aesthetic. Therefore, it is recommended that to have active utilization pattern, focus of universities must be on the social need of the users and the design of the GS provided to ease accessibility.

Keywords: Availability; Green spaces; campus scape; space identity; utilization pattern; Survey

Word Count: 295

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List of Acronyms

Abbreviation	Meaning
UHI	Urban Heat Island
SD	Standard Deviation
MV	Mean Value
GS	Green Spaces
CGP	Campus Green Park
SFG	Sport Field with Grass
WST	Walkways with Shrubs and Trees
LULC	Land Use and Land Cover
UGS	Urban Green Spaces
CGS	Campus Green Spaces
COGS	Campus Open Green Spaces
OGS	Open Green Spaces
GIS	Geographic Information System
GEI	Google Earth Imagery
UPGS	Urban Public green space
UCGS	University Campus Green space
ABUAD	Afe Babalola University Ado-Ekiti
ACU	Ajayi Crowther University
CALEB	Caleb University
CU	Covenant University
EU	Elizade University
RUN	Redeemers University of Nigeria
NNBC	Nigeria National Building Code

Chapter One

Introduction

1.1 Background to the Study

Green spaces (GS) are ecosystem services relevant for creating social balance in an environment through the creation and maintenance of decent public space and natural environments for social interactions[1]. Architectural landscape theorists, opined that green spaces are notable for offering a unique attraction to any environment inclusive of a university environment[2]. Many authors have attempted to define what green spaces are; for instance, GS was categorized as an important element of any public open space[3]. While GS are consisted of unbuilt land area such as parks, gardens, lawns, and natural reserves[4]. GS play a vital role in enhancing the quality of life in urban spaces, inclusive of a university campus[5].

Similarly, green space is defined as "publicly accessible areas covered with natural vegetation, such as grass, plants or trees (and may include) built environment features, such as parks, as well as less managed areas, including woodland and natural reserves[6]. Thus, the last definition is in tandem with the focus of this research work, which defines green spaces as publicly accessible open spaces covered with green vegetation which could either be natural or manmade. Green space is a common feature noticeable in any university community as they play an important role in sustainable environment[7].

GS are any open piece of land developed, undeveloped and is accessible to the public such as, university lawn, playgrounds, public seating areas, public plazas and vacant reserved lots[2]. Consequently, GS provides a sense of direction and visual acuity in campuses; integrating

and organizing places and elements as well as providing an aesthetic appeal in an environment[8].

Thus, assuming a key role towards enhancing the University environment and improving the quality of life of the member's community while also performing sustainable ideals of an organized community[9].

Universities all over the world has green space (GS) as an integral part of their campus, harnessing the complimentary functions and benefits derived from them[10]. Green spaces (GSs), such as parks and gardens, sports facilities and green corridors, play a significant role towards providing environmental, social, and economic functions and advantages to a community[11]. In developed countries green space are not just an aesthetic connotation or addition but a critical infrastructure which supports the community wellbeing, biodiversity and climatic regulations[12]. Consequently therefore, Universities have started prioritizing the provision of green spaces on campuses based on this growing body of information through the incorporation of GS in learning environments and all outdoor spaces as a recreational facility or as an aesthetic infrastructure[13].

In contrast to Universities in developed countries; GS utilization faces numerous challenge which are very significant among which are inadequate planning stemming from poor funding, maintenance and limited awareness of potential benefits[14]. For instance, most private universities in Nigeria boast of large land resources, which are often undeveloped, underdeveloped or poorly maintained and designed where available[15, 16]. Furthermore, the rapid expansion of private university campuses in Nigeria have further exacerbated the pressure on green spaces, leading to their fragmentation and loss. Unlike their counterparts in developed countries, Nigerian universities often lack comprehensive strategies for integrating

green spaces into their campus planning. As a result, students may not fully benefit from the environmental and social advantages that well-maintained green spaces can offer[17].

In addition, green spaces are extensive and multifunctional; bringing different benefits in different ways, to different users and with different results[4]. Hence the different positions of various authors have lent credence to the indispensability of GS to man and his environment. Hitherto, literature further revealed that aside enhancing the image of universities, GS influences the academic performance of students by reducing stress, thereby promoting the metal wellbeing of the students in preparedness for academic life and excellence[4]. Its availability offers serenity and beauty to the institution and also serve as a meeting place for social contacts and interaction[18].

Previous research revealed that the mechanisms by which interactions with GS could positively affect the psychological and/or physiological well-being of students in university environments varies [19]. This is referred to as the utilization of any space (open green space) based on the urban and regional planning[20]. Thus, an insight explaining the likelihood of individual use of GS for different purposes is termed use pattern. While studies have identified factors responsible for effective use of GS as users' needs, quality of the physical features and the spatial structure of the space which submitted that use pattern is one of the prominent factors to successful campus park. Thus utilization will increase when user's needs and preferences

are met[21,22].

Use pattern was categorized by different scholars as Passive activities (PA), Active individual (AI), and Active group activity (AG)[23]. Passive activities include relaxation, recreation or socializing such as meeting friends, reading and others; Active individual activities include

outdoor sport activity, done individually such as jogging and walking while active group activities are similar to active individual, except it is performed in a group, for instance playing basketball[16]. Similar study also classified use pattern into two forms namely Passive activities and active activities[24]. Meanwhile, a different approach to use pattern was asserted when another author, classified use pattern into seven categories namely necessary activities, optional/recreational activities, social activities, physical activities, passive physical activities, moderate activities and vigorous activities[25].

However, there are other known types of activities that are perceived as negative activities, because they make the users uncomfortable which in turn increases the level of stress thereby leading to non-use or outright misuse [26]. Therefore, comprehension of user's needs is key for any well-designed green space in order to ensure that the GS attracts people, facilitates their activities and encourages them to spend more time when undertaking these activities[27].

Howbeit, securing the green space development in university community requires hard work, especially, personal engagement through protection, creation, and development[4]. In this context, previous studies have identified certain factors that stimulate public acceptance and appreciation of green space use pattern, for instance, use pattern of parks is highly determined by the facilities provided, park sizes and park physical characteristics[28, 29]. Consequently, provision of "water fountains, restrooms, barbeques, picnic areas, seating, signage, and shade" will play a significant role in promoting satisfaction of green spaces while in use[30]. While, presence of trees and bushes, gardens, grass, flowers, natural settings and water features are other aesthetics features that also affects the usage of open public green spaces[10].

Furthermore, aside the positive uses and use patterns, possible grounds for misuse of GS also exist, such as lack of grass, poor-quality sidewalks and features are common green spaces utilization challenges [23]. In addition, littering of paths, parks and other public spaces, with unwarranted empty cans, bottles, food wrappers and other litters ruins the aesthetic beauty of the GS, leading to abandonments[31]. This argument are grounds for misuse and abuses which are noticeable in campuses, thus impeding the efficient use of GS and performance.

Users of green spaces and the green space itself are interconnected, which are premised on affective and emotional responses, which are in congruence with people's perceptions of their environment and their articulation[32]. Hence the behavior and the value that users placed on green space is dependent on his/her perception of the environment. Consequently, established GS misuse by members of the University community might be connected with the observed disappearance of green lands owing to increasing development, limiting the student, staff and visitors the first-hand opportunity to learn and appreciative of their environment, but rather attitudinal changes which can be spontaneous and in response to time, stress and activity. Therefore, it becomes important that studies be carried out to assess the extent of use and pattern of use, the factors responsible or affecting use as well as impact of use of green spaces on the campus scape (image or identity) among private universities in the Southwest Nigeria.

1.2 Statement of the Problem

Green space is a common landscaping feature in the university community as it provides a sense of direction by integrating and organizing different places and elements as well as providing an aesthetic sense in the university environment[3]. However, in Nigerian universities, the potential of campus green spaces remains largely underutilized and inadequately managed[33]. Over the years, studies have examined GS from different

perspectives across the different public spaces such as workplace, school etc. both at national and global level.

Research have shown that about 207 million students globally attend a college or university, and a growing number of these students' report that they are experiencing high levels of stress due to the demands of college life[34,35,36]. Interestingly, several studies reported that the academic performance of students is positively affected by the physical environment of the university where they study[37, 23, 25]. In addition, GS reduces the fear of illegal and undesirable activities, thus promoting a sense of safety[38]. Therefore, usage of GS through variety of recreational activities is key for a healthy life style.

Recent studies conducted on campus green spaces in Nigerian universities revealed high disparity from the actual green space use from the intended use. For instance usually, most private univeristies in Nigeria always redesign or repurpose the GS for other use[15]. This is orchestrated by rapid expansion of private university campuses in Nigeria putting pressures on the existing GS and their utilzation. Lack of a strategic framework for green space management has resulted in inconsistent policies and practices across private institutions in Nigeria, which further exacerbate the problem[16].

In addition, over the years, studies have further identified different use patterns as well as examining the association between types of GS use pattern and factors influencing usage across different types of GS. Previous studies related to parks and green open spaces, highlighted two essential measures which influence the level of park utilization namely people's needs and preferences on activities conducted within the park area[39,40,18]. While other studies submitted that park use pattern is mostly influenced by the facilities provided, park sizes and park physical characteristics[21, 41].

However, these factors varied across the different studies. For instance, activities conducted, frequency of usage and travel time are among frequently used measures to determine GS utilization[42,43]. On the contrary, other studies also documented factors influencing use pattern as maintenance, safety, facilities, accessibility, distance and natural elements[23,44].

Reviewed studies on GS use pattern showed that most of these studies have been conducted in the western and eastern countries[45]. Meanwhile, review also revealed that most of these studies have focused on use pattern across different urban spaces such as open space[9]. However, studies conducted in campus communities have majorly been a cross sectional approach with homogenous population[46,12 41]. Another example explored the use of nature and quality of university life at a university in Texas. Little or none had been conducted on GS use pattern across different university at the same time as a way of comparing outcome from each university[26]. Thus, this study seeks to bridge this gap by conducting similar research but employing a cross sectional approach with homogeneous population.

Consequently, most of these studies on GS use pattern had employed a single method of analyses as either quantitative or qualitative analyses while very few had employed mixed method [12,15,47]. This is one of the gaps that will be bridged by this study in order to arrive a broader understanding of the subject of study, boost validity and dependability of data for stronger findings that are generalizable, this study will employ mixed method. More so, a rising number of research has examined the effects of urban greening. But, the campus green space as an integral part of urban greening which have been established to support the campus life of the college students, has gained not too much attention in literature[48].

In Nigeria, very few studies have considered the GS pattern within university environment. For instance, the perception of trees and greens in open spaces for environmental quality in the

Federal University of Technology, Akure[49]. Though the study established that green spaces are tools in networking between both students and staff and means for community integration for comfortable and pleasant settings, nothing was done regarding the pattern of use. Also, studies have revealed that, several university institutions in Nigeria are struggling to design or improve their campus environments, for the singular purpose of creating the features and functions of an urban ecosystem, to gain a greener aesthetic look. Despite the fact that, data describing the sort and level of green space use pattern and associated benefits discussed amongst university student population is inadequate[50].

It is imperative that harmony should exists between buildings and green spaces in an environment to achieve a, liveable, functional, enjoyable and amenable environment[51,52]. In addition, the attractiveness and image of any neighborhood or city can stimulate the perceptions of people of that place.

There is growing need for comprehensive evaluation of green space use patterns in private universities in Nigeria to inform sustainable campus planning and ensure that the attractiveness of university environment is promoted and preserved or enhanced for future generation making this research worthy of exploring. This study further seeks to address these challenges by evaluating the current patterns of GS utilization in private universities in Nigeria, by doing so, the study will contribute to the development of sustainable university environment that supports academic success and wellbeing of the students.

1.3 Justification of the Study

Green space has become the object of interest in global research, due to the changing value placed on them not only as decorative or aesthetic elements within an institutional space, but rather serving as media through which other functions are expressed such as, ecological,

social function, economic function[53]. University students feels different stressors due to the pressure of various exams, academic courses, college life, and financial issues, which in turn affected the way they behave in a space[54]. Consequently, emotional problems pertaining to relationships with fellow students and faculty members had also been identified as further stressors[55]. Therefore, there is a need for the provision of a campus environment for which stresses are reduced if not eliminated.

Numerous studies have acknowledged the social, environmental, and economic benefits that GS provides for humankind, most especially students from different social and economic background[56]. For instance, that students who used the campus green spaces more frequently were perceived to have better quality of life, when compared with those students who used green spaces less frequently [26]. Students are the primary beneficiaries of green spaces within university campuses, using these areas for relaxation, social interaction, and academic activities. Their perceptions, attitudes, and usage patterns directly influence the effectiveness and value of green spaces. By focusing on students, this study can assess the extent to which green spaces meet their needs and expectations. Understanding student utilization patterns is critical for designing and managing these spaces in ways that enhance their well-being and academic success. Additionally, students' feedback can provide valuable insights into potential improvements and innovations in green space management[57].

Similarly, the outdoor spaces and landscape of campus environment have the potential of supporting relationship among students, improve quality of university community, and enhance psychological and social behavioral values of students[58]. Private universities in Nigeria have become increasingly prominent due to their rapid growth and the distinctive features of their campuses. These institutions often have more flexible administrative

structures, allowing for quicker implementation of campus planning and green space management strategies. Studying private universities provides an opportunity to explore innovative approaches to green space utilization that may differ from those in public institutions. Moreover, private universities often cater to a diverse student population with varying expectations for campus amenities, including green spaces, making them an ideal setting for evaluating different utilization patterns[16].

Furthermore, maintenance, safety, facilities, accessibility, distance and natural elements are the significant factors that influence campus green space usability[23,37]. Buttressing this, quality of a GS is greatly affected by the pattern of human activities, which most times lead to a misuse of the space[46]. Thus, negative usage condition of green spaces, most students rarely or occasionally visit the green space[40]. Hence, to improve the quality of these spaces it is essential to determine to what extent GS users value the ecosystem services that are provided[59].

Southwestern Nigeria is home to a significant number of the country's private universities and is a region with a rich cultural and environmental heritage. The selection of this region for the study is justified by its diverse range of universities, which vary in size, infrastructure, and campus planning philosophies. Southwestern Nigeria's climate and urbanization patterns also present unique challenges and opportunities for green space management. By focusing on this region, the study can provide region-specific recommendations that take into account local environmental conditions and socio-cultural factors, which are crucial for the sustainable development of university campuses in Nigeria[15].

The study focuses on students of private universities, and Southwestern Nigeria was strategically chosen to address the unique challenges and opportunities presented in these context. By

evaluating green space utilization in this specific setting, the study aimed to develop targeted strategies that can be adapted to other regions and types of universities across Nigeria. The findings will not only contribute to the academic discourse on sustainable campus development but also provide practical recommendations for improving the management and utilization of green spaces in Nigerian universities, ultimately enhancing the quality of the educational environment.

1.4 Aim and Objectives of the Study

The aim of this research work was to evaluate the pattern of green space utilization in private universities in South Western Nigeria with a view to establish the impact of Green Space utilization on campus scape (Aesthetics/Image). In view of these, the specific objectives were to;

i. investigate current conditions of the available green spaces within each Private University in South Western Nigeria.

ii. evaluate the perceived benefits of Green Space utilization in the study area iii. assess the use pattern of the green space in the study area. iv. identify factors that influences utilization pattern in the study area.

v. assess the perceived impact of green space availability and utilization on the Campus Scape (image/attractiveness).

1.5. Research Questions

This research answered the following questions;

1. What are the current conditions of available green spaces in Private Universities in South Western, Nigeria?
2. What benefits does available green space have on the users of the space in the study area?
3. What is the utilization pattern in the identified green spaces?

4. What are the factors that influence utilization pattern of the available green spaces in the study area?
5. How does the perceived impact of green spaces availability and utilization affect the Campus Scape (image/attractiveness)?

1.6 Scope of the Study

This study will be carried out in private universities in South West Nigeria to analysis the use pattern of the green spaces. The population for this study is the students of each selected university campus since similar studies also used students as the study population[42,44 60]. Although, there are many aspects of green spaces, to be investigated, however this study will focus on the use pattern of designed/landscaped green spaces within the university environment area in order to deeply elicit its multi-dimensional effect on the campus scape or image. For the purpose of this study one university was randomly selected in each six state of the Southwest Nigeria who has a total of thirty-seven (37) private universities. This includes

Lagos State (Caleb University), Ekiti State (Afe Babalola University), Ogun State (Covenant University), Oyo State (Ajayi Crowther University), Osun State (Redeemer's University) and Ondo State (Elizade University).

1.7 Limitations of the Study

This study was limited to private universities only as the resources available couldn't have been adequate to cover the entire Nigeria within the proposed time of the study.

1.8 Operational Definition of Terms

A few terms and concepts are used frequently throughout this thesis and it is important to be familiar with how I defined these concepts in the context of this study when reading this

thesis. **Green space (GS)** is defined as all open space with a high degree of cover by vegetation, e.g., parks, woodlands, nature areas and other green space. It can have a designed or cultural character as well as a more natural character. Only areas that can be entered by users are included.

Use of green space (UGS) is defined broadly as any sort of visit to a green space, with looking at the duration of the stay, the reason for visiting or the activity done while visiting; e.g., passing through on the way to a destination is also counted as use.

Physical activity (PA) is defined as the self-reported participation in organized or unorganized sport or exercise, both indoors and outdoors, at least once a week.

Health is defined by the World Health Organization as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

Green Space Managers and City Planners are defined broadly as all professionals within a public administration that work with the planning and managing of green space.

Green Spaces: this area open spaces either reserved or unreserved that are covered with vegetation. It could be natural or artificial

Campus Green Space: this are green spaces within a campus area, they define the campus

Active Activities: This are physical activities that requires the use of energy and body movement e.g., walking, jogging, dancing, running, praying etc.

Passive Activities: This are activities that does not require energy or bodily movement such as reading, sightseeing etc.

Conviviality: This are availability of eating, drinking and talking points in a friendly way with other people.

Sporting Pitches with Green: A major open area at sport centers that are covered with vegetation.

Open Space: Are areas not covered by buildings, roads or infrastructure providing opportunities for recreation, relaxation, socialization and environmental benefits.

Public Realm: Shared outdoor spaces accessible to the university community, fostering social interaction and community engagement and civic identity.

Landscape Architecture: Design of outdoor spaces to balance aesthetics, functionality and sustainability.

Biodiversity: Variety of plant, animal, fungi and microorganism species in a given ecosystem.

Sustainable Design: Design minimizing environmental impact through materials, energy efficiency and water conservation.

WHO: World Health Organization is a specialized agency of the United Nations (UN) responsible for international public health.

Parklet: Small parks or green spaces which are publicly accessible pedestrian friendly area.

Courtyard: An enclosed outdoor space with a building.
Campus Quad: A central outdoor space surrounded by buildings such as academic departments, library, student union building and hall of residents.

Botanical Garden: A garden featuring diverse plant species for recreation, research and education.

Arboretum: A botanical garden that focuses on trees and shrub planting.

Endnotes

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Chapter Two

Literature Review

2.1 Conceptual Review

This chapter critically reviews relevant previous work in the area of green space in relation to types, significance, pattern of use and as well as the impact of the use pattern on the campus scape. The essence is to ascertain what has been done in the previous work, know the status of scientific knowledge, have background information and establish gaps that needed further research.

2.1.1 Green Spaces

Green space is an important and common component of the environment. Overtime, there have been growing and progressive academic research on green space across disciplines such as health and medical sciences, urban design and planning, architecture, ecology, and biological sciences sequel to the established facts that nature positively impacts human wellbeing[1, 2].

By definition, green spaces come from the world green and space with the adjective "green" qualifying the space[2]. However, several researchers have denoted GS by different terms such as urban greenspace, green infrastructure[3]. The Merriam-Webster online dictionary simply defined GS as a 'community space consisting of land (as parks) rather than buildings. With the growing knowledge in research on green space, several scholars have defined greenspace from different perspective across various related discipline.

From the context of vegetation, green space is defined as "land covered with some form of vegetation[3]. Similarly, but with keen expression on means of existence, green spaces are urban

area primarily covered with vegetation, which are directly (e.g., active or passive recreation) or indirectly (e.g., positive influence on the urban environment) available for the utilization[4]. Other studies described urban green space as an integrated area comprising natural, seminatural, or artificial green land, providing manifold benefits to different groups of people within the city extent. However, this definition expatiated on the means of existence of GS which implies that aside natural existence, GS can also be man-made.

From the general view of green space, the Environmental Protection Agency (EPA) also defined green space with example as "open space on land that is undeveloped (has no buildings or any other built structures with some exceptions) and is accessible to the public. This includes; areas covered in vegetation, schoolyards, playgrounds, public seating areas, public plazas, and vacant lots. Meanwhile, as subset of open spaces, green spaces have also been defined to cover all green infrastructure such as network of natural, semi-natural and artificial

ecological system within a given area[5, 6]. Hence, it is not only limited to urban parks and gardens but also covers land made up mainly of unsealed, permeable, "soft" surfaces such as soil, grass, shrubs and trees which are privately or publicly accessible or managed[7]. Likewise, GS are defined as "an open space situated within the city limits with a good vegetation cover planted deliberately or inherited from pre-urbanization vegetation and left by design or by default[8]. GS is an open space mainly covered by vegetation which are directly or indirectly available for human usage[2].

As a channel of connectivity, GS is further defined as any vegetated land adjoining an urban area and includes bushland, nature reserves, national parks, outdoor sports fields, school playgrounds and rural or semi-rural areas[9]. GS may either be linear (occurred along transport

routes such as roads, railways), semi-natural (wetlands, woodland), functional (allotments, churchyards, school grounds) and amenity (parks and gardens) [10].

Considering GS from social perspectives, GS are public goods accessible by citizens and includes nature for all residents (e.g., urban parks, squares, median strip, roadsides, sidewalks, etc. Likewise, green spaces are also viewed as land that is primarily set aside for sports, nature conservation, recreation, public gatherings, passive outdoor and enjoyment[11]. Examples include public parks, gardens, reserves, publicly owned forecourts and squares.

Distinctively, GS is not limited to vegetation or natural elements alone, they are also regarded as "bodies of water or areas of vegetation in a land-scape, such as forests and wilderness areas, street trees and parks, gardens and backyards, geological formations, farmland, coastal areas and food crops; not just a vegetated land or structure but also a water or geological features found in a given area[12]. By this definition, publicly owned land may not necessarily be a green area thus the excluding the adjective "green" that qualify the space as well as defeating the benefits derivable from the green areas[13].

In view of all the aforementioned description of green space, it is obvious that there is little consensus on the definitions of green space which can be associated with the different methodologies as well has how it is being qualified and quantified across the disciplines. Nevertheless, to avoid ambiguity and ensure operationalization of term, this study will seemingly be restricted to the use of green space within the sphere of campus environment in other to avoid misconception emerging from the use of terms that qualifies it. Hence, by this study GS is an area of land that is naturally or artificially covered with different types of vegetation and accessible for human use.

2.1.2 Types of Green Spaces

Several literatures have identified different types of green space. While there are few studies that analyze variations in types and functions of urban green spaces at finer scales[14]. Previous studies on GS types submitted that green spaces are divided into several types based on the needs that these spaces meet and which as well could affect the different ecosystem services provision[15]. In the sense that the capacity of various ecosystem services provided by green space is context-specific and different depending on their type and size[16,17].Various types of urban green spaces such as public parks, road belt green space, wetland, and private gardens are extremely heterogeneous with different vegetation communities and diversities reflecting diverse social needs and personal preferences that further influence eco-function value provision[18].

Associating green space classification into different types with the heterogeneity of the components of green spaces communities, documented four types as public parks, road belt green space, wetland, and private gardens which are extremely heterogeneous with different vegetation communities and diversities [26]. Likewise, another study classified green space into four types in China namely public parks, protective green spaces, square green spaces, and attached green spaces which are also spatially heterogeneous [23].

Additionally, there are many other studies whose focus of classification was on how vegetation types like trees, shrubs and herbaceous as well as services rendered by the vegetation communities in ecosystem[19, 20, 21, 22]. On the premise of identified key plant properties affecting ecosystem service, namely provisioning, regulating, cultural and supporting services categorized urban green space into three main categories with examples as; tree (Forest, Tree plantation, Wood verge, Tree patch, Tree row, Espalier, Connected solitary,

Tree, Isolated solitary Tree), shrub (Scrub patch, Hedge, Group of shrubs) and herbaceous plants (Climbers and plant walls, Extensive green roof, Intensive green roof, Pasture, Meadow, Flower bed, Tall herb vegetation, Flower field, Water plants, Arable land, Vegetable garden)[23].

Furthermore, other studies also classified GS into six different types based on ownership and accessibility with examples namely;

Public Park (PU) -this includes comprehensive parks, citywide parks, regional parks, community parks, parks in residential areas, gardens and parks in residential quarters, theme parks, children's parks, zoos, botanic gardens, historical gardens and parks, scenic spots, amusement parks, other theme parks, and belt-shaped parks[24&25].

Residential green space (RG) -this type of green space included residential quarters and communities[28, 29].

Attached green space (AT) -this type of green space included public facilities, industrial green space, green space for warehousing, green space for external traffic, green space for municipal facilities, and special green space[28, 29]. Roadside green space (RO) -this type of green space included roadside verges and similar green fields[28, 29]. Production and protective green space (PG) -this type of green space included green space for production and protection[28, 29].

Agricultural land (AG) -this type of green space included cultivated land, garden plots, forest land, grassplots, agricultural land for facilities, field ridges, and country roads[28, 29]. While another study continues the categorization of green spaces into seven categories namely;

Green space with natural functions (provincial or national parks and woodlands).

Green space with sport facilities (golf courses or any sport facilities). Green space used for fairs and other fun activities (any type of park, excluding provincial and national parks as well woodlands with sport facilities). Green space crossed by walking or cycling tracks (any type accessed and completely or partly crossed by walking or cycling tracks).

Green space crossed by roads (any type accessed and completely or partly crossed by a road), Green space accessible by public transportation (bus or metro).

Green space surface area illustrating its size[26]. Also, classified green space into three different categories based on size, these include;

Extra-small (XS): also known as street greenery, are vegetation accessed or viewed on the street such as street trees, park strips, front yards, and median strips without a consolidated planning and management system unlike in other elements where green spaces are managed by private individuals or companies (e.g., front yards) while others are controlled by public agencies (e.g., median strips)[27, 28]. Meanwhile irrespective of XS nature, it can help improve physical health outcomes by enhancing physical activity, mental health outcomes and relieve stress[29].

Small to large (S–L) and Extra-large (XL): this is the most typical type of urban green space larger than street greenery (XS) is the urban park (S-XL) such as regional parks, state parks, and national forests and parks[30]. Furthermore, Table 2.1 presents different types of green space across countries showing the variations in terminology and size criteria.

Table 2.1: Types of Green spaces by Country

S/N	Country	Source	Type	Size Criteria
	United States	National Recreation and Park Association (Metes and Hall, 1995)	Mini Park	0.4–2 ha (1–5 acres)
			Neighborhood Park	2–4 ha (5–10 acres)
			Community Park	8–20 ha (20–50 acres)
	United Kingdom	Greater London Authority (2016)	National resource area	variable
			Pocket parks under	0.4 ha (1 acre)
			Small open spaces	2 ha (1–5 acres)
			Local parks and open spaces	2 ha (5 acres)
			District parks	20 ha (50 acres)
			Metropolitan Parks	60 ha (150 acres)
			Regional parks	400 ha (1000 acres)
	Canada	City of Toronto (2013)	Parkettes under	under 0.5 ha (1.2 acres)
			Neighborhood Parks	over 0.5 ha (1.2 acres)
			Community parks	over 3 ha (7.4 acres)
			District parks	over 5 ha (12.4 acres)
			City parks	over 15 ha (37.1 acres

Source[31]

green spaces of different sizes have unique benefits for environmental sustainability and human health, thus their complementary functions in improving urban residents' quality of life[32]. Though, GS of diverse sizes individually play significant role in meeting various social needs, however, large GS have received special attention, given their complexity in programs, ecology, and relation to abutting urban environments[33]. Meanwhile, smaller GS might be

designed with focus on the amenities needed in the local communities, large parks containing a variety of natural habitats and vegetation provides distinct natural experience and as well improved social, health, and environmental benefits[34, 35, 36].

Another categorization of green space into types based on means of ownership are public and private vegetated open spaces with natural areas available to users either directly or indirectly[37].

Plate 2.1: Pictures Showing Typically Maintained Sample Green Space

Source[37]

With reference to specific types of green space, the importance of various types and scales of green space urban green space in providing cooling effects and reducing air pollution[38]. Using qualitative method, the study analyzed 102 peer-reviewed studies published over the past five years and found that urban green spaces from trees and parklets to green roofs and large natural spaces generally provide significant health benefits for residents and the community[40].

In addition, it was discovered that ecological benefits are not limited to green space type alone but directly associated with the size, quality and density of the various types of green space.

Thus, discovered that urban green space can provide cooler, cleaner air at the site, neighborhood and city level with greater cooling effects when green spaces are closely spaced and connected smaller green spaces than large individual parks with open grass areas. The study therefore submitted that improving the quantity, quality and connectivity of green spaces; prioritizing green strategies for vulnerable urban areas; and integrating greening policies with broader health and land-use planning policies[40].

From the perspective of green space types, several scholars/literatures have classified green space differently based on diverse premises such as functions, sizes, vegetation categories. Hence, the lack of consensus in classification associated with absence of uniform basis. Notably, while some studies have associated benefits from green spaces (mental health) to different types such as woodlands, forests, bushland, and gardens, in modern urban cities and towns, parks and green open space are among the most widely available forms, and important for mental health[39]. However, very few of these studies have specifically examined the types of green spaces responsible for the various benefits associated with these spaces within the university communities. Therefore, this study therefore seeks to investigate the various types of green spaces across university communities that promote or are responsible for healthy state of the university populations in order to enhance campus architecture and policymakers in optimizing campus green space structure and composition that can maximize ecosystem services provision for the benefit of the communities.

2.1.2.1 Urban Green Spaces (UGS)

Urban green space is a major component of sustainable cities that offers multiple health, environmental, social and economic benefits to users. Generally, urban green space is a combination of green paved, open and burial places, sports grounds, private gardens, formal and informal green forests, road verges, derelict land, and horticulture within a city[40, 41].

Another study defined urban green space as defined as vegetated areas in urban environment existing either as natural or man-made vegetation and present in built-up areas[42]. Other studies expatiated that the term "urban green space" also refers to formal and informal green sites, as well as "open spaces" with the capacity to provide ecological functions (like sports clubs, playing fields, open barren land, etc.)[43]. Summarily, urban green space majorly consists of natural elements which usually include parks, forest patches, open spaces, residential gardens of narrow strips of trees along streets[2].

Consequently, urban green spaces were categorized into four groups in another study: Parks, which have been allocated for general public to engage in their activities leisurely, Semipublic green spaces such as open spaces in hospitals, government or private departments etc., Private green spaces which are the residential garden units maintained by urban residents, Street green spaces which are the tree layouts along roadways[44].

Another category of urban green space was proposed into six groups which are: Attached Green Spaces (AGS), Park Green Spaces (PGS), Ecological Green Spaces (EGS), Road Green Spaces (RGS), Other Green Spaces (OGS), and Productive Plantation Green Spaces (PPGS). However, there seems to be no universal categorization for urban green space[47].

Urban green spaces provide ecosystem services that assist in mitigating global climate changerelated challenges e.g., by regulating extreme temperatures or floods and reducing air and noise

pollution[45, 46]. Intrinsically, physical and social functions provided by urban green space varies depending on the existing element[47]. With the significant benefits provided by green spaces within the urban environment, there is a growing concern over the preservation, creation and quality of urban green space due to the increasing rate of urbanization, the

intensification of urban areas, the move towards privatized spaces (i.e., gated communities) and the changing role of technology in connecting people[48]. Although, several countries across Europe and the United States have been implementing urban greening programmes towards increasing the quantity and quality of gardens and parks[49].

Nevertheless, recent studies have reported a decline in the use of UGS by citizens, including areas where such programmes are operated[50]. Surprisingly, this decline was associated to factors such as socio-economic characteristics of users (e.g., age, education, income) to physical features of spaces such as greenery quality and quantity, available facilities and proximity) [51, 52]. Hence, the need to access the use pattern in university environment as most studies are often centered on urban setting.

2.1.2.2 Parks and Gardens

Parks and gardens are one of the notable examples of green spaces. these are described as space next to a residential building within an urban area, which is either privately owned or rented, where inhabitants have autonomy over which could either be a few plants in containers on the building's plinth to the entire curtilage containing trees, shrubs, grasses, and other kinds of vegetation, etc[53] . Gardens are multifunctional apart from the primarily identified benefits of adding beauty to the environment, they are major source of food in forms of fruits and vegetables which promote quality and quantity of nutrients available to urban households[54]. Secondly, it serves as a main source of livelihood through income generated from the sale of gardening products which differs across region from a study conducted in Ondo state Nigeria[54].

While another study in Oyo state found that garden work is profitable weekly[55]. In addition, gardens provide materials for herbs and fuel (wood), maintains biodiversity and environmental

services such as wind control, runoff infiltration, temperature control etc. while vegetation within parks promote park cooling island (PCI) effect, as against urban heat island (UHI) in paved areas by reducing temperature[38].

Buttressing on garden's ability to regulate biodiversity, gardens support 'in situ conservation of a wide range of plant genetic resources[16]. Interestingly, more studies revealed that adult females engage more than males in domestic gardening though little or no evidence has ascertained whether youth and children more than adults or low-income more than middle- to high-income households actively engage in gardening[53]. However, insufficient land, destruction by stray/domestic animals, insufficient funds, theft, lack of information, pests, water shortage, high costs of improved inputs were identified as constraints or challenges mitigating gardening[56].

Likewise, quantity and quality as measured by poor maintenance, insecurity, rowdiness, lack of proper facilities, long-distance to residential areas, inability to meet peculiar religious and family needs, encroachments and informal activities, poor management regimes were identified as the major constraints to frequent park usage hence the poor satisfaction derived from usage[41]. According to previous studies, these were evidential in parks in Abuja, Akure, Ibadan[57,58,59].

2.1.2.3 Campus Open Green Spaces (COGS)

Campus open green spaces are generally known as accessible green space supporting campus ecosystems, without buildings and made up of different elements connected to each other[72].

They are multifunctional landscape services (LS) providers that simultaneously promote air quality, ensure pleasant climatic conditions, habitats for biodiversity, outdoor spaces to play, do sport, rest, and improve the psychological wellbeing of people[60].

Campus is subdivided into two basic categories namely green spaces and grey spaces[70]. Hence, campus green spaces are a subset of campus open spaces. recently, campus green spaces have gained prominence in the ranking of important urban green areas than it was in the past. Interestingly, many universities attention have drifted towards designing and improving their campus environment by creating the characteristics and functions of an urban ecosystem, to gain a "garden-park" look[39].

Studies have proven that visual quality increases in the areas dominated with plants especially trees and shrubs which also increases the students 'preference for landscapes[61]. While, other studies found a relationship between the frequency of using campus green spaces and perceived quality of life while another discovered a correlation between students' perceptions of the quantity of campus green space and campus green space awareness[62].

2.1.2.4 Elements of Green Spaces

Element of green space refers to assemblage of individual plants together that provides similar functions and services[63]. Studies have shown that green spaces can be studied on many different scales, ranging from parcel level (park, garden) to the individual plant scale[64]. This is explained based on the different services provided by each. While parks and gardens may provide entirely different services depending on their composition for instance a lawn mainly serves as a playground for kids, a botanical garden is more relevant from an ecological, educational and scientific point of view and individual plants may serve other purposes depending on their context (e.g., a row of street trees as part of an ecological

network, versus a solitary tree for ornamental purposes) [65]. Based on review, scholars have categorized green space elements into different types based on their distinct characteristics such as extent (surface area), structural diversity, spatial configuration (shape, area/edge length, connectivity) and management (frequency of harvesting and human disturbance) which affects the ecosystem

services provided [66, 67, 68].

2.1.2.5 Ground Covers/Lawns

Ground covers/lawns are one of the basic elements of green spaces. This includes any form of vegetation that blankets or cover the soil with unique advantages[69]. They comprise of grass species-cultivars, woodland, farmland, garden plot, grassland, wetland, and garden green space within the built-up areas[70]. Culturally and aesthetically, they are one of the most frequently used types of urban green infrastructure introduced basically as a decorative element for human enjoyment[71]. More importantly, they offer ecosystem services such as serving as habitat for some urban fauna species, prevent heat-island effect through transpiration and evaporation, regulate water cycle through promotion of infiltration, promote regeneration of ground-water stocks and evapotranspiration[72].

2.1.2.6 Shrubs

Shrubs are element of green space characterized by woody and consistently thick plants that are smaller than trees in size and branches out into various trucks or stems around the base[80]. One distinctive difference between shrubs and tree is the fact that they are generally shorter with an average height of three meter and densely concentrated in nature[85]. Shrubs are usually characterized with broad green leaves, hardy plants and lack well-defined trunk. They are aesthetic in nature especially when characterized with flowers and also offer ecosystem

services such as being a source of shelter to smaller organisms, prevent soil erosion and restore green cover[77].

2.1.2.7 Trees

Trees are integral component of urban settings. They play important role in promoting improved public health and provide aesthetic benefits to the environment[73]. Beyond aesthetic advantages, trees are highly recognized as backbone of urban forests and ecosystems[74]. They support greatly in improving air quality, cooling of local air temperatures, filtering and retaining storm water, sequester carbon, and contribute to healthier and more beautiful cities[75].

Invariably, it's is noted that the benefits of trees can vary depending on the context in which they are planted[76]. For instance, trees planted strategically near buildings can maximize the impact of trees' cooling effect and subsequently reduce air conditioning costs while also protecting the building against whirl wind[79].

In addition, planting large species of trees and maintaining them so they reach maturity results in more benefits than the same number of trees of a smaller species[77]. Similar to the urban setting, trees are also play significant role in university environment such as regulation of campus ecosystem. For example, trees add canopy effect along the university's sidewalks, walkways etc. and provide cooling and shade effect and as well help in controlling the wind speeds and in retaining water[80].

2.2 General Perception About Green Spaces (GS)

For many years, landscape and ecological researchers have been trying to understand the perceived concept of green spaces, and its impact on man. As science progresses so is the amount

of knowledge in the field expands[90]. This section itemized the cognitive perception of scholars as it pertains to the global benefits of green spaces as follows;

2.2.1 Physiological Benefits of Green Spaces

Physiological benefits of green space to man are due to the level of exposure to green spaces and availability[78]. A number of studies have been conducted that investigated the correlation between health and exposure to natural green spaces[88]. While another study conceptualized health on three domains: The number of self-reported physical symptoms recounted in the past days. It was discovered that exposure to natural areas had positive impact on the health of the people compare to does who did to visited green space within the time duration[81].

Furthermore, those who were already sick was noted to have recovered after a visit to Green Space, thus it was clear that natural areas have healing effect significantly, which is called healing garden[70]. In Ulrich broad studies, he noted that gardens foster a sense of control and provides access to privacy, social support, physical exercise. This Ulrich study had been further supported by recent studies[2].

Green spaces do not only offer healing in healing gardens in hospitals, but it also has physiological effects in campus areas, serving as stress abatement among the member of the community particularly students[60]. It also provides ideal avenue for physical exercise which promotes health reassurance in man[25]. Exercising in green spaces have been found to improve both self-esteem and mood as confirmed in related studies on health and wellbeing[75].

Thus, physiological benefit of green spaces on health is related to the role trees and plants plays in ecosystem balance serving as buffers against noise pollution[81].

2.2.2 Restorative Benefit

Natural environment, plays a significant role of human restorative tendencies[90]. The theory by Kaplan, noted that, green space exposure or utilization assists in the restoration of human attention and stress recovery. This position by Kaplan, was corroborated by another study when a study compared the perceived restorativeness of natural environment and urban environment; the findings indicated that naturals environment had the highest restorative rating[20]. Though, further studies opined that, coastal environments were more conducive for restoration, however, it can be very impossible most times to have access to coastal environment as such the most likely environment for replacement is a green space within any inner-city environment[67].

2.2.3 Stress Reduction

Not only do green space assist in restoration, it also helps in stress reduction. The concept of stress reduction was originally postulated by Ulrich when he discovered that psychological responses existed when man viewed natural landscape which helps to reduce stress[56]. Stress reducing attributes of green spaces have been examined widely across several studies[90]. A study on the green spaces, salivary cortisol patterns and how green spaces influenced one another was carried out, the result showed that there was significant between stress and cortisol secretion and quality of green space in the living environment[80]. This finding indicated that availability of green space and exposure reduces stress as seen from the level of cortisol secreted in both studies.

2.2.4 Health and Well-Being

Globally, there is a significant shift in the burden of disease from communicable, maternal, perinatal, and nutritional causes to non-communicable diseases (NCDs) with cardiovascular diseases (CVD) accounting for the most NCD deaths worldwide claiming about 17.5 million people annually and proceeded by cancers and respiratory diseases[79]. Additionally, Mental health is another leading cause of disability globally, thus the increasing emphasis on the promotion of mental wellbeing as a more preventive and population-based complement to the treatment of mental illness[83].

physical activities (PA) are the key factors in improving global public health due to its effects on various health outcomes, with strong evidence of risk reduction for chronic diseases and cognitive and functional decline and improvement in mental health[80,56]. Therefore, green space is an important component of a city that is closely related to the health and well-being of city dwellers[81] with reference to physical and emotional health, psychology and feeling/mood. These aspects are very crucial being that they go a long way in determining the effectiveness and efficiency of an individual in a community regardless of age or gender.

Consequently, there is a relationship between the social and health benefits derived from green spaces which increased social cohesion can be associated with various physical and psychological health benefits, reason being that the presence of green spaces can encourage positive social interactions that cultivate social cohesion in ways that enhance health and wellbeing[82].

Several studies that have examined mental health in relation to green space. Though positive associations have been recorded, there are been some dissimilarity in outcomes, and the effect is

not necessarily the same for different genders or age groups[48]. For example, a study in Swedish confirmed an association between green space exposure, physical exercise and improved mental wellbeing among women, while Australian study, discovered that access to green space was of benefits only for the mental health of men, and also affirmed that the importance of greenspace varied by age[83].

In a study conducted among 280 Japanese male college students were assessed on physiological stress. Participants were made to viewed and walked throughout 24 forest and city environments. Participants rated their moods, and a variety of physiological measures were measured over a 2-day period[81]. This revealed a significantly lower measures of salivary cortisol, pulse rate, and blood pressure, and increased parasympathetic nerve activity when participants were in forest settings relative to being in the city meanwhile students also reported fewer depressive symptoms when exposed to forest environments[82].

However, despite the associations recorded between green space and mental wellbeing, asserted that there is limited evidence regarding the characteristics of green space such as accessibility and quality[84]. Hence, the call for more detailed information on the mechanisms and the characteristics of green spaces that may promote better mental health[84]. On the contrary, a recent study in UK, (controlling for individual and regional covariates) documented that on the average, individuals living in urban areas with more green spaces had both lower mental distress and higher well-being[85] .

The ecological significance of green spaces may be highly associated with their sizes in terms of surface area, the vegetation density and the available types, while the social functions and their ability to attract people may as well depend on facilities allocated green spaces[86]. In the study of with focus on identifying the relevance of proximity to certain types of green spaces

as well as their spatial location in relationship with the most morbid cardiovascular diseases (CVD) and diabetes[87]. Using Poisson and negative binomial regression models were fitted to quantify the relationship between distances to specific types of GS and CVD morbidity as well as some risk factors (diabetes and hypertension) while controlling for several social and environmental confounders, it was discovered that green spaces with sports facilities showed a significant relationship to cerebrovascular diseases[87].

Hence, GS can advantageously be used to reduce cardiovascular diseases (CVDs) and diabetes which further revealed that the worse state of cardiovascular health of the suburban population may be associated with the lack of attractive (i.e., features inside or connected to the vegetation) and easily accessible green spaces, particularly those that stimulate vigorous physical activity as suggested by the results of this study[88]. However, the study did not state the specific types of green spaces promoting the relationship submitted that it may be necessary to reconsider their types and location. Although, several studies have revealed the significant impact of green spaces in promoting healthy state of living for human beings, there is serious gap in understanding the type of GS, frequency of visits etc. that is adequate enough to instigate healthy living either mental or physical.

2.3 Significance/Benefits of Green Spaces to University Environment

Green spaces are important and inseparable element of urban ecosystems with multidimensional advantages[23]. The continuous rise of the human population coupled with the rapid urbanization has caused many environmental impacts associated with the reduction of green spaces[88]. Such impact has documented by previous literatures include severe conditions of thermal stress, air pollution, and noise nuisances, which critically influence the health and well-being of the cities' inhabitants[89]. Green space is a central element of

sustainable cities, providing multiple health, environmental, social and economic benefits[90]. Several studies have identified with the limitless benefits accruable from green space to the various dimension of the society. Green space plays an important role in complex urban ecosystems, it offers significant ecosystem services with environmental, aesthetic, recreational and economic benefits[91]. Similarly, other studies also affirmed that green space offers health benefits, social sustainability, environment and psychological improvement[92]. Hence, there seems to be a broad consensus categories defining the various benefits derived from green space. Research studies such as also documented the benefits as environmental, social, economy, health and

well-being[93, 94 ,95 ,96 ,97].

2.3.1 Environmental Benefits

Fundamentally, green spaces beautify the environment. However, beyond beautification, green spaces offer ecosystem services that enhances the urban communities by maintaining biodiversity and regulating the urban climate as described below[98].

2.3.1.1 Pollution Removal and Noise Reduction

The increase in urbanization and industrialization has generated unfriendly release also known as pollutant into the environment in forms of solid waste from chemicals, liquid droplets or gases from carbon dioxide, Sulphur dioxide and nitrogen oxides; as well as emissions from factories. These have breed different anti-healthy effects on the environment and human life[59]. However, recent research has attested that greening can reduce air pollutants directly and largely reduce the levels of noise[59]. Exceptionally, green space such as trees has the ability to capture and filter multiple air pollutants, including ground-level ozone, Sulphur-dioxide, nitrogen oxides and particulate matter[117]. Trees in urban areas could remove

air pollutants and improve air quality by absorbing harmful gas from cars or plants and intercepting particulate matter. Thus, green space promotes air quality through the process of carbon storage and sequestration which ensures balance of carbon and oxygen in the air[59].

2.3.1.2 Ecological Benefits

Green space offers ecosystem benefits ranging from maintenance of biodiversity to the regulation of urban climate[99]. Notably, the variation in the climatic factors known has climate change over the years has been a major concern not just to developmental sector of the economy such as agricultural sector but also threatens human lives and livelihood sustainability. These variations in form of droughts, floods which increases the contamination of surface runoff in urban areas has led to continuous deterioration of water quality in streams, rivers, lakes, and wetlands, changes in temperature and precipitation, wildfires and heatwaves increase human vulnerability to incidence of chronic kidney diseases, cardiovascular mortality and other negative health consequences[100,101].

Other indirect impacts include reduced labor capacity of susceptible occupations, displacement of populations from initial domain[102,103]. Hence, the records that climate induced disasters or hazards has led to thousands of deaths worldwide and the major stimulator of the global burden diseases[104]. Therefore, green space is an important tool to regulate microclimate through shading, evapotranspiration, boosting air movements, and increasing heat exchange, which mitigates urban heat island (UHI) effects at a city scale[105].

Similarly, studies revealed that ecosystem services offered by green space contribute to mitigating global climate change-related challenges[106,107,108 ,109]. For instance, trees have a superior ability to provide thermal comfort and relief from heat. Green spaces can intercept

rainfall and reduce rainfall runoff as well as bringing more rainfall infiltration, thus reducing the frequency of urban floods and storm-water treatment costs and damages[110].

For instance, quasi-experimental study within residential estates in the Ibadan metropolis described the link between temperature, tree density, and CO_2 concentration. Temperature and CO_2 were high in areas where few or no trees were observed while decrease in CO_2 was associated with tree density. Thus, understanding the linkage between green spaces and human well-being under global challenges such as climate change and urbanization may be crucial for sustainable and resilient urban development[111].

Although, green spaces could be a very cost-effective way to decrease the need for expensive gray infrastructure, such as retention tanks and sewer systems[112]. Contrarily to the position submitted previously that green spaces have limited runoff avoiding capacity, however, it suggested that the combined development of green and gray infrastructure would be more effective and practical for flooding mitigation in a university environment[113,114].

2.3.2 Social Benefits

Socially, green space serves as the basic platform that supports and enhance social cohesion through being an avenue for recreation and leisure. Social inclusion is especially concerned about people or groups of people who are at risk of deprivation, segregation or marginalization[115]. Inclusion therefore is defined as the process of improving the conditions of participation in society for people who are disadvantaged, by enhancing their opportunities and their access to resources. Thus, green space is a key construct that promote social cohesion and enables interpersonal dynamics and sense of connection among people thus stimulating social interaction.

While there is a correlation between socioeconomic factors and happiness, social interaction facilitation via green space have been confirmed to be more significant by promoting social cohesion through social contact; which allow people to naturally encounter neighbors in local green spaces in the course of walking dogs, gardening, and having outdoor parties, which enhances community engagement and most especially in larger green areas such as parks which encourage public events and activities, thus enhancing social mixing between communities[116,117,118].

Green spaces serve as a near resource for relaxation; provide emotional warmth[119]. Research conducted in Swedish showed that the more time people spend outdoors in green spaces, the less they are affected by stress, further studies shown that green space reduces the fear of illegal and undesirable activities, thereby enhancing the sense of safety[120,121]. Physical characteristics of space and their social "interaction with individuals, the relation between social interaction and space and the possibilities of landscape design which can enhance social interaction have been investigated[122].

The findings indicated that landscape design has the potential of contributing to the improvement of the existing conditions and increasing the communication between the people through spatial design green spaces have the potential of supporting relationship among students, improve quality of university community, and enhancing psychological and social

behavioral values of students[123,124]. This condition will increase the likelihood of interdisciplinary communication and collegiality.

2.3.3 Economic Benefits

The economic impact of green space cannot be underestimated. Green space helps to shape the landscape of an environment thereby promoting the economic by making it attractive for businesses. Such attractive environment boost value addition through increment of property values especially houses sited close to green spaces, creation of more job avenues as many individuals will have the opportunity to work on various parks and gardens and other related businesses, and generation of revenues to augment government expenditure[125].

In additionally, green space also promotes economic benefit via energy savings and increase in property values[66]. The study argued that the use of plant materials to reduce the energy costs of cooling buildings has increasingly gained recognition over the years. Hence, a cost-effective reason for increasing green space and tree planting in temperate climate cities. Meanwhile, owing to it to serve as an event center, picnic venues crusade grounds, campaign grounds as well as business places noted that that green spaces and landscaping increase property values and financial re-turns for land developers, of between 5% and 15%. Thus, a strategic tool for economic development and sustainability[126].

2.4 Green Space Use Pattern

The relevance of green space landscape in any environmental settings be it urban or academic institutions cannot be overemphasized. Health benefits, social sustainability, environment and psychological improvement are among countless benefits offers by green space[58]. Across these settings, research studies have documented various activities that constitutes benefits accrued from green spaces such as relaxation, recreation, walking, meeting friends, reading etc. These various activities have been classified into what is called pattern of use, in this

context review have identified two basic use patterns tantamount to green spaces namely Active pattern and Passive pattern.

2.4.1 Passive Use Pattern: Passive activities are such activities that are not energy driven. They, are characterised with reading and watching people and the surrounding nature[61]. See Plate 2.2: Pictures showing passive use pattern.

Plate 2.2: Picture Showing Passive activities Source[61]

2.4.2 Active Use Pattern: These are energy driven activities. Active activities include outdoor sports activity done individually such as jogging and walking[127]. See Plate 2.3

Plate 2.3: Picture Showing Active activities Source[132]

The type of physical activity carried out in green urban spaces by the adult population and evaluated the impact of its value on the population's health using systematic review[146]. The result revealed the most common training programs performed in green urban spaces as exercises with free and easy access with walking being the most popular type of activities due to the ease of accessibility and convenience.

Previous studies have revealed predominant use pattern across different areas at national and international levels. For instance, majority of park users in Malaysia prefer social and active activities such as jogging and meeting friends rather than passive activities[61]. Similarly, study in Birmingham showed that jogging, walking, and team sports were the most popular use pattern in the area[128]. In another study, research conducted in Seoul revealed that park users tended to spend time with friends, eat or drink, do their hobbies, such as photography, or commute through the park which defined as passive activities[129]. In contrast, in addition to physical activities as measure of use pattern, other study measured use pattern by related neighborhood park, frequency of walk, frequency of visitation[130].

Studies have investigated the association between green spaces and use pattern. The relationship between the presence, amount and attributes of public green space in new greenfield neighborhood and the mental health of local residents[48]. The findings showed that the overall number and total area of public green spaces were both significantly associated with greater mental wellbeing. Meanwhile, positive mental health was not only associated with parks with a nature focus, but also with green spaces characterized by recreational and sporting activity[135].

Summarily, green space activities identified through previous studies were very diverse and spectacular to the area of study and category of user, hence the identification of green space use pattern within the university environment will assist planners to determine suitable facilities as well as appropriate design settings which are concurrent to user's needs and preferences.

2.4.3 **Urban Public Green Space** (UPGS)

Urban Public green space (UPGS) is synonymous to areas of the public environment with vegetation such as grass, trees, shrubs, etc. [148]. The areas within the urban public spaces with vegetation as public green space, such as public parks, lawns, street trees, private or public gardens, cemeteries, sports fields, and green walls and roofs[135]. Thus, (UPGS) is a broad concept encompassing all areas with vegetation in the urban fabric. Public parks are open to the public, located in urban or suburban communities, with the purpose of civic benefit to users from the general public[135].

2.4.4 **University Campus Green Space** (UCGS)

University campus green space (UCGS) are analogous to Urban green spaces (UPGS). The urban nature of university campuses therefore qualifies their green spaces to be categorized in similar ways which has been approached in different ways by different authors. While some authors classified them according to historical origin, others classified them by their benefits[120]. Though this position has been criticized by other authors, owing to the fact that, most of the theoretical works on benefits lack specificity on spatial configuration, scale and functions of different kind of green spaces[135]. Though university campus exists in different forms and function, however the meaning of green spaces to it are the same offering an opportunity for social integration, economic and ecological advantages to the community[146]. For instance, environmental, ecological, social and aesthetic values of the green spaces were classified by another author while others classified it to traditional and innovative spaces [150]. Furthermore, more approaches to green space categorization also existed namely, Morphology, function, scale and gradient of privacy. Morphological categories are linear and scattered, functional categorization is socio-cultural, environmental and urban planning. The

scale domain include region, town, district, neighborhood, and local gradient of privacy includes private, semi private and public[131].

2.4.4.1 University Environment

University environment, also known as campus environment is an integral component that promote daily routines of living, working and learning for an increasing number and diversity of users[135]. University environment, just like urban city influences the lives of a great number and variety of people who study, work, play, visit, eat, and acquire goods and services from the facilities. Category of such people include the students; undergraduate and graduate, male and female, single and married, fraternity and independent, full-time and part-time, credit and non-credit, residential and commuter, and faculty; professor and visiting lecturer. Environment and human are an organic unity, hence an important platform for college students' education, spiritual civilization, as well as a major means of developing socialist core values[132]. Consequently, campus environment is a sum total of environmental factors that influence students' learning and life in campus, which involves three elements--campus material environment, campus cultural environment and campus interpersonal environment[2]. Studies argued that university environment should be suitable for learning in order to enhance social and personal development of students[133]. Meanwhile, suitability of university environment refers to its ability to support people in maintaining an appropriate balance between coping with pressure in stressful situations and ensuring sufficient periods of rest[134]. Additionally, suitability of a campus environment also implies good and conducive environment that promote good relationships between fellow students, relationships between students and lecturers, and the physical environment such as class size, air temperature in the classroom, noise

control, and campus cleanliness[135]. Thus, if a conducive learning environment can be created, it will create the motivation in students to concentrate more and achieve their learning goals[138].

By design, campus environments comprise of open/outdoor and indoor spaces. Some of the elements that makes up the university environments includes roads, buildings, and spaces, forming a physical environment, just like the urban pattern[136]. Campus open spaces are described as accessible urban ecosystems, without buildings[137] and made up of different elements connected to each other. Campus open spaces as multifunctional landscape services (LS) providers, which simultaneously offer vital benefits, such as improving air quality, ensuring pleasant climatic conditions, habitats for biodiversity, offering outdoor spaces to play, do sport, rest, and provide psychological benefits[138].

Basically, campus open spaces are made up of green spaces and grey spaces[139]. However, students in university campuses are often faced with high level of stress, referring to a malfunction between the campus environment and the students' need while other studies have proven that exposure to natural environments is expected to translate to psychological wellbeing, improvement in mood, pleasure, even better health and positive impact on academic

performance[9,140,141]. Hence, the focus of this study on green space as an element with significant role on behavior, attitude, and quality of life[142].

2.4.4.2 Land Use Classifications in a University Environment

By design, the university environments are structured to accelerate the interactions and ensure active connections among the different categories of people within the campus and smooth running of various activities. Hence, campus planning is a process of outlining the long-term direction of institution's physical and built environment for maximum use of resources and sustainability. Categorically, these involves open space, buildings, pathways, roads etc. The built environment comprises of various buildings categorized as zones[143].

Furthermore, Land Use and Land Cover (LULC) according to Nigeria National Building Code (NNBC) for universities showed that, maximum percentage of built-up area are 30-40% for low density area, 40-50% medium density area, 50-60% high density area and 20% minimum for GSs respectively allowable in a university depending on location[144].

2.4.4.3 Residential Uses: This is where people live; which can involve family dwellings of various sorts based on residential density. Residential land use can be land use for low density consisting of single-family homes, semi-detached homes, and duplexes, also medium density which can be townhouses and low-rise apartments while high density consists of high-rise apartments and private and common open space while the most intensive residential land uses are associated with clusters of apartment buildings, which can support extremely large densities of human populations[163]. Residential land uses also comprises of single-family residences, suburban homestead, or any number of other designations which cover homes, apartments, duplexes, trailer parks, and condominiums[147].

2.4.4.4 Commercial Uses: Commercial lands use are those used predominantly for the sale of products, services and for commercial activities, which includes any land use that is used for buying, selling, or trading goods and services which provide opportunities for a broad range of

retail, professional offices and other uses intended to meet the need of the society, which is mostly located along the main road, major highways, access routes to cities, freeway corridors, and in urban central business districts. However, there are several types of commercial land use which is usually dependent upon the business use of the property, and often the number of business patrons. Office buildings, shopping centers, nightclubs, hotels, certain warehouses, some apartment complexes as well as vacant land that have the potential for development into these types of buildings can all be grouped as commercial land use[147].

2.4.4.5 Institutional Uses: Institutional land use includes government administrative offices and facilities, military installations, correctional facilities, religious, that is, buildings and grounds occupied by churches and other structures used for meetings, worship, and activities of religious groups. Also, health institutions include public or private clinics for medical or mental health treatment or diagnosis which are located within the communities that they serve and land occupied by facilities that provide a variety of health care and physical or mental rehabilitation services to residents, including hospitals, medical clinics, doctors' offices, medical laboratories, nursing homes, and sanitariums, while the surrounding grounds, parking areas, and support buildings associated with these facilities are included[147].

The land occupied by the educational buildings or other uses associated with educational institutions, to include all public and private educational institutions, including pre-schools for children below kindergarten age, public or private daycare, elementary and secondary high schools, colleges, universities, trade and vocational schools, and other educational institutions.

Institutional land use to consists of medical and health care service which include, hospitals and convalescent home and other medical and health services e.g., dentist, doctor, chiropodist, and optician[147].

Also, to include places of worship as in Churches, mosques and synagogues, while educational land uses connected with educational establishments which among others include schools, colleges, higher and further education centers, universities and other specialized learning places. Other institutional land use includes community protection and justice administration services e.g., police stations, fire stations, coastguard and lifeboat stations, and law courts, community protection and detention centers, Community meeting places club, public

sanitation facilities and animal welfare facilities[144].

2.4.4.6 Recreational Uses: This comprise of indoor and outdoor land and facilities developed to support assembly, recreational, cultural, or entertainment activities which include indoor public or private facilities for cultural activity, recreation, and public assemblies, such as planetariums, civic centers, theatres, auditoriums, indoor tennis courts, field houses, and enclosed stadiums. Outdoor cultural, public assembly, and recreational lands (and their accompanying incidental buildings) including museums and other indoor cultural activities that include facilities libraries, museums, art galleries, planetariums, aquariums, nature or craft exhibits, historic buildings, and historical monuments[147].

2.4.4.7 Agricultural Uses: Agricultural land use is related to the production of food and maybe broadly defined as land used primarily for the production of farm commodities. Agricultural land use are lands that are used for crops, grain and forage crops, pastureland, and idle fields in rotation to cultivated crops or pasture and also included land and buildings used for livestock's raising, poultry and other animal operations[147].

2.4.4.8 Transportation Uses: Transport land uses as land used for transport, tracks and ways, transport terminals, interchanges and car parks. The land is used for moving people and goods from one place to another[147].

2.4.4.9 Water Bodies This includes all areas of surface water with no, or minimal, emergent vegetation land with a significant tree, shrub, or herbaceous cover which that are permanently, seasonally, or periodically swamped[147].

Since campus green spaces open to users are the ones in core academic, administrative and residential areas of the university other categorization of green areas are excluded from this present study.

2.5 Concept of Campus Scape

The concept of "campus scape" encompasses the comprehensive design and organization of a university's physical environment, integrating architectural structures, natural landscapes, and infrastructural elements to create a cohesive and functional space that supports both academic and social activities[139]. This holistic approach not only enhances the aesthetic appeal of the campus but also plays a crucial role in promoting sustainability and the well-being of its occupants. The term Campus Scape refers to the overall physical, spatial, and aesthetic composition of a university or college campus. It encompasses the design, layout, and interaction between natural and built environments within the campus. Campus scape integrates elements such as: Architectural design (academic buildings, auditoriums, hostels, administrative offices), Landscaping (green spaces, gardens, trees, water features), Circulation networks (roads, pedestrian walkways, bike lanes), Public spaces (plazas, courtyards, recreational areas) and Cultural and social spaces (art installations, gathering spots)[139].

A well-designed campus scape enhances the educational experience by promoting connectivity, sustainability, aesthetics, and functionality. It contributes to students' well-being and fosters a sense of community within the university.

2.6 Factors Affecting Green Space Utilization

Green space is an important component of the Campus settings promoting sustainability of life and the environment. Its contributions towards maintaining balance between the environment and the existing lives cannot be underestimated. Howbeit, studies have identified underlying factors that triggers or retard the efficiency of its use. these factors directly or indirectly influence the use pattern in a way that could either be positive or negative on the outcome of use as well[145, 146].

While some of the studies look at factors from the perspectives of amenities presents within the green spaces, some were based on human factors with focus on the socio-economic characteristics of users. Hence, recent developments in high quality parks have ascertained the essential of park use pattern, perception and user's needs[62, 63].

Studies related to parks and green spaces, asserted two essential measures that influence the level of park or green space utilization as people's needs and preferences on activities conducted within green space area[147].

Distinctly, other studies noted that use pattern is highly associated with the facilities provided, sizes and physical characteristics of the various types of green space which also is in correlation with other scholars who in addition to facilities submitted that green space use pattern depends

largely on maintenance, safety, accessibility, distance and natural elements[148,149]. Meanwhile, use pattern is not only quality dependent based on the aforementioned factors but also dependent on the social demographics or social-economic characteristics of users while described the use of green space as a function of individual factors, the perceived environment, the physical environment (i.e., the characteristics of the green space itself) and various interactions[150, 151].

Studies on GS and factors affecting the use of GS focus on two broad groups of variables; variables related to users as individual characteristics and physical and environmental variables related to UGS and surrounding neighborhoods which is not exclusively to the context of the compact urban development but relate to elements that associate with it. The physical and environmental variables contributing to the use of urban parks can be put into different themes. One theme of the study focuses on the perceived environment of the urban parks, such as accessibility to urban parks, quality of urban parks, attractiveness, and safety.

Accessibility to an urban park indicates the level of services each park offers regarding its spatial distribution[152]. Accessibility to the park is a multidimensional concept that can relate to the distance and proximity of residents' houses to the park and the quantity and quality of the

park's amenities[153, 154]. Distance to a park has been noted as one of the fundamental factors affecting its use; when traveling distance increases, the park uses decreases[155]. Also, the quality of urban parks regarding landscape, facilities, and vegetation affects their use [156]. It's been noted that all users appreciate high-quality parks regarding cleanliness, lack of litter, and sense of maintenance[157].

The other theme of the literature focuses on the elements of the parks' surrounding neighborhood in relation to park use. Elements include walking, cycling, active travel and public transportation[158]. In a recent study in Hong Kong, urban park accessibility for every housing state with different transportation modes (walking, bus, mass transit railways)[159]. They found that public transportation shortened the travel time to urban parks for all residents and increased its use. Land use mix has also been associated with park use. The contribution of a study in Boston, Cincinnati is that access to various land uses in the walkable distance from home to the park increases the park use of the children and their physical activity[6].

This is also supported by another study in Bogotá that found that land-use diversity in the surrounding neighborhood of a park promotes the active park use of older adults[5]. Also, another author found a positive link between land use mix and children's park uses and parkbased physical activity in New York City[160]. The result of another study indicates an association between built-environment density and park use[161]. The second research group focuses on the users and their individual features in park use. User's age has been noted as an essential factor affecting park use[162]. Several studies have investigated the ability of UGS to provide suitable environments for specific age groups, such as children and the elderly.

However, we know little about park use considering different user groups, the differences and similarities between their use pattern, and how GS can afford various user groups[165]. Only one recent study in a park in central Landskrona, Sweden, has investigated the environmental affordances of an inclusive urban park for different age groups[163]. This study approaches the age-inclusive parks with the concept of multifunctionality and environmental affordances (possibilities for actions). The results indicate that social multifunctionality for various age

groups is obtainable since different users enjoy having people around them because of liveliness and safety.

Another study indicates the importance of developing various environmental features to offer various affordances, such as lively and quiet places[167]. However, the study and study area are not in the context of a university green space and overlook some elements that have been found significant by other studies for affecting the use of urban parks, such as gender, dominating male participants in the study.

User's gender has also been noted as a contributing factor influencing urban parks' use from a study conducted at Kumasi, Ghana[164]. Also, in a study in low-income neighborhoods in Los Angles, women reported fewer and shorter durations of park visits[165]. Moreover, gender has been linked to the perception of safety in urban parks in a study in Poland[166]. The authors indicate a considerable difference between male and female respondents who felt less safe than male respondents in the same urban park. Also, they highlight the need for more genderinclusive urban parks[183]. Consequent upon this finding from previous authors work and global reviews on factors affecting green spaces, further work was done where this factor was succinctly categorized into Individual Factors, Physical Environmental Factors, Perceived Environmental Factors and Combination of Factors and Interaction Between Factors[174, 184].

2.6.1 Individual Factors

Various studies have found correlations between individual factors such as age, education, gender and ethnicity and the use of UGS[174]. Consequently, participating in outdoor recreational activities is influenced by the social environment; if a person's friends and

family commonly participate in outdoor recreation, this person is more likely to participate too[184].

2.6.2 Physical Environmental Factors

Distance, size, presence of facilities and possibility for activities are all thought to affect the use of Campus Green Space (CGS)[184]. Distance is frequently reported as the main environmental factor influencing the use of green space[183]. However, the methods used to measure distance to, describe the characteristics, attractiveness or quality of CGS in more detail, vary considerably between the different studies and the results are therefore not directly comparable. Three main methods have been posited for measuring environmental factors namely; environmental assessment; self-reported environmental perception by residents; standardized field assessment by experts; assessment of measurable environmental features using a Geographic Information System. The different methods each have their own benefits and drawbacks, and researchers therefore increasingly use multiple methods[184].

2.6.3 Perceived Environmental Factors

This factor is based on subjective or objective view of an environmental assessments scenario[183]. Perceived environmental factors are a better predictor for behavior than objectively measured environmental factors[174]. The poor correspondence between objective and perceived environmental factors by dividing space into three separates, but closely related parts: inner space, experienced space and outer space, see the figure 2.1.

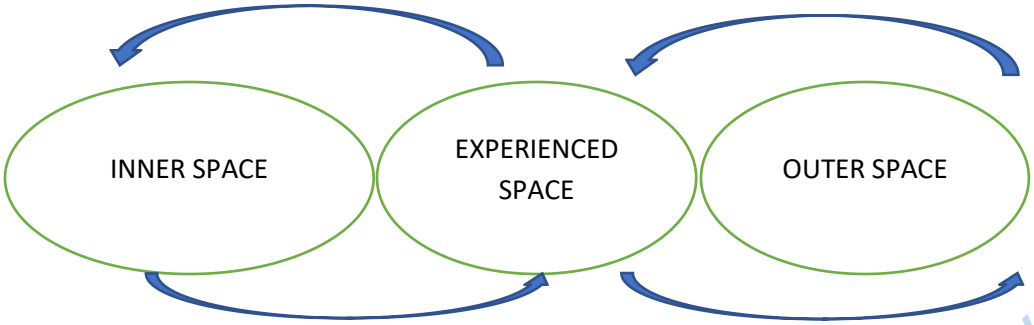

Figure 2.1. Inner, Outer and Experienced Space Adapted[167]

Outer space is the 'real' space that can be described objectively. Inner space is the state of mind of each individual person, including his or her previous experiences, preferences, mood, etc[184].

Inner and outer space are connected by means of experienced space, which could be described as the individual perception of 'real' outer space. Based on this review, the author concludes that the way a space is experienced has more effect on behavior than the objectively measurable characteristics of that space[184].

2.6.4 Combination of Factors and Interaction Between Factors

Few published studies have examined the relative influence of individual and physical environmental factors on physical activity. An Australian study for instance showed that the direct influence of the physical environment on the level of physical activity was secondary to individual and social environmental factors[168]. Based on the same material, they also looked at relative influence of the environmental versus the individual factors on walking and found them to be almost equally important[172]. Based on the finding that individual and environmental factors are almost equally important in stimulating walking, for an intervention strategy that focuses both on people and places[171]. She also suggests targeting

future interventions to specific population groups since the relative importance of the different factors varies for each population segment.

2.7 Impact of Green Space Availability and Utilization on Campus Image (Attractiveness)

An increasing body of study has explored the impact of campus green spaces. Though, the green space on campus, recognizes the importance of GS elements having contributory impact on the entire student and the university environment at large has gained limited attention[169]. For instance, in nearly over 20 years of private university establishment in Nigeria and its campus construction and development, attention had been given more to physical infrastructures at the expense of GS, thus the reason for a speedy focus on sustainable and optimized green campus planning is gaining prominence[170].

Campus greening is an important part of ecosystem services inherent with an urban space and a main index used in measuring the outlook on an environment. GS provision usually gives campus designers and managers serious challenge; however, it provides students with a wealth of ecosystem services, including saving energy, regulating microclimate which in turn leads to the improvement in the level of attractiveness of the campus[171]. In addition, the availability of such GS helps in developing a sustainable campus and it environ, both for physical and leisure actions having a positive impact on stress reduction and campus image[185]. More studies opined that, the mere presence of GS on any campus engenders mindfulness, increase the urge for physical fitness and overall well-being contributing to the campus landscape activities as well as promotes good vistas[172]. From the foregoing it is clear that GS availability plays crucial role on the overall outlook of both the university and the urban ecosystem with the capability of improving the appearance of the university at large.

2.8 Theoretical Background: Understanding the Use of Campus Green Space

Studies that submitted that educational environments can all have an effective role in the behavior of their users which could range from impact on their learning to subjects such as sense of belonging, social relations, social communication, accountability, etc.[173]. However, these impacts are threatened from user's attitudes towards the environment. In paradigmatic study of perspective, several theories have explained the relationships between individuals and the environment such as green spaces. Good number of theories have attempted to explain why people do or do not engage in a certain behavior and as well provide perspectives on the person-environment relationship.

2.8.1 Socio-Ecological Model

The theoretical framework that situates itself with the use of Green Spaces is the socioecological model. In the field of social research, this model is commonly used as a conceptual framework to structure and understand factors influencing human behavior[174]. Studying the use pattern of CGS could be part of the socio-scientific fields, and for that reason, I have chosen to use a socioecological model as framework for understanding the use of CGS. The concept behind the socio-ecological model is that the environment humans live in should be seen and studied in the same way as the environment for plants and animals, which basically comes down to the idea that you cannot understand a person's behavior without understanding the

'system' or 'environment' he or she lives in[175].

In a socio-ecological model, various levels of influence on a person's behavior can be divided into individual factors (e.g., age, education, personal experiences, friends, family) and environmental factors (e.g., physical environment, cultural environment, policy environment).

Socio-ecological model as framework for understanding the use of CGS, see figure 2. The model in figure shows that the behavioral 'use of CGS' can be seen as the result of individual factors, the perceived environment, the physical environment and various interactions.

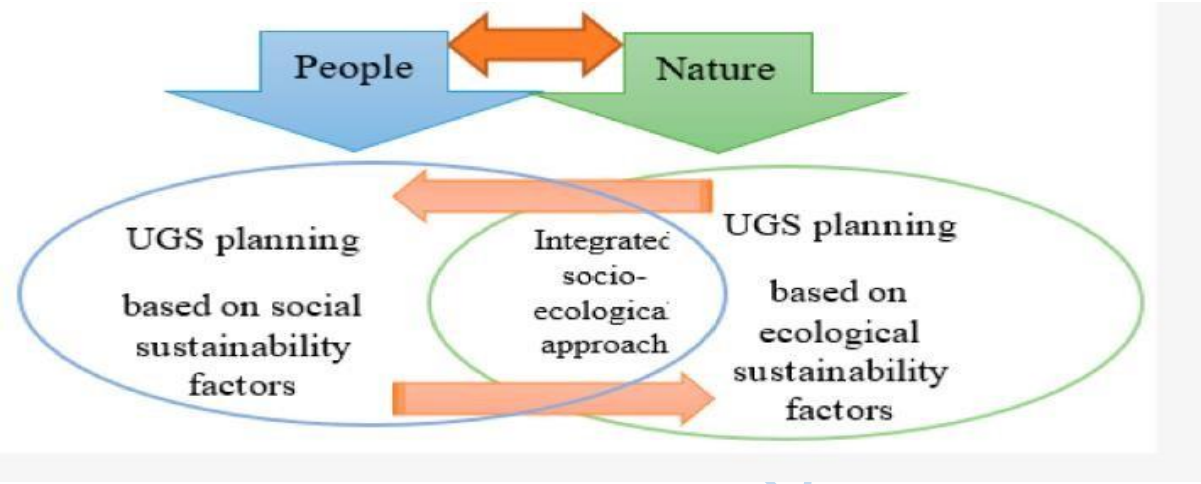

Figure 2.2A: Integrated Socio-Ecological Approach for UGS Planning and Design for Social and Ecological Sustainability Source[175]

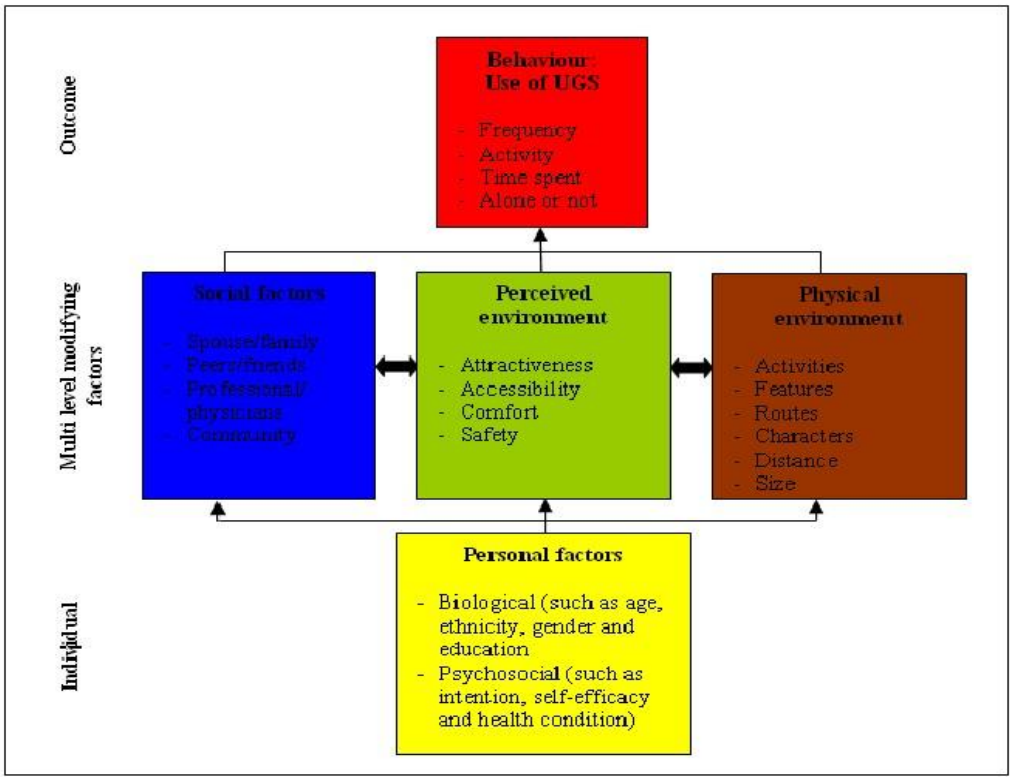

Figure 2.2B: Integrated Socio-Ecological Approach for UGS Planning and Design for Social and Ecological Sustainability Source[176]

2.8.2 Theory of Place

Another theory for understanding the people-environment relationship is theory of place. This theory focuses on the relationship between human being and the physical environment and as well revolves round place making described as the "process of creating place which occurs authentically and unselfconsciously in the interactions between people and physical environments" [177]. Notably, the three components of place which emphasized the importance of experience, choice and the interaction between components in understanding place are physical settings, concept and activity [178].

Likewise, components of goal-oriented behavior towards a place as (a) the quality of the place based on social and physical resources to satisfy the goal directed behavior and (b) how it compares to other alternative places in terms of emotional bonds to the setting and the activities afforded by the setting[179,180 ,181]. The theory of place is discussed within four contexts as explain below[182];

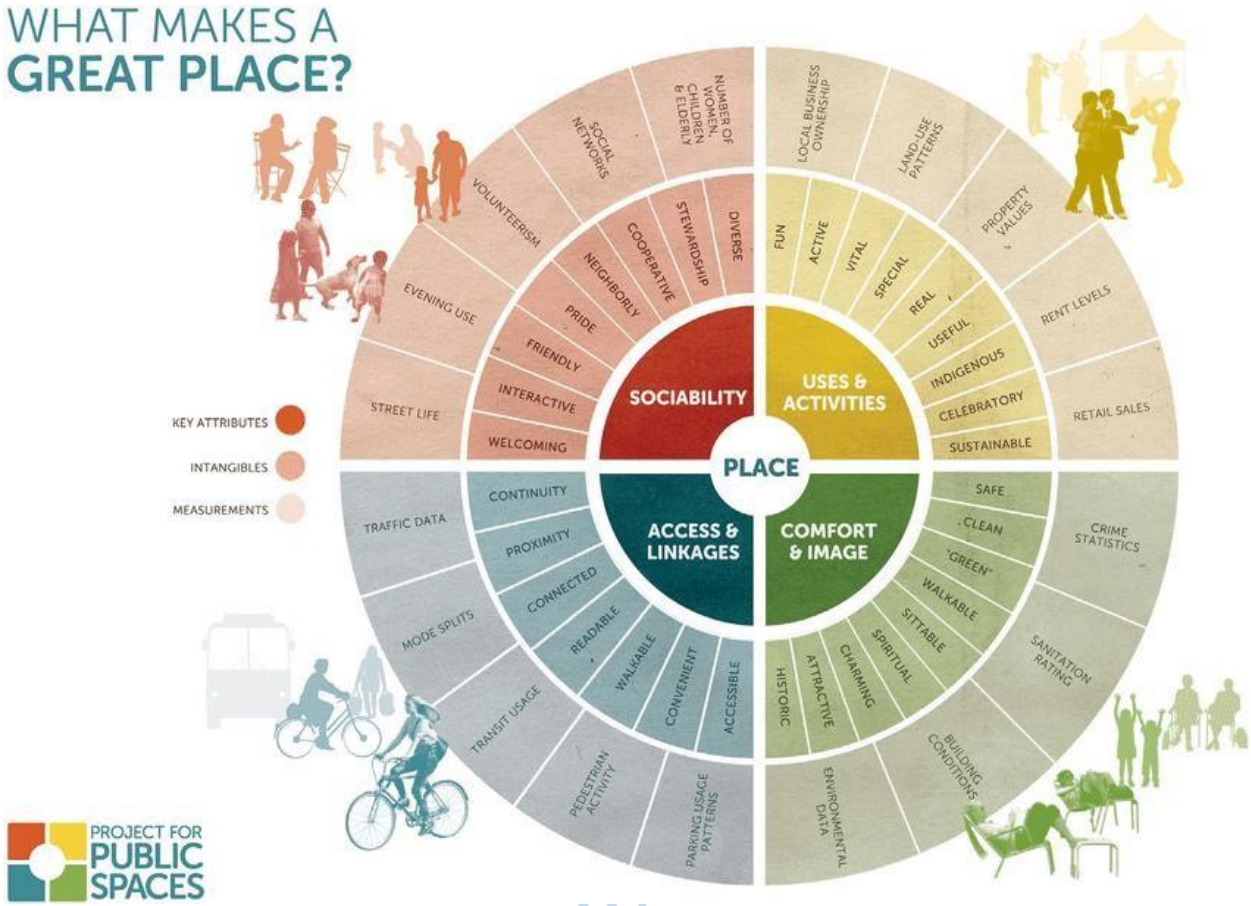

Figure 2.3: Place Diagram Source[187].

The place diagram has five consecutive rings, which refers to the significance of four principal urban qualities which are sociability, used, activities and access and linkages, comfort and image[183]. It pointed to the overall importance of public domain and space between buildings which configures behavior and experience[187]. Even though the framework is not specific about campus green spaces, being general in nature with many aspects that may not be relevant to university campuses, its significance lies in its users-based approach which is the focus of this research which offers insight into some factors on which users' satisfaction may be hinged.

The suitability of this framework in providing insight to guide the present study is also accountable for the richness of the details of the four principal urban qualities in its third ring.

Consequently, the division of access and linkages to continuity, proximity, connected, walkable, convenience, accessible, apart from readable which is cognitive, suggest it to be spatial and therefore central to this research. For the purpose of this research, some of the components of the other three principal urban qualities can be regrouped to be either, cognitive, affective and behavior of users of CGS which determines overall satisfaction and pattern of use.

2.9 Conceptual Framework of the Study

The theory and concepts reviewed would help in describing the objectives of this study. This studies conceptual framework is hinged on the theory of place and the concept of sustainability. In the theory of place, identity of space is characterized by the behavior associated with the space(practice), physical parameters of the setting(materiality) and the description/concept which users hold about the behavior in the physical environment(meaning). Furthermore, the social economic and cultural surrounding of the space will ensure consistency in how the physical space are used or unused which agrees with the concept of sustainability.

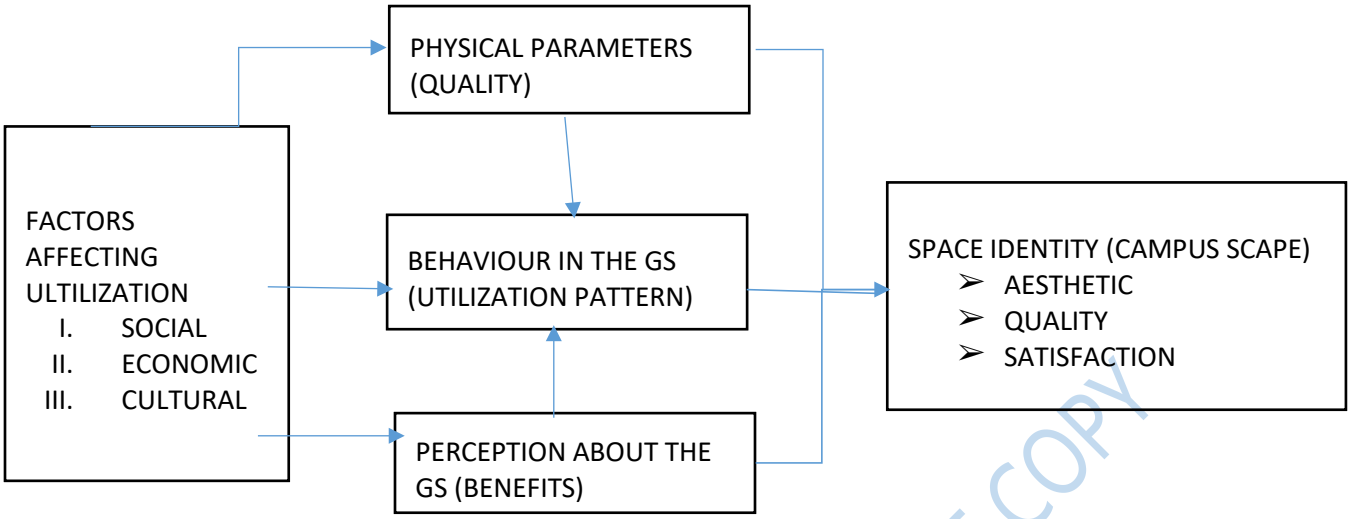

Figure 2.4: The Conceptual Framework of the Study Author's Concept

2.9.1 Framework for Health Campus Green Space Design

This framework linked three approaches of Landscape, spatial and green spaces designs. It identifies the elements associated with these three approaches to include lawn, tree, sculpture, fountain, courtyard, privacy, food and biodiversity, among others and linked them to stress alleviation strategies[184]. Even though with good theoretical underpinning, in literature, a major flaw subsists in its designer-oriented approach which is not much favored by the twenty first century democratic, feedback and two-way communication paradigm where user should be the central theme in open green space delivery [185].

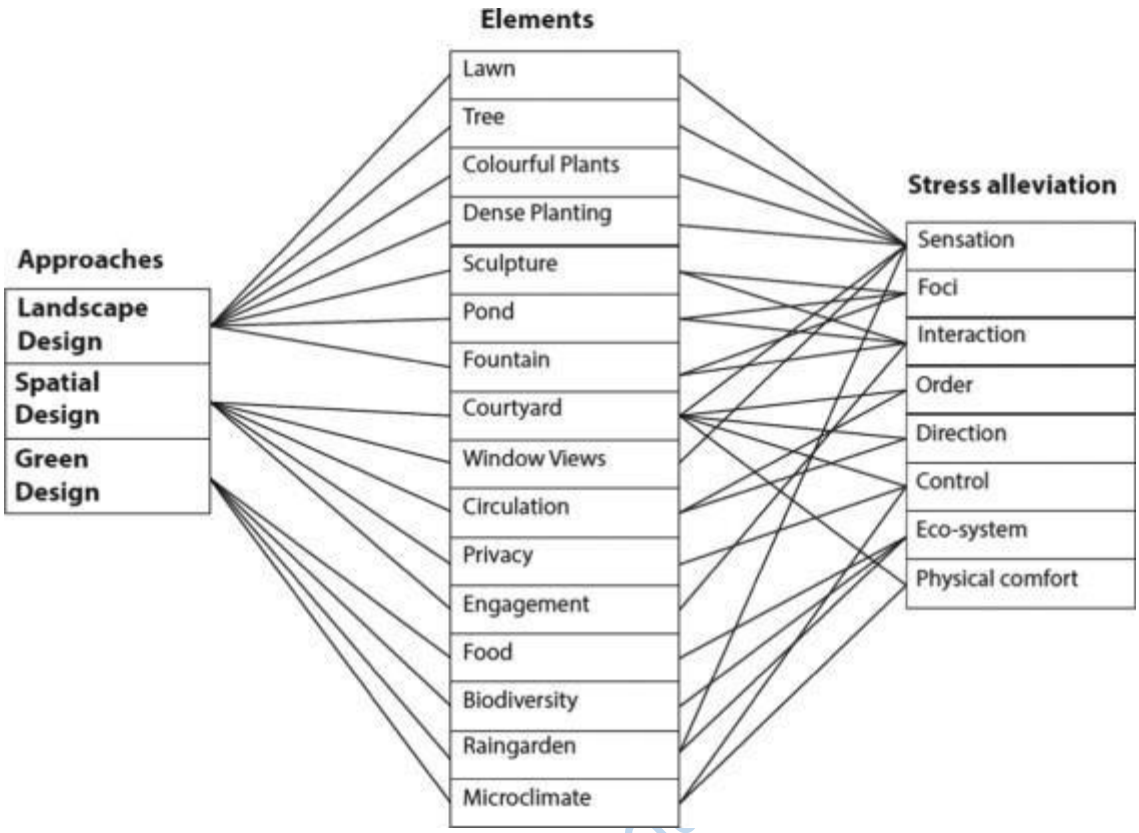

Figure 2.5: Framework for Healthy Campus Open Space Design Diagram Source[193]

Consequently, the very few typologies (Courtyard and Rain Garden only) of open spaces and limited number of variables used for the three approaches suggest the limitation of the frame work for generalization. The typologies, did not follow any established grouping in literature among others[186]. Acknowledging the weakness in the framework, another author recommended that qualitatively examined design strategies would elicit optimum use of space which will create healthy, vibrant and sustainable leaning, teaching and research environment[194]. Despite the defect of this framework, it provides a good approach to understanding the nature of CGS we draw a closure and linkages to the stated objectives of this research which can be adopted.

2.10 Summary of Literature Review

Literature search has revealed mass of research in landscape studies of campus green spaces across countries, this section highlights gaps that were identified through review of existing literatures.

Firstly, identified from literature reviewed is the dearth of literature on the studies of GS use pattern. Observed was the fact that most studies have been conducted in the western and eastern countries, with limited literatures in Africa especially Nigeria[187, 44]. While, other studied have focused on use pattern across different open spaces, parks only few have been done on green spaces[36,15]. Furthermore, studies conducted on campus communities have majorly been a cross sectional approach with homogenous population[188,12]. Another example of such was the study conducted at which explored the uses of nature and quality of university life [41].

Secondly, Little or none had been conducted on GS use pattern across different university at the same time as a way of comparing outcome from each university[26]. Thus, this study seeks to bridge this gap by conducting similar research but employing a cross sectional approach with heterogeneous population.

Thirdly, moreover, most of these studies on GS use pattern had employed a single method of analyses as either quantitative or qualitative analyses while very few had employed mixed method[12,15,189 ,44.] This is one of the gaps that will be bridged by this study in order to arrive at a broader understanding of the subject of study, boost validity and dependability of data for stronger findings that are generalizable, this study will employ mixed method.

Furthermore, very few studies have considered the GS pattern within university environment in Nigeria. For instance, the perception of trees and greens in open spaces for environmental

quality in the Federal University of Technology, Akure was examined and not green spaces[190]. Though the study established that green spaces are tools in networking between both students and staff and means for community integration for comfortable and pleasant settings, nothing was done regarding the pattern of use. Hence, the differences in use patterns of GS in universities in Nigeria are worth exploring. However, considering the economics of research and in ensuring timeliness, this study is limited to the western region of Nigeria being the region where the first university started.

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Chapter Three

Methodology

This section outlines the procedure used in carrying out the study. It generally contains the research design, philosophy of research, research population, sources and type of data, research instrument, data collection procedure, and methods of data analysis, it gives literature support to the ideas presented.

3.1 Research Design

Research is an original contribution to the existing stock of knowledge through study, observation, comparison and experiment [1]. It is described as a systematic and organized way of finding answers to questions[2]. In addition, research is the process of bringing inexistence to existence[3]. Therefore, research design is the framework of methods and techniques employed in ensuring that the stated research questions are appropriately and effectively answered. Therefore, this study is an explanatory concurrent mixed method research design; this implies the study began with quantitative methods which were followed up by qualitative method designed to explain the quantitative findings in depth.

3.1.1 Research Philosophy

The purpose of doing research as stated earlier is a means to gain an insight or understanding of a problem and a methodological search for solutions to the problem[4]. Research is the exploration and analysis of general issues; an act of generating new frontier of knowledge[5]. Research Philosophy therefore is a relentless investigation of underlying propositions of empirical sciences, a verification of our assumptions about man and the universe[6].

Research philosophy represents the way in which researchers view the world, and directly influences how data about a phenomenon is collected, analyzed and applied. There are three

reasons why research philosophy is important[7]. Firstly, to help decide on the overall research strategy. Secondly, to avoid unnecessary work and thirdly to help choose or adapt research methods according to the knowledge structure and experience. Thus, there are four philosophies in research namely positivism/post positivism, interpretive/constructivism, pragmatism and advocacy/participatory [8].

However, the pragmatic philosophy was adopted for the purpose of this study. This is because for behavioral research, it is inappropriate to draw conclusions using one source of evidence given the nature of the research questions asked. Therefore, the use of the pragmatic research philosophy is justifiable for this study. As the pragmatic approach will be combining both positivism and interpretative using their related research approaches and tools.

Pragmatism emerged as a result of challenge of dominance of the mono method of positivism and interpretative in the 60's and consequently produced the mixed methods[9]. Pragmatism research philosophy accepts concepts to be relevant only if they support action. Pragmatics "recognize that there are many different ways of interpreting the world and undertaking research, that no single point of view can ever give the entire picture and that there may be multiple realities[10]. Pragmatism explores actions, situations and consequences rather than antecedent conditions[8]. The belief of a pragmatist is not to focus on methods but on the research question and use all approaches available to understand the problem[16]. The approach does not allow the researcher to be comfortable within only qualitative or quantitative approach but applies concepts to solve problems[10] by mixing data collection, methods and data analysis. As such the only way data can be acquired is through the combination of action and reflection[11].

This therefore links pragmatism to the mixed method approach.

3.1.2 Research Approach (Mixed Method)

In pursuance of the objectives as stated in chapter one, a mixed method approach was employed. Mixed method is closely linked to pragmatic paradigm which allows for pragmatic selection of sources and methods required to best achieve the study aim[16]. The approach was therefore informed by the pragmatic philosophy adopted by the researcher.

Mixed methods research combines elements of quantitative research and qualitative research in order to answer your research question. Mixed methods can help you gain a more complete picture than a standalone quantitative or qualitative study, as it integrates benefits of both methods. Mixed methods research is often used in the behavioral, health, and social sciences, especially in multidisciplinary settings and complex situational or societal research[12].

The mixed method is an approach that has comparisons between quantitative data in numerical form, derived from questionnaires or structured interviews and qualitative data, that is, descriptive data from observation or unstructured interviews[13]. Uniquely, this method gives deeper insight or understanding of the subject of study, ensure triangulation for credibility of findings; gives complementary results because the result from one method informs the other method [14]. The Table 3.1 gives the description of how mixed method was applied to attain the stated objectives.

Table 3.1: Research Approach per Objective (Mixed Method Approach)

S/N	Objectives	Research Approach
1.	Identify availability and current conditions of green spaces within each private universities in South West, Nigeria.	Quantitative and Qualitative
2.	Evaluate the perceived benefits and impact of Green Space availability and utilization in the study area	Qualitative and Qualitative
3	Assess the use pattern of the green space within the study area.	Quantitative and Qualitative
4	Identify factors that's influences utilization pattern in the study area.	Quantitative
5	Assess the impact of green space availability and utilization on the Campus Scape	Qualitative and Quantitative

Source: Researchers Fieldwork 2024

3.1.3 Research Strategy

Research strategy is one of the elements of research design that builds on the research approach. There are many different forms of research strategy, however, based on the objectives itemized for this study, a multiple case study research strategy employing both qualitative and quantitative research tools or instruments. Table 3.2 shows the Research strategies that was adopted for each of the study objective.

Table 3.2: Research Strategy Per Objective

S/N	Objectives	Research Approach	Research Strategy
1.	Identify availability and current conditions of green spaces within each private universities in South West, Nigeria.	Quantitative and Qualitative	Survey, Physical Observation and GIS
2.	Evaluate the perceived benefits of Green Space availability and utilization in the study area	Qualitative and Qualitative	Survey and Physical Observation
3	Assess the use pattern of the green space within the study area.	Quantitative and Qualitative	Survey and Physical Observation
4	Identify factors that's influences utilization pattern in the study area.	Quantitative	Survey
5	Assess the impact of green space availability on the Campus Scape (image)	Qualitative and Quantitative	Survey, Physical Observation/Google Earth Imagery (GEI) and Geographic Information System (GIS)

Source: Researchers Fieldwork 2024

3.2. Methods for Data Collection

This study employed the use of quantitative and qualitative data collection methods in order to have adequate and comprehensive information necessary to achieve the study objectives.

i. Primary Quantitative data was collected using questionnaire administered to the students of the selected private Universities in South West Nigeria, and primary qualitative data was collected through observation guide for data on current physical condition of the available green spaces across the selected private universities. While; ii. Secondary data was collected with the use of Geographic Information System (GIS) to generate Google Map Imagery and Land Use and Land Cover of the available GS in the selected universities.

3.3. Study Population and Sample Frame (Quantitative)

Research population refers to the total number of items from which information is desired[1]. It is a group of individuals, persons, objects or items from which samples are taken for measurements and from whom information is to be obtained and to which a generalization is to be made[15, 16, 20]. A research study population is the aggregate of elements or a subset of the population from which samples are drawn.

The study population for the research work comprises of all students of each private university located in South West, Nigeria. Generalization for this study was made based on the study population. However, a sample frame was used in this study as it will be impossible to study all private universities in the South West Region of Nigeria. Thus, one private University from each state within the South West Nigeria was randomly selected using ballot to make up the sample frame of 6 universities in all. The university selected includes Redeemer University

(Osun State), Afe Babalola University (ABUAD) (Ekiti State), Covenant University (Ogun State), Elizade University (Ondo State), Caleb University (Lagos State) and Ajayi Crowther (Oyo State).

Table 3.3: List of Private Universities in South West Nigeria

S/N	State	Private Universities	Year of Establishment	Total Number of UNI per state
1	**Ekiti**	**Afe-Babalola University**	**(2009)**	1
2.	Lagos	Augustine University	2015	
		Pan-Atlantic University	2002	6
		Anchor University	2016	
		Caleb University	**2007**	
		Eko University of Medical and Health Sciences	2017	
		James Hope University	2021	
3.	Ogun	Babcock University	(1999)	12
		Covenant University	**(2002)**	
		Crawford University	(2005)	
		Crescent University	(2005)	
		Mcpherson University	(2012)	
		Mountain Top University	(2015)	
		Bells University of Technology	(2005)	
		Chrisland University	(2015)	
		Hallmark University	(2015)	
		Christopher University	(2015)	
		Southwestern University	(2012)	
		Trinity University	(2019)	
4.	Ondo	Wesley University of Science and Technology.	(2007)	3
		Achievers University	(2007)	
		Elizade University	**(2012)**	
		Bowen University	2001	8
5	Osun	Fountain University	2007	
		Joseph Ayo-Babalola University	2006	
		Kings University	2015	
		Adeleke University	2011	
		Oduduwa University 2009 Westland University 2019		
		Redeemer's University	**2005**	
6.	Oyo	**Ajayi Crowther University**	**2005**	7
		Dominican University	2016	
		Precious Cornerstone University	2017	
		Lead City University	2005	
		Kola Daisi University	2016	
		Atiba University	2017	
		Dominion University	2019	

Source[16]

3.4. Sampling Techniques

Sampling is the procedure of selecting units of observation which can be generalized to a larger

population in research[17, 18]. Sampling in mixed methods involves combining well established quantitative and qualitative techniques in creating ways to answer the research questions [23, 19]. The sampling technique used in selecting respondents to make up the sample size of the study was simple random sampling. This was conducted by listing the samples, assigning numbers to the units and selecting randomly to make up the sample size. This is done in order to eliminate any bias in the choice to make up the sample size for the study.

3.5 Sample Size (Quantitative)

This is very important to ensure that results of the study can be generalized to the research population at a reasonable level of confidence. The sample size for this study was calculated using Yamane's sample size formula. The determination of sample size depends on the degree of precision to be achieved, the nature of analysis to be performed, ability of the researcher to gain access to the subject, the number of variables that have to be examined simultaneously and selection of relevant unit of analysis and the likely response rate[20].

A sample size should neither be too small so as to achieve the objectives nor too large to incur costs or waste of resources[1]. However, the larger the sample size, the higher the level of accuracy of the findings[21]. The sample size for the study was calculated thus and the distribution per university is shown in Table 3.4.

$n=N/(1+N(e)^2$ ……1

where n= The sample size N= The population of the study e = The margin error in the calculation (0.05)

=46,840/**(1+46,840(0.05)2**……2

=46,840/118.10……3

= 396.61

= 397 students

Thus a 10% attrition shall be added to the 397 for non-responses rate in a questionnaire is allowable resulting in a total of 437 sample size[22]. However, for the purpose of questionnaire distribution, 660 copies were distributed across the selected university.

Table 3.4: Showing the Population and Sample Size Distribution

University	Population Students	PPS%	Sample Size Distribution
Afe Babalola University (ABUAD)	8500	17	74
Ajayi Crowther University (ACU)	4751	10	44
Redeemers University (RUN)	11,465	23	101
Caleb University	11,428	23	100
Covenant University (CU)	8,301	17	74
Elizade University	4738	10	44
Total	49,183	100	437

Source: Student Affairs of each Universities (December 2023)

3.6 Operationalization of Variable

Operationalization of variable is the simple process of defining variables into measurable factors in order to achieve the stated objectives. Hence, this section will describe the various variables and how they will be measured. These variables are categorized as socio-economic variables, available forms of GS, physical condition of GS, GS use pattern, factors affecting GS use pattern and impact of GS on campus scape. The following variables are shown in the table below.

Table 3.5: Operationalization of Variable by Objectives

S/N	Objectives	Variables	Scale of Measurement	Data Type	Data Analysis	Data Display
		Section A (Socio-Economic Characteristics)				
1		Gender	Male (1) Female (2)	Nominal	Descriptive	
2		Age	Years: 16-25 (1), 26-35 (2), 36-45 (3), 46-55 (4), 56-65 (5) 65 and above (6			
3		Student Category	Undergraduate (1) Post graduate (2)			
4		Place of resident	Campus (1), off campus (2)			
				Nominal	Descriptive	
				Nominal	Descriptive	
				Nominal	Descriptive	
				Nominal	Descriptive	
				Ordinal	Descriptive	

					Frequency,
				Ordinal	Frequency, Descriptive
				Ordinal	Descriptive
12		Fountain with shrubs/grass	Poor (1), Fair (2), Good (3), Very good (4), Excellent (5)		
5		Academic level	100(1), 200(2), 300(3), 400(4), 500and above (5)		
6		University	ABUAD (1), ACU (2), CALEB (3), CU (4), EU (5), RUN (6)		
7	Identify availability and current conditions of green spaces within each private universities in South West, Nigeria.	Types of green space	Flower garden (1), Lawns (2), Sport fields with Grass (3), Botanical gardens (4), walkways with grass (5)		
8		Nature of GS	Natural(1), Artificial (2), Both (3)		
9		Campus Park (2),	Poor (1), Fair Good (3), Very good (4), Excellent (5)		
10		Flower garden	Poor (1), Fair (2), Good (3), Very good (4), Excellent (5) 13		
11		Botanical garden	Poor (1), Fair (2), Good (3), Very good (4), Excellent (5)		
			Courts Poor (1), Fair (2),		

			Ordinal	Descriptive	
		(football, lawns etc)	Good (3), Very good (4), Excellent (5)		
14		Walkways with shrubs/grass	Poor (1), Fair (2), Good (3), Very good (4), Excellent (5)	Ordinal	Descriptive
15	**Physiological**	Impact on recovery	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4), Major effect (5)	Ordinal	Descriptive
16		Access to privacy	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4), Major effect (5)	Ordinal	Descriptive
17		Access to social support and interaction	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4), Major effect (5)	Ordinal	Descriptive
18		Access to physical exercise	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4), Major effect (5)	Ordinal	Descriptive
19	**Psychology**	Self-esteem	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4), Major effect (5)	Ordinal	Descriptive
20		Impact on your mood	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4), Major effect (5)	Ordinal	Descriptive
21	**Stress Alleviation**	Recovery after long academic work	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4),	Ordinal	Descriptive

					Frequency,
			Major effect (5)		
22		Lower mental distress	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4), Major effect (5)	Ordinal	Descriptive
23		**Restorative** Neutral	Restoration of human attention	No effect (1), Minor effect (2), Ordinal	Descriptive (3), Moderate effect (4), Major effect (5)
24		Restore your mental fatigue and higher well-being	No effect (1), Minor effect (2), Neutral (3), Moderate effect (4), Major effect (5)	Ordinal	Descriptive
25	Spaces in the study area.	Investigate the perception about you like the GS	Green dissatisfied (1), Dissatisfied (2), Undecided (3), Satisfied (4), Very satisfied (5)	How much do Ordinal	Very
26		Quietness	Very dissatisfied (1), Dissatisfied (2), Undecided (3), satisfied (4), Very satisfied (5)		Ordinal
27		Function of recreation	Very dissatisfied Frequency, (1), dissatisfied (2), Undecided (3), satisfied (4), Very satisfied (5)		Ordinal
28		Function coolness	Very dissatisfied (1), dissatisfied (2), Undecided (3), satisfied (4), Very satisfied (5)	Ordinal	Frequency,
29		Function of shelter for a variety of plant and animal life	Very dissatisfied Frequency, (1), dissatisfied (2), Undecided (3), satisfied (4),		Ordinal

		Very satisfied (5)		
30	Function of: reduction of air pollution	Very dissatisfied (1), dissatisfied (2), Undecided (3), satisfied (4), Very satisfied (5)	Ordinal	Frequency,
31	Function of visual appearance	Very dissatisfied (1), dissatisfied (2), Undecided (3), satisfied (4), Very satisfied (5)	Ordinal	Frequency,
32	Evaluate the benefits of Green Space Campus Park scape/image.	Not accessible (1), Faily accessible (2), Undecided (3), accessible (4), Very accessible (5)	Ordinal	Frequency, availability and utilization on campus
33	Flower garden	Not accessible (1), Faily accessible (2), Undecided (3), accessible (4), Very accessible (5)	Ordinal	Frequency,
34	Botanical garden	Not accessible (1), Faily accessible (2), Undecided (3), accessible (4), Very accessible (5)	Ordinal	Frequency,
35	Fountain with shrubs/grass	Not accessible (1), Faily accessible (2), Undecided (3), accessible (4), Very accessible (5)	Ordinal	Frequency,
36	Courts (football, lawns etc)	Not accessible (1), Fairly accessible	Ordinal	Frequency,

			(2), Undecided (3), accessible (4), Very accessible (5)		
37		Walkways with shrubs/grass	Not accessible (1), Faily accessible (2), Undecided (3), accessible (4), Very accessible (5)	Ordinal Frequency,	
38		Hour of accessibility	Morning (1) Afternoon (2) Evening (3) Night (4) No Response (5)	Nominal Frequency,	
39		Days of the week most accessible	Monday (1) Tuesday (2) Wednesday (3) Thursday (4) weekend (5) No Response (6)	Nominal Frequency,	
40	**Use Pattern of Green Space**	Do you use GS	Yes (1), No (2)	Nominal	Frequency,
41	Assess the use pattern of the green space Frequency of Every time [1] Nominal Frequency, within the study area. Use Almost every time [2] Occasionally[3] Almost never [4], Never(5)				
42		Duration of Stay	Very short [1] short [2] Undecided [3] long [4] very long [5]	Ordinal Frequency,	
43		Time of visit	Morning (1) Afternoon (2)	Nominal Frequency,	

				Ordinal	Frequency,
			Evening (3), Night (4), No response (5)	Ordinal	Frequency,
44		Reason to Misuse the GS	Frequency, Yes (1), No (2)	Nominal	
45		Reason for the Misuse	Stress(1), Convenience (2), Proximity (3), Weather(4), Lack of Amenities (5),	Nominal	
46		Reading	Flower garden [1] Lawns [2], Sport field with grass [3] Botanical garden [4] Walkways with grass [5], Campus park [6]	Ordinal	
47		Relaxing with friends	Flower garden [1] Frequency, Lawns [2], Sport field with grass [3] Botanical garden [4] Walkways with grass [5], Campus park [6]	Ordinal	
48		Sightseeing	Flower garden [1] Frequency, Lawns [2], Sport field with grass [3] Botanical garden [4] Walkways with grass [5], Campus park [6]	Ordinal	
49		Chatting	Flower garden [1] Frequency, Lawns [2], Sport field with grass [3] Botanical garden [4]	Ordinal	

					Frequency,
					Frequency,
50		Picnicking	Walkways with grass [5], Campus park [6] Flower garden [1]	Ordinal	
			Frequency, Lawns [2], Sport field with grass [3] Botanical garden [4] Walkways with grass [5], Campus park [6]		
51		Meditation	Flower garden [1]	Ordinal	
			Frequency, Lawns [2], Sport field with grass [3] Botanical garden [4] Walkways with grass [5], Campus park [6]		
52		Eating	Flower garden [1]	Ordinal	Frequency,
			Lawns [2], Sport field with grass [3] Botanical garden [4] Walkways with grass [5], Campus park [6]		
53		Sitting	Flower garden [1] Lawns [2], Sport field with grass [3] Botanical garden [4] Walkways with grass [5], Campus park [6]		
54	Identify factors that's influences utilization pattern in the study area.	Age	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)		factor analysis

				Ordinal	Frequency,
				Ordinal	Frequency,
55		Sex	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency, factor analysis
56		Economic Status	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency, factor analysis
57		Place of Residence	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
58		Exposure	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
59		Availability of Wifi connectivity	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
60		Availability Kiosk or café	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
61		Availability furnitures	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,

			Ordinal	Frequency,
62	Availability of artificial Lighting	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
63	Availability of Waste bin	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)		
64	Availability of close by Rest room	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
65	Solar radiation	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
66	Breeze (air)	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
67	Presence of Erosion	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
68	Precipitation	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
69	Proximity	Very high (1) High (2) Indifferent (3)	Ordinal	Frequency,

				Ordinal	Frequency,
			Low (4) Very low (5)	Ordinal	Frequency,
70		Accessibility (Walking route)	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
71		Cleanliness	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)		
72		Safety	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)		
73		Design	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
74		Shading devices	Very high (1) High (2) Indifferent (3) Low (4) Very low (5)	Ordinal	Frequency,
75	Impact of the available Green Space on your Campus Scape	Presence of green space	Strongly Disagree (1) Disagree (2) Neutral (3) Agree 4) Strongly Agree (5)	Ordinal	Frequency,
76		Well maintained green space	Strongly Disagree (1) Disagree (2) Neutral (3) Agree 4) Strongly Agree (5)	Ordinal	Frequency,

				Ordinal	Frequency,
				Ordinal	Frequency,
77		Shaping the university's public image.	Strongly Disagree (1) Disagree (2) Neutral (3) Agree 4) Strongly Agree (5)	Ordinal	Frequency,
78		Attracting prospective students to our university	Strongly Disagree (1) Disagree (2) Neutral (3) Agree 4) Strongly Agree (5)	Ordinal	Frequency,
79		Improve my perception of my university	Strongly Disagree (1) Disagree (2) Neutral (3) Agree 4) Strongly Agree (5)	Ordinal	Frequency,

			Ordinal	Frequency,
80	Contributes to a sense of environmental responsibility	Strongly Disagree (1) Disagree (2) Neutral (3) Agree 4) Strongly Agree (5)	Ordinal	Frequency,
81	Enhances the university (1) image (2)	Strongly Disagree Disagree Neutral (3) Agree 4) Strongly Agree (5)		
82	Creates a welcoming and inviting atmosphere	Strongly Disagree (1) Disagree (2) Neutral (3) Agree 4) Strongly Agree (5)	Ordinal	Frequency,
83	Improves the overall campus aesthetics	Strongly Disagree (1) Disagree (2) Neutral (3) Agree 4) Strongly Agree (5)	Ordinal	Frequency,

Source: Researchers Fieldwork 2024

3.7 Reliability and Validity Test (Quantitative)

Presented in this sub-section are the procedures taken by the researcher to ensure that the instruments for this study were reliable and valid.

3.7.1. Reliability Test

Reliability of a research is concerned with how the measurement derived from a study is consistently repeated by someone else measuring same thing at different times and under different conditions. Therefore, reliability test shows how consistent or stable a measure is

Ordinal Frequency,

Ordinal Frequency,

under diverse conditions and circumstances from which the same or similar result is expected. Reliability is mainly concerned with random errors. It is mostly calculated using association measures called correlation coefficient or coefficient of reliability; this is the correlation between two or more measures that are supposed to measure same construct. Reliability test

of a measure is concerned with equivalency, stability with time and internal consistency of the measures[23].

However, for this study the reliability of the study instrument was determined using the internal consistency method. This was to ensure proper designing and pre-testing the questionnaire through a pilot survey conducted on a sample of the same character with the sample used for the main study. The pilot test was conducted through the administration of a physical questionnaire to 45 respondents comprising of final year students of Lead City University.

Most of the construct of the questionnaire were rated on a 5-point Likert-type (see Appendix 1).

The Cronbach alpha reliability test was conducted on section B variable 2C, section C variables 1-3 and section D which are variables that measured the assessment of green space use pattern, the factors affecting green space use pattern and the attitude of university community towards green space use pattern respectively. The result as presented in Table 3.6 shows that the result of all the constructs is above the recommended minimum value of 0.7 alpha, which implies that the instrument was reliable as all the scale of measurement consistently measured the constructs as intended.

Table 3.6: Reliability Test

Constructs	Cronbach Alpha	Number of Items
How often do you carry out the identified activities	0.947	14
Rate your satisfaction about the following factors influencing your use of green space	0.964	19
Rate the physical conditions of the following Green Spaces (GS)	0.890	8
Rate the impact of Green Space pattern of use on your institution	0.834	8
Perception towards Green Space Use Pattern	0.834	21
Perception of impact on Green Space Availability on Campus scape(image)	0.958	9

Source: Researchers Fieldwork 2024

This is justifiable as several studies had used this method for testing the reliability of a measured variables[24], which are:

Test-retest: This method is used to test the stability of a test when administered twice to same respondents but at different times. The correlation between the results of the responses of the respondents to the test administered at different times is measured. This method is however being limited in some areas as when the time interval between the administrations of both tests is short the respondents might remember their answers from the previous one. In addition, when the time interval between the two administrations is two long the respondents are subjected to maturation as their decisions might have been influenced by exposure or change in idea towards the concept being tested[25].

Alternative/Parallel Form: This method involves preparing two similar test measuring same thing, which will be administered to the same set of respondents. The difference in the

responses of the respondents will be compared to know if the test is actually measuring the concepts being tested. The scores of the differences are correlated and the result is called the coefficient of stability. The only limitation of this method is the difficulty of constructing two similar tests that will be able to measure same thing [30,31].

Spilt-halves: This involves the test to be divided into two halves and administered to the same set of respondents. Using the spilt halve method involves that the test is divided based on the evens and the odds especially in cases when the test is very long. This method usually takes care of the limitations of the test-retest method. Usually, a correlation formula is used to measure the correlation coefficient of stability between the two halves administered [30,31].

Inter-rater: Judges or respected people are selected to measure consistency of the instrument. The selected judges go through the instrument and their judgments are compared to determine the internal consistency of the test. The correlation between the judgments of the two judges will determine the specific reliability of the test and the cumulative reliability of the judges is calculated using the Spearman-Brown formula. The result is called the effective reliability of the test[29,30,31].

Internal Consistency: This particularly measures consistency within the instrument and questions. It measures how well questions set to measure a construct measure well the construct within the test. An estimate of the averaged inter-correlation of the questions on a construct within a test is calculated mostly using the Cronbach alpha coefficient test formula the value is between 0 and 1, ideally the closer the value is to 1 the more reliable the instruments, any values below 0.7 shows the reliability is low. The internal consistency coefficient increases as the item numbers increases. Therefore, if the coefficient of

consistency is low, it implies the questions measuring each construct are too short or the questions have little in common, meaning they do not actually measure the construct [29,30,31].

3.7.2. Validity Test

Validity deals with how meaningful the components of the research are. This implies it shows how well the research instrument measures the right thing it was designed to measure[30,31]. However, this research adopted the construct validity approach using the content test method. This was conducted by operationalizing the variables for the studies. Several questions were asked and they were subjected to the research supervisor's and expert review. The operationalization of variables is presented in Table 3.5. This validity ensured that questions in each construct successfully described and measured the construct in the questionnaire and thus, ensured that the questions asked covered the objectives of the study. This is justifiable as indicated that social science researchers should consider these four important validity tests in researches[30]. These are:

Statistical Conclusion Validity: This tends to look at if a relationship exists between two variables. It involves inferences made if it is rational to presume a co-variation between the two variables if an alpha level and variances obtained are given. This method can be disadvantageous if the statistical power of the researcher is weak, assumptions are debased, measures and treatment of measures reliability are low, and there is presence of random error in test administration and random heterogeneity in the respondents [30].

Internal Validity: This deals with the validity of the research. Internal validity looks at the relationships that exist between the variables. If they are causal or there are other factors responsible for the relationships in that study. It looks at, if the instrument truly tests the

situation being tested or the result gotten from the test is because of some internal influencing factors. This validity is limited by threats such as maturation, history, understanding of instrument, respondent's selection, diffusion of treatments, compensation and many internal influences [30].

Construct Validity: Looks at how well the concept to be tested is transferred into a working reality in the data collection instrument. This implies how well the variables in the research are operationalized. Construct validity is carried out using face, content, concurrent and predictive, and, convergent and discriminative validity methods [30].

Face Validity: Face validity is a type of translational validity method that involves subjecting the operationalization of the constructs to a face judgment subjective to the perception of the judge. Consequently, face validity is identified as a weak method of construct validity in research [30, 31].

Content Validity: This is a qualitative translational means of ensuring that the instrument for the test properly defines the meaning of a concept. It therefore involves the researcher providing theoretical definitions for the concepts as accepted by experts in the area of study and selects constructs that clearly covers the concept tested. To carry out a content validity involves the researcher asking several questions about the instrument and asking for the judgment of experts in the area of study [30, 31].

Concurrent and Predictive Validity: Concurrent and predictive validity are criterion based (involves the test result being compared with one or more external benchmarks) validity test. Using concurrent validity, the test measures is compared at the same time with the provided external benchmark. It has the ability to predict an event as it occurs. The predictive validity

test on the other hand compares the test measures with a future occurrence. That is, it has the ability to predict future events [30, 31].

Convergent and Discriminative Validity: The convergent and discriminating validity is also a criterion related validity test that involves measuring the convergence and divergence of a particular item (subject of investigation) by investigating the same item using different methods. The result of each method will then be compared to each other in terms of correlation. This type of validity is carried out using the multi-trait and multi-method matrix. This matrix works in such a way that same trait of the item will be tested using different methods. The inter-correlation of each method is then determined to know how convergent or divergent the items were [30, 31].

External Validity: External validity involves testing if the causal relationship for a particular measure for a particular population (may be population of study) can be generalized over another set of population. This is carried out by varying the population and checking for the same relationship within those populations [30]. Therefore, external validity involves measuring how generalizable is the causal relationship identified between two constructs in a test.

3.8 Data Processing and Analysis

Data analysis is the process of cleaning, changing and processing data collected from respondents in order to obtain actionable and relevant information that aids informed decision making. Since the data that was collected comprise of qualitative and quantitative data, hence both qualitative and quantitative analytical tools was employed for this study.

i. Quantitative analysis was achieved with the use of descriptive and inferential statistical tools. The process of data analysis was preceded by coding; the process of

transforming collected data into meaningful and analyzable categories and cleaning, this helped to detect missing values and remove wrong entries, duplicates and outliers.

ii. Qualitative data was analyzed using descriptive analysis and content analysis.

iii. Data on socio-economic characteristics was analyzed using descriptive statistics such as frequency tables, percentages, etc.; iv. Data on identification of GS was analyzed descriptively. In addition, data on current physical condition of green space was analyzed using descriptive, content analysis and

GIS

v. Data on use pattern was analyzed with descriptive statistics, cross tabulation to compare the use patterns in each university. Furthermore; vi. Data on factors affecting GS use pattern was conducted using, descriptive frequency and factor analysis.

vii. GIS analysis was conducted to establish the physical impact of GS availability and utilization on campus attractiveness, while Regression was conducted to identify the significant impact of characteristics of available green space on campus image (attractiveness and campus scape). Table 3.7 gives a summary of the analysis to be conducted per objective.

Table 3.7: Data Analysis per Objective

S/N	Research objectives	Data analysis methods
1.	Identify availability and current conditions of green spaces within each private universities in South West, Nigeria.	Qualitative (descriptive, content analysis), Quantitative analysis (descriptive analysis using SPSS) and GIS

2.	Evaluate the perceived benefits of Green Space availability and utilization in the study area	Quantitative analysis: descriptive analysis using SPSS
3	Assess the use pattern of the green space within the study area.	Quantitative analysis: descriptive analysis using SPSS
4.	Identify factors that's influences utilization pattern in the study area.	Quantitative analysis: descriptive analysis using SPSS
5	Assess the impact of green space availability and utilization on the Campus Scape	Synchronic Analysis (GIS), Descriptive and inferential Analysis using SPSS

Source: Researchers Fieldwork 2024

3.9 The Field Work

The fieldwork for this study was divided into three parts. The first part involved a preliminary survey conducted to pretest the questionnaire (May to June 2023), while the second part involved data collection through administration of copies of questionnaire, physical observation of the study area (October 2023 to February 2024) and GIS mapping of the study area (April to May 2024). The third part involved data sorting and analysis (between February and June 2024).

3.9.1 Pilot Test

The approach adopted for the pilot study was physical questionnaire administration. The questionnaire for the study was administered to 45 final year students of Lead City University. The choice of Lead City University was premised on the fact that it shares similar characteristics and location with the study area. This was conducted within four weeks and responses were collected. The pilot test was conducted to enable the researcher identify if there were ambiguous or complex questions in the instrument, and to determine if the questions measured the variables the researcher intended to investigate. The reactions of the

respondents helped the researcher to adjust some questions in the questionnaire especially as they relate to the aim and objectives of the study.

3.10 Data Collection

Primary quantitative Data was collected using paper and pencil questionnaire administration where the researcher alongside research assistant were employed for administration. The questionnaire administration was done concurrently across the selected private universities from October 2023 to January 2024. The research assistants were properly mentored and involved in a demo practice before dispatched to each study location. The copies of questionnaires were returned and properly sorted for quantitative analysis.

A total of 660 copies of questionnaire were administered to all the respondents across the study area during the main data collection as shown in table 3.8. Out of this number 485 (73.48%) were returned. A total of 357 (73.61%) out of the figure returned were found suitable for analysis through data cleaning process[26]. This figure (357) represents 81.69 % of the calculated minimum sample size of 437 (100%). This is within the very good rate of 70-85% in landscape assessment face-to-face questionnaire survey research[27]. Therefore, a robust response rate was achieved and results of analyses of the data are reliable.

Table 3.8: Breakdown of Copies of Questionnaires Administered on Users of Green Spaces in Selected Private Universities in South West Nigeria During the Main Data Collection

University	Population Students	PPS%	Sample Size Distribution	Number Of Questionnaires administered	Number Of Questionnaires returned	Number suitable for analysis	Percentage of suitable data
Afe Babalola University (ABUAD)	8500	17	74	100	80	74	100
Ajayi Crowther University (ACU)	4751	10	44	80	66	44	100
Redeemers University (RUN)	11465	23	101	150	89	64	63.36
Caleb University	11,428	23	100	150	95	57	56.43
Covenant University (CU)	8,301	17	74	100	81	74	100
Elizade University	4738	10	44	80	74	44	100
Total	49,183	100	437	660	485	357	81.69

Source: Fieldwork 2023

While the primary qualitative data collection was conducted by the researcher through physical visitation to each selected campuses, the observation was guided using an observation guide already approved by supervisors and assessors. The physical observation was conducted between January and February 2024.

Secondary data collection was conducted using GIS between April and May 2024, data collected includes Google Imagery, Land Use and Land Cover Maps and Land Use and Land Cover data. Which were also descriptively analyzed.

Endnotes

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Chapter Four

Results and Discussion of Findings

Presentation and analysis of data obtained from this study are presented in this chapter. The results of analysis are based on objectives which seek to investigate the current conditions of available green spaces within each selected private universities in South West, Nigeria. It evaluated the perceived benefits of available Green Space in the study area, assess the use pattern of the green space within the study area, identify factors that's influences utilization pattern in the study area and assess the impact of the characteristics of available green space on the Campus Scape in the study area.

4.1. Socio-economic Characteristics of the Respondents

The results of the socio-economic characteristics of the respondents as shown in Table 4.1 reveals that; The users are disproportionately males (56.0%) than females (44.0%), mostly undergraduates (86.6%) in an active age bracket of 16-25 years (89.1%). Majority lived on campus (84.9%), while their academic levels are fairly distributed 100 (10.6%), 200 level (15.4%), 300 level (22.1%), 400 level (26.1%), 500 level (9.8%), 600 level (2.6%) and postgraduate (13.4%) respectively. The highest percentage are between 300 and 400 level respectively with total percentage standing at (48.2%) than others.

Furthermore, the mean value of academic level was the highest (3.83) and SD Value standing at 1.53, this shows that years of student on campus can play significant role in determining

and ability for give and experience the university GS. This data shows that all categories of users are adequately represented which suggest the result should be adequate for generalization synthesis. The responses on quality rating are also reliable since the respondents are well acquainted with green spaces and therefore their value judgements can be upheld as outcomes of their experiences while using their University Green Spaces.

Table 4.1: Table Showing Socio-economic Characteristics of Respondents

Variables	Categories	Frequency	Percentage	SD
Gender	Male	200	56.0	0.50
	Female	157	44.0	
	Total	**357**	**100.0**	
Age	16-25	318	89.1	1.23
	26-35	22	6.2	
	36-45	11	3.1	
	46-55	5	1.4	
	56 above	1	.3	
	Total	**357**	**100.0**	
Student Category	Undergraduate	309	86.6	0.34
	Postgraduate	48	13.4	
	Total	357	100.0	
Residence	Campus	303	84.9	0.36
	Off Campus	54	15.1	
	Total	**357**	**100.0**	
Academic Level	100	38	10.6	
	200	55	15.4	1.51
	300	79	22.1	
	400	93	26.1	
	500	35	9.8	
	600	9	2.6	
	Postgraduates	48	13.4	
	Total	**357**	**100.0**	

Source: Authors Fieldwork (2023)

These distributions suggest both peculiarities and generalizations. The peculiar needs of the genders, age ranges, students' categories, place of residence and academic levels are central to the success in provision and utilization pattern of the university green spaces. That majority are undergraduate and within a youthful age and living on campus shows the justification for green space provision in these campuses and also suggested the pattern of utilization that would be expected based on the nature of green spaces available. The campus green space should be well laid out and also encourages active living. The distribution also suggests that university campus GS planning should provide adequate mix of uses in terms of location, proximity, size and quality.

4.2. Availability and Current Conditions of Green Spaces within each Private Universities in South West, Nigeria

This section presents result of the study on availability of green spaces, nature of the available spaces and the currents physical conditions of the green spaces in respective private universities in South-West Nigeria. Respondents were initially asked if green spaces were available in their university (see section B 7 of questionnaire in the Appendix 1) and the result is presented in Figure 4.1. Similarly, to corroborate the responses by the respondents, evidence of availability of green spaces were shown in plates (see plate 4.1- 4.24). In addition, this section presents nature of the available GS in each location of the study (see section B 8 of questionnaire in the Appendix 1). Consequently, further questions on current physical condition of the identified and available green spaces were asked (see section C 9-14 of questionnaire in the Appendix 1).

4.2.1 Availability of GS in the Selected Study Area

The results of GS availability as shown in Table 4.2 revealed that 100% of the respondents at ABUAD said YES to the availability of the following green spaces, campus green park, Sport fields with grass, lawns, walkways with shrubs/grass/trees. While 100% said NO to the availability of Botanical gardens and Fountain with shrubs/grass. In addition, at ACU, 100% of the respondents said YES to the availability of Sport fields with grass, lawns, Walkways with shrubs/grass/trees. While 100% said NO to the availability of Botanical gardens, campus green park, and Fountain with shrubs/grass. Consequently, at CALEB, 100% of the respondents said YES to the availability of Sport fields with grass, lawns, walkways with shrubs/grass/trees.

Table 4.2: Availability of GS in the Selected Study Area

Universities	Campus Green Park		Sport fields with grass		Botanical gardens		Fountain with shrubs/grass		Lawns		Walkways with shrubs/grass/trees	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
ABUAD	74 (100%)	0 (0%)	74 (100%)	0 (0%)	0 (0%)	74 (100%)	0 (0%)	74 (100%)	74 (100%)	0 (0%)	74 (100%)	0 (0%)
ACU	0 (0%)	44 (100%)	44 (100%)	0 (0%)	0 (0%)	44 (100%)	0 (0%)	44 (100%)	44 (100%)	0 (0%)	44 (100%)	0 (0%)
CALEB	0 (0%)	54 (100%)	54 (100%)	0 (0%)	0 (0%)	54 (100%)	0 (0%)	54 (100%)	54 (100%)	0 (0%)	54 (100%)	0 (0%)
CU	74 (100%)	0 (0%)	74 (100%)	0 (0%)	0 (0%)	74 (100%)	0 (0%)	74 (100%)	74 (100%)	0 (0%)	74 (100%)	0 (0%)
EU	0 (0%)	44 (100%)	44 (100%)	0 (0%)	0 (0%)	44 (100%)	0 (0%)	44 (100%)	44 (100%)	0 (0%)	44 (100%)	0 (0%)
RUN	64 (100%)	0 (0%)	64 (100%)	0 (0%)	0 (0%)	64 (100%)	0 (0%)	64 (100%)	64 (100%)	0 (0%)	64 (100%)	0 (0%)

Source: Authors Fieldwork (2023)

Plate 4.1: Picture Showing Availability and Physical Condition of ABUAD Lawns Located in Front of the Talent Discovery Center and White Rock Building in ABUAD Source: Authors Fieldwork (2023)

While 100% said NO to the availability of Botanical gardens, campus green park, and fountain with shrubs/grass. Furthermore, at CU and RUN, 100% said YES to the availability of the following green spaces, campus green park, Sport fields with grass, lawns, walkways with shrubs/grass/trees. While 100% said NO to the availability of Botanical gardens and fountain with shrubs/grass. Nevertheless, at EU, 100% of the respondents said YES to the availability of Sport fields with grass, lawns, walkways with shrubs/grass/trees. While 100% said NO to the availability of Botanical gardens, campus green park, and Fountain with shrubs/grass.

Plate 4.2: Picture Showing Availability and Physical Condition of ABUAD Sport Field with Grass Source: Authors Fieldwork (2023)

This result suggests that large proportions of the students from where the respondents were drawn indicated their awareness about the availability of identified green spaces in their respective universities. This implies that GS availability is relatively high in the selected private universities in South-West Nigeria, thus, this selected university have provided conducive physical environment for their students.

Plate 4.3: The Garden Located Beside the College of Sciences (College 1) and Love Garden ABUAD with Furniture Source: Authors Fieldwork (2023)

In addition, for some reasons all selected private universities do not feel that Botanical Garden and fountain with grass and trees are important GS to be made available in a private university as the finding revealed unavailability of these two GS.

In addition, the result from this study as shown in Table 4.2 aligns with finding by several research, which states that green spaces availability in a university campus plays a significant role in fostering a conducive and holistic learning environment. GS availability contributes to the overall well-being of students, faculty, and staff through the provision of serene areas for relaxation, recreation, and socialization[1,2,3].

This result also agrees to the position of other authors who noted that Universities are hive of academic activity, and thus inclusion of green spaces provides a respite from the academic rigor. GS serve as tranquil retreats where individuals can unwind, reflect, and recharge. The incorporation of such spaces aligns with the principles of biophilic design, which emphasizes the connection between humans and nature in the built environment[4,5,6].

Plate 4.4: Lawn Crossing in Front of the Female Hall 1 and Love Garden ABUAD
Source: Authors Fieldwork (2023)

Nevertheless, the result presented shows that, the availability of green spaces in university campuses can vary since all types of green spaces were not available in the study areas.

The reason could be as a result of limited space and competing demands for resources in creating expansive green areas and some that does have, has direct bearing on the aesthetics of

the universities[7, 8]. The reason could be as a result of limited space and competing demands for resources in creating expansive green areas and some that does have, has direct bearing on the

aesthetics of the universities[9, 10].

Universities should as a matter of priority integrates all kinds green spaces into their master plans and consider innovative solutions such as vertical gardens, rooftop gardens, or community gardens to maximize the use of available spaces. Exposure to nature, even in small doses within urban settings like university campuses, can significantly reduce stress levels and improve cognitive function. Having accessible green spaces on campus provides students with opportunities to unwind, exercise, and engage in recreational activities, positively impacting

their mental health and academic performance[11, 12].

In summary, the availability of green spaces in a university campus is essential for promoting a holistic educational experience. These spaces contribute to physical and mental well-being, foster community engagement, and align with the principles of sustainable and biophilic design. Universities should recognize the importance of green spaces in enhancing the overall quality of campus life and make deliberate efforts to incorporate and maintain them.

4.2.2 Nature of Available Green Spaces (GS) in the Selected Study Area

Results presented in Table 4.3 reveal that 64.1% of respondents indicated that the available GS were natural, while 5.6% indicated that they are artificial GS, 30% said there are both natural and artificial GS in the study area while only 0.3% of the respondents showed No-response in their questionnaire. These results suggested that, most of the available green

spaces in the study area were assessed by the respondents to be natural, and a handful of the spaces has a combination of both natural and artificial GS elements across the study area. Also, the mean value of 4.41 and SD value of 1.54 shows that, nature of GS is very essential in usability as well as the outlook of the university in terms of aesthetic and sustainability of the available GS type[12].

This result was further ascertained as shown in plate 4.5-4.24, which shows evidence of the nature of existing green spaces across various private universities in the South-West Nigeria. The effects of artificial versus natural green spaces in a university setting can differ and rely on a number of variables, such as the intended usage of the spaces, community preferences, and the goals of the green spaces.

Although there isn't much data explicitly comparing the impacts of artificial versus natural green spaces in literature. Research has demonstrated that being in natural settings helps reduce stress and increase mood alleviation. Natural green spaces can help create a more upbeat and encouraging studying atmosphere in university settings[5]. As against artificial greens which are only for aesthetic and has no impact on well-being. People tend to favor natural environments over artificial ones. Nevertheless, preferences can differ from person to person. For instance, other studies by researchers have shown that people typically favor natural settings for relaxation and healing[13,14].

Thus, the result implied that, the environment of universities can benefit from well-designed artificial green spaces as much as natural ones since both contributes significantly. The unique circumstances, objectives, and preferences of the university community should be taken into account when making decisions about green spaces design and elements on campus.

Table 4.3: Nature of Available Green Spaces (GS) in the Study Area

Nature of GS	Frequency	Percent	Mean	SD
Natural	229	64.1	4.41	1.54
Artificial	20	5.6		
Natural and Artificial	107	30.0		
No Response	1	0.3		
Total	357	100.0		

Source: Fieldwork 2023

4.2.3 Physical Conditions of the Available Green Spaces (GS)

In order to understand the physical conditions of the green spaces available in each study area, the respondents were asked to rate the observed conditions across all the identified green spaces available within their campus. Questions asked for this section was based on a 5point Likert Scale where 1 represents poor; 2 represents fair; 3 represents good; 4 represents very good, and 5 represents excellent condition. This in essence was to measure respondents' familiarity and knowledge base about their environment as shown in Table 4.4 to 4.12.

4.2.3.1 Physical Conditions of the Available Campus Green Park (CGP)

It was found from result presented in Table 4.4 that although 95.9% of respondents indicated the physical condition of the campus green park at ABUAD was good only 4.1% of the respondents noted that the CGP was fair and no one said it was out rightly poor. Similarly, respondents at ACU, CALEB and EU had no result for Campus green spaces since this CGP category was absent within their university. However, the respondents from CU reported that, 81.1% agreed that the GS within their university was good and excellent, 16.2% said they were fair and 2.7% noted that it was poor. Consequently, at RUN, 59.4% of the respondent revealed that their CGP was good, while 28.1% revealed that the CGP was fair and 12.5% said it was poor.

This result implied that majority of the respondents in each university across the study area saw their campus green park as being in good physical condition. Furthermore, based on results from Table 4.5, ABUAD came first in ranking followed by CU and RUN. However, the results align with finding from the physical observation conducted as shown in plate 4.1-4.24 and

(Table 4.5 observation table). As, the observation revealed that, ABUAD's and CUs has well designed and maintained CGP, while RUN has well designed and averagely maintained CGP. In addition, based on the observation, furniture's were available and in good conditions whoever in adequacy, ABUAD and RUN has more furniture's than CU.

Furthermore, lighting is available in CU for night usage of the CGP which was not provided for in ABUAD and RUN as shown by the observation. Nevertheless, the three CGP's under observation has waste bins for waste disposal strategically located as shown in the plates. On adequacy of canopies from trees ABUAD and CU has more trees within their CGP as against fewer trees providing shades at RUN.

Universities	Poor (1)		Fair (2)		Good (3)		Very Good (4)		Excellent (5)		Non-Response (6)		Rank
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
ABUAD	0	0.0	3	4.1	20	27.0	36	48.6	15	20.3	0	0.0	1st
ACU	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
CALEB	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
CU	2	2.7	12	16.2	29	39.2	22	29.7	9	12.2	0	0.0	2nd
EU	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
RUN	8	12.5	18	28.1	24	37.5	12	18.8	2	3.1	0	0.0	3rd

Table 4.4: Physical Conditions of the Available Campus Green Park

Source: Authors Fieldwork (2023)

Table 4.5: **Physical Conditions of the Available Campus Green Park by Observation**

Universities	Poor	Fair	Good	Excellent	Rank

ABUAD		X	1st
CU		X	2nd
RUN	X		3rd

Poor: Badly designed and not maintained, Fair: Badly designed and fairly maintained, Good: Well, designed and averagely maintained and Excellent: Well, designed and well maintained

Source: Authors Fieldwork (2023)

4.2.3.2 Physical Conditions of the Available Sport Field with Grass (SFG)

It was found from result presented in Table 4.6 that although 98.6% of respondents indicated the physical condition of the Sport Field with Grass at ABUAD was good only 1.4% of the respondents noted that the SFG was poor. Similarly, respondents at ACU opined that 63.6% was good, while 27.3% said the SFG was fair and 9.1% said it was poor respectively. At CALEB 28.2% of respondents reported that their SGF was good, 47.4% said it was fair while 24.6% said the SGF was poor.

At CU, 54.1% of responded reported that their SGF was good, 31.1% said it was fair while 14.9% said the SGF was poor. In addition, the respondents from EU reported that, 56.8% agreed that the SGF within their university was good and excellent, 25% said they were fair and 18.2% noted that it was poor. Consequently, at RUN, 34.4% of the respondent revealed that their SGF was good, while 31.3% revealed that the SGF was fair and 23.4% said it was poor.

This result implied that respondents in each university across the study area saw the physical condition of their Sport Field with Grass differently. While ranking the conditions, based on the respondent's assessment across the universities, ABUAD came first, ACU ranked second, EU third, CU fourth, RUN fifth and lastly CALEB ranked sixth position.

Furthermore, the result of the observation revealed that CU was ranked first this is because it has well designed and maintained main sport field with grass. ABUAD and EU came second

since it was well designed and averagely maintained. In addition, CALEB and RUN came distant fourth because the sport field was badly designed and fairly maintained. Also, ACU was ranked sixth because it was badly designed and poorly maintained. These results can further be supported by the pictures as shown in plate 4.5-4.24 and the results from the observation Table 4.7.

Table 4.6: Physical Conditions of the Available Sport Field with Grass

Universities	Poor (1)		Fair (2)		Good (3)		Very Good (4)		Excellent (5)		Non-Response (6)		Rank
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
ABUAD	1	1.4	0	0.0	5	6.8	44	59.5	24	32.4	0	0.0	1st
ACU	4	9.1	12	27.3	17	38.6	7	15.9	4	9.1	0	0.0	2nd
CALEB	14	24.6	27	47.4	12	21.1	3	5.3	1	1.8	0	0.0	6th
CU	11	14.9	23	31.1	31	41.9	6	8.1	3	4.1	0	0.0	4th
EU	8	18.2	11	25.0	14	31.8	8	18.2	3	6.8	0	0.0	3rd
RUN	15	23.4	20	31.3	22	34.4	6	9.4	1	1.6	0	0.0	5th

Source: Authors Fieldwork (2023)

Universities	Poor	Fair	Good	Excellent	Rank
ABUAD			X		2nd
ACU	X				6th
CALEB		X			4th
CU				X	1st
EU			X		2nd
RUN		X			4th

Table 4.7: Physical Conditions of the Available Sport Field with Grass by Observation

Poor: Badly designed and not maintained, Fair: Badly designed and fairly maintained, Good: Well, designed and averagely maintained and Excellent: Well, designed and well maintained

Source: Authors Fieldwork (2023)

4.2.3.3 Physical Conditions of the Available Lawns

It was found from result presented in Table 4.8 that although 97.2% of respondents indicated the physical condition of the Lawns at ABUAD was good only 1.4% of the respondents noted that the lawn was poor and fair respectively. At ACU 66% of the respondents opined that the lawns were good, while 25% said the lawns was fair and 9.1% said it was poor. At CALEB

70.1% of responded reported that their lawn was good, 17.5% said it was fair while 12.3% said the lawns was poor. At CU, 89.1% of responded reported that their lawn was good, 9.5% said it was fair while 1.4% said the lawns was poor.

In addition, the respondents from EU reported that, 75% agreed that the lawns within their university was good and excellent, 20.5% said they were fair and 4.5% noted that it was poor. Consequently, at RUN, 68.8% of the respondent revealed that their lawns were good, while 20.3% revealed that the lawns were fair and 10.9% said it was poor. These results revealed that in each university across the study area the physical condition of their lawns varied differently.

Ranking the physical condition of the lawns, based on the respondent's assessment across the universities, ABUAD came first, ACU ranked second, EU third, CU fourth, RUN fifth and lastly CALEB ranked sixth position. These results can further be supported by the physical observation as shown in plate 4.1-4.24. Though, from the plates and observation Table 4.9, ABUAD and CU tied in the physical lawn condition, this is because both campus Lawn was well designed and maintained. In addition, EU lawns was fairly designed and fairly maintained.

However, RUN and CALEB, the lawn cover is extensive, well maintained but badly designed. This is because there were numerous situations of lawn crossing being observed, while for ACU the lawn was badly designed and maintained. Thus, the result of the observation aligns with the respondent's response on the physical conditions of the lawns in the selected universities.

Table 4.8: Physical Conditions of the Available Lawns

Universities	Poor (1)	Fair (2)	Good (3)	Very Good	Excellent	Non-	Rank

							(4)		(5)		Response (6)		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
ABUAD	1	1.4	1	1.4	13	17.6	38	51.4	21	28.4	0	0.0	1st
ACU	4	9.1	11	25.0	16	36.4	12	27.3	1	2.3	0	0.0	6th
CALEB	7	12.3	10	17.5	28	49.1	10	17.5	2	3.5	0	0.0	4th
CU	1	1.4	7	9.5	32	43.2	24	32.4	10	13.5	0	0.0	2nd
EU	2	4.5	9	20.5	12	27.3	13	29.5	8	18.2	0	0.0	3rd
RUN	7	10.9	13	20.3	29	45.3	12	18.8	3	4.7	0	0.0	5th

Source: Authors Fieldwork (2023)

Universities	Poor	Fair	Good	Excellent	Rank
ABUAD				X	1st
ACU	X				6th
CALEB		X			4th
CU				X	1st
EU			X		3rd
RUN		X			4th

Table 4.9: Physical Conditions of the Available Lawns by Observation

Poor: Badly designed and not maintained, Fair: Badly designed and fairly maintained, Good: Well, designed and averagely maintained and Excellent: Well, designed and well maintained
Source: Authors Fieldwork (2023)

4.2.3.4 Physical Conditions of the Available Walkways with Shrubs and Trees (WST)

Respondents were asked of the extent of their assessment of the physical condition of the available Walkways with Shrubs and Trees (WST) in their university. The result is presented in Table 4.10.

Table 4.10 shows respondents' reaction to the statement on Walkways with Shrubs and Trees

(WST). It was found that 98.6% of respondents indicated the physical condition of the Walkways with Shrubs and Trees (WST) at ABUAD was good only 1.4% of the respondents noted that the WST was fair and no one said it was out rightly poor.

At ACU 84.1% of the respondents opined that the lawns were good, while 13.6% said the lawns was fair and 2.3% said it was poor. At CALEB 70.2% of responded reported that their WST was good, 15.8% said it was fair while 14% said the WST was poor. At CU, 85.1% of responded reported that their WST was good, 10.8% said it was fair while 4.1% said the WST was poor. In addition, the respondents from EU reported that, 86.3% agreed that the WST within their university was good and excellent, 9.1% said they were fair and 4.5% noted that it was poor.

Plate 4.5: Picture Showing Litters on Lawns Source: Authors Fieldwork 2023

Consequently, at RUN, 78.1% of the respondent revealed that their WST were good, while 15.6% revealed that the WST were fair and 6.3% said it was poor. These results revealed that in each university across the study area the physical condition of their WST varied differently and shows positive assessment with over 70% agreeing that the conditions were good. Ranking the physical condition of the WST, based on the respondent's assessment across the

universities, ABUAD came first, EU ranked second, CU third, ACU fourth, RUN fifth and lastly CALEB ranked sixth position.

However, it is important to note that majority of the respondents from each university indicated that the physical conditions of the WST in these campuses are great. Which corroborate findings from observation as the results revealed that all the WST were well designed and maintained as shown in observation Table 4.11 and Plate 4.5-4.24.

Universities	Poor (1)		Fair (2)		Good (3)		Very Good (4)		Excellent (5)		Non-Response (6)		Rank
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
ABUAD	0	0.0	1	1.4	11	14.9	36	48.6	26	35.1	0	0.0	(98.6%)1st
ACU	1	2.3	6	13.6	18	40.9	16	36.4	3	6.8	0	0.0	(84.1%) 4th
CALEB	8	14.0	9	15.8	29	50.9	10	17.5	1	1.8	0	0.0	(70.2%) 6th
CU	3	4.1	8	10.8	32	43.2	17	23.0	14	18.9	0	0.0	(85.1%) 3rd
EU	2	4.5	4	9.1	15	34.1	13	29.5	10	22.7	0	0.0	(86.3%) 2nd
RUN	4	6.3	10	15.6	24	37.5	23	35.9	3	4.7	0	0.0	(78.1%) 5th

Table 4.10: Physical Conditions of the Available Walkways with Shrubs and Trees

Source: Fieldwork 2023

Universities	Poor	Fair	Good	Excellent
ABUAD				X
ACU				X
CALEB				X
CU				X
EU				X

RUN	X

Table 4.11: Physical Conditions of the Available Walkways with Shrubs and Trees by Observation

Poor: Badly designed and not maintained, Fair: Badly designed and fairly maintained, Good: Well, designed and averagely maintained and Excellent: Well, designed and well maintained

Source: Authors Fieldwork (2023)

4.2.3.5 Current Physical Conditions of the Available GS Land Use and Land Cover (LULC) Table 4.12: Current Physical Conditions of the Available GS

Universities	Built-Up Land								**Total**		**% by Density (NNBC, 2016). (Allowable GS 20%)**	
	Light Vegetation (Planned green spaces)		Dense Vegetation (Unplanned green spaces)				Bare Land					
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Den.	%
ABUAD	1.22	45.86	0.74	27.82	0.65	23.44	0.05	1.88	2.66	100	Low	30-40
ACU	0.10	20.0	0.07	14.0	0.30	60.0	0.03	6.0	0.50	100	High	50-60
CALEB	0.29	36.25	0.23	28.75	0.24	30.0	0.04	5.0	0.8	100	Low	30-40
CU	2.25	34.56	1.77	27.19	2.07	31.80	0.42	6.45	6.51	100	High	50-60
EU	0.16	18.60	0.49	56.98	0.17	19.78	0.04	4.65	0.86	100	Low	30-40
RUN	1.83	39.27	1.02	21.89	1.46	31.33	0.35	7.51	4.66	100	Low	30-40

Source: Authors Fieldwork 2024

It was revealed from result presented in Table 4.12 on land use and land cover GIS analysis of the entire University environment and supported by GIS maps as shown in figure 4.6-4.11 in square kilometer to ascertain the state of available green space cover against other land uses and cover. The results revealed that, at ABUAD, the higher percentage being 45.86% of the LULC was covered with light vegetation (planned green spaces) which shows good campus green spaces, 27.82% was covered with dense vegetation, 23.44% as Built-up area and 1.88% as bared land without any vegetation; since the percentage of planned green spaces were more than the built up and bared land one can infer that the current physical condition of GS at ABUAD is very good. While at ACU, only 20.0% of the landed area was covered with light vegetation, 14% with dense vegetation, with 60% of the entire University mapped area

builtup and only 6.0% bared. The import of this ACU result is indicative of the poor current physical condition of the GS in the University.

In addition, at CALEB, 36.25% of the university area map was covered with light vegetation, 28.75% with dense vegetation while 30% was built-up and only 5.0% bared. This result is indicative of the strength and the outlook of the university as well as the value the university placed on green space planning and provision. Furthermore, at CU, 34.56% of the area mapped out was covered with light vegetation, 27.19% with dense vegetation, 31.80% built-up and 6.45% bared. This result also elicits to the fact that the university has ample GS that were planned since the area covered with GS was more than that of the built-up area.

Also at EU, only 18.6% of the mapped area was covered with GS, the larger percentage of the area was covered with dense vegetation which is indicative of the small size of the campus, while 19.78% was built-up and only 4.65% bared. Thus, with the percentage variance (1.18%) of light vegetation and built-up landed area at EU showed that the available GS within EU is small when compared to the built-up area. While at RUN, 39.27% of the mapped landed area was covered with light vegetation, 21.89 with dense vegetation, 31.33% built-up and 7.5% bared.

Based on the GIS result, ABUAD (45.86%) has the largest planned GS on the scale of available mapped area within the developed university area, followed by RUN (39.27%), CALEB (36.25%) and CU (34.56). While ACU ranked lowest with (20%) planned GS to developed area (60%). EU has 56.98% of the mapped area unplanned hence the reason for the exclusion.

4.2.3.6 Summary Discussion on Current Physical Conditions of the Available GS

Based on the result presented above, it revealed that ABUAD has the largest GS, and how green spaces are used can be greatly impacted by their physical state. For instance, this position agreed with previous studies which noted that, aesthetic appeal of green spaces influences how the university community uses them. When an area is kept up and visually appealing, people are more likely to spend time outside. Neglected or badly maintained green areas may deter people from using them, which could have a detrimental effect on their experience on campus as a whole[15].

Furthermore, The presence of useful features like shade, seating, and recreational areas in green spaces increases their use. When these spaces have the infrastructure in place to support various activities, such as studying, socializing, and exercising, then students are more likely to participate in these activities[16]. Also, the size of the available GS determines the level, image and appearance thereby improving the attractiveness of the university environment both to the members of community or to visitors[17].

Consequently, well-maintained and aesthetically pleasing environments have been linked to lowered stress levels, improved cognitive function, and overall well-being[18]. The engagement and mental health of the university community may suffer as a result of neglected or inadequate green spaces.

Thus, Universities should prioritize the maintenance, usability, size and aesthetic appeal of these spaces in order to create a sustainable environment that enhances the social, physical attractiveness of the environment as well as improve the overall academic experiences of students.

Plate 4.6: Picture Showing Availability and Physical Condition of ACU Lawns Source: Fieldwork 2023

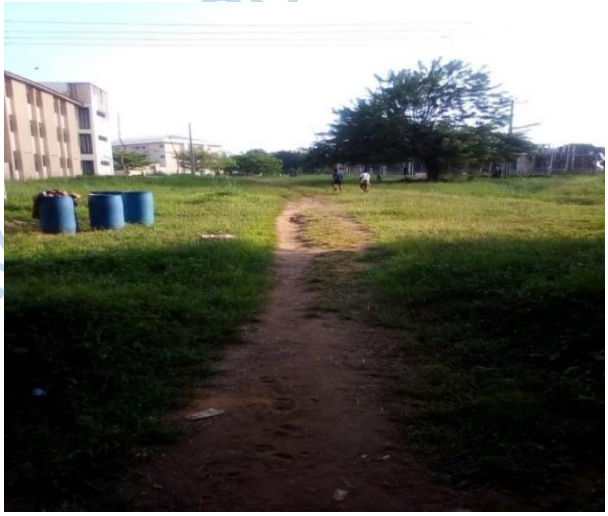

Plate 4.7: Picture Showing Availability OF Waste Bin and Physical Condition of ACU Lawns

Source: Fieldwork 2023

Plate 4.8: Picture Showing Lawns Converted to Football Pitch at ACU

Source: Fieldwork 2023

Plate 4.9: Picture Showing Unkempt Lawn at ACU

Source: Fieldwork 2023

Plate 4.10: Picture Showing Dispersed Lawn Crossing at ACU Source: Fieldwork 2023

Plate 4.11: Picture Showing Availability and Physical Condition of CALEB Lawns Source: Fieldwork 2023

Plate 4.12: Picture Showing Availability and Physical Condition of Furniture at CALEB Lawns

Plate 4.13: Picture Showing Availability and Physical Condition of Waste and Waste Bins at CALEB Lawns Source: Fieldwork 2023

Plate 4.14: Picture Showing Availability and Physical Condition of Kiosk near CALEB Lawns Source: Fieldwork 2023

Plate 4.15A: Picture Showing Availability and Physical Condition of CALEB Lawns (Lawn Crossing) Source: Fieldwork 2023

Plate 4.15B: Picture Showing Availability and Physical Condition of CALEB Lawns (Lawn crossing) Source: Fieldwork 2023

Plate 4.16: Picture Showing Availability and Physical Condition of CALEB Lawns (Lawn Restriction) Source: Fieldwork 2023

Plate 4.17: Picture Showing Availability and Physical Condition of CU Lawns Source: Fieldwork 2023

Plate 4.18: Picture Showing Availability and Physical Condition of CU Lawns Source: Fieldwork 2023

4.19A **4.19B Plate 4.19A& 4.19B: Picture Showing Availability and Physical Condition of CU Sport Field with greens Source: Fieldwork 2023**

Plate 4.20: Picture Showing Availability and Physical Condition of CU Lawns (Lawn crossing) Source: Fieldwork 2023

Plate 4.21: Picture Showing Availability CU Lawns Used as Parking Lot Source: Fieldwork 2023

Plate 4.22: Picture Showing Availability and Physical Condition of CU Lawns (Lawn Restriction) Source: Fieldwork 2023

Plate 4.23A: Picture Showing Availability and Physical Condition of CU Lawns (Night Condition) Source: Fieldwork 2023

Plate 4.23B: Picture Showing Availability and Physical Condition of CU Lawns (Night Condition) Source: Fieldwork 2023

Plate 4.24: Picture Showing Availability and Physical Condition of CU Lawns (Waste dump site) Source: Fieldwork 2024

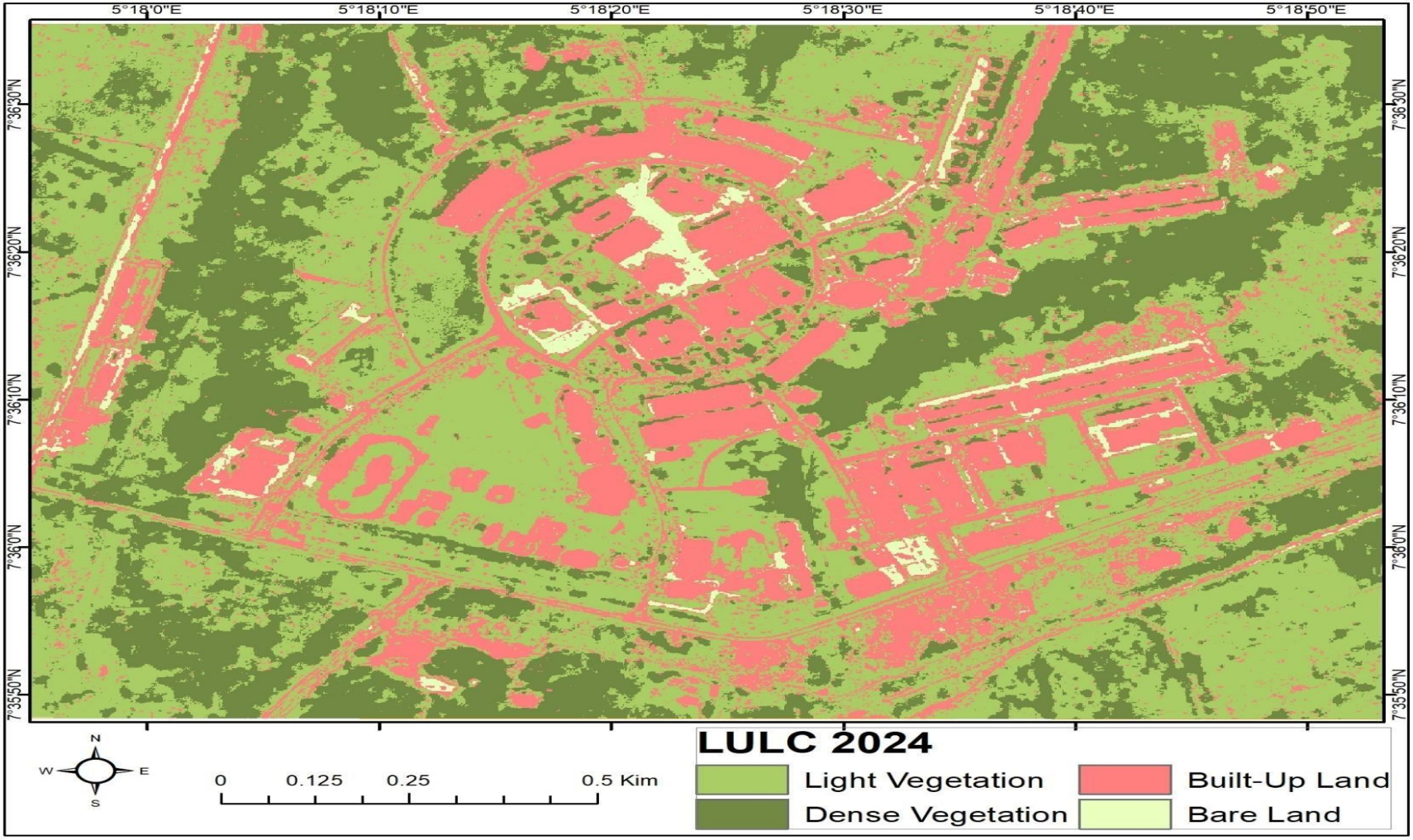

Figure 4.6: Map Showing LULC of ABUAD 2024 Source: Fieldwork 2024.

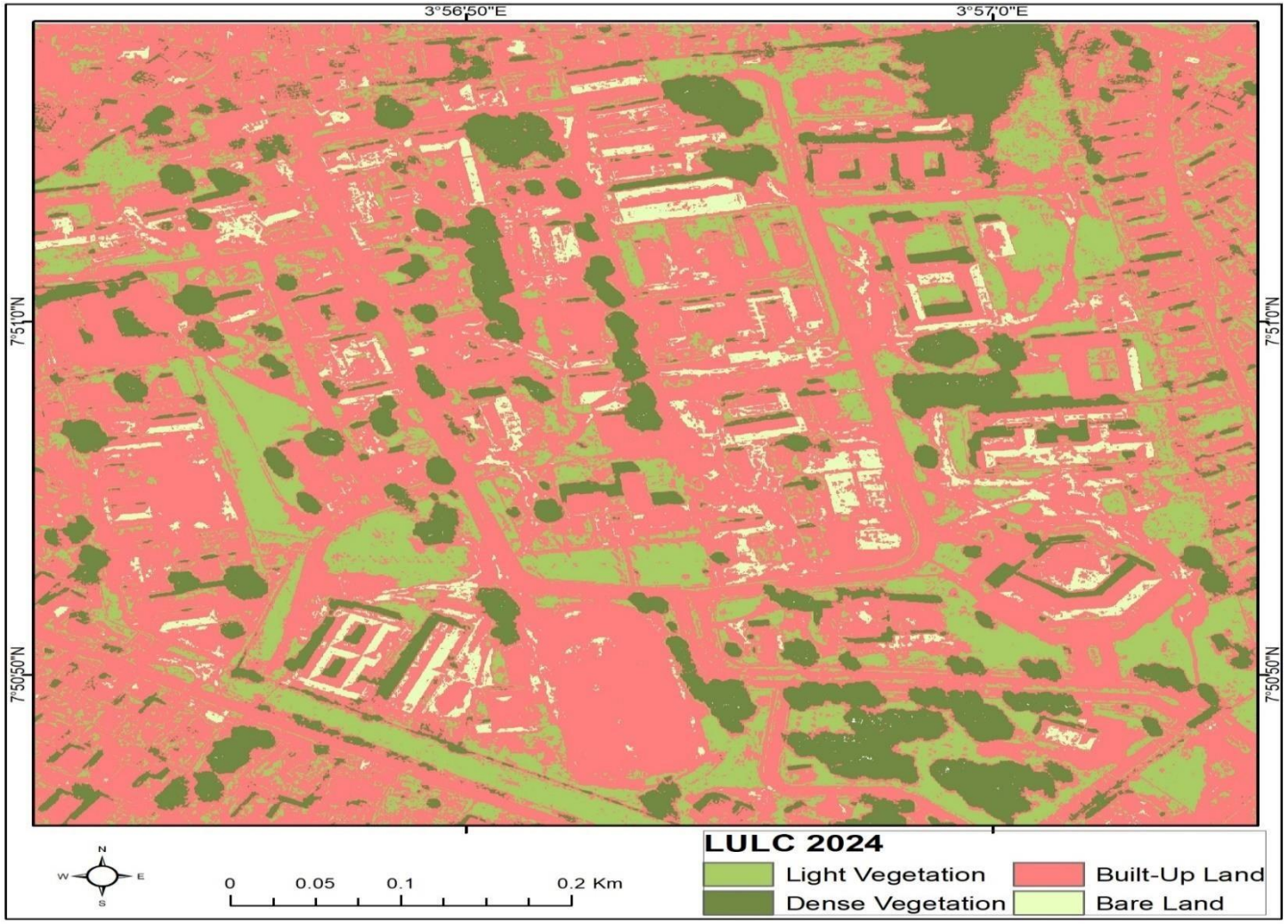

Figure 4.7: Map Showing LULC of ACU 2024 Source: Fieldwork 2024.

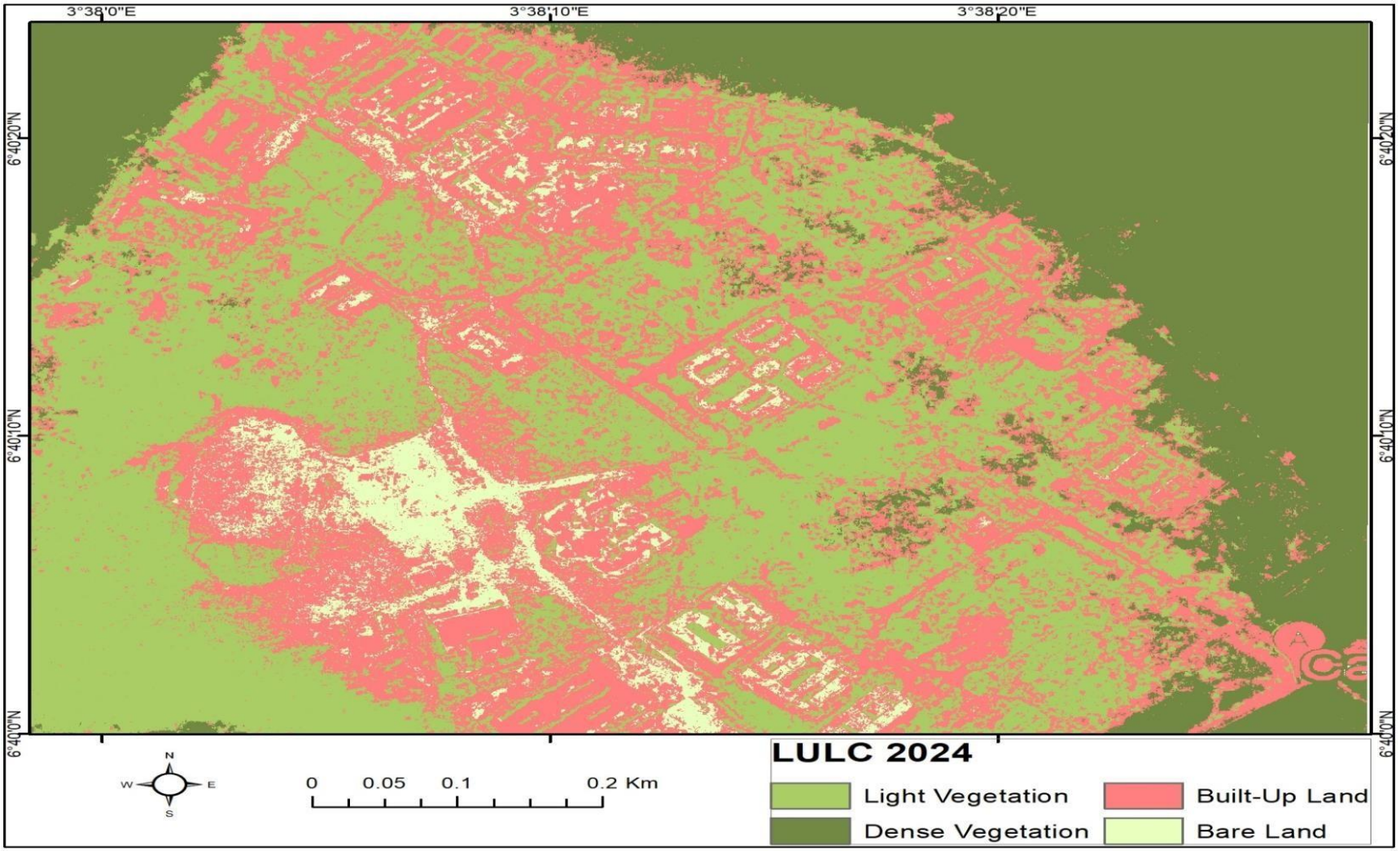

Figure 4.8: Map Showing LULC of CALEB 2024 Source: Fieldwork 2024.

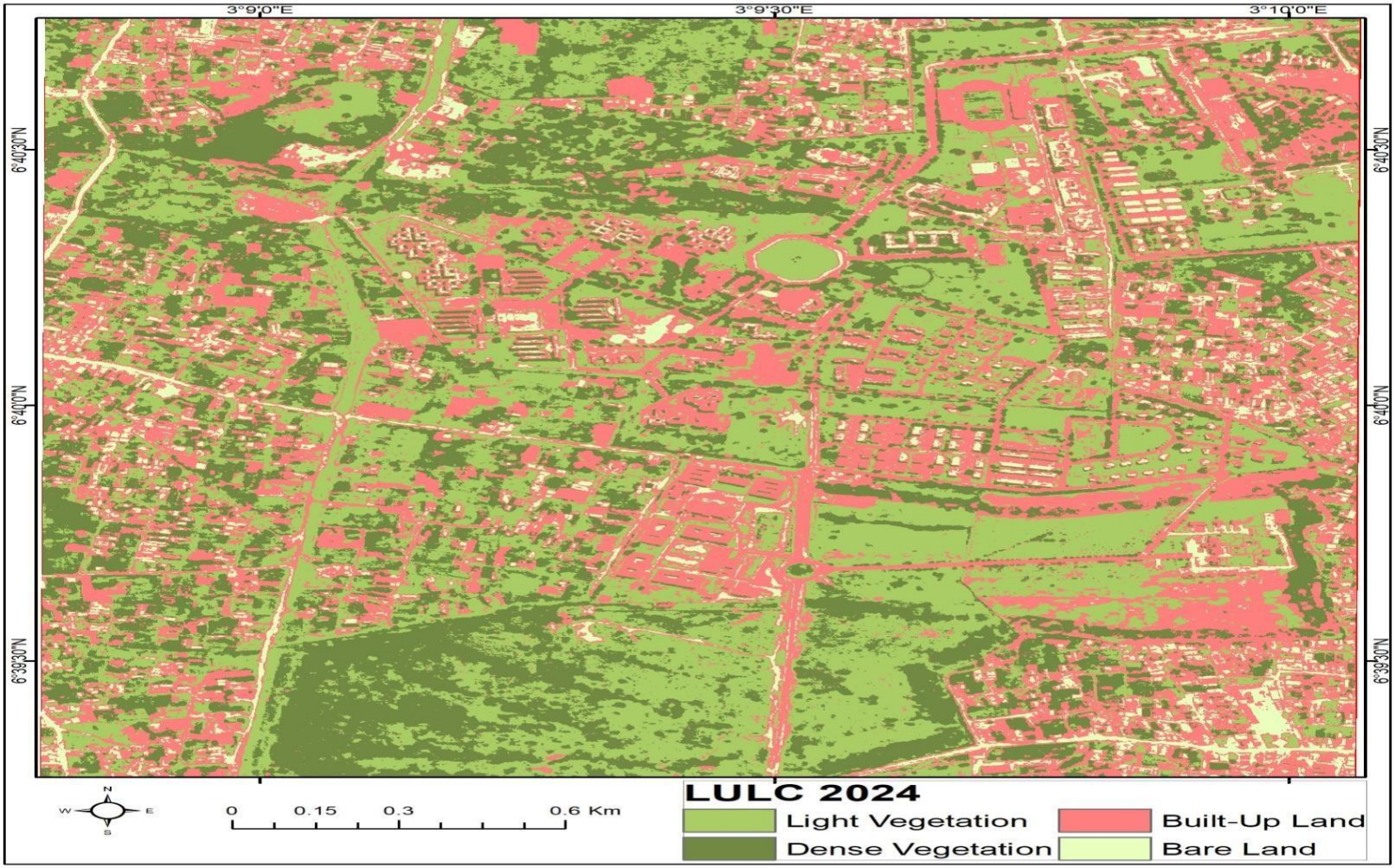

Figure 4.9: Map Showing LULC of CU 2024 Source: Fieldwork 2024.

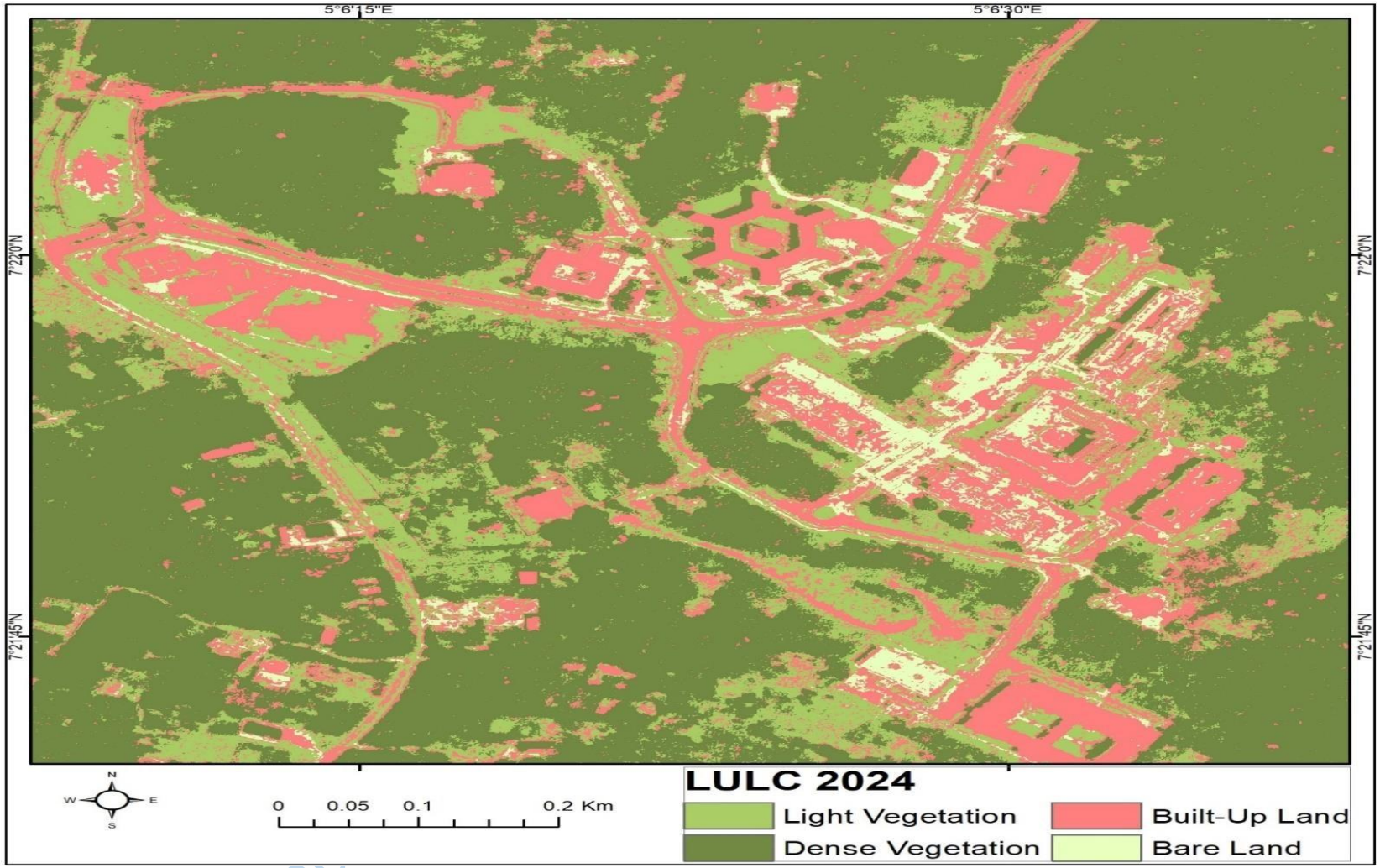

Figure 4.10: Map Showing LULC of EU 2024 Source: Fieldwork 2024.

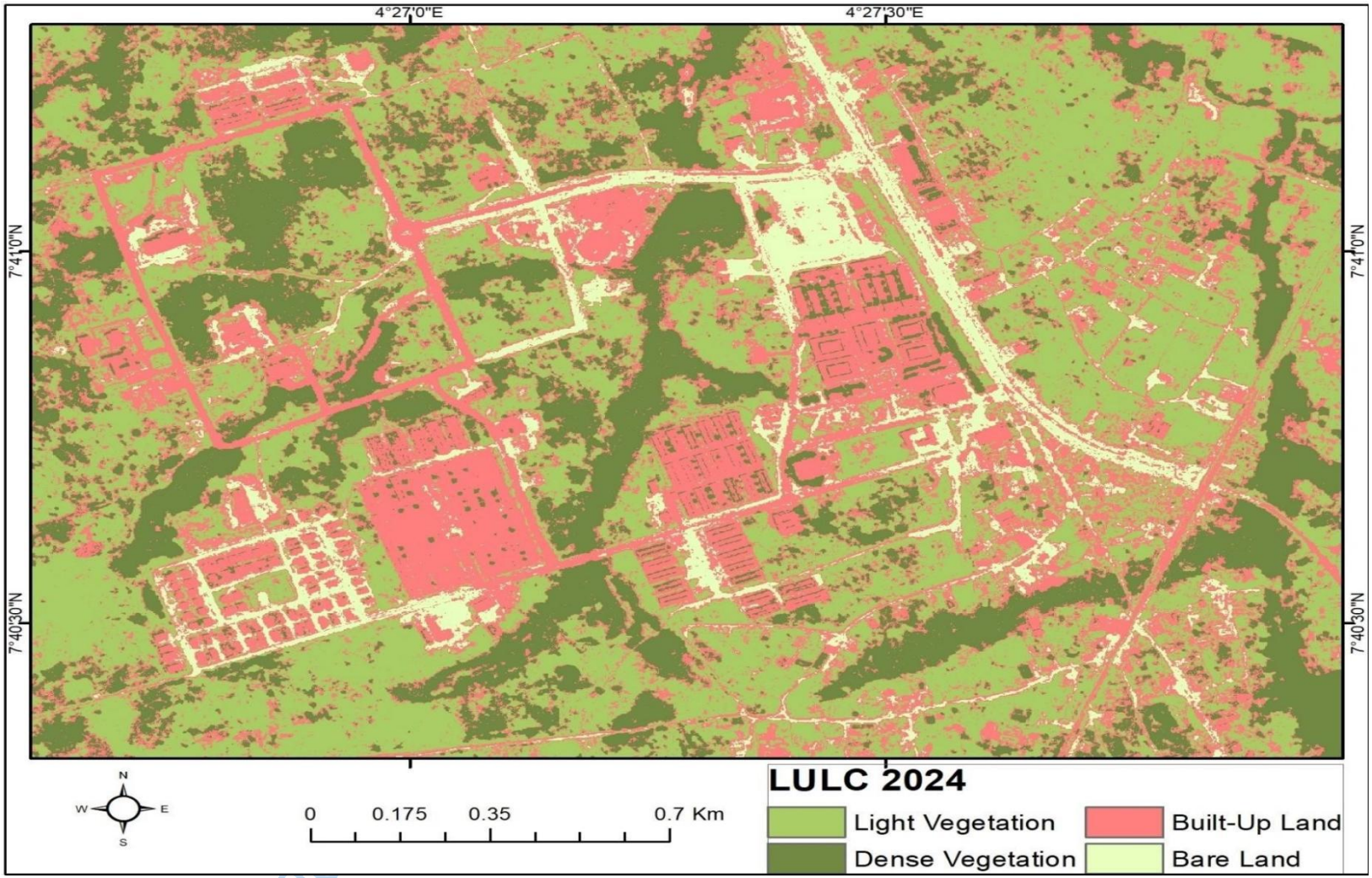

Figure 4.11: Map Showing LULC of RUN 2024 Source: Fieldwork 2024

4.3. Perceived Benefits and Impacts of GS in the Study Area

This section discusses the perceived benefits and impact green spaces has on the users and environment in a university. Some of such benefits include the social, health and well-being and environmental as identified from literature[19]. The respondents' ratings as responses to question asked on benefits were subjected to descriptive analysis. The results are presented in Tables 4.13.

4.3.1. Perceived Social Benefits of Green spaces

Respondents were asked questions on different social constructs. The result presented in this section included only the opinion of respondents who indicated the green spaces on university campus has varied effect on them. Question asked for this section was based on a 5point Likert Scale where 1 represents No effect; 2 represents Minor effect; 3 represents Neutral; 4 represents Moderate effect, and 5 represents major effect. and the result were presented as seen in Table 4.13.

On question of privacy, it was found from the result that only 18.2% of the respondents indicated that the green spaces have effect on their feeling of privacy, 27.5% was neutral and undecided while the largest percentage of 54.3% respondents said it had no effect at all. From this result it can be inferred that among the social benefit of support social privacy the green spaces in the study areas are poor in offering privacy to the users.

This was evident with a low mean value of 2.33. In a similar vein, questions on how the GS supported recreational activities and functions within the study area, 44.2% / 60.2 of the respondents said it had major and moderate effect on them, 23.5% / 24.6 was neutral while 32.2% / 15.2 said it has No or minor effect on them with a mean value of 3.0 / 3.54 respectively.

This result shows positive credence to the fact that the GSs in the study area has strong social benefits to the users and the university community at large.

	Physiological effects	No effect (1)		Minor effect (2)		Neutral (3)		Moderate Effect (4)		Major Effect (5)			
		Freq	%	freq	%	Freq	%	Freq	%	freq	%	M	SD
Social Benefits	support privacy	125	35.0	69	19.3	98	27.5	50	14.0	15	4.2	**2.33**	**1.207**
	Support recreational activities	67	18.8	48	13.4	84	23.5	134	37.5	24	6.7	**3.0**	**1.238**
	satisfies the function of recreation	17	4.8	37	10.4	88	24.6	165	46.2	50	14.0	**3.54**	**1.012**
Environmenta Benefits	campus quietness	18	5.0	22	6.2	102	28.6	166	46.5	49	13.7	**3.58**	**0.973**
	campus coolness	16	4.5	16	4.5	90	25.2	173	48.5	62	17.4	**3.7**	**0.959**
	Accommodation of plant and animal life	22	6.2	37	10.4	119	33.3	141	39.5	38	**10.6**	**3.38**	1.014
	Reduction of air pollution	21	5.9	32	9.0	112	31.4	132	37.0	60	**16.8**	**3.5**	1.059
	Campus beautification	18	5.0	21	5.9	66	18.5	140	39.2	112	**31.4**	**3.86**	1.082
	How much are you satisfied with the design of your school GS	28	7.8	45	12.6	89	24.9	153	42.9	42	11.8	**3.38**	**1.094**
Health and wellbeing Benefits	Recovery from sickness	161	45.1	64	17.9	91	25.5	37	10.4	4	1.1	**2.04**	**1.106**
	Access to physical exercise	62	17.4	45	12.6	68	19.0	116	32.5	66	18.5	**3.22**	**1.357**
	Improves selfesteem	147	41.2	62	17.4	99	27.7	34	9.5	15	4.2	**2.18**	**1.191**
	Mood alleviation	78	21.8	64	17.9	87	24.4	90	25.2	38	10.6	**2.85**	**1.309**
	Stress recovery	87	24.4	49	13.7	97	27.2	96	26.9	28	7.8	**2.80**	**1.318**
	Mental health improvement	90	25.2	45	12.6	88	24.6	104	29.1	30	8.4	**2.83**	**1.318**

Table 4.13: Perceived Benefits and Impacts of GS in the Study Area

Source: Fieldwork 2024

The outcome of this research and responses were in agreement with the research conducted in the United States of America on the relationship between social cohesion and urban green space, it opined that green spaces have the potential to foster positive social interactions that improve health and well-being by fostering social cohesion[20]. Furthermore, another study conducted in Iran also corroborated the importance of green spaces to social benefits and a nexus for social interaction[21].

4.3.2. Perceived Environmental Benefits of Green spaces

Respondents were asked questions on different environmental constructs as found in the literature. The result presented in this section included only the opinion of respondents who indicated the green spaces on university campus has varied effect on them. Question asked for this section was based on a 5point Likert Scale where 1 represents No effect; 2 represents Minor effect; 3 represents Neutral; 4 represents Moderate effect, and 5 represents major effect. and the result were presented as seen in Table 4.13.

Question was asked on the level of quietness(tranquility) experienced within the GS, it was discovered from the result that only 60.2% of the respondents indicated that the green spaces have effect on their feel of quietness, 28.6% was neutral and undecided while the lowest percentage of 6.2% and 5 respondents said it had no effect or poor effect on them. From this result it can be inferred that among the environmental benefits noted in the literature, the level of quietness within the different universities is very high.

Thus, this result is in tandem with the research conducted on green space and urban heat island mitigation, findings from the research showed that apart from green spaces reducing heat islands with an urban space or university environment, it also offers support contributing to the quietness of the environment in which they are found[22]. Furthermore, the importance of

GS quietness to the respondents was evident with a high mean value of 3.58.
In addition, questions on how the GS support campus coolness which is a construct very important for any recreational activities and functions within the study area, 65.9% of the respondents said it had major and moderate effect on them, 25.2% was neutral while 4.5% said it has No or minor effect on them with a mean value of 3.7 respectively. This result shows positive credence to the fact that the GSs in the study area has strong environmental benefits to the users and the university community at large.

Consequently, questions on level of how the GS offers accommodation to different species of biomes (plant and animal), 50.1% of the respondents agreed that the green spaces have different varieties of biomes within each of the university campuses under study. However, 33.3% was neutral which implies that they neither said it the GS has effect or support plant and animal life in their responses. Nevertheless, 10.4% noted that the GS as No effect on plant and animal life and 6.2% said it has poor effect with mean value of 3.38 which is low when compared with the mean of coolness and quietness.

This result agrees with the study on biodiversity, which revealed that because GS serve as habitats for a variety of plant and animal species, they are essential for maintaining biodiversity

within the university environment[23,24,]. This was further, corroborated by another researcher who noted that these places serve as havens for local wildlife and plants, aiding in the preservation of biological diversity[25,26].

Consequently, question on how GS helps in the reduction of air pollution, 16.8% of the respondents agreed that the GS has major effect in the control of air pollution within the study area, 37% noted that it has moderate effect. These two results show positive assessment of the relevance of the GS in controlling air pollution with 53.8% response rate. Why 31.4% was neutral in their assessment, nevertheless 9% of the respondents opined that it has minor effect and 5.9% said it has No effect. The impulse to this result from the findings shows that air pollution was abated evidently in the study area.

This result agrees with the research conducted in the United States, which evaluated the benefits, cost and decision-making processes on air quality and urban trees. The findings asserted that, air pollution reduction occurs during photosynthesis since the vegetation in GS absorbs pollutants and releasing oxygen[27 ,28].

Furthermore, questions on does GS have effects on campus beautification in the study areas; 70.6% of the respondents indicated that GS has major and moderate effects (31.4% & 39.2%) respectively. 18.5% was neutral and 5.9% said it has minor effect with 5% saying it has No effect at all. This result is synonymous to the finding by Kaplan on his work in the experience of nature, where he asserted that, a campus's visual appeal is enhanced by green areas, which also foster a lively and friendly atmosphere. Well-planned landscapes with a diversity of trees, flowers, and plants improve the environment's overall aesthetic appeal[29].

In conclusion, the addition of well-planned green spaces to university design and planning greatly enhances the aesthetics, wellbeing, and general standard of academic life. Numerous studies in the fields of public health, urban planning, and environmental psychology attest to these advantages[29].

4.3.3. Perceived Health and Wellbeing Benefits of Green spaces

Respondents were asked questions on different Health and wellbeing constructs as found in the literature. The result presented in this section included only the opinion of respondents who indicated that green spaces within their universities has varied effect on them. The questions asked were based on a 5point Likert Scale where 1 represents No effect; 2 represents Minor effect; 3 represents Neutral; 4 represents Moderate effect, and 5 represents major effect. and the result were presented as seen in Table 4.13.

On question on how well green spaces helps in recovery from sickness, 63% of the respondents' said GS has No or Minor effect on them when exposed to them during their recovery phase when sick, this is evident from the low mean value of (2.04). Why, 25.5% of respondents were neutral when asked question on recovery from sickness. Similarly, 10.4% and 1.1% said it has moderate and major effect on their recovery. The import of this result is not out of place since most of the green spaces across all the study area lack green space utilization enrichment infrastructures, such as furniture's and uninhibited access to the GS at all times as seen in plate 4.1-4.24.

Furthermore, when asked question on access to physical activities, 51% of the respondents agreed that the green spaces support their access to physical activities. The mean value of 3.22 is a testament to the way the respondents responded to the assessment. However, 19%

was indifferent and neutral while, 12.6% and 17.4% respondents said it has minor and No effect on their access to physical exercise respectively. This position is in tandem with the observation carried out across each university as shown in plate 4.1-4.24.

Consequently, on questions on improvement of self-esteem and mood alleviation respondents answered the questions differently: why 13.7% agreed that GS has major and moderate effect on their self-esteem improvement, it was a higher percentage of 35.8% of respondents who responded to question on mood alleviation. Also, 27.7% and 24.4% of respondents were neutral on the question of improvement of self-esteem and mood alleviation respectively. This higher percentage neutrality is a testament to the fact that that the respondents could not place the impact of GS to serving the purposes of self-esteem and mood alleviation which are both important construct of health and wellbeing. While, a whopping 58.6% said the GS has No or Minor effect on their self-esteem improvement, a comparative number also responded the same way on mood alleviation with 39.7% saying it has No or Minor effect on them.

In addition to health and wellbeing assessment, more questions were asked on stress recovery and mental health improvement, the outcome of the responses were dispersed with near to tie results. 34.7% of respondents agreed that the GS has major and moderate effect on their stress recovery, similarly, 37.5% agreed it has major and moderate effect on their mental health improvement. 27.2% and 24.6% were neutral in both cases of stress recovery and mental health improvement. While 13.7%/12.6% of respondents said GS has minor effect on them, same for the respondents who said GS has No effect on them with the respective percentages of 24.4% and 25.2% respectively on stress recovery and mental health improvement.

The outcome of this results shows green spaces has limited impact on the health and wellbeing of the students across all the universities in the study area. The result is not farfetched due to the fact that the universities were more concerned about campus beautification with high mean value of 3.8 as against the therapeutic effect of green spaces with all low mean values less than 3 in all cases. This result negates the essence of what green spaces should offer the university environment and its users. Which from literature, research consistently indicates that exposure to green environments is associated with various health benefits, both mental and physical. A seminal study revealed that views of nature promote stress reduction and enhance overall wellbeing[30]. Subsequent investigations have supported these findings, suggesting that proximity to green spaces is linked to lower levels of anxiety and depression[31].

Additionally, green spaces promote physical activity, which is essential for preventing chronic illnesses. The presence of parks and leisure spaces promotes outdoor physical activity, which in turn lowers the risk of obesity and improves cardiovascular health[32], this position was further strengthened from the outcome of the study which shows positive responses to the level in which the respective university green spaces support active activities.

Thus, Green spaces in university campuses serve as a diversion from the stresses of academic life by reducing noise and pollution. Campus planning that prioritizes the integration of natural elements into built environments is crucial for promoting the overall well-being of the communities, as evident in the health benefits of green spaces.

4.4. Assessment of Green Space Use Pattern Across Study Area

This section discusses the utilization pattern in the identified green spaces. The two major patterns found in the literature are active and passive utilization. The subsections for this section are presented under the following headings which are the accessibility of green space across the universities, use pattern of green spaces, active activities in green spaces, and passive activities in green spaces. The results of the findings are shown in Table 4.14 to 4.20.

4.4.1 Accessibility of Green space, across the Universities

The ease with which people and communities can access and enjoy open, natural spaces like parks, gardens, forests, and other outdoor areas is referred to as "green space accessibility." This factor is important for a number of reasons, including the direct effects it has on people's physical and mental health, community cohesion, and the overall environmental sustainability of the university environment. The results of the findings on accessibility are shown in Table

4.14 to 4.20 respectively.

4.4.1.1 Level of Accessibility of Green Spaces Across Different Universities in the study area.

The results of the findings of level of accessibility of GS are shown in Table 4.14. Using a 5point Likert Scale where 1, 2, 3, 4, and 5 represent not accessible, fairly accessible, undecided, accessible, and very accessible respectively, respondents were asked to rate their access to green spaces within their campus. The various green spaces captured in this context include a campus green park, sports fields with grass, lawns, and, walkways with

shrubs/grass, however, a botanical garden, a fountain with shrubs/grass, was absent in all the six (6) universities under review.

Table 4.14: Level of Accessibility of GS in the Study Area

	Universities	Not accessible (1)		Fairly accessible (2)		Undecide (3)		Accessible (4)		Very accessible (5)		Non-Response (6)		Total	Rank
		Freq.	%	Freq.	%	Freq	%	Freq	%	Freq.	%	Freq.	%		
Campus Green Park	**ABUAD**	0	0.0	6	8.1	6	8.1	43	58.1	19	25.7	0	0.0	74	2nd
	ACU	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	44	100	44	NIL
	CALEB	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	57	100	57	NIL
	CU	2	2.7	5	6.8	3	4.1	38	51.4	26	35.1	0	0.0	74	1st
	EU	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	44	100	44	NIL
	RUN	8	12.5	21	32.8	3	4.7	24	37.5	8	12.5	0	0.0	64	3rd
Sport Fields with Grass	**ABUAD**	0	0.0	0	0.0	1	1.4	41	55.4	32	225	0	0.0	74	1st
	ACU	1	2.3	6	13.6	3	6.8	23	52.3	11		0	0.0	44	5th
	CALEB	6	10.5	2	3.5	4	7.0	27	49.1	18	31.6	0	0.0	57	4th
	CU	1	1.6	7	9.5	3	4.1	38	51.4	25	33.8	0	0.0	74	3rd
	EU	3	6.8	1	2.3	1	2.3	20	45.5	19	43.2	0	0.0	44	2nd
	RUN	2	3.1	7	10.9	6	9.4	26	40.6	23	35.9	0	0.0	64	6th
Lawns	**ABUAD**	0	0.0	1	1.4	7	9.5	38	51.4	28	37.8	0	0.0	74	1st
	ACU	5	11.4	7	15.9	5	11.4	20	45.5	7	15.9	0	0.0	44	4th

	CALEB	4	7.0	2	3.5	6	10.5	30	52.6	13	22.8	0	0.0	57	2nd
	CU	74	100	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	74	6th
	EU	4	9.1	9	20.5	6	13.6	14	31.8	11	25	0	0.0	44	5th
	RUN	4	6.3	9	14.1	9	14.1	31	48.4	11	17.2	0	0.0	64	3rd
Walkways with Shrubs/Grass	**ABUAD**	0	0.0	0	0.0	2	2.7	42	56.8	30	525	0	0.0	74	1st
	ACU	2	4.5	5	11.4	1	2.3	25	56.8	11		0	0.0	44	2nd
	CALEB	3	5.3	3	5.3	5	8.8	25	43.9	21	36.8	0	0.0	57	4th
	CU	74	100	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	74	6th
	EU	2	4.5	4	9.1	5	11.4	16	36.4	17	38.6	0	0.0	44	5th
	RUN	1	1.6	4	6.3	5	7.8	29	45.3	24	37.5	0	0.0	64	3rd

Source: Fieldwork 2024

The result shown in Table 4.14 reveals in ABUAD 0.0% of the respondent indicated CGP was not accessible, 8.1% indicated its fairly accessible, 8.1% was undecided while 58.1% and

25.7% respectively said it was accessible and very accessible, Similarly, at ACU, CALEB and EU 100% of the respondents were non response, this is due to the fact that, CGP was not available as shown in Table 4.3 in both institutions. Nevertheless, at CU, 2.7% respondent indicated that CGP was not accessible, 6.8% indicated its fairly accessible, 4.1% was undecided, 51.4% and 35.1% respectively said it was accessible and very accessible. Consequently, at RUN, 12.5% of the respondent said CGP was not accessible, 32.8% said fairly accessible, 4.7% was undecided, 37.5% and 12.5% respectively said it was accessible and very accessible respectively.

Ranking the level of accessibility of CGP across each university, CU came first, followed by ABUAD and RUN respectively. This result is corroborated with the observation conducted by the researcher which show that CGP in CU was better planned, maintained, and facilities were made available for both day and night accessibility. Although at ABUAD and RUN the

CGP was observed to be planned, however the green space was not well maintained and facilities were not made available for night accessibility, as shown in Plates 4.1-4.24.

Furthermore, Table 4.14 reveals the level of accessibility of Sport Fields with Grass (SFG) across the Universities. At ABUAD, 0.0% respondent indicated that SFG was not accessible and fairly accessible, 1.4% was undecided while 55.4% and 43.2% respectively said it was accessible and very accessible. In addition, at ACU, 2.3% respondent said SFG was not accessible, 13.6% said fairly accessible, 6.8% was undecided while 52.3% and 25% respectively said it was accessible and very accessible. For CALEB, 2.3% respondent said SFG was not accessible, 13.6% said fairly accessible, 6.8% was undecided while 52.3% and 25% respectively said it was accessible and very accessible.

While at CU, 1.6% respondent said SFG was not accessible, 9.5% said fairly accessible, 4.1% was undecided, 51.4% and 33.8% respectively said it was accessible and very accessible and 0.0% was non-response. In EU, 6.8% respondent said SFG was not accessible, 2.3% said fairly accessible and undecided while 45.5% and 43.2% respectively said it was accessible and very accessible and 0.0% was non-response. At RUN, 3.1% respondent said SFG was not accessible, 10.9% said fairly accessible, 9.4% was undecided, 40.6% and 35.9% respectively said it was accessible and very accessible respectively, while 0.0% was non-response.

Ranking the level of accessibility of SFG across each university, ABUAD came first, followed by EU and CU came third. Based on the observation conducted by the researcher, this could be as a result of the fact that at ABUAD the SFG was very opened to the use of students likewise at EU, however at CU it was observed that there was availability of two SFG with one having restricted access as that one was barricaded as shown in Plates 4.1-4.24.

In addition, on the level of accessibility of Lawns, the results revealed that, at ABUAD, 0.0% respondent said lawn was not accessible, 1.4% said fairly accessible, 9.5% was undecided while 51.4% and 37.8% respectively said it was accessible and very accessible, 0.0% was non-response. Also, at ACU, 11.4% respondent said lawn was not accessible, 15.9% said fairly accessible, 11.4% was undecided while 45.5% and 15.9% respectively said it was accessible and very accessible.

Similarly, at CALEB, 7.0% respondent said the lawn was not accessible, 3.5% said fairly accessible, 10.5% was undecided while 52.6% and 22.8% respectively said it was accessible and very accessible. While at CU, 100% of the respondent said lawn was not accessible. Consequently, in EU, 9.1% respondent said lawn was not accessible, 20.5% said fairly accessible, 13.6% were undecided while 31.8% and 25% respectively said it was accessible and very accessible. At RUN, 6.3% respondent said lawn was not accessible, 14.1% said fairly accessible, 14.1% was undecided, 48.4% and 17.2% respectively said it was accessible and very accessible respectively.

Ranking the level of accessibility of the lawns across each university, ABUAD came first, followed by CALEB that ranked second and RUN came third respectively, while CU was the most inaccessible lawn among all the universities under investigation. The outcome of this assessment can further be corroborated as shown in plate 4.1-4.24 where all the lawns in CU was observed to be barricaded with dwarf metal fences. This implies that at CU in order to prevent the students from crossing the lawn, the culture was forced by erecting the observed barricades. Its necessarily does not imply that the lawns were properly designed but preventive mechanism was put in place, showing a forced behavioral pattern. This implies

that in the design of lawns user's preferences and convenience must first be considered in order to have a good landscape planning and utilization especially public spaces.

Similarly, on the level of accessibility of Walkways with Shrubs/Grass (WS/G), the results revealed that, at ABUAD, 0.0% respondent said WS/G was not accessible and fairly accessible, 2.7% was undecided while 56.8% and 40.5% respectively said it was accessible and very accessible. Also, at ACU, 4.5% respondent said WS/G was not accessible, 11.4% said fairly accessible, 2.3% was undecided while 56.8% and 25% respectively said it was accessible and very accessible.

At CALEB, 5.3% respondent said WS/G was not accessible and fairly accessible, 8.8% was undecided while 43.9% and 36.8% respectively said it was accessible and very accessible. While at CU, 100% of the respondent said WS/G was not accessible. In EU, 4.5% respondent said WS/G was not accessible, 9.1% said fairly accessible, 11.4% were undecided while 36.4% and 38.6% respectively said it was accessible and very accessible. In addition, At RUN, 1.6% respondent said WS/G was not accessible, 6.3% said fairly accessible, 7.8% was undecided, 45.3% and 37.5% respectively said it was accessible and very accessible respectively.

Ranking the level of accessibility of WS/G across each university, ABUAD came first, followed by ACU that ranked second and RUN came third respectively, while CU was the most inaccessible WS/G among all the universities under investigation. The outcome of this assessment can further be corroborated as shown in plate 4.5-4.24 where most walkways in CU was barricaded with dwarf metal fences. This also implies that the behavior of the users was forced. Thus, these results shown in Table 4.14 reveals that the University with the most

accessible green space is ABUAD which ranked first. This was premised on the number of times ABUAD came first.

4.4.1.2 Period of GS Accessibility Across the Study Area

The result on accessibility in Table 4.15 shows the main analysis for period of the day GS are accessible across different Universities. The result revealed that when considering morning time accessibility across the universities ABUAD came first with 26.5%. while considering accessibility of the GS across the universities in the afternoon, and night CU came first with 21.3% and 31.4% respectively, followed by ABUAD with 18%, and 28.6% respectively. However, CU and ABUAD tied with 23.1% when it comes to accessibility of the GS in the evening. It is worthy to note that Table 4.15 shows that all the GS spaces are accessible at different times of the day but at variance from each other.

The reason for variance in time of accessibility across the study areas can be due to the level of restrictions in place in each university. For instance, plate 4.1- 4.24 shows evidence of restriction from 7pm in CALEB University based on researchers' observation, while there is presence of night time illumination at CU which supported the reason while students could use the green spaces during the evening and night period.

Table 4.15: Period in a Day GS is Accessible in the Study Area

Universities	Morning		Afternoon		Evening		Night		Non-Response		Total
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
ABUAD	22	26.5	22	18	27	23.1	10	28.6	0	0.0	74
ACU	13	15.7	20	16.4	11	9.4	0	0.0	0	0.0	44
CALEB	7	8.4	23	18.9	20	17.1	0	0.0	0	0.0	57
CU	16	19.3	26	21.3	27	23.1	11	31.4	0	0.0	74
EU	7	8.4	12	9.8	16	13.7	9	25.7	0	0.0	44
RUN	18	21.7	19	15.6	16	13.7	5	14.3	0	0.0	64
Total	83	100	122	100	117	100	35	100	0	0.0	357

Source: Fieldwork 2024

Table 4.16: Period in a Week GS is Accessible in the Study Area

Universities	Monday		Tuesday		Wednesday		Thursday		Weekend		Total
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
ABUAD	2	8.7	0	0.0	3	12.5	7	18.4	62	24.7	74
ACU	6	26.1	2	9.5	2	8.3	4	10.5	30	12	44
CALEB	1	4.3	5	23.8	7	29.2	8	21.1	36	14.3	57
CU	5	21.7	8	38.1	7	29.2	9	23.7	45	17.9	74
EU	5	21.7	0	0.0	2	8.3	8	21.1	29	11.6	44
RUN	4	17.4	6	28.6	3	12.5	2	5.3	49	19.5	64
Total	23	100	21	100	24	100	38	100	251	100	357

Source: Fieldwork 2024

Similarly, Table 4.16 shows the results of the analysis for period of the week GS are accessible across different Universities. The result revealed that while GS across the universities were accessible throughout the week, weekend shows the most preferred period GS utilization is high. While the reason may not be known as questions on reason was not asked, however, one may infer the reason to be stressful academic activities during the week days. This result is in agreement with research conducted on school green space and its impact on academic performance, it was discovered that students that has more access to green space performs better in their academic activities than students that sparingly used green space[33]. The result shows relationship between restrictions, lighting infrastructures and level of accessibility of any green space. This position was further supported by research

conducted in another study where it not discovered that accessibility is very dependent on time[34].

Thus, the significance of the time of day for green space accessibility highlights the necessity of campus planning that takes into account a range of uses and activities and amenities at various times of the day. Establishing secure and easily accessible green areas at different times of the day promotes a livelier and healthy community life[35]. In order to ensure inclusivity and maximize the benefits to the community, it is imperative that green space designs and planning take into account a variety of schedules, preferences and time such green spaces are available[35].

4.4.2 Use Pattern of Green Space across the Study Area

The results of use pattern of GS as revealed in Table 4.17 shows the assessment of the utilization pattern of green spaces across the study area. Questions were asked on different variables around use, with varied scales such as, do you use the university green space, how often do you visit, duration of stay, time of visit, misuse of the GS and reason for misuse of the GS.

Table 4.17: Assessment of the Use Pattern of Green Space across the Study Area

Variables	Scale		Universities						Total
			ABUAD	ACU	CALEB	CU	EU	RUN	
Do you use the University Green space	Yes	Freq.	58	31	46	60	33	53	281
		%	73.4	70.5	80.7	81.1	75	82.8	78.7
	No	Freq.	16	13	11	14	11	11	76
		%	26.6	29.5	19.3	18.9	25	17.2	21.3
How often do you use the GS	Every Time (5)	Freq.	21	10	7	16	17	13	84
		%	28.4	22.7	12.3	21.6	38.6	20.3	23.5
	Almost Every Time (4)	Freq.	25	14	13	21	7	27	107

		%	33.8	31.8	22.8	28.4	15.9	42.2	30.0
	Occasionally/Sometimes (3)	Freq.	10	4	15	11	3	11	54
		%	13.5	9.1	26.3	14.9	6.8	17.2	15.1
	Almost Never (2)	Freq.	2	4	11	12	6	2	37
		%	2.7	9.1	19.3	16.2	13.6	3.1	10.4
	Never (1)	Freq.	16	12	11	14	11	11	75
		%	21.6	27.3	19.3	18.9	25	17.2	21.0
Duration of stay	**Very Short**	Freq.	31	14	22	26	12	21	126
		%	41.9	31.8	38.6	35.1	27.3	32.8	35.3
	Short	Freq.	14	9	10	13	11	17	74
		%	18.9	20.5	17.5	17.6	25	26.6	20.7
	Undecided	Freq.	16	11	10	14	12	12	75
		%	21.6	25	17.5	18.9	27.3	18.8	21
	Long	Freq.	11	4	6	11	4	9	45
		%	14.9	9.1	10.5	14.9	9.1	14.1	12.6
	Very Long	Freq.	2	6	9	10	5	5	37
		%	2.7	13.6	15.8	13.5	11.4	7.8	10.4
	No response	Freq.	0	0	0	0	0	0	0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time of Visit	**Morning**	Freq.	22	6	12	17	5	12	74
		%	29.7	13.6	21.1	23	11.4	18.8	20.7
	Afternoon	Freq.	22	7	15	15	5	13	77
		%	29.7	15.9	26.3	20.3	11.4	20.3	21.6
	Evening	Freq.	14	19	15	26	23	23	120
		%	18.9	43.2	17.5	35.1	52.3	35.9	33.6
	Night	Freq.	0	1	5	3	0	5	14
		%	0.0	2.3	8.8	4.1	0.0	7.8	3.9
	No response	Freq.	16	11	10	13	11	11	72
		%	21.6	25	17.5	17.6	25	17.2	20.2

Misuse of the GS	**Yes**	Freq.	19	7	49	11	10	23	119
		%	25.7	15.9	86	14.9	22.7	35.9	33.3
	No	Freq.	54	37	8	63	34	41	237
		%	73	84.1	14	85.1	77.3	64.4	66.7
Reason for Misuse of the GS	**Stress**	Freq.	11	0	20	6	2	6	45
		%	14.9	0.0	35.1	8.1	4.5	9.4	12.6
	Convenience	Freq.	5	2	19	4	2	7	39
		%	6.8	4.5	33.3	5.4	4.5	10.9	10.9
	Proximity to Destination	Freq.	49	37	8	61	34	40	229
		%	66.2	84.1	14.0	82.4	77.3	62.5	64.1
	Weather Condition	Freq.	6	4	2	2	3	1	18
		%	8.1	9.1	3.5	2.7	6.8	1.6	5.0
	Lack of Amenities	Freq.	1	0	2	0	0	4	7
		%	1.4	0.0	3.5	0.0	0.0	6.3	2.0
	No Response	Freq.	2	1	6	1	3	1	18
		%	2.7	2.3	10.5	1.4	6.8	1.6	5.0
		Total	74	44	57	74	44	64	357

Source: Fieldwork 2024

4.4.2.1 Usability of Green Space across the Universities in the Study Area

The result of Table 4.17 revealed that, when respondents were asked if they have used the university green space before, 78.7% of the respondents across the universities said Yes, while only 21.3% said No. The result presented in Table 4.12 further reveals that the GS is well utilized across all the universities as the percentages of respondents that indicated yes

varied between 70.5% (ACU) and 82.8% (RUN). This implies that majority of the respondents finds their university GS useable and attractive for use, since GS offers numerous benefits as established in various studies.

In addition to GS offering spaces for leisure and recreation, health advantages, job opportunities, and student development, other advantages also include improvement of the micro-climate, preserving biodiversity, and improving air quality[36, 37]. Furthermore, other studies opined that GS been central to human existence, has the ability to restore harmony to the university environment, easing academic stressors. Most notably, Roger Ulrich's psychophysiological stress reduction theory clarifies how people who are experiencing high levels of stress can benefit from both direct and indirect contact with nature (such as visits to green spaces with views over a natural setting) by relaxing and shifting into a more positive emotional state. Ulrich claims that when exposed to natural stimuli that are not dangerous, people are naturally inclined to find them calming, and this results in feelings of improved wellbeing and relaxation[38].

An increasing amount of research has shown that people's stress levels may be impacted by simply having access to green space. Thus, from the forgoing the student utilization of GS is vital to their overall wellbeing on campus and hence the reason for use.

4.4.2.2 Frequency of Respondents Visits and Duration of Stay in GS across the Universities

Even though when respondents were asked if they used the GS with 78.7% revealed yes and 21.35 said no. the respondents were further asked how often they visit the GS. 23.5% of respondents said every time, 30% said almost every time, 15.1% said sometimes, 10.4% almost never and 21% said never. Nevertheless, large number of respondents choose every

time and almost every time (53.5%) which shows a positive use of the GS on rate of frequency. For instance, Table 4.13 if we combine the result of every time and almost every time, the findings revealed that for ABUAD (62.2%), ACU (54.5%), CALEB (35.1%), CU (50%), EU (54.5%) and RUN (62.5%) students visit the GS frequently. Similarly, on duration of stay, 35.3% opined that their stay is usually very short, 20.7% said short, only 21% was undecided, 12.6% and 10.4% respectively said long and very long.

Reviewing this result with over 50% noted that their stay is short which could only imply that, green space enrichment characteristics were either absent or inadequate. This assertion agrees with the findings of studies which opined that quality GS with good amenities encourages use of GS by students[39]. The result of observation in plate 4.1-4.24 also supported Asamoah position which shows that various forms of restrictions, inadequate shading devices, poor GS management as well as inadequate seating have contributed to the short stay in the university GS across the study area.

4.4.2.3 Time of Visit Across the Universities

Table 4.17 also reveals the time of visit of the respondents to the university GS, 20.7% of respondents said morning, 21.6% said afternoon, 33.6% picked evening time which is the highest while only 3.9% of respondents picked night time and 20.2% was non-response. Even though generally, the result reveals that visit to the GS is high at evening, results showed variance across the universities as ABUAD (29.7%) had most respondents indicating morning visit, CALEB (26.3%) had most respondents indicating afternoon visit while ACU (43.2%), CU (35.1%), EU (52.3%), and RUN (35.9%) had majority of the visits in the evening.

The impulse of this result is that, respondents mostly visit at evening when the serenity and coolness required of any GS can be achieved since most GS across the universities in the study area has limited natural and artificial canopies see plate 4.5-4.24. While the small number of respondents that picked night also implies that apart from CU with presence of lighting to the GS areas at night no other university made provisions for such as seen in plate 4.5-4.24. Thus, adequate amenities, shading must be provided to encourage proper use of the university GS at all and any time.

4.4.2.4 Misuse and Reasons for GS Misuse across the Universities

More so, when respondents were asked questions on possible misuse of their university GS majority opined that they have never misuse the university GS with 66.7% saying No and only 33.3% said Yes. However, result of observation as shown in plate 4.5-4.24 showed varied degrees of different forms of misuse and abuses ranging from lawn crossing, lawn walking and presence of litters scattered all over the university GS.

Nevertheless, to established the reason for misuse respondents were further asked some questions, while 12.6% of respondents alluded to reason for misuse to be stress, 10.9% said it was due to convenience, 64.1% due to proximity to destination, 5% due to weather condition, 2% due to lack of amenities and 5% were non-response. These results are in agreement with, study on abuse of GS showed that in the study trash was seen on the majority of campus lawns, and university's authorities were blamed for this condition[40].

The study also blames university authority for neglecting to erect trash cans at strategic locations around campus green areas thus resulting in the abuse that was observed. In

addition, that study opined that students and other campus users' attitudes were the root cause for the littering problem and lawn crossing.

It was found from that study that most users occasionally walked on lawns to take shorter routes to their destinations. The study mentioned that respondents of the study thought that this "common" act made the GS on campuses less beautiful. Again, the study concluded that insufficient efforts were being made by the university administration to deter individuals, particularly students, from walking on the lawns. Therefore, it is imperative that in university design and planning, university authorities must consider users need and preferences. Lawns should be designed to consider shortest routes to avoid inevitable abuses.

4.4.3 Active Activities in Green Spaces across the Study Area

Table 4.18 shows the summary of active activities conducted in the identified green spaces accessible across the universities. This was captured based on the proportion of respondents engaging in the following listed activities as found in the literature. The following active activities considered in this study are jogging, running, walking, handball playing, football playing, cycling, dancing, and aerobic activities.

Table 4.18: Assessment of Active Activities in Green Spaces Where They Are Mostly Done Across the Study Area

Activities	Campus Green Park		Sport fields with grass		Lawns		Botanical garden		Fountain with shrubs/grass		Walkways with shrubs/grass		Mean	SD
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Jogging	0	0	249	69.7	0	0	0	0	0	0	108	30.3	3.21	1.84
Running	0	0	249	69.7	0	0	0	0	0	0	108	30.3	3.21	1.84
Walking	0	0	0	249	69.7	0	0	0	0	0	108	30.3	3.21	1.84
Handball playing	0	0	96	26.9	3.37	1.82	0	0	226	63.3	35	9.8	0	0

Football 0 0 356 99.7 0 0 0 0 0 0 1 .3 2.01 0.21 **playing**														
Cycling	0	0	112	31.3	0	0	0	0	0	0	245	68.6	5.38	1.64
Dancing	0	0	137	38.4	164	45.9	0	0	0	0	56	15.7	4.01	1.62
Aerobic 0 0 137 38.4 164 45.9 0 0 0 0 56 15.7 4.01 1.62 **exercise**														
Praying	0	0	137	38.4	164	45.9	0	0	0	0	56	15.7	4.01	1.62

Source: Fieldwork 2024

69.7% of the respondents were found to engage very often in jogging, running and walking within the sport fields with grasses, while only 30.3% engages with same activities within walkways with shrubs and grass, none of the respondents noted that they observed the above three activities in the rest of the green spaces within their universities. Similarly, 63.3% of the respondents were also found to engage in handballing within sport fields with grass, 9.8% in lawns and 26.9% on walkways with shrubs and grass. In addition, in the case of football playing 99.7% of the respondents engages in this activity within the sport field with grass with only 0.3% playing football on walkways.

In addition, 68.6% of the respondents engages in cycling on walkways, 31.3% on sport fields while none of the respondents does cycling activity in the other form of green spaces within the universities. Table 4.18 further showed that 38.45% of respondents observed dancing, aerobic and praying activities in sport fields with grass, while 45.9% observes the same activities on lawns and 15.7% on walkways with none respondent picking other green spaces for the same activities.

These results revealed that the aforementioned activities occur within the expected and designated green spaces in each of the universities in the study area as established in literature which is evident from the mean values all above 3.0 and SD value 1.0[37]. Furthermore, it also revealed that the pattern of active activities in the study area are consistent with the findings of Fernandes et al, which opined that the patterns of green space

utilization among school children are dependent on many factors among which are accessibility, availability, nature of the GS as well as proximity[41].

Similarly, this finding also agrees with the studies on green space and academic performance, which asserted that nature of green space is synonymous to the type of activities to be used for[42]. This position by different scholars implies that, activities should be green space specific else, green space misuse is inevitable. Thus, continuous green space misuse if unchecked would lead to an irreversible abuse in most cases.

4.4.4 Passive Activities in Green Spaces across the Study Area

The results in Table 4.19 provides the summary of passive activities conducted in accessible green spaces across the universities. This was also captured based on the proportion of respondents engaging in any of the identified activities namely reading, relaxing with friends, sightseeing, chatting, picnicking, meditation, eating, and sitting. The result showed that 19.0% of respondents reads at sport fields, 77.0% at lawns and 3.9% on walkways, while no respondent reads in other identified green spaces within their universities.

Also, 36.4% of respondents found relaxing with friends appealing on campus green parks, 12.6% on sport fields, 51.0% on lawns, wherefore no respondent picked botanical garden and fountains as they were not available see Table 4.3. In addition, 9.6% of respondents said they sightsee on and around sport fields, 9.0% on lawns however, the largest number of respondents noted that they sightsee more on walkways 81.5%. Consequently, on the other passive activities such as chatting, picnicking and meditation, respondents opined that 36.4% does them at campus green parks, 12.6% observing them on sport fields, 51.0% on lawns, while no respondent picked botanical garden, fountains and walkways.

Table 4.19: Assessment of the Passive Activities in Green Spaces where they are Mostly

Activities	Campus Green Park		Sport fields with grass		Lawns		Botanical garden		Fountain with shrubs/grass		Walkways with shrubs/grass		Mean	SD
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Reading	0	0	68	19	275	77	0	0	0	0	14	3.9	4.93	1.61
Relaxing with friends	130	36.4	45	12.6	182	51.0	0	0	0	0	0	0	3.17	1.90
Sightseeing	0	0	34	9.6	32	9.0	0	0	0	0	291	81.5	5.54	1.17
Chatting	130	36.4	45	12.6	182	51.0	0	0	0	0	0	0	3.17	1.90
Picnicking	130	36.4	45	12.6	182	51.0	0	0	0	0	0	0	3.17	1.90
Meditation	130	36.4	45	12.6	182	51.0	0	0	0	0	0	0	3.17	1.90
Eating	0	0	14	3.9	343	96.1	0	0	0	0	0	0	3.17	1.90
Sitting	127	35.6	107	30.0	123	34.4	0	0	0	0	0	0	3.17	1.90

Source: Fieldwork 2024

Furthermore, on eating, majority of the respondents picked lawns for the activity 96.1%, while only 3.9% of the remaining respondents observed eating around sport fields. Nevertheless, for sitting majority of the respondents are even with very close percentages. 35.6% campus green park, 30% sport field and 34.4% lawns. The result showed the dominance of eating by 96.1% of the total respondents over other identified passive activities in green spaces across the universities. This was followed by sightseeing and reading which accounted for 81.5% and 77% of the respondents respectively.

However, generally the result revealed that a higher percentage of the respondents perform most of the activities on the lawn when compared with the other GS understudy, perhaps this give a better explanation to why the lawns in the universities are littered and misused a high mean value all above 3.0 also lend credence to the way the respondents reacted. This result is in agreement with Asamoah et al findings on why litters are common/noticeable in university green spaces[43]. Meanwhile, the most utilized green space for the major passive activities

(eating, chatting, picnicking, relaxing with friends and reading) was the lawn followed by the walkways with shrubs/grass (sightseeing).

This suggests the availability of amenities such as seating or food vendors in or around the lawn as shown in Plate 4.5-4.24. This result is in alignment with another study that found chatting with friends, watching games/nature, and attending events as the most passive activities in outdoor utilization of open space in residential neighborhoods of Osogbo though the open space was not restricted specifically to only green spaces[44].

The result further implies that in the design and planning of Universities GS, the GS should be designed in such a way that it is activity centered to avoid misuse and abuse of the spaces. For instance, the result showed the inappropriate use of the lawns as the activities carried out on those lawns has overlapped activities that should be conducted on the Campus green park. This could be as a result of the extensive lands allotted to lawns and the provision of canopy trees and furniture on the lawn.

4.5. Utilization Pattern across the Universities in the Study Area

The results in Table 4.20 shows the summary behavior of green space utilization pattern across all the six universities in the study area on frequency of use. The result revealed that at ABUAD, 62.2% of respondents actively utilize the university GS frequently, while 16.2% passively utilize the GS with 21.6% said No use at all. Also, at ACU, 54.5% are active users, 18.2% passive users and 27.3% NO use at all. In addition, at CU, 50% were active users of GS, 31.1% passive users and 18.9 No use at all.

Table 4.20: Utilization Pattern across the Universities in the Study Area

Universities

Variables	Scale		ABUAD	ACU	CALEB	CU	EU	RUN	Total
How often do you use the GS	**Active use**	Freq.	46	24	20	37	24	40	**191**
		%	62.2	54.5	35.1	50	54.5	62.5	**53.5**
	Passive use	Freq.	12	8	26	23	9	13	**91**
		%	16.2	18.2	45.6	31.1	20.4	20.3	**25.5**
	No use at all	Freq.	16	12	11	14	11	11	**75**
		%	21.6	27.3	19.3	18.9	25	17.2	**21.0**
	Total	Freq.	**74**	**44**	**57**	**74**	**44**	**64**	**357**
		%	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Duration of stay	**Passive**	Freq.	45	23	32	39	23	38	**200**
		%	60.8	52.3	56.1	52.7	52.3	59.4	**56.0**
	active	Freq.	13	10	15	21	9	14	**82**
		%	17.6	22.7	26.3	28.4	20.5	21.9	**23.0**
	No use at all	Freq.	16	11	10	14	12	12	**75**
		%	21.6	25	17.5	18.9	27.3	18.8	**21**
	Total	Freq.	**74**	**44**	**57**	**74**	**44**	**64**	**357**
		%	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Fieldwork 2024

Furthermore, in EU, 54.5% similar to ACU are active users, 20.4% are passive users with only 25% No use at all. At RUN, the result also revealed that 62.5% are active users of GS, 20.3% passive users and 17.2% no use at all. However, at CALEB, the result showed variance with 45.6% of respondents revealed that they passively utilize the GS frequently, 35.1% actively and 19.3% no use at all. The impulse of this result indicated that majority of the students actively utilize their University GS, thus we can therefore conclude that on frequency of GS utilization across private Universities in South west Nigeria, the utilization pattern is active.

This result aligns with findings from research conducted among Furman University Greenville students in Southeastern USA, on active and passive use of GS and its impact on health and well-being of the students, which shows that active GS use influences the well-being of the students[45].

Furthermore, Table 4.21 also supported the pattern of utilization when respondents were asked question on their duration of stay (how long) and the result revealed that duration of stay on the GS at ABUAD, is passive with 60.8% of respondents indicated passive utilization, 17.6% active stay and 21.6% said no stay at all. Also, at ACU, 52.3% of respondents indicated passive stay at their University GS, 22.7% indicated active stay while 25% indicated No stay at all. In addition, at Caleb, 56.1% of respondents indicated passive stay, 26.3% active stay and 17.5% indicated No stay at all. More so, at CU, 52.7% of respondents revealed passive stay within the GS, 28.4% indicated active stay, while 18.9% said no stay at all. Similarly, at EU 52.3% of respondents indicated passive stay similar to result from ACU, 20.5% indicated active stay and 27.3% no stay at all.

Furthermore, at RUN, 59.4% of respondents revealed that they stay long during GS utilization in their university, 21.9% indicated active stay and 18.8% indicated no stay at all. This results from Table 4.21 can therefore be inferred as follows, that majority of users though they frequent the GS, the utilization pattern is passive across the Universities. This is because, if duration of stay is short and very short as shown in Table 4.13, it could then mean that, pattern of use cannot be active but passive notwithstanding the percentage of utilization.

Why the reason for short stay was established in the previous study by Fernandes who opined that, accessibility, availability, amenities and maintenance are very critical to determining duration,

frequency and time of utilization of any GS which in turn determines the nature and pattern any GS would be put to[46].

4.6. Factors that Significantly Influence the Utilization Pattern of GS in the Study Area

This section discusses the extent of influence factors identified from literatures on the utilization pattern of GS among the Universities selected in the study Area. Some of such factors include the design factors which form parts of technology, social factors, environmental

factors and economic factors[47, 48, 49]. The respondents' ratings as responses to question asked on influencing factors on utilization pattern were subjected to factor analysis. The results are presented in Tables 4.21 to 4.27.

Table 4.21: Factor Analysis of factors that Influence Utilization pattern of GS

Factors	% Variance accounted for	Variables	Component Loadings
Factor 1	24.460	Availability of Furniture	0.795 0.733
Design parameters		Availability of Artificial lighting fixtures	0.727
		Availability of WIFI connectivity	
		Availability of Kiosks for small chops	0.722
		Availability of Waste Bins	0.625
		Availability of Conveniences (Rest room)	0.600
Factor 2	17.183	Economic status	0.873
		Sex	0.840 0.837
Social characteristics of the GS and		Age	0.787
		Place of residence	0.712
Users		Exposure (Civilization/socialization)	
Factor 3	8.747	Cleanliness	0.819
		Accessibility	0.724
Economic characteristics of the GS and Users		GS Design	0.682

		Safety	0.678
		Shading devices	0.566
		Breeze (Air)	0.438
Factor 4	6.721	Precipitation	0.804
		Presence of Erosion	0.786
Environmental characteristics of the GS		Proximity to destination	0.550
		Solar radiation	0.436

Source: Fieldwork 2024

In determining the number of factors to be extracted for the rotated factor analysis, an initial non-rotated factor analysis was conducted using the principal component analysis method and five major components with Eigen Values greater than 1 were extracted. To ascertain if the extracted components should be selected for the Rotated PCA, the values were compared with structure matrix conducted randomly for the 21 factors investigated in this study as presented in Table 4.21. The structure matrix analysis was conducted because literature reported that explorative factor analysis is insufficient to determine the number of factors underlining a particular construct or variable.

Table 4.21 presents result of factors analysis of respondents' reactions to questions on factors that influence utilization pattern in the study area as shown in Section F1 of the questionnaire (See Appendix 1). The questions include 21 factors drawn out of literature identified to determine the utilization pattern. Principal Component Analysis (PCA) was conducted on the items to help categorize the factors into relevant groups.

Table 4.22: Initial Non-Rotated Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.137	24.460	24.460	5.137	24.460	24.460
2	3.609	17.183	41.644	3.609	17.183	41.644
3	1.837	8.747	50.391	1.837	8.747	50.391
4	1.411	6.721	57.112	1.411	6.721	57.112
5	1.076	5.123	62.235	1.076	5.123	62.235
6	.989	4.712	66.946			
7	.810	3.855	70.801			
8	.746	3.552	74.353			
9	.632	3.010	77.363			
10	.597	2.845	80.208			
11	.558	2.655	82.863			
12	.480	2.286	85.149			
13	.472	2.250	87.398			
14	.430	2.049	89.447			
15	.394	1.876	91.323			
16	.368	1.750	93.073			
17	.334	1.588	94.662			
18	.313	1.493	96.154			
19	.279	1.329	97.483			
20	.277	1.318	98.801			
21	.252	1.199	100.000			

Source: Fieldwork 2024

The result presented in Table 4.22reveals the four relevant groups and the factors loaded under each group that influence the utilization pattern of GS in the study area. Prior to the factor analysis conducted a non-rotated factors analysis was conducted to predict the number of groups to be used for the factor analysis. The non-rotated factor analysis resulted in the extraction of five components and thereby, the rotated factor analysis was conducted limiting it to only four factors with loading not less than 0.3.

The percentage variance accounted for the four components extracted was about 57.12% suggesting that these components do have a high influence on the utilization pattern of GS in the study area as shown in Table 4.22. Table 4.22 further revealed that factor 1 (Design parameters) has six items loaded on it, while factor 2 (Social characteristics of the GS and Users**)** and Factor 3 (Economic characteristics of the GS and Users) has five and Six items loaded on them respectively, while Factor 4 (Environmental characteristics of the GS) has four items loaded on them.

Table 4.23: Rotated Component Matrix for Factors Influencing GS Utilization Pattern

Factors	Conditions	Component loading for each category				
		1	2	3	4	
Economic	Availability of Furniture	.795				
	Availability of artificial lighting fixtures	.733				
	Availability of WIFI connectivity	.727				
	Availability of Kiosks for small chops	.722				
	Availability of Waste Bins	.625				
	Availability of Conveniences (Rest room	.600				
Social	Economic status		.873			
	Sex		.840			
	Age		.837			
	Place of residence		.787			
	Exposure(civilization/socialization)		.712			
Design	Proximity to destination			.819	.724	
	Accessibility					
	GS Design (planning)			.682		
	Integrate signage or interactive features			.678		
	Shading devices			.566		
	Rain gardens (this helps to manage storm water)			.438		
Environmental	Precipitation				.804	.786
	Presence of Erosion					
	Breeze (Air)				.550	
	Solar radiation				.436	

Source: Fieldwork 2024

Also, the result of the principal component analysis conducted on the 21 items on a 5point Likert-type scale reveals a correlation coefficient between all the items as not less than 0.3 except item 5 (ease to imitate it) with 0.22. The Karser-Oklin Measure of Sampling Adequacy

(KMO) value was 0.834 and the Bartlett's Test of Sphericity was significant at a value of 0.00. This result indicated that the factors and the items loaded in each component are well correlated and of great significance.

Tables 4.24, 4.25, 4.26, and 4.27 however, present respondents' perceived influence of the factors in each group on the utilization pattern of GS across each Private Universities in the South West Nigeria as selected.

Prior Conditions	**Scale**	**Frequency**	**Percentage (%)**	**Mean Score**	**SD**	**Rank**
Furniture	Very High (1)	64	17.9	**2.48**	**1.13**	4th
	High (2)	151	42.3			
	Not Sure (3)	74	20.7			
	Low (4)	43	12.0			
	Very Low (5)	25	7.0			
Availability of artificial lighting fixtures	Very High (1)	59	16.5	2.63	1.19	2nd
	High (2)	130	36.4			
	Not Sure (3)	84	23.5			
	Low (4)	51	14.3			
	Very Low (5)	33	9.2			
Availability of WIFI connectivity	Very High (1)	95	26.6	2.54	1.37	3rd
	High (2)	117	32.8			
	Not Sure (3)	53	14.8			
	Low (4)	40	11.2			
	Very Low (5)	52	14.6			
Availability of Kiosks for small chops	Very High (1)	75	21.0	2.47	1.14	5th
	High (2)	128	35.9			

	Not Sure (3)	86	24.1			
	Low (4)	47	13.2			
	Very Low (5)	21	5.9			
Availability of Waste Bins	Very High (1)	98	27.5	2.35	1.17	6th
	High (2)	118	33.1			
	Not Sure (3)	81	22.7			
	Low (4)	37	10.4			
	Very Low (5)	23	6.4			
Availability of Conveniences (Rest room	Very High (1)	69	19.3 29.1	2.68	1.27	1st
	High (2)	104				
	Not Sure (3)	89	24.9			
	Low (4)	56	15.7			
	Very Low (5)	39	10.9			
	Non-response (6)					

Table 4.24: Influence of Economic Factor on GS Utilization Pattern

Source: Fieldwork 2024

Table 4.24 presents respondents' perceived influence of variables indicating economic factors on GS utilization across the study area. Economic factors consist of factors such as Furniture**,** Availability of artificial lighting fixtures, Availability of WIFI connectivity, Availability of Kiosks for small chops, Availability of Waste Bins and Availability of Conveniences (Rest room).

Table 4.24 further reveals that all the variables that indicated economic factor in this study have minimal influence on the Utilization pattern of the GS by students, as all have mean scores value of below 3.0. In this case, any mean score value less than 3.0 indicate low influence, 3.0 indicate neutral, while values greater than 3.0 indicates high influence. Though all the economic factors show low influence, however the identified factors showed varied

level of influence with Availability of Conveniences (Rest room) having the highest mean value of 2.68 and standard deviation of 1.27.

The result presented in Table 4.24 fits into the factors identified to be usually mention of enablers of GS utilization in open space planning particularly in a university environment from findings in the study conducted on active and passive use of green space, health, and wellbeing amongst university students[50]. That research revealed that provision, management and adequacy of necessary amenities promotes usability which serves as enabler of the perceived pattern of GS utilization. However, the lower respondent mean value shows that either the amenities were present or not though important but does not stop them from using their university GS. This could also premise on the fact that private institutions are usually nondemocratic in nature since student opinion countless in decision making.

In addition, Table 4.25 shows the respondents perceived influence of social factors on GS utilization pattern across the study area. Table 4.25 reveals that among the variables in this category they all have higher influence on the Utilization pattern of the GS by students, as all have mean scores value of above 3.0. In this case, any mean score value less than 3.0 indicate low influence, 3.0 indicate neutral, while values greater than 3.0 indicates high influence.

The factors in this category aligns with findings from several other studies conducted on using social media text data to analyze the characteristics and influencing factors of daily urban green space usage a Case Study of Xiamen, China, the study revealed that social factors such as economic status, age, sex, place of residence and civilization are pivotal to how students would appreciate and utilize GS[51]. In addition, the result also aligns with findings from exploring the determinants of urban green space utilization based on microblog check-in data in Shanghai, China[52].

Table 4.25: Influence of Social Factors on Utilization Pattern

Prior Conditions	Scale	Frequency	Percentage (%)	Mean Score	SD	Rank
Economic status	Very High (1)	22	6.2	**3.46**	**1.16**	1st
	High (2)	46	12.9			
	Not Sure (3)	121	33.9			
	Low (4)	83	23.2			
	Very Low (5)	85	23.8			
Sex	Very High (1)	22	6.2	3.37	1.27	2nd
	High (2)	68	19.0			
	Not Sure (3)	109	30.5			
	Low (4)	71	19.9			
	Very Low (5)	87	24.4			
Age	Very High (1)	28	7.8	3.37	1.23	2nd
	High (2)	56	15.7			
	Not Sure (3)	115	32.2			
	Low (4)	72	20.2			
	Very Low (5)	86	24.1			
Place of residence	Very High (1)	40	11.2	3.18	1.27	3rd
	High (2)	72	20.2			
	Not Sure (3)	101	28.3			
	Low (4)	73	20.4			
	Very Low (5)	71	19.9			
Exposure (Civilization/socialization)	Very High (1)	38	10.6 26.1	3.03	1.22	4th
	High (2)	93				
	Not Sure (3)	100	28.0			
	Low (4)	73	20.4			
	Very Low (5)	53	14.8			

Source: Fieldwork 2024

Table 4.26 presents respondents' perceived influence of variables indicating Design factors on GS utilization across the study area. Design factors consist of factors such as Proximity to

destination, Accessibility and Connectivity, GS Design (planning), Integrate signage or interactive features, shading devices and availability of Rain gardens (this helps to manage storm water). Table 4.25 further reveals that all the variables that indicated Design factor in this study have minimal influence on the Utilization pattern of the GS by students, as all have mean scores value of below 3.0. In this case, any mean score value less than 3.0 indicate low influence, 3.0 indicate neutral, while values greater than 3.0 indicates high influence.

Table 4.26: Influence of Design Factors on Utilization Pattern

Prior Conditions	Scale	Frequency	Percentage (%)	Mean Score	SD	Rank
Proximity to destination	Very High (1) High (2)	65 108	18.2 30.3	3.52	1.04	1st
	Not Sure (3)	131	36.7			
	Low (4)	39	10.9			
	Very Low (5)	14	3.9			
Accessibility	Very High (1)	134	37.5	3.01	1.02	5th
	High (2)	134	37.5			
	Not Sure (3)	52	14.6			
	Low (4)	29	8.1			
	Very Low (5)	8	2.3			
GS Design (planning)	Very High (1)	115	32.2	3.17	1.10	2nd
	High (2)	128	35.9			
	Not Sure (3)	66	18.5			
	Low (4)	35	9.8			
	Very Low (5)	13	3.6			
Integrate signage or interactive features	Very High (1)	121	33.9 42.6	3.02	0.99	4th
	High (2)	152	13.7			
	Not Sure (3)	49				
	Low (4)	27	7.6			
	Very Low (5)	8	2.2			
Shading devices	Very High (1)	124	34.7 33.6	3.14	1.12	3rd
	High (2)	120				

	Not Sure (3)	69	19.3			
	Low (4)	27	7.6			
	Very Low (5)	17	4.8			
Rain gardens (this helps to manage storm water)	Very High (1)	134	37.5	1.94	0.96	6th
	High (2)	145	40.6			
	Not Sure (3)	54	15.1			
	Low (4)	15	4.2			
	Very Low (5)	9	2.5			

Source: Fieldwork 2024

Though all the design factors show high influence, however the identified factors showed varied level of influence with proximity to destination having the highest mean value of 3.52 and standard deviation of 1.04. The result presented in Table 4.26 fits into the factors identified to be an enablers of GS utilization in open space planning particularly in a university environment from findings in the study conducted on active and passive use of green space, health, and well-being amongst university students[53]

That research revealed that outlook of GS can either promotes or denies useability. A beautifully designed GS with all design parameters serves as positive enabler of the perceived pattern of GS utilization. However, the higher respondent mean value above 3.0 except rain garden with mean value less than 3.0 shows that the physical characteristic of the GS which design factors offers were important to the students at the time of use to a large extent, though they are seen to enhance the GS but the absence of such does not stop university GS utilization. This could also premise on the fact that private institutions are usually non-democratic in nature since student perception about the university environment in most cases are not considered in planning the institution.

Furthermore, Table 4.27 presents respondents' perceived influence of variables indicating environmental factors on GS utilization across the study area. Environmental actors consist of factors such as Precipitation, Presence of Erosion, Breeze (Air) and Solar radiation.

Table 4.27 further reveals that most of the variables that indicated environmental factor in this study have minimal influence on the Utilization pattern of the GS by students, as all have mean scores value of below 3.0 except the presence of erosion that h

as the mean value greater than 3.0. In this case, any mean score value less than 3.0 indicate low influence, 3.0 indicate neutral, while values greater than 3.0 indicates high influence. Though most of the factors show low influence, however the identified factors showed varied level of influence with presence of erosion having the highest mean value of 3.14 and standard deviation of 1.20.

Prior Conditions	**Scale**	**Frequency**	**Percentage (%)**	**Mean Score**	**SD**	**Rank**
Precipitation	Very High (1)	49	13.7	2.73	1.06	2nd
	High (2)	91	25.5			
	Not Sure (3)	146	40.9			
	Low (4)	49	13.7			
	Very Low (5)	22	6.2			
Presence of Erosion	Very High (1)	42	11.8	3.14	1.20	1st
	High (2)	58	16.2			
	Not Sure (3)	115	32.2			
	Low (4)	91	25.5			
	Very Low (5)	51	14.3			
Breeze (Air)	Very High (1)	137	38.4	1.93	0.95	4th
	High (2)	140	39.2			
	Not Sure (3)	51	14.3			
	Low (4)	25	7.0			

	Very Low (5)	4	1.1			
Solar radiation	Very High (1)	105	29.4	2.31	1.17	3rd
	High (2)	112	31.4			
	Not Sure (3)	87	24.4			
	Low (4)	30	8.4			
	Very Low (5)	23	6.4			

Table 4.27: Influence of Environmental Factors on Utilization Pattern

Source: Fieldwork 2024

The result presented in Table 4.27 fits into the factors identified to be an enabler of GS utilization in open green space planning particularly in a university environment from findings in the study conducted on active and passive use of green space, health, and well-being amongst university students[55]. The research revealed that outlook of GS promotes/denies useability. A beautifully designed GS with evidence of erosion can be a major turn off for useability which has negative influence on the pattern of GS utilization. However, the lower respondent mean value shows that the physical characteristic of the GS which remaining environmental factors offers were not that important to the students at the time of use to a large extent, though they are seen to enhance the GS but the absence of such does not stop university GS utilization.

4.7. Assessment of the Impact of Green Space Availability and Utilization on The Campus Scape.

This section presents results on observation of how the GS availability and its utilization have impact on the physical form (campus scape) and characteristics of the respective Universities in the study area under the following themes, Aesthetics, design and planning. This observation was done using pictures of utilization and google image of the respective

university to ascertain the nature of the campus planning and GS availability. The result of the observation is presented in Plate 4.25-4.27 and Figure 4.13-4.17 respectively.

4.7.1. Impact of Green Space Availability and Utilization on Campus Scape.

A campus's overall campus-scape, which affects many aspects of the campus environment, can be greatly impacted by the presence and use of any form of GS. Plate 4.25A and 4.25B shows evidence of CGP availability and utilization at ABUAD, a cross section of the picture indicated how the availability of CGP had supported utilization. In addition, it reveals the form of utilization in the CGP which is socializing between students and recreation activities expected in a GS. Other potential impact the GS has on the Universities includes but not limited to aesthetic enhancement, which shows that a well-designed GS contributes to the visual appeal of the University[54].

For instance, this observation aligns with the findings done which state that campus aesthetic quality has impact on the perception and use of campus green space. Using MS Excel statistic package for a study carried out in Gombe state University Nigeria, where the respondents agrees that campus green space utilization is important to the overall image(aesthetic) of the university environment, this the paper asserted that GS is an integral part of a university as such the its availability and usage determine the how healthy a university would be[55].

By casting shade over the surrounding area and bringing in some cooling, green spaces can help reduce the impact of the urban heat island. A more comfortable campus environment can be achieved through strategic planning and design that optimizes the cooling effects of the green park, particularly in the warmer months. Thus, contributing to environmental sustainability, awareness, campus heat island mitigation and stewardship,

Plate 4.25A: Showing Designated Campus Green Park at ABUAD Authors Fieldwork 2024

affecting the image of the campus GS[56, 57]. Also, the study, went further to reveal that quality of Campus GS bolster and promotes place attachment among students.

Plate 4.25B: Showing Designated Campus Green Park at ABUAD Authors Fieldwork 2024

Furthermore, the impact of GS availability and Utilization on campus image was further corroborated by another study where it was revealed that for a GS to have positive impact on

the campus scape (image of the university), the nature and condition of the GS must be good (management) of available GS[58]. This implies that, GS planning (design) and management also determines utilization which in turn affect the image of the university. This position was further supported by another researcher who opined that the design and management style of any university GS can have great impact or influence on the use of GS wherein unchecked use can lead to GS abuse, thus

Plate 4.26A: Showing Designated Campus Green Park at CU Authors Fieldwork 2024

Plate 4.26B: Showing Designated Campus Green Park at CU during the Night Authors Fieldwork 2024

Similarly, Plate 4.26A, 4.26B and 4.27 reveals the same attribute of GS availability and utilization and its impact of the campus of both CU and RUN. While ACU, CALEB and EU do not have a designated campus green park as earlier indicated.

Plate 4.27: Showing Designated Campus Green Park at RUN Authors Fieldwork 2024

The presence of a Campus Green Park and its careful use influence the campus community's general atmosphere, environmental effect, and well-being. Thus, sustainable campus landscape can be achieved through efficient planning and management of these areas.

4.7.2. Impact of Campus GS availability and utilization on Campus Design and Planning.

Figure 4.12: Google Earth Image Showing the GS at ABUAD Source[59]

Figure 4.12 and 4.13 reveals the nature of planning of the GS within the core area of ABUAD campus. The result of the observation indicated that the availability of GS around the university shows beauty and class. It also reveals that, the university was properly designed with quality attention given to the provision, planning and maintenance of the available GS. This result aligns with the finding from the research conducted on a campus green space in China which opined that attractiveness of a university is dependent on the availability, accessibility, design, planning and maintenance of their GS[60].

Figure 4.13: Google Earth Image Showing the GS at ABUAD Source[63]

Furthermore, at ACU, figure 4.14a and 4.14b shows evidence of the nature of planning of ACU GS, first the outcome of the observation shows sign of uncoordinated GS planning, which shows that inadequate GS has negative impact on the campus scape of ACU if compared with ABUAD. Also, the GS was not purposely designed as such the ACU GS has contributed to the poor image of the University among its counterpart private University in the study area.

Figure 4.14a: Google Earth Image Showing the GS at ACU Source[63]

Figure 4.14b: Google Earth Image Showing the GS at ACU Source[63]

Similarly, Figure 4.15a and 4.15b shows the google image of CALEB university GS, the result of the observation survey also shows the beautiful nature of the university GS. Figure 4.15a indicated that the university has expansive and dedicated area for GS planning which are purposely designed similar to ABUAD GS.

Figure 4.15a: Google Earth Image Showing the GS at CALEB Source[63]

In addition, Figure 4.15b also shows how the GS have contributed the general ambience of the CALEB university environment. The result is indicative of the importance and significance of a purposely designed GS in and around a university. The map further lends credence to how well GS availability and utilization has impact on the campus scape. The result was supported by the findings from the study on 'is the grass always greener 'which noted that nature and access to GS bolster students' sense of belonging and place attachment[61]. Thus, availability and utilization of any GS is dependent on the beauty of the GS, a beautiful GS is a beautiful campus which in turn promotes the image of the university socially, economically and environmentally.

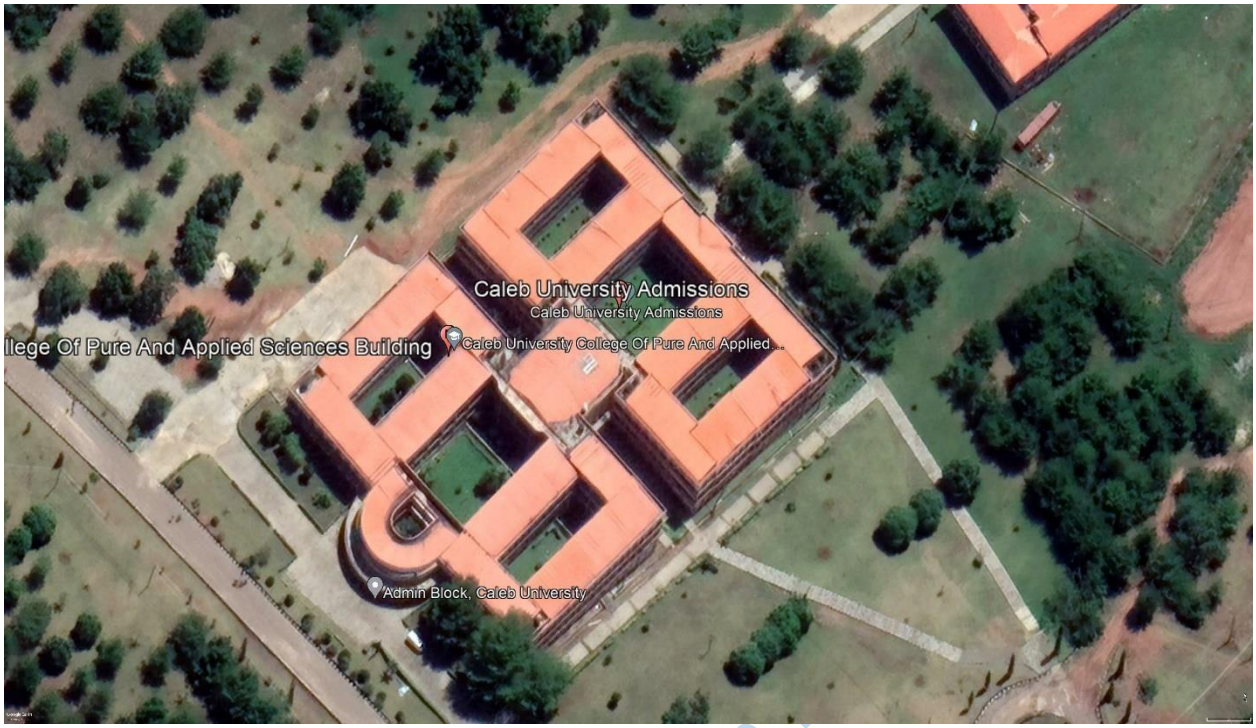

Figure 4.15b: Google Earth Image Showing the GS at CALEB Source[63]

Also, Figure 4.16a and 4.16b reveals the condition, nature of the GS in relation to the image of the CU university environment.

Figure 4.16A: Google Earth Image Showing the GS at CU Source[63]

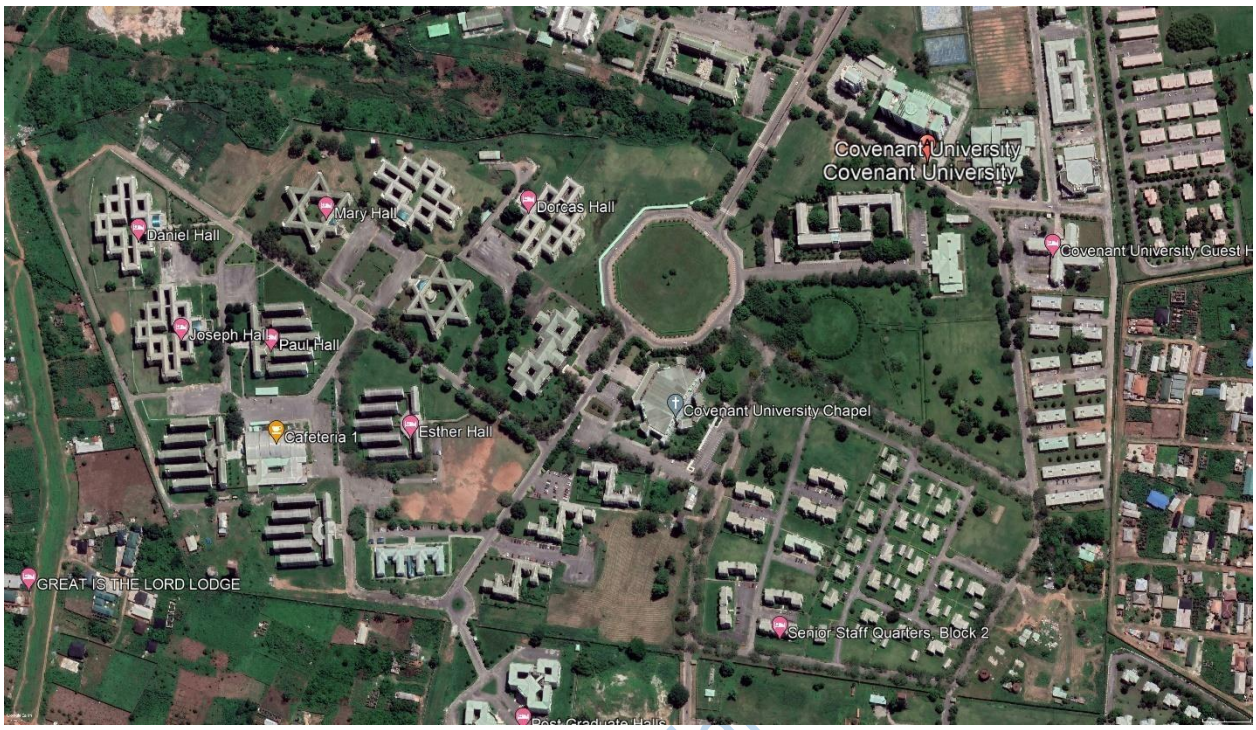

Figure 4.16B: Google Earth Image Showing the GS at CU Source[63]

Figure 4.16a reveals the beautiful scenery the CU GS created, coordinating eyesight and movement from one facility to another. The figure further showed the value GS brought to the campus. This indicated that the more the available GS the more scape of the university is improved. This image can also be supported by plate 4.27A and 4.27B which shows the manner the GS is put to use. Figure 4.16A and 4.16B also indicated the form of campus planning that exist at CU couple with a beautifully designed landscape. For instance, a study conducted on improvement indicators of a good campus planning asserted that, beautifully design GS is a positive indicator of a good campus planning, and a good campus planning leads to an improved campus scape[62].

In addition, at EU, Figure 4.17 indicated limited GS availability and hence limited positive impact on the campus scape of the university. The figure also reveals that, despite the

enormous land mass of the university, the GS is still in a developing state. Figure 4.17 further showed that apart from the sport field and walkways and lawns around the faculty building, university gym and fitness center, cafeteria there are limited sight of GS within the core academic area for student use. The figure also indicated poor campus scape as the major green are unplanned in its virgin state.

Figure 4.17: Google Earth Image Showing the GS at EU Source[63]

In furtherance, figure 4.18A and 4.18B shows how GS has shaped the RUN campus. Though the university is still developing, the google image shows evidence of the campus scape and how GS as contributed to it. A good scenery as previously posited depends greatly on the nature of the GS and the planning of the buildings using GS as delineating factors.

Figure 4.18A: Google Earth Image Showing the GS at RUN Source[63]

Figure 4.18B: Google Earth Image Showing the GS at RUN Source[63]

In summary, nature of available GS as well as the form of utilization can greatly impact the general outlook of any university environment. Thus, university stakeholders must be intentional about how and well the university GS, would be planned, run and maintained for a sustainable university environment.

4.7.3. Impact of Campus GS Availability and Utilization on Campus Image between 2015 and 2014 Land Use and Land Cover Analysis (LULC).

Table 4.28: Impact of Campus GS Availability and Utilization on Campus Image

Universities	(LULC). (Sq.Km)	Light Vegetation (Planned green spaces)		Dense Vegetation (Unplanned green spaces)		Built-Up Land		Bare Land		Total (Sq.Km)	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
ABUAD	2024	1.22	45.86	0.74	27.82	0.65	23.44	0.05	1.88	2.66	100
	2015	1.33	50.0	0.80	30.08	0.49	18.42	0.04	1.50	2.66	100
ACU	2024	0.10	20.0	0.07	14.0	0.30	60.0	0.03	6.0	0.50	100
	2015	0.22	44.0	0.13	26.0	0.09	18.0	0.06	12.0	0.50	100
CALEB	2024	0.29	36.25	0.23	28.75	0.24	30.0	0.04	5.0	0.8	100
	2015	0.26	32.50	0.47	58.75	0.06	7.50	0.01	1.25	0.8	100
CU	2024	2.25	34.56	1.77	27.19	2.07	31.80	0.42	6.45	6.51	100
	2015	1.36	20.89	3.49	53.61	1.36	20.89	0.30	4.61	6.51	100
EU	2024	0.16	18.60	0.49	56.98	0.17	19.78	0.04	4.65	0.86	100
	2015	0.18	20.93	0.50	58.14	0.12	13.95	0.06	6.98	4.66	100
RUN	2024	1.83	39.27	1.02	21.89	1.46	31.33	0.35	7.51	4.66	100
	2015	1.21	25.97	2.10	45.06	0.69	14.81	0.66	14.16	4.66	100

Authors Fieldwork 2024

between 2015 and 2014 Land Use and Land Cover Analysis (LULC).

It was discovered from result presented in Table 4.28 on land use and land cover GIS analysis of the six-university environment and supported by GIS maps as shown in figure 4.19-4.24 in square kilometer to ascertain the state of available green space cover against other land uses and cover between the year 2015–2024-year duration and their impact on the campus image. The results revealed that, at ABUAD, in year 2015, the percentage of planned green spaces were higher (50%) than the 45.86% of the LULC with light vegetation (planned green spaces) in the year 2024 with a reduction by 4.14%, this reduction is a negative indicator on the outlook of the university within the years under review. To established the course of the reduction in GS, Table 4.28 further shows that the Built-up area increased from 18.42% in 2015 to 23.44% as Built-up area thus the reduction in the GS within the period. Similarly, in 2015 and 2024 the dense vegetation was 30.08% and 27.82% respectively. While the percentage of bared land also increased from 1.50% to 1.88% respectively within 2015 and 2024 development period.

Thus, in retrospect, one may infer that at ABUAD within the 10 years' duration under review physical development, utilization and different forms of misuses had led to the erosion of once attractive campus to a campus with poor image. Though physical observation of the current year condition state otherwise, however comparing how the university was in 2015 to 2024 showed a sharp contrast. This finding agrees with the findings of several researcher who asserted that development and utilization can erode campus green space beauty if not checked[63]. Thus, for sustainable campus green space planning, efforts must be sustained to ensure that as development takes form the integrity of the GS is not compromised.

While at ACU, in year 2015, the percentage of planned green spaces were also higher (44%) than the 20% of the LULC with light vegetation (planned green spaces) in the year 2024 with

a reduction by 24%, this reduction is a negative indicator on the outlook of the university within the year's period under review. To established the course of the reduction in GS, Table 4.28 further shows that the Built-up area increased from 18% in 2015 to 60% as Built-up area thus the reduction in the GS within the period. Similarly, in 2015 and 2024 the dense vegetation was 26% and 14% respectively. However, the percentage of bared land also decreased from 12% to 6% respectively within 2015 and 2024 development period.

The import of this ACU result is indicative of the poor current physical condition of the GS in the University and low attractiveness of the entire community within 10-year period. This result is in tandem with the finding on a study conducted in USA and UK universities which revealed that as university strives to improve the physical infrastructures on campus, this has a way of affecting the outlook of the GS through reduction in GS allotted, thus, efforts must be made to ensure that the attractiveness of the GS in terms of size of land cover, which has a way of improving the image of the university and students experience must be a priority[64].

In addition, at CALEB, in year 2015, the percentage of planned green spaces were lower (32.5%) than the 36.26% of the LULC with light vegetation (planned green spaces) in the year 2024 with an increase by 3.75%, this increase is a positive indicator on the outlook of the university within the years under review. To established the cause of the increase in GS, Table 4.29 shows that the Built-up area though increased from 7.5% in 2015 to 30% as Built-up area this did not affect the available GS within the period rather it increases, which mean the management of the university consistently in 10 years' duration improves on the GS available and of course maintained the image of the University positively for aesthetic appeal. Similarly, in 2015 and 2024 the dense vegetation was 58.75% and 28.75% respectively, it can be corroborated that the sharp decrease in the dense vegetation cover was as a result of

the increase in the physical development and utilization within the period. While the percentage of bared land also increased from 1.25% to 5% respectively within 2015 and 2024 development period which also revealed that utilization also increased within the period.

This result is indicative of the strength and the outlook of the university as well as the importance the university placed on green space planning and provision via sustained master plan audit. Furthermore, at CU, in year 2015, the percentage of planned green spaces were lower (20.89%) than the 34.56% of the LULC with light vegetation (planned green spaces) in the year 2024 with an increase by 13.67%, this increase is a positive indicator on the outlook of the university within the years under review. To established the cause of the increase in GS, table 4.29 and figure 14b, and 20 shows that the Built-up area though increased from 20.89% in 2015 to 31.80% as Built-up area this did not affect the available GS within the period rather it increases, which mean the management of the university consistently in 10 years' duration improves on the GS available and of course maintained the image of the University positively for aesthetic appeal.

Similarly, in 2015 and 2024 the dense vegetation decreased from 53.61% and 27.19% respectively, this implies that the sharp decrease in the dense vegetation cover was as a result of the increase in the physical development of the built-up area and utilization within the period. While the percentage of bared land also increased from 4.61% to 6.45% respectively within 2015 and 2024 development period which also revealed that utilization also increased within the period. This result also elicits to the fact that the university has ample GS that were planned since the area covered within GS was more than that of the built-up area.

Also at EU, in year 2015, the percentage of planned green spaces also decreased from (20.93%) to 18.60% of the LULC with light vegetation (planned green spaces) in the year

2024 by 2.33%, this reduction in GS is a negative indicator on the outlook of the university within the years under review. To established the cause of the decrease in GS, Table 4.28 shows that the Built-up area increased from 13.95% in 2015 to 19.78% as Built-up area. In addition, in 2015 and 2024 the dense vegetation decreased from 58.14% and 56.98% respectively, it can be corroborated that the slight decrease in the dense vegetation cover was as a result of the increase in the physical development and utilization within the period. While the percentage of bared land also decreased from 6.98% to 4.65% respectively within 2015 and 2024 development period which revealed that though development increases same as utilization, the university management were able to reduce misuse to barest minimum.

While at RUN, in year 2015, the percentage of planned green spaces were lower (25.97%) than the 39.27% of the LULC with light vegetation (planned green spaces) in the year 2024 with an increase by 13.3%, this increase is a positive indicator on the outlook of the university within the years under review. To established the cause of the increase in GS, Table 4.29 shows that the Built-up area though increased from 14.81% in 2015 to 31.33% as Built-up area this did not affect the available GS within the period rather it increases, which mean the management of the university consistently in 10 years duration improves on the GS available and of course maintained the image of the University positively for aesthetic appeal, secondly, it was also the year RUN moved to Ede Osun State the current permanent site[65]. In 2015 and 2024 the dense vegetation at RUN was 45.06% and 21.89% respectively, it can be corroborated that the sharp decrease in the dense vegetation cover was as a result of the increase in the physical development and utilization within the period. While the percentage of bared land decreased from 14.16% to 7.51% respectively within 2015 and 2024

development period which also revealed though utilization increased GS planning, maintenance was sustained within the period.

Comparing these results across the six (6) within the 10-year phased period, one can see variance in GS behavior across each university why some of the university witness sharp decline in GS and positive campus image and attractiveness, some improved exponentially. For instance, ABUAD GS declined from 50% to (45.86%) in 10 years, followed by ACU which also decreased from 44% in 2015 to 20% in 2024 and EU 20.93% in 2015 to 18.60% in 2024. While, CALEB (32.5% and 36.25), CU (20.89% and 34.56%) and RUN (25.97% and

39.27%) all experienced increase respectively between 2015 to 2024.

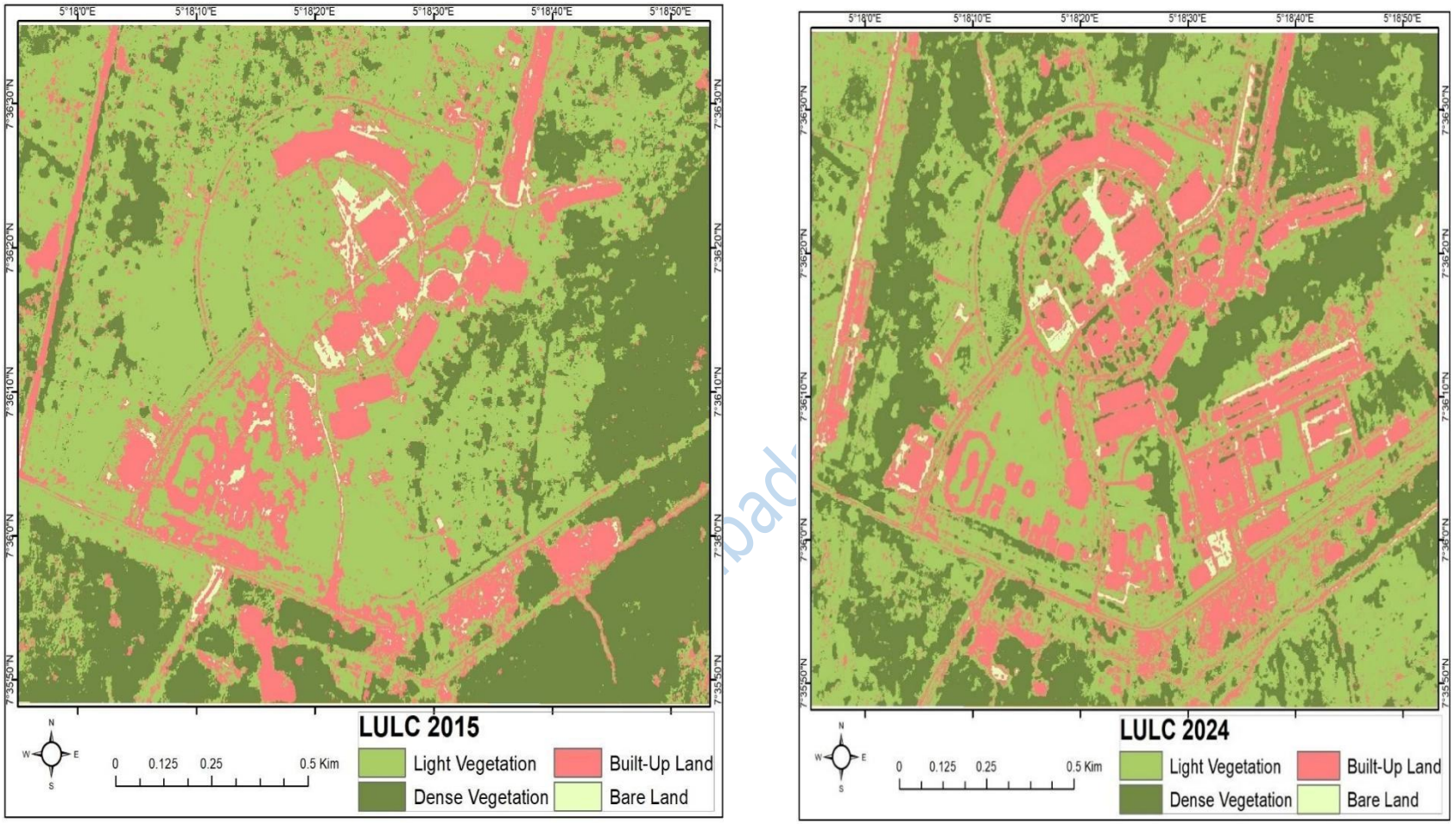

Figure 4.19: Google Earth image Showing the LULC of ABUAD in 10-year duration 2015-2024 Authors Fieldwork 2024

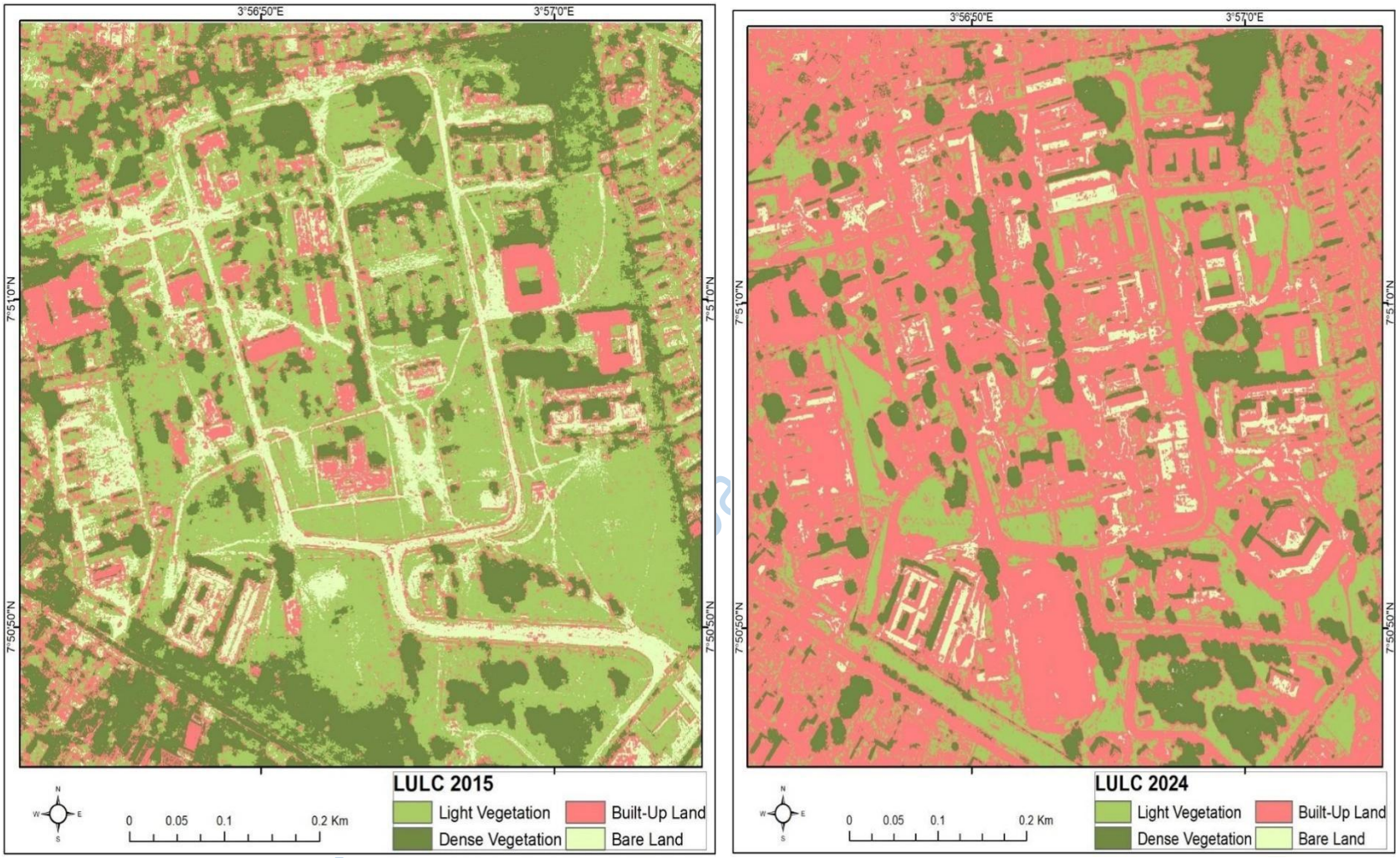

Figure 4.20: Google Earth Image Showing the LULC of ACU in 10-year Duration 2015-2024 Authors Fieldwork 2024

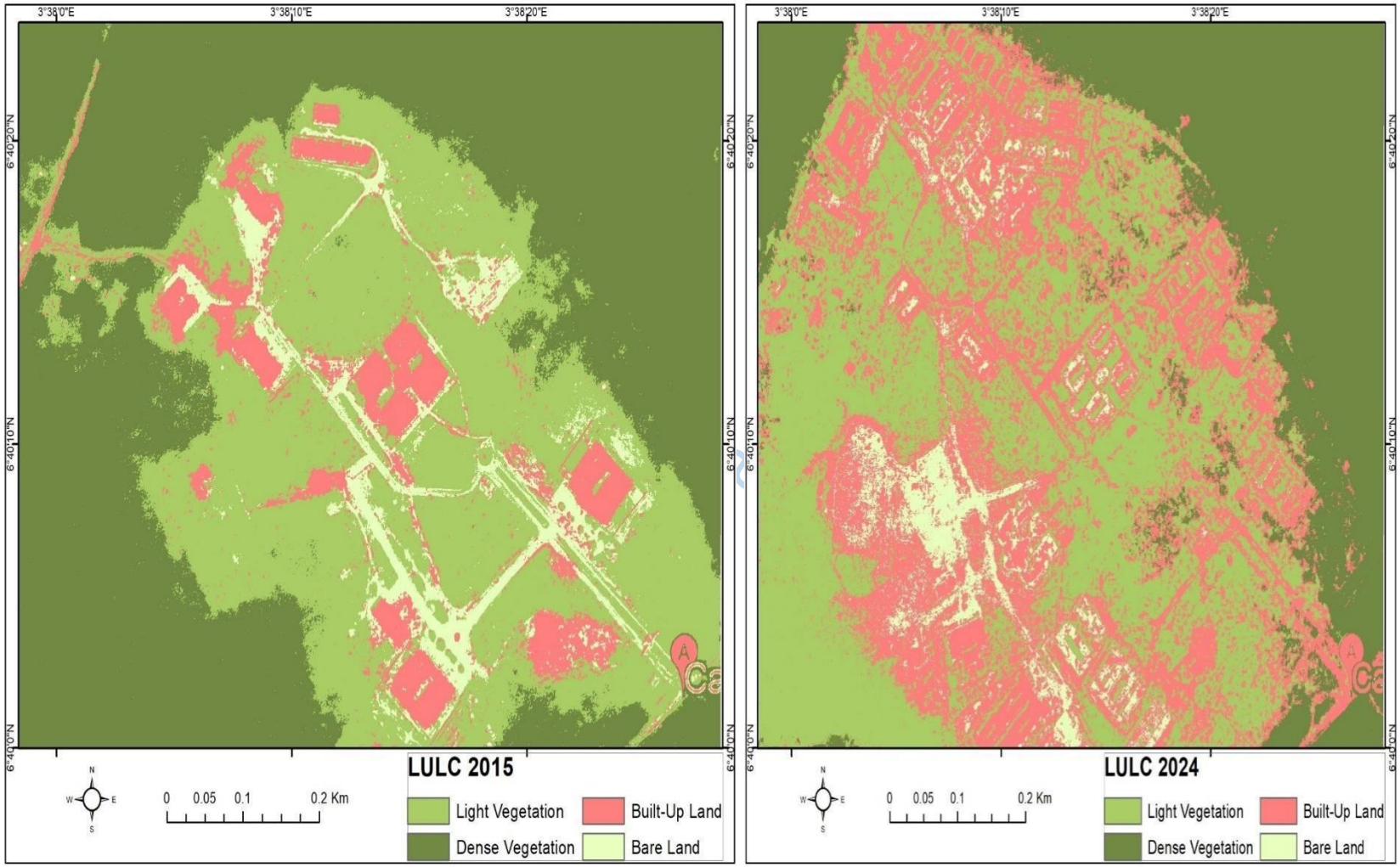
3°38'0"E
3°38'10"E
3°38'20"E
6°40'20"N
6°40'10"N
6°40'0"N
N
W
E
S
0 0.05 0.1 0.2 Km
LULC 2015
Light Vegetation
Built-Up Land
Dense Vegetation
Bare Land
LULC 2024

Figure 4.21: Google Earth Image Showing the LULC of CALEB in 10-year Duration 2015-2024 Authors Fieldwork 2024


3°9'0"E
3°9'30"E
3°10'0"E
6°40'30"N
6°40'0"N
6°39'30"N
0 0.15 0.3 0.6 Km
LULC 2015
Light Vegetation
Built-Up Land
Dense Vegetation
Bare Land

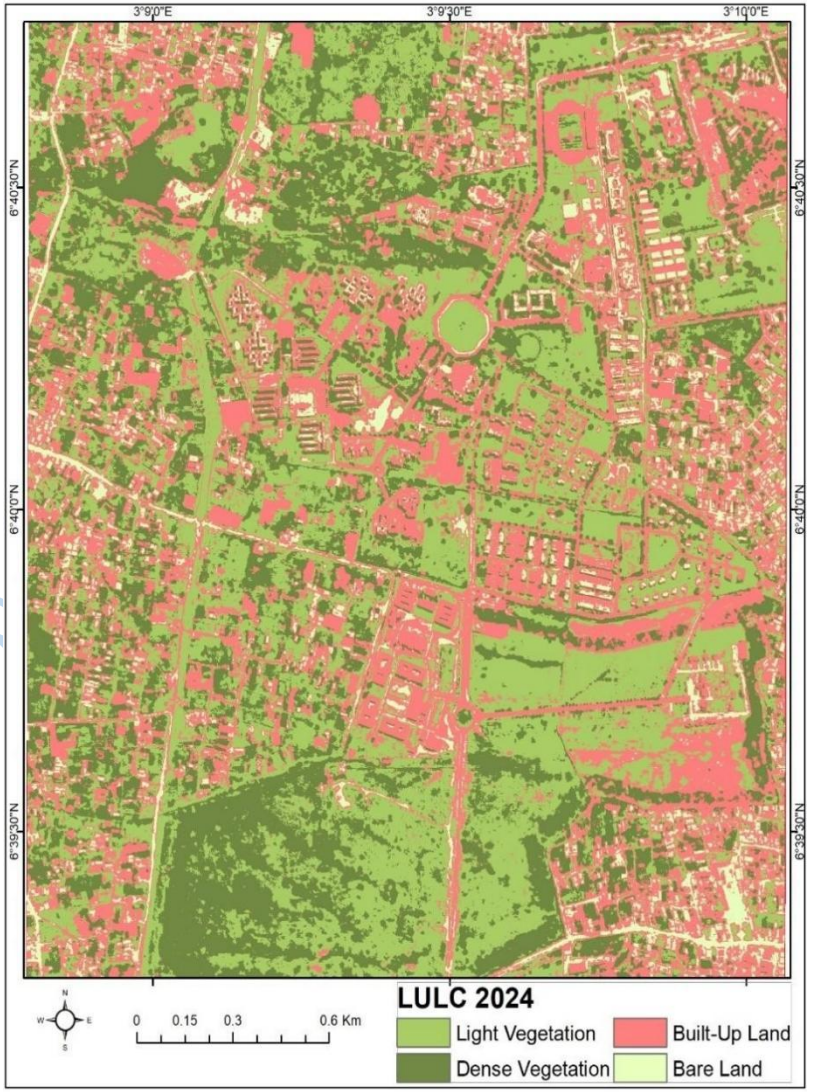
3°9'0"E
3°9'30"E
3°10'0"E
6°40'30"N
6°40'0"N
6°39'30"N
0 0.15 0.3 0.6 Km
LULC 2024
Light Vegetation
Built-Up Land
Dense Vegetation
Bare Land

Figure 4.22: Google Earth Image Showing the LULC of CU in 10-year Duration 2015-2024 Authors Fieldwork 2024

Figure 4.23: Google Earth Image Showing the LULC of EU in 10-year Duration 2015-2024 Authors Fieldwork 2024

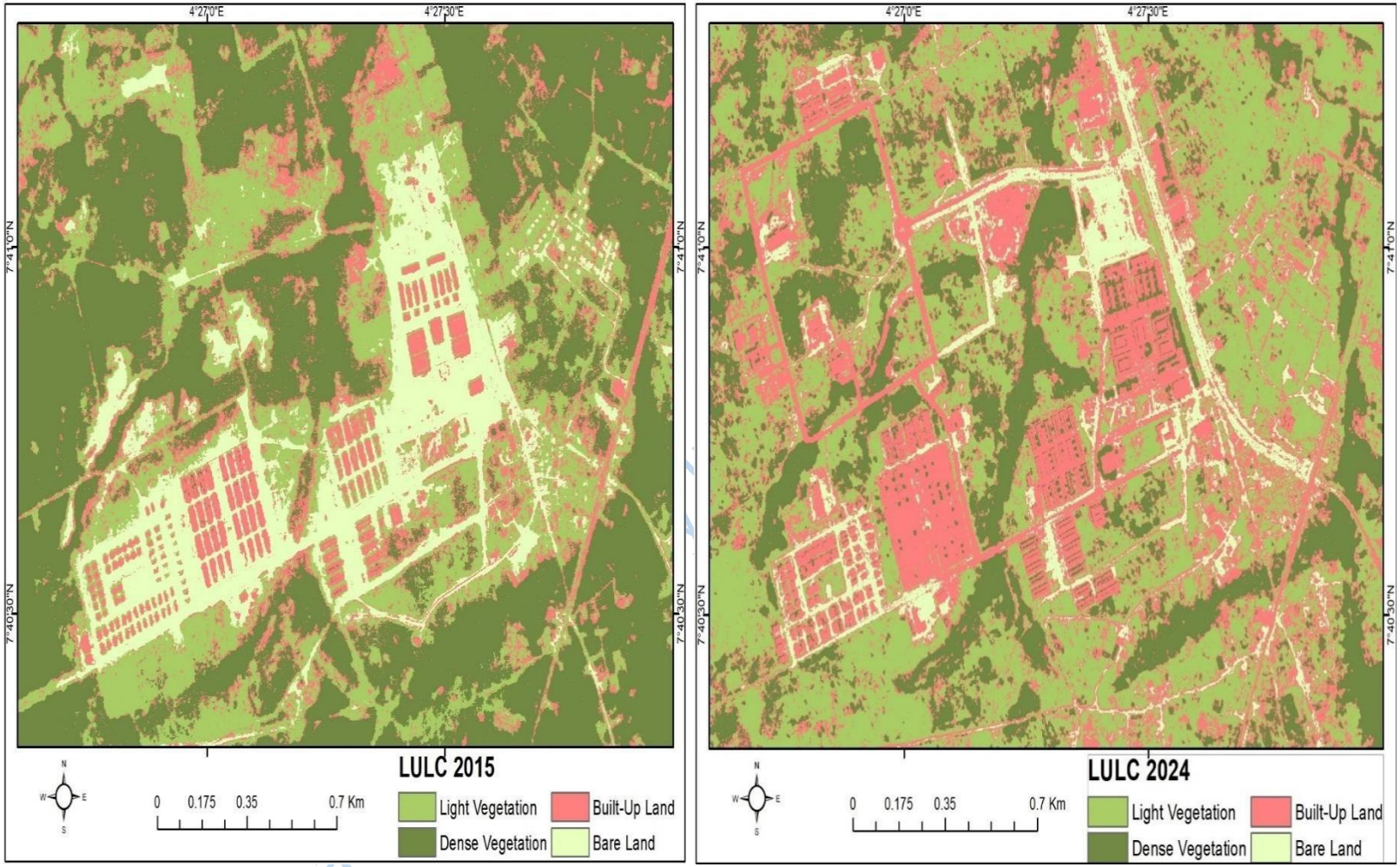

Figure 4.24: Google Earth Image Showing the LULC of RUN in 10-year Duration 2015-2024 Authors Fieldwork 2024

4.7.4 Perceived Impact of Availability of Green Space on the Campus Scape (Attractiveness/Image)

The results in Table 4.29 shows the result on respondents rating on the perception of the impact of GS availability and utilization on their campus scape (Attractiveness/Image) in the selected

Universities within the study area. The participants' response was assessed using 5-point Likert type scale where "1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree". The result reveals that all the variables were found to have high impact on the level of the attractiveness of their respective campuses in the study area. This is because all the mean score values calculated using SPSS were above 3.0. However, "its impact level" (mean= 4.06 and SD =1.205, 1.197) was identified as the variable in this category with the highest impact on the campus scape. This result aligns with findings of the study conducted in US and UK which indicated that the level of attractiveness(image) of a campus is dependent on its characteristics, level of maintenance, availability of diversity of flora and fauna etc[68].

Table 4.29: Impact of green space availability on the Campus Scape (Attractiveness/Image)

Questions	Scale	Frequency	Percentage (%)	Mean Score	SD	Rank
The presence of green space positively influences my perception of my university	**Strongly Disagree** (1)	23	6.4	4.06	1.205	1st
	Disagree (2)	30	8.4			
	Neutral (3)	21	5.9			
	Agree (4)	113	31.7			
	Strongly Agree (5)	170	47.6			

	Total	357	100			
Well, maintained green space on campus contributes to a positive university image	**Strongly Disagree** (1)	26	7.3	3.92	1.251	9th
	Disagree (2)	36	10.1			
	Neutral (3)	31	8.7			
	Agree (4)	113	31.7			
	Strongly Agree (5)	151	42.3			
	Total	357	100.0			
Campus green space plays a crucial role in shaping the university's public image.	**Strongly Disagree** (1)	24	6.7	4.06	1.197	1st
	Disagree (2)	25	7.0			
	Neutral (3)	26	7.3			
	Agree (4)	113	31.7			
	Strongly Agree (5)	169	47.3			
	Total	357	100.0			
Campus green space are important in attracting prospective students to our university	**Strongly Disagree** (1)	25	7.0	3.98	1.227	8th
	Disagree (2)					
	Neutral (3)					
	Agree (4)					
	Strongly Agree (5)					
	Total					
Increasing the number of green space on campus will improve my perception of my university	**Strongly Disagree** (1)					
	Disagree (2)					
	Neutral (3)					
	Agree (4)					
	Strongly Agree (5)					

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				ree (1)	33	9.2				
				Disagre	25	7.0				
e Campus green space contributes to a sense of environmental responsibility at our university				(2)	116	32.5				
				Neutral (3)						
				Agree (4)						
32	9.0				161	45.1				
25	7.0				357	100.0				
117	32.8				25	7.0	4.04	1.205	3rd	
158	44.3				26	7.3				
357	100.0									
22	6.2	4.01	1.204	5th	24	6.7				
							118	33.1		
				Strongly Agree (5)	164	45.9				
				Total	357	100.0				
				Strongly Disagree (1)	26	7.3	4.01	1.205	5th	
				Disagree (2)	27	7.6				
				Neutral (3)	20	5.6				
				Agree (4)	129	36.1				
				Strongly Agree (5)	155	43.4				
The diversity of plant species in our campus green space enhances the university image				Total	357	100.0				

	Strongly Disagree (1)	27	7.6	4.03	1.228	4th
	Disagree (2)	26	7.3			
	Neutral (3)	23	6.4			
	Agree (4)	114	31.9			
	Strongly Agree (5)	167	46.8			
Green space on campus creates a welcoming and inviting atmosphere for students and visitors						
	Total	357	100.0			
	Strongly Disagree (1)	28	7.8	4.01	1.246	5th
	Disagree (2)	29	8.1			
	Neutral (3)	20	5.6			
	Agree (4)	115	32.2			
	Strongly Agree (5)	165	46.2			
The integration of green spaces with the university's building improves the overall campus aesthetics						
	Total	357	100.0			

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However, to further identify which variables of the available GS that significantly has impact on the campus scape in the study area as indicated by the respondents in the survey, a regression analysis was conducted. In this case, "Campus scape" was the dependent variable and the independent variables were characteristics of the available GS as shown in Table 4.29. while the results of the regression model and the ANOVA, respectively are presented in

Tables (4.30 to 4.32). The result presents the value of multiple correlations (R) and the coefficient of determination (R^2) in the model summary Table. The result from Table 4.30 reveals correlation of 0.78 between dependent (Campus scape) and independent variable (characteristics of GS available).

Table 4.30: Regression Model Summary of Impact of GS on Campus scape Model Summary

Multiple R	R Square	Adjusted R Square	Standard Error of Estimate
.779[a]	.607	.606	5.84276

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Where a = Campus scape

This implies that availability of a good GS could impact positively on the campus scape in so many ways. The value of R^2 being 0.606 implies that the independent variable (Characteristics of Available GS) accounted for 60.6% of the total variance observed in campus scape leaving the remaining 39.4% to other variables which are factors that were not accounted for in this model.

Table 4.31: The ANOVA Result of the Regression Analysis

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	188.374	12	15.698	32.863	.000[b]
	Residual	160.021	335	.478		
	Total	348.395	347			

* Significant at $p < 0.001$

Furthermore, Table 4.31 reveals that the regression model is statistically significant (sig = 0.000, meaning that the $p < 0.001$). This implies that the independent variables significantly impact the campus scape of the universities in the study area.

To identify which of the independent variables that significantly contribute to the attractiveness of each campus in the study area, the coefficients of regression is presented in Table 4.32.

Green space Characteristics	Std error	Standardized Coefficients Beta	t < 2	Sig. < 0.05	Tolerance > VIF < 10 0.1	
Presence of green space	**.064**	**.347**	**6.247**	**.000**	**.444**	**2.252**
Maintenance of green space on campus	**.074**	**.447**	**7.247**	**.001**	**.543**	**3.151**
Design of the GS	**.049**	**.492**	**7.287**	**.000**	**.854**	**1.171**
Number and size of available GS	.028	.377	1.656	.099	.628	1.592
Location of the available GS	**.043**	**.143**	**3.293**	**.001**	**.729**	**1.372**
Diversity of plant species in our campus green space	**.053**	**.332**	**4.257**	**.003**	**.524**	**1.242**
Environmental factors (presence of gully erosion)	**.028**	**.500**	**5.108**	**.000**	**.891**	**1.122**
Prior condition of the	**.061**	**.379**	**4.843**	**.002**	**.412**	**2.428**

Table 4.32: Coefficients of the Regression Analysis

economic amenities within the GS						

* Significant at $p < 0.05$

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In addition, result presented in Table 4.32 reveals number and size of GS, location, prior conditions and diversity of plant species as factors or characteristics that predict how the campus scape would be perceived. It is evident in Table 4.32 that all the characteristics of the GS was most important factor since they had higher β values from 0.500, to the least β value of 0.143 among the factors that significantly influenced campus scape.

This result aligns with the place making theory, which indicated that the nature of a space, its maintainability and scope were key elements towards the outlook of the place[68]. In addition, the result also covers the social, design, economic and environmental factors as indicated by the place making framework on which premises this study was hinged on.

In addition, Table 4.32 presents the tolerance and VIF value for each of the independent variables. The tolerance and VIF values reveal if there is any multicollinearity among the variables, however, the variables studied here showed no multicollinearity as all tolerance value are below 0.1 and not all VIF values are above 10. This implies the independent variables are not closely related, meaning that each variable has its own peculiar characteristics.

4.8. Validation of the Conceptual Framework of the Study

The issue discussed in this section is how the conceptual framework was validated and the approach used. A conceptual framework was proposed in chapter two of the study (Fig 2.4). The framework as presented captures the key issues investigated in the research and explained how the various concepts and variables investigated relate with one another. It was based on the conceptual framework that data were collected and analyzed and the results represented. Since the conceptual framework was initially a proposal of the underpinning assumptions that guided the research, after the collection and analysis of data, it is important to validate the conceptual framework of the current study.

Validation in this context refers to showing the extent to which the initial assumptions and propositions made at the conception of the study are valid in the light of findings and conclusions emanating from the study. In validating a conceptual framework, the researcher must address the question of whether the proposed framework makes sense not only to the researcher but also to other scholars and practitioners[66,67] . Based on the findings of this research as presented and discussed in chapter four of this thesis, the graphic illustration of the validated conceptual framework is shown in Figure 4.12.

In order to validate the conceptual framework proposed in the Chapter Two of this thesis a regression analysis was conducted where the Campus scape was the dependent variable and independent variable are the characteristics of GS available. The result in Table 4.30 shows the model summary of the regression, which revealed all the variables that significantly determine the attractiveness of the Campus scape. With R^2 of 0.607, the result shows that the predictive strength of the regression model is about 60.7%. Thus, suggesting that the model developed for this research has merit in predicting the impact of green space characteristics on campus attractiveness in Nigerian private universities sampled in this research.

Furthermore, Table 4.31 shows the ANOVA result, which reveals that the model is very significant. That is the attractiveness of the campuses is reliably determined by all the variables as shown in Figure 4.12 at $F_{(12, 347)} = 32.863$ at $p < 0.05$.

Figure 4.12 presents the relationship between different variables that has influence on university green spaces in private universities in Nigeria. It further revealed the factors that significantly influenced the utilization of the available GS and the benefits of the GS and how all these characteristics has impact on the overall campus scape of each university in the selected areas.

The first concern of this study is to determine the availability and current physical conditions of the available GS. From the survey data, it was observed that respondents indicated that four GSs were available all through namely (Campus green park, Sport field with grass, Lawn and Walkways with Trees and Shrubs), while Botanical Garden and fountain with Shrubs and trees were absent. Furthermore, the respondents were also of the opinion that the current physical conditions of their GS were above average for most of the universities selected in the study. This submission is also supported by the LULC results, which revealed that GS availability was high and the currents physical conditions was also above average.

Based on the findings of this research, it is evident that all the universities in the study area understood the importance of GS in terms of provision and maintenance and thus took it as part of their planning strategy in fostering a rounded campus that not only pay attention to buildings but also the quality of their outdoor open spaces.

The second key issue investigated in the study and presented in Table 4.13 is the perceived benefits of GS in the study area. Based on the conceptual framework earlier discussed in the study, it was proposed that the GS has social, environmental and health benefits on both the users of the campus GS and the campus community. However, the result from the study revealed that respondents indicated that social and environmental benefits is significant to the users while health benefit is not significant as earlier proposed. This is evident as almost all mean value in the social benefits category was 3.0 and above, except for issues of GS supporting privacy that had mean value below 3 (M: 2.33). This outcome is expected as GS is an outdoor environment, thus would offer limited or no privacy.

While, environmental benefits had all the mean value above 3.0. In the same vein this result is expected considering the finding from the literature which noted that GS availability has significant influence on the general outlook of any environment.

The third key issue investigated in the study and presented in Table 4.15 to 4.20 is the assessment of green space use patterns. Based on the conceptual framework earlier discussed in chapter two, two utilization pattern were identified from literature namely active and passive utilization pattern. Thus, the research set out to identify the utilization patterns across case studies. The results revealed, that majority of users though they frequent the GS, the utilization pattern is passive across the Universities (if users indicates that duration of stay is short or very short as shown in Table 4.13, it could then mean that, pattern of use is passive

notwithstanding the frequency of utilization (visitation), however if duration of stay is long or very long then pattern of use would be Active utilization). The reason for short stay was established in the previous study by Fernandes as accessibility, availability of GS, amenities and maintenance, as these are very critical to determining the duration, frequency and time of utilization of any GS which in turn determines the nature and pattern any GS would be put to[34].

The fourth issue investigated in this study are key factors that significantly influence utilization pattern of GS in the study area. Based on the conceptual framework earlier discussed in Chapter Two, three categories of factors were identified to influence GS use pattern namely, social, economic and environmental factors, however, after the results of factor analysis was conducted and loaded, four categories of factors (social, economic, environmental and design) were indicated to be very important and not just three that was initially proposed. Similarly, when their level of significance was analyzed, social and design factor was indicated by the respondents to have significant influence on utilization pattern of the GS across the study areas with mean value all above 3.0. While economic and environmental factors though very important, the result of the survey showed majority of the users indicated that they both has limited impact on their utilization of the GS.

Lastly, based on the theories reviewed in this study on which the conceptual framework was hinged, the results of this study have evidently established that the green space availability has direct impact on utilization pattern, it further established the relationship between utilization pattern and factors that influence or prevent utilization. It also strengthens the relationship between utilization and the benefits inherent in the use of GS. All the

characteristics have been established to have great impact on the attractiveness of the campuses.

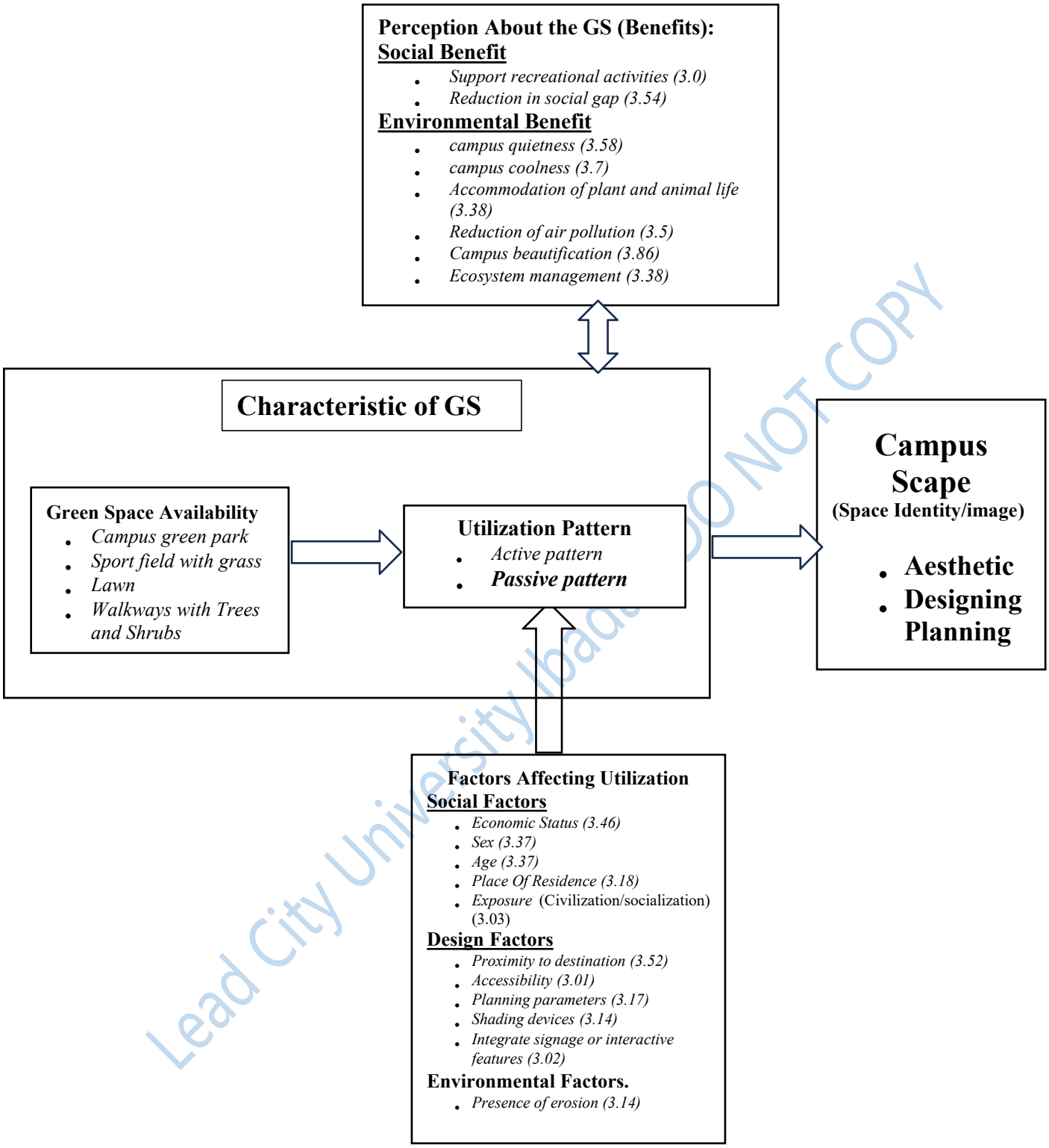

Figure 4.25: Validated Conceptual Framework of the Study
Author's Concept 2024

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Chapter Five

Conclusion

5.1. Summary of Findings

This section presents the key findings of the evaluation conducted on the Green Space Utilization Pattern in Private Universities in South West Nigeria. The key findings in this section are summarized based on the five objectives of this study. In addition, it should be

noted that these findings are based on the responses from the selected private Universities in South West Nigeria.

Firstly, majority of the respondents are students in both undergraduate and post graduate programmes across the study area. In addition, all of the respondents are students of private universities in South West Nigeria. Furthermore, most of the respondents had experience their respective campus with their years of studies ranging from 100 to 600 respectively.

Secondly, the study shows that large proportions of the respondents indicated their awareness about the availability of sport field with grass, lawn, walkway with grass and campus green parks in their respective universities. For some reasons all selected private universities do not have Botanical Garden and fountain with grass and trees. Nevertheless, the result presented shows that, the availability of green spaces in university campuses can vary since all types of green spaces were not available in the study areas.

In addition, the result of the evaluation conducted concerning the current physical conditions of the availble GS in the study area revealed that the available GS across the selected universities judging from the observed maintenance, planning, landcover and landuse was averagely good.

Thirdly, the study revealed that respondents perceived the social and environmental benefits of GS as important to them while the health benefits was of little or no significant to them as none of the mean values was equal or greater than 3.0. For social benefits support for recreational activities and reduction in social gap were the only benefits perceived as significant while support for privacy was not significant. Also, for environmental benefits campus quietness, campus coolness, accommodation of diverse plant and animal species, reduction of air pollution, campus beautification and ecosystem management were all perceived as significant.

Fourthly, the study revealed that the utilization of the GS varies from active use to passive use. However, the frequency of utilization in all selected universities is more active use than passive use. Indicating majority of respondents visits the available GS. In determining the utilization pattern of respondents across the universities the duration of stay of the students was investigated and the result showed variance as well, however the majority of the respondent do not actively utilize the GS as mostly their duration of stay was short or very short. Therefore, the majority of users though they frequent the GS (visit), the utilization pattern is passive across the Universities (as duration of stay is very short or short).

Fifthly, findings on factors influencing utilization showed that out of all the categories of factors (economic, social, design and environmental) investigated the mean value of social and design was the highest with value above 3.0. The social factors which were identified as influencing GS utilization are economic status (3.46), sex (3.37), age (3.37), place of residence (3.18) and exposure (civilization/socialization) (3.03). While the factors in the design categories are proximity to destination (3.52), accessibility (3.01), planning parameters (3.17), shading devices (3.14) and integration of signage or interactive features (3.02).

Lastly, the impact of availability and utilization of GS (characteristics of GS) on campus scape was revealed to be a significant influence as the regression model conducted reveals that characteristics of the GS explains the influence on campus scape by 60.7%. The outcome of the observation and GIS analysis also showed physically how strong the available GS in the selected universities determines the various landforms (Scape) across all the universities as the percentage of the built-up area and barred land was low in comparison to the light vegetation (designed GS) and dense vegetation (conservation GS) across a 10 years duration (2015-2024), thus, indicating a positive influence.

5.2. Conclusion

Based on the key findings of this study as presented in the preceding sections, the following conclusions were drawn. First, it is important to provide green spaces across all tertiary institutions because of the numerous benefits they offer which ranges of aesthetic, health and well-being, social cohesion and campus planning.

Secondly, it is noteworthy that the characteristics of the users' preferences must be a priority to providers of the campus GS. Since must of the private universities has close internal control mechanism, the proprietors must not just plan a rigid campus for dynamic human. Priority should be placed on social advantages and environmental advantages especially when it comes to a campus green space.

Thirdly, based on the findings of the study it should be noted that frequency of visitation to GS does not determine a pattern of active utilization, as pattern is determined overtime, thus it is importance to design campus GS in a way that will encourage longer stay period during visitation. Which also mean that availability and accessibility of GS is important to the students, however to encourage longer stay and active utilization pattern active use elements and facilities should be made available.

Fourthly, based on the results of the study, utilization of GS is greatly influenced by social needs of the students and design parameter provided by the school. This could be reason why the utilization pattern in the study area was majorly passive despite active visitation of students.

Lastly, the findings of the study shows that characteristics of GS (availability and utilization) is a significant variable that determines the campus scape (image and attractiveness). This is imperative as the way a university campus is viewed both by users and visitors is largely

determined by GS availability, physical conditions/accessibility (design Parameters) and utilization pattern (socials needs).

5.3 Recommendations

In view of the findings of this study, the following recommendations are proffered:

i. Campus planning must give credence to ample green spaces, not just for virtual appeals but to ensure a balanced ecosystem that GS offers.

ii. Critical factors identified to influence utilization of campus GS and determines active utilization pattern of GS overtime was identified in this study as social preferences and design factors which is effective in the determining the individual needs and concerns. In view of this, it is recommended that landscape architects and proprietors involved in campus planning should work together in developing a common platform that promotes and priorities the needs of the users (primary users being students).

iii.Furthermore, the design factors showed that design of GS is very sacrosanct to use and attractiveness, therefore the Nigerian University commission should recommend a bench mark for green space planning at inception before granting licenses to start and also use same as a checklist for future university reaccreditation.

5.4. Contributions to Knowledge

This section presents areas where the study has been able to contribute to knowledge on the green space planning and management. The study has contributed to knowledge in the following areas:

i. The study has established that some demographic and environment characteristics of the respondents such as sex, age etc. significantly influenced the manner in which green space are used.

ii. The study has been able to identify one more factor that greatly have impact on utilization pattern from the three initially established in literature (social, economic and environmental) to include design parameter.

iii. The result from this study have also provided a framework which will serve as guide for policy makers, landscape architects towards sustainable landscape assessment, planning, implementation and management. Which will help future campus planning as it affects green spaces.

5.5. Suggested Areas for Further Research

The following areas are suggested for further studies based on the key findings and limitations of the research.

i. Evidence based-studies should be conducted to further establish the benefits of GS to other campus users. This is very important as it would facilitate the maximization of GS benefits in campus planning in Nigeria. This will further validate findings of the current research.

ii. The current study investigated utilization pattern using a cross-sectional survey with the administration of questionnaire and observations as the only primary data collection method used while using synchronic data as source of secondary data. To this end, it is suggested that future studies should consider adopting longitudinal survey research design in order to gather primary data overtime.

iii. Furthermore, other studies should investigate the impact of GS utilization on the quality of life and wellbeing of the members of the university community at large.

iv. The current study is limited to private universities in south west Nigeria, future study can make efforts to investigate using the same methods across different proprietors and other classes of university across the country.

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Appendix 1 Questionnaire

Dear Participant

My name is Babajide Sunday Aseyan, I am a PhD student at Lead City University Ibadan. For my dissertation, I am carrying out research on the topic: Evaluation of Green Space Utilization Pattern in Private Universities in South West Nigeria. Because you are a student in the study area, I am soliciting your participation in this research study.

For the purpose of clarity, Green Space (GS) had been defined as any open spaces within the university that are covered with green vegetations such as trees, grasses, shrubs. Only green spaces in planned area of the university environment area are considered excluding virgin bushes such as conservation areas of the university environment.

The following questionnaire will require approximately 10 minutes of your time to complete and all information given will be treated with confidentiality. I will really appreciate if you can kindly assist me by answering and indicating your opinion as applicable in this instrument.

Thanks.

Section A: Socio-economic Characteristics (Tick (x) in the Provided box as Applicable)

1. Gender: a) Male [ ] (b) Female [ ]
2. Age: a)16-25 [ ] (b) 26-35 [ ] (c) 36-45 [ ] (d) 46-55 [ ] (e) 56 and above [ ]
3. Student Category: a) Undergraduate [ ] , (b)Post graduate [ ]
4. Where do you Currently Reside (Student): a) Campus [ ] (b) Off-campus [ ]
5. Academic Level: (a)100 [ ] (b) 200 [ ] (c) 300 [ ] (d) 400 [ ] (e) 500 [ ] (f) 600 and above [ ]
6. University: (a)ABUAD [ ] (b) ACU [ ] (c) CALEB [ ] (d) CU [ ] (e) EU [ ] (f) RUN [ ]

Section B: Available Green Spaces (Tick (x) in the Provided box as Applicable)

7. Which of the following green spaces are available in your school? Tick as much as applicable (a) Lawns [ ] (b) Sport field with grass [ ] (c) Botanical garden [ ] (d)Walkways with shrubs, grass and trees [ ], (e) Campus green parks [ ] (f) Fountain with shrubs/grass [ ]
8. What is the nature of the available green spaces in your school?
   a) Natural [ ] (b) Artificial [ ] (c) Natural and Artificial [ ]

Section C: Rate the physical conditions of the following Green Spaces (GS) (Tick (x) in the Provided box as Applicable)

s/n	Green Spaces (GS)	Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
9	Campus Green Park					
10	Sport fields with grass					
11	Botanical gardens					
12	Fountain with shrubs/grass					
13	lawns					
14	Walkways with shrubs/grass/trees					

	Features	**No effect** (1)	**Minor effect** (2)	**Neutral** (3)	**Moderate Effect** (4)	**Major Effect** (5)
	Physiological					
15	When sick does GS has impact on your recovery					
16	Does GS support your access to privacy					
17	Does GS support your access to social support and interaction					
18	Does GS support your access to physical exercise					
	Psychology					
19	Does GS improve your selfesteem					
20	Does GS have impact on your mood					
	Stress Alleviation					
21	Does GS aid your stress recovery after long academic work					
22	Does GS lower mental distress					
	Restorative					
23	Does GS assist in the restoration of human attention					
24	Does GS restore your mental fatigue and higher well-being					
	Other Benefits of Green space	**Very dissatisfied** (1)	**Dissatisfied** (2)	**Undecided** (3)	**Satisfied** (4)	**Very satisfied** (5)
25	How much are you satisfied with the design of your school GS					
26	How satisfied with the level of quietness in the GS environment					
27	How much does the area satisfies the function of recreation					
28	How much does the area satisfy the function of coolness					
29	How much does the area satisfy the function of shelter for a variety of plant and animal life					

30	How much does the area satisfy the function of: reduction of air pollution					
31	How much does the area satisfy the function of visual appearance					

D. Perception about Green Spaces (GS)

a) Think about any of the green spaces you have ever visited or frequent in your university, and Tick (x) in the Provided box as Applicable, how each of the following had affected you?

Section E: Assessment of Green Space Use Pattern (Tick (x) in the Provided box as Applicable) a) Accessibility of Green space, rate the level of accessibility of the following GS

s/n	Green Spaces (GS)	Not accessible (1)	Fairly accessible (2)	Undecide (3)	Accessible (4)	Very accessible (5)
32	Campus Green Park					
33	Sport fields with grass					
34	Botanical garden					
35	Fountain with shrubs/grass					
36	lawns					
37	Walkways with shrubs/grass					

38. Which Period of the Day are the Green Spaces Accessible?
    a) Morning [ ] b) Afternoon [ ] c) Evening [ ] d) Night [ ] e) No response [ ]

39. Which Days of the Week are the Green Spaces most Accessible?
    a) Monday [ ] b) Tuesday [ ] c) Wednesday [ ] d) Thursday[ ] e) weekend [ ] (f) No response [ ]

b. **Use Pattern of Green Space (Tick (x) in the Provided box as Applicable)**

40. Do you use the University Green space a) Yes [ ] (b) No [ ] . If yes answer the question below
41. How often do Use the UGS? (a) every time [ ] (b) Almost Every time [ ] (c) Occasionally [ ] (d) Almost never [ ] (e) Never [ ]
42. Duration of Stay? (a) very short [ ] (b) short [ ] (c) Undecided [ ] (d) long [ ] (e) very long [ ] (e) No response [ ]
43. When do you normally visit? (a) Morning [ ] (b) Afternoon [ ] (c) Evening [ ] (d) Night [ ] (e) No Response [ ]

44. Have you had any Reason to Misuse the GS? a) Yes [ ] (b) No [ ] . If yes answer the question below
45. State your Reason for the Misuse? a) Stress [ ] (b) Convenience [ ] (c) Proximity to Destination [ ] (d) Weather Condition [ ] e) Lack of Amenities [ ] (f) No Response [ ]

d. Choose from the following Passive Activities. Where you mostly do them in your University Green Spaces from 1-6 **(Tick (x) in the Provided box as Applicable)**

	Activities	Campus Green Park (1)	Sport Fields with Grass (2)	Lawns (3)	Botanical Garden (4)	Fountain with Shrubs/Grass (5)	Walkways with Shrubs/Grass (6)
46	Reading						
47	Relaxing with Friends						
48	Sightseeing						
49	Chatting						
50	Picnicking						
51	Meditation						
52	Eating						
53	Sitting						

F. Factors Affecting Green Space Use Pattern (Tick (x) in the Provided box as Applicable)

1. How does this following factors influence your Use of the Available Green Spaces in your Campus?

	Features	**Very high** (1)	**High** (2)	**Indifferent** (2)	**Low** (2)	**Very low** (2)
54	Age					
55	Sex					
56	Economic status					
57	Place of residence					
58	Exposure					
59	Availability of Wifi connectivity					
60	Availability Kiosk or café					

61	Availability Furnitures					
62	Availability of Artificial Lighting					
63	Availability of Waste bin					
64	Availability of Close-by Rest room					
65	Solar Radiation					
66	Breeze (Air)					
67	Presence of Erosion					
68	Precipitation					
69	Proximity					
70	Accessibility (Walking route)					
71	Cleanliness					
72	Safety					
73	Design					
74	Shading devices					

G. Impact of green space availability on the Campus Scape (Attractiveness/Image)

1. On a scale of 1-5 please indicate your perception about the impact of the available Green Space on your Campus Scape

	Questions	**Strongly Disagree** (1)	**Disagree** (2)	**Neutral** (3)	**Agree** (4)	**Strongly Agree** (5)
75	The presence of green space positively influences my perception of my university					
76	Well maintained green space on campus contributes to a positive university image					

77	Campus green space plays a crucial role in shaping the university's public image.					
78	Campus green space are important in attracting prospective students to our university					
79	Increasing the number of green space on campus will improve my perception of my university					
80	Campus green space contributes to a sense of environmental responsibility at our university					
81	The diversity of plant species in our campus green space enhances the university image					
82	Green space on campus creates a welcoming and inviting atmosphere for students and visitors					
83	The integration of green spaces with the university's building improves the overall campus aesthetics					

Appendix II

Observation Guide

1. **Physical Conditions of the Available Campus Green Park by Observation**

Universities	Poor	Fair	Good	Excellent	Rank

ABUAD					
CU					
RUN					

Poor: Badly Designed and Not Maintained Fair: Badly Designed and Fairly Maintained Good: Well, Designed and Averagely Maintained Excellent: Well, Designed and Well Maintained

2. Physical Conditions of the Available Sport Field with Grass by Observa

Universities	Poor	Fair	Good	Excellent	Rank
ABUAD					
ACU					
CALEB					
CU					
EU					
RUN					

Poor: Badly Designed and Not Maintained Fair: Badly Designed and Fairly Maintained Good: Well, Designed and Averagely Maintained Excellent: Well, Designed and Well Maintained

3. Physical Conditions of the Available Lawns by Observation

Universities	Poor	Fair	Good	Excellent	Rank
ABUAD					
ACU					
CALEB					
CU					
EU					
RUN					

Poor: Badly Designed and Not Maintained Fair: Badly Designed and Fairly Maintained Good: Well, Designed and Averagely Maintained Excellent: Well, Designed and Well Maintained

4. Physical Conditions of the Available Walkways with Shrubs and Trees by Observation

Universities	Poor	Fair	Good	Excellent
ABUAD				
ACU				
CALEB				
CU				
EU				
RUN				

Poor: Badly Designed and Not Maintained Fair: Badly Designed and Fairly Maintained Good: Well, Designed and Averagely Maintained Excellent: Well, Designed and Well Maintained

Bio-data.

A. Personal Data.

1. **Full Name** : **ASEYAN** Babajide Sunday.
   No 2 Abidogun Street Police Post Molete Ibadan Building behind Adron Homes jdeestev@gmail.com
   aseyan.babajide@lcu.edu.ng
   +234-7062329683
2. **Date and Place of Birth** : 24th February, 1985 / Isanlu, Kogi State

3. **Nationality** : Nigerian 4. **Marital Status** : Married 5. **Number of Children & their Ages** : Three (6yrs, 3yrs, 7Months)

6. **Name and Address of Spouse** : Mrs. Oluwabunmi Kemi **ASEYAN**
No 2 Abidogun Street Police Post Molete
Ibadan Building behind Adron Homes
+234-8068237605

7. **Name and Address of Next of Kin** : Mrs. Oluwabunmi Kemi **ASEYAN**
No 2 Abidogun Street
Police Post Molete
Ibadan Building behind Adron Homes
+234-8068237605

B. Educational Background and Qualifications Educational Institutions Attended with Dates 8. Educational Background Attended with Dates i. Primary Education

St. Joseph Old Primary School Isanlu, Yagba East, Kogi State 1991-1996 **ii. Secondary Education**

St Kizito's College Isanlu, Yagba East, Kogi State 1996-2002

iii. Higher Educational Institutions

Lead City University, Ibadan Oyo State 2021 Till date
Federal University of Technology, Akure Ondo State 2018-2021
Federal University of Technology, Akure Ondo State 2013-2014.
Federal University of Technology, Akure Ondo State. 2007-2012

9. **Pure Academic Qualifications with Dates i. Primary Education**

School Leaving Certificate 1996

ii. Secondary Education

Senior Secondary School Certificate (NECO) 2002.

iii.Higher Educational Institutions

Doctor of Philosophy in Architecture In view 2024

Mphil/Doctor of Philosophy in Architecture 2021

Masters of Technology in Architecture 2014
Bachelor of Technology in Architecture 2012
(Second Class Upper)

10. **Professional Qualifications with Dates**

Architects Registration Council of Nigeria (ARCON). 2018. (Professional Certification number, F/4189)

11. Current Employment with Dates

Lead City University: Lecturer

12 . **Previous Employments/Position/Dates (Starting with the Latest)**

Place/Organization	**Position**	**Date**
ALFAD Associates, Unit 301, Right Wing, 2nd Floor, Academic Building Federal University of Technology Akure Ondo State	Senior Architect	2018
National Youth Service Corp (NYSC) Physical Planning Department, Federal Polytechnic Ado Ekiti,Ekiti State.	CORPS Architect	2015
ALFAD Associates, Unit 301, Right Wing, 2nd Floor, Academic Building Federal University of Technology Akure Ondo State	Graduate Architect	2015
Student Industrial and Work Experience Services (SIWES), Physical Planning Department, Federal University of Technology, Akure,Ondo State.	Student Architect	2011
Private Professional Practice.		2011 Till date

13. **Research Interests**

Research Interest : Landscape Architecture/ Urban Design

14. **List of Publications.**

Thesis/ Dissertation

Green Architecture a Panacea for Sustainable Housing: 2012
A Case Study of Alagbaka, Shagari Village and Orita Obele Housing Estate Akure, Ondo State Nigeria
(An Unpublished B.TECH Thesis)

Proposed Lokoja Transportation Interchange, Kogi State: 2014
A Panacea for Coordinated and Sustainable Environment
(An Unpublished M.TECH Thesis)

a. Published Articles:

1. **Aseyan B.S** & Ayoola, H. A**.** *The Assessment of Open space Utilization in Lead City University.* **Journal of Research in Architecture & Planning,** 5(1), 2021,11-22.

2. **Aseyan B.S &** Ayeni, D. A**.** Green infrastructure, a Tool for Storm Water Management: A Case Study of Akure, Ondo State, Nigeria. **DARCH20211stInternational Conference on Architecture and Design, 2021**

3. Afolabi, S.A, Babalola, O., Olaniyan, O.M & **Aseyan, B**. *Maintenance Culture in Selected Public Buildings within Ibadan Metropolis.* **European Journal of Development Studies**, 2(3), 2022, 58-69

4. *Olubi A.R* **&** **Aseyan B.S.** *Sustainability Housing Delivery for the Urban Poor in Nigeria.* **International journal of Civil Engineering, Construction and Estate Management,** 10(1),2022, 21-34

5. *Olubi A.R* **&** **Aseyan B.S.** *Cultural Streetscape: Its Value-System, Space and Significance in Oyo Town, Nigeria*. **Advanced in Social Sciences Research Journal,** 9(12),2022, 465-474

6. **Aseyan, B.S**, Babalola, O, Ayoola, H.O & Olugbesan, A. *Evaluation of the causes of Housing Decay in Ibadan core settlements.* **Tropical Journal of the Built Environment (TJOBE),** 4(1),2023, 51-62

7. **Aseyan, B.S,** Adedire, F, Babalola, O & Orkpeh, A.K. *Impact of Gully Erosion on Housing Accessibility: A Case Study of Ibadan Core Settlements.* **Tropical Journal of the Built Environment (TJOBE),** 3(2),2022, 39-48.

8. Oyedeji, M.E, **Aseyan, B.S,** Ajijola, S, Adedire, F & Obaleye, O.J. *Energy Efficient Principles in the design of a Vocational Training Center.* **Archiculture Journal of department of Architecture University of Jos, Nigeria.** 5(2), 2023

9. Babalola, O, Ibem, E.O, Ezema, I.C, **Aseyan, B.S** & Agbebiyi, O . *Diffusion of Lean Construction Knowledge Among Building Firms in the Nigerian Building Industry*. **Tropical Journal of the Built Environment (TJOBE),** 4(1), 2023,1-18

b. Publication Under Review

I. Review of the Analytic Evaluation of Ecological Imbalance in Public Green Spaces. Frontier of Architecture Research. (Submitted manuscript).

II. Assessment of Influence of University Open spaces on Student Well-being in a Typical Nigerian University. (Accepted manuscript).

III. Assessment of circulation conditions in a shopping mall: A case study of Ibadan South West, Oyo State, Nigeria. (Accepted manuscript).

IV. Assessment of water reticulation system of Forest Hill Estate, Jericho, Ibadan, Oyo State, Nigeria. (Accepted manuscript).

V. Modification and transition of Peri-urban housing development: A case study of TSE AYU Benue State, Nigeria (accepted manuscript).

15. **Major Conferences/ Workshops Attended**

1.. LCU post graduate multi-disciplinary international academic conference 2023

Theme: Innovative Research and Quality Education for Sustainable Development

2. DARCH20211stInternationalConferenceonArchitecture and Design 2021

3. **Architects Colloquium:** 2021

Theme: Architecture and the Nigerian development agenda XI,
Sub Theme: I. Covid-19 and the search for a new normal Architectural response.
II. The architect and society towards a more secure environment
Organized by Architects Registration Council of Nigeria in Abuja

4. Architects Colloquium: 2018

Theme: Architecture and the Nigerian development agenda XIII, Sub Theme:
Architecture and Sustainable built environment.
Organized by Architects Registration Council of Nigeria in Abuja

16. Workshop on Current issues in Architecture at annual general meeting 2021 Organized by Oyo State Chapter of Nigeria Institute of Architects

17. Workshop on Current issues in Architecture at annual general meeting 2016 Organized by Ekiti State Chapter of Nigeria Institute of Architects

18. Information on Fellowship: Nil
19. Detail Administrative Experience
    i. 400 level Adviser ii. Accreditation Coordinator 2
    iii. Departmental Liaison Officer
    iv. SIWES Coordinator

20 **Teaching Experience**

Arc 303	Building Components And Methods	iii
Arc 313	Building Components And Methods	iv
Arc 304	Building Services For Architects	i
Arc 314	Building Services For Architects	ii
Arc 317	Building Economics, Quantities And Extimating	
Arc 211	Architectural Design Studios	ii
Arc 401	Architectural Design Studios	v
Arc 403	Building Components And Methods	v
Arc 404	Building Services For Architects	iii
Arc 414	Building Services For Architects	iv
Arc 406	Brief Formulation	
Arc 706	Advance Building Services For Architects	i
Arc 716	Advance Building Services For Architects	ii

21. .Student Supervision Undergraduate 2021/2022 Academic Session

1. Makanjuola Babatunde (Lcu/Ug/20/17146)
   Design Topic: Proposed Design of Faculty of Engineering for Lead City University, Ibadan Oyo State, Nigeria (Application of Sustainability Principles in The Design of a Faculty Building)

2. Shittu Abolaji Mutiu (Lcu/Ug/20/17847)
   A Proposed Student Center for Lead City University, Ibadan Oyo State, Nigeria. (Landscaping as A Panacea for Student Integration in A Students Village)

3. Ilori Ayobami Mathew (Lcu/Ug/19/15881)

   Design Topic: A Proposed Student Center for Lead City University, Ibadan Oyo State, Nigeria. (Integration of Biomimicry Architecture into The Design of Students Village)

4. Daniel Daniella (Lcu/Ug/18/13324)

Design Topic: A Proposed Student Center for Lead City University, Ibadan Oyo State, Nigeria. (Landscape Parameters for Students Village Design)

22. Student Supervision Postgraduate 2021/2022 Academic Session

I. Obisesa Oluwasegun Kayode (Lcu/Pg/002138)

Design Topic: A Proposed Faculty of Architecture for Lead City University (Evaluation of Natural Lighting in Faculty Building)

II. Kumuyi, Michael Ayodeji (Lcu/Pg/002139)

Design Topic: Proposed Five Star Hotel, Eko Atlantic City, Lagos State, Nigeria. (Design Consideration for A Tourist Facility) III. Afolabi Eyitayo Adetunji (Lcu/Pg/002152).

Design Topic: Proposed Design of Shopping Mall for ACE (Effective Use of Daylighting Through the Adoption of Passive Strategies)

23. Student Supervision Undergraduate 2022/2023 Academic Session

i. Adeniyi, Emmanuel Akinniyiade (Lcu/Ug/21/19126)

Design Topic: Proposed Staff Club House Design for Lead City University (Functional and Spatial Consideration for A Recreational Centre Design).

ii. Daramola Abosede Esther (Lcu/Ug/21/19992)

Design Topic: Proposed Lead City University Ventures (Design Considerations for Commercial Buildings)

iii. Omole Victor O (Lcu/Ug/21/19876)

Design Topic: Proposed Library Design for Lead City Uiversity, Ibadan Oyo State Nigeria (Functional and Spatial Configuration for University Library Building Design)

24. Student Supervision Postgraduate 2022/2023 Academic Session

i. Odor Ogechukwu Emmauel (Lcu/Pg/002735)

Design Topic: Proposed Ceci Shopping Mall, Ibadan Oyo State Nigeria (An Assessment of Circulation in a Public Place Design)

ii. Oyedeji, Marvel Ewaoluwa (Lcu/Pg/002847)

Design Topic: Proposed Vocational Study Centre for Oyo State, Nigeria (Invigoration of Energy Efficiency Principles in The Design of a Vocational Study Centre)

25. **Service To Community 26. Extra-Curricular Activities**

i. Reading
ii. Photography
iii. Researching

27. **Names and Addresses of 3 Referees**

i. **Prof. A.A. Taiwo:** Professor of Architecture, Department of Architecture Federal University of Technology Akure P. O Box 3063 Akure Ondo State. aataiwo@futa.edu.ng, abraham_taiwo@yahoo.com, Tel:+2348035888286

ii. **Dr. Oludare Obaleye:** Senior Lecturer, Department of Architecture Lead City University Ibadan, Oyo State. Tel: +23408035956815

iii. **Dr. H.A Ayoola:** Associate Professor, Department of Architecture Federal University of Technology Akure P. O Box 3063 Akure Ondo State. Tel:+234-8033799014

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Signature **Date**

The University Compliance Certificate

This is to certify that this thesis by Babajide Sunday **ASEYAN** with matriculation number LCU/PG/002887 in the department of Architecture, Faculty of Environmental Design and Management Lead City University, Ibadan is in full compliance with the approval of the University's format and style.

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Signature Date