Remodeling University of Ibadan Zoological Garden.

(Assessment of Landscape Planning in Building Sustainable Environment: A case study of Ibadan, Oyo State.)

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Being a M.Sc Thesis presented to the Department of Architecture, Faculty of Environmental Design and Management Studies at Lead City University Ibadan, Oyo State.

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Certification

This is to certify that this academic research thesis was carried out by Mr. Olayemi Mayowa Ayodele with Matric No. LCU/PG/005094 of Department of Architecture, Faculty of Environmental Design and management Studies, Lead City University, Ibadan, Oyo State, Nigeria, for the honor of Master-of-Science (MSc.) degree in Architecture. To the best of my knowledge, this academic research work has not been presented or been brough forward in any previous submission for any degree of this or any other University. I ensured that there was no conflict of interest and all sources of information quoted have been duly acknowledged by means of references.

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Declaration

I hereby affirm that this submission is my original work and that to the best of my knowledge, belief that it does not contain any previously published or written materials of another researcher which to a considerable extent has been accepted for the honor of any other certification or qualification of an institution or other higher learning organization, except where due acknowledgement is made in the manuscript. I also acknowledge any assistance received in terms of style, presentation, and language expression, while asserting that the intellectual content of the thesis is my own conception.

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Abstract

This study focused on the assessment of landscape planning practices in Ibadan, Oyo State, Nigeria, with a focused on creating sustainable environments. The study explores the interconnection between effective landscape management and the pursuit of sustainability objectives in the context of Ibadan's rapid urbanization. The city grapples with various environmental issues, such as inadequate urban infrastructure, depletion of natural resources, and diminishing biodiversity. The goal of this investigation is to assess the current landscape planning strategies in Ibadan and propose methods for integrating principles of sustainable development into these strategies.

Comprehensive methodology was adopted such as case studies and comparative evaluations, the study demonstrated how sustainable landscape planning methods was contributed to strengthened urban resilience, lessening carbon footprints, and enhancing public health results. Furthermore, the research assessed the efficacy of existing landscape planning frameworks and their incorporation of ecological, social, and economic factors. The results indicate a lack of cohesive planning endeavors and insufficient involvement of the public in decision-making processes, both of which impede the potential for sustainable outcomes. The study underscored the significance of integrating input from local communities and traditional knowledge into landscape planning activities to ensure their cultural relevance and environmental sustainability.

Furthermore, the paper deliberated on the importance of incorporating green infrastructure, such as green parks, gardens (Zoological Garden, botanical garden etc.) and green corridors, to bolster urban resilience, combat the impacts of climate change, and provide critical ecosystem services. Recommendations were put forth for policymakers, urban planners, and stakeholders to formulate inclusive landscape strategies that prioritize sustainability, conservation of biodiversity, and community well-being. By evaluating the current landscape planning status and its implications for sustainability in Ibadan, this study contributed to the broader dialogue on urban planning in Nigeria and presents valuable insights for other cities confronting similar challenges.

Keywords: Landscape Planning, Green Infrastructure, Ecological Restoration and Garden, Environmental Sustainability, Ibadan Biodiversity, Sustainable Development.

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CHAPTER ONE

2.0 INTRODUCTION

2.1 BACKGROUND OF THE STUDY

The environmental quality refers to the overall state of the physical environment, which is influenced by various environmental factors. Human existence is characterized by two distinct realms: the natural world comprising flora, fauna, soil, air, and water, and the world shaped by human-created social institutions and artifacts using technology and scientific knowledge. The integration of these two worlds presents continual challenges (Terwase and Theresa, 2013). Ferial A., et al. (2006) emphasize the significance of natural elements like rivers, mountains, and vegetation in urban settings. These elements not only serve as urban landmarks but also contribute to a dynamic ecosystem that enhances the ecological structure of cities, creating lasting memories for visitors and shaping citizens' identities.

According to François Chiron et al (2023), which emphasis on how green spaces play a crucial role in urban design by mitigating the isolating aspects of cities. Kaplan (1995), Braveman (2003), Leminen et al. (2012), Lottrup et al. (2015), and Rudnicka et al. (2020), highlight the importance of green areas in enhancing the livability of cities, providing numerous benefits to urban dwellers. Proximity to green spaces has been linked to improved well-being and happiness by Lyytimaki and Sipila (2009); Wolch et al. (2014); Bounoua et al. (2020); Mudau et al. (2020), offering a sanctuary from the stresses of modern life.

Ayeni (2012) underscores the positive impact of exposure to nature on individual well-being, suggesting that landscaping with elements like gardens, trees, and flowers can enhance quality of life by improving the environment and providing aesthetic appeal. Shahli, Hussain, Tukiman, and Zaidin, (2014) highlight the role of plants in creating visually pleasing environments that contribute to the community's well-being. Plants not only enhance the aesthetic value but also provide practical functions such as directing traffic flow, moderating the environment, and engaging various senses.

Landscaping plays a vital role in improving environmental quality, economic prosperity, and the physical and mental health of individuals (Chen Gong et al 2023, Alex X. Niemiera 2015, Ibimula, 2014). Landscape planning involves the strategic design and execution of beautification projects, following fundamental principles such as unity, balance, scale, harmony, and variety. It aims to create a harmonious environment that enhances human comfort and well-being. Kingsley and Christopher, (2014) view landscape planning as a tool for urban enhancement that

fosters beauty and aesthetic appeal, ultimately contributing to environmental quality. Well-designed landscapes offer numerous benefits including relaxation, stress reduction, improved quality of life, and better physical and mental health (Chen Gong et al, 2023, Morris, 2003; Southeast England Development Agency (SEDA) 2005; Thompson et al., 2007).

An effective implementation of landscape planning requires thorough consideration on how concepts and ideas in landscape planning can be effectively communicated to end users. It is crucial to carefully think about incorporating concepts, theories, and methods from planning to establish a strong foundation for proper landscaping. Sustainable landscaping in urban environments involves shaping and enhancing outdoor spaces to reflect the functional and aesthetic qualities of public areas within cities. These public spaces, including parks, gardens, playgrounds, streets, and open areas, serve as shared spaces where daily urban experiences take place. The environment plays a vital role as an interactive medium through which human life activities are carried out, providing essential resources such as air, water, food, and materials for various needs (Yan Li1, Qingli Sun, 2023).

Urbanization has witnessed significant growth in recent years, with the urban population accounting for about 45% of the world's population. While urbanization offers benefits like access to clean water and hygiene, its negative impacts on the environment, particularly urban degradation and pollution, cannot be overlooked. By Emmanuel Mwenje , Parveen Kumar, 2023, Climate change, loss of biodiversity, and increased pollution, largely resulting from unchecked technological advancement, pose threats to the Earth's natural heritage. Poor integration between urban areas and natural surroundings, coupled with inadequately designed technology and infrastructure, lead to a decline in ecological quality and ultimately affect human well-being.

The reduction of ecologically valuable landscapes within urban areas has given rise to various environmental challenges. To address these issues and promote a sustainable urban environment, it is essential to incorporate more nature and natural elements into urban landscapes. Enhancing people's understanding and appreciation of natural features in urban settings is crucial, as urban landscapes serve as the platform for diverse human activities (Zhou Shen , Haiwei Yin et al, 2023).

According to Christiana O., Oluwole O., et al, (2019) and Ine R., Jan D., Ben S., et al (2023), continuous exploitation of environmental resources has led to the deterioration of well-landscaped areas, resulting in an unpleasant environment for both living and non-living components. Factors such as rapid urbanization, rural-urban migration, economic downturn, deteriorating infrastructure, poor housing conditions, and inadequate maintenance contribute to

the degradation of natural landscapes. This situation is evident in cities like Ibadan in Oyo State, where human activities like deforestation and destruction of landscape elements are impacting the environment negatively.

In Aleksandra L., Karolina Z., et al (2023) research works which make us understand that the interaction between people and the surrounding environment highlights the significance of evaluating the spatial organization of a particular region for the purposes of establishing, overseeing, and maintaining it in a sustainable manner.

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1.2. STATEMENT OF RESEARCH PROBLEM

Insufficient urban landscape planning has been associated with poor maintenance and inadequate management of green spaces in cities, impacting the aesthetics of the environment and the well-being and productivity of inhabitants (Fadamiro & Atolagbe, 2006). According to Peter Henry Rolfs 2020, Recognizing the significance of identifying and assessing green areas in urban settings, evaluating urban landscapes, and fostering a healthy and sustainable environment through suitable regulations and actions has become increasingly important. Landscape assessment plays a critical role in resource management for effective planning and sustainable development, aiming to appraise the appropriateness and sustainability of an area for various uses while taking into consideration its intricate components. An essential aspect of sustainable development involves considering the natural environment and its components through landscape evaluation and assessment, as highlighted (Simmonds in 1983). Landscape assessment entails a formal, thorough, and systematic evaluation of the physical attributes, social aspects, and economic factors of an area. The primary objective of landscape assessment is to ensure that assessment outcomes and environmental impacts are integrated into strategic decision-making processes, such as urban planning decisions (Liu Jie, et al., 2010).

The study focuses on Ibadan, renowned for its historical significance and urban layout as one of the oldest settlements and the capital of Oyo State, being recognized as the largest indigenous city in sub-Saharan Africa. Ibadan has served as a prominent administrative hub since the British colonial period in the former Western Region of Nigeria. At the time of Nigeria's independence, Ibadan stood not only as the largest and most populous city in the country but also the third largest in Africa after Cairo and Johannesburg. With its rich historical heritage and flourishing economic activities, Ibadan has gained prominence nationally and even internationally, attracting

an increase in its population. However, the region is currently grappling with challenges such as strained social amenities, pollution, and environmental degradation factors, leading to an imbalance in the landscape environment and giving rise to physical, social, and economic problems (Adedeji, Fadamiro, & Adeoye, 2014). Urgent measures are required to address the situation in Ibadan to prevent irreversible deterioration of the city's landscape. To prevent such scenarios, conducting a thorough assessment of the city's landscape and proposing necessary measures to align human activities with the landscape are imperative.

1.3 JUSTIFICATION OF STUDY

The analysis of landscapes involves a multidisciplinary approach that integrates various fields such as ecology, earth science, system science, environmental science, and computer science to evaluate the suitability of land development and utilization (Peter Henry Rolfs, 2020, Liu Jie, et al, 2010). Landscape planning plays a crucial role in driving economic growth and ensuring sustainable use of land resources. Viewing a landscape through the lens of ecological protection and construction is imperative in assessing its characteristics and potential (Peter Henry Rolfs, 2020, Liu Jie, et al, 2010). Landscape assessment, as a formal and systematic process, involves evaluating the evolution of a landscape by considering the natural and human processes that shape it (Obiefuna, Idrisand Uduma-Olugu, 2011), as well as determining its values and possible land use options over time. Assessing landscape structures requires a detailed analysis of spatial elements like size, shape, type, and organization, utilizing metrics such as area, perimeter, and shape index to understand the landscape planning dynamics in a given area (Christiana O., Oluwole O., 2019, Dongwoo & Kyushik, 2012). Studies on urban environments reveal challenges such as conflicting land uses, unattractive cityscapes, aesthetic deficiencies, and traffic congestion (Oduwaye, 2009). The patterns and structures of landscapes significantly impact ecological processes and environmental quality (McGarigal, Cushman & Ene, 2002), underscoring the importance of landscape planning in shaping the functionality and development strategies of an area (Fasona et al. 2007). According to Yan Li1, Qingli Sun (2023) landscape assessments, changes in a landscape can be identified, enabling a better understanding of land-use transformations and environmental impacts. Assessing the landscape of a specific region, such as Ibadan, is crucial to ensuring that environmental developments align with global standards and sustainability principles (Obiefuna, Idris and Uduma-Olugu, 2011)

1.4. AIM AND OBJECTIVES OF THE STUDY

1.4.1 AIM OF THE STUDY

The aim of this research thesis is to evaluate the built environment with a prospect of incorporate sustainable design principle to mitigate environmental impact and recommends suitable planning strategies to attain sustainable city Landscape.

1.4.2. OBJECTIVES OF THE STUDY

To accomplish this, the subsequent goals were established:

i. To identify the need for good landscape planning in a building sustainable environment.
ii. To implement conservation and sustainability initiative within the urban neighbourhood.
iii. To identify the current obstacles affecting landscape planning and management.
iv. To identify a zoo as a garden that helps preserving green spaces in an urban environment.

1.5. RESEARCH QUESTIONS

1.5.1. RESEARCH QUESTIONS

i. What is the need for good landscaping within the built environ?
ii. How can modern recreational space/green space help conservation?
iii. What are the present obstacles affecting landscape planning administration?
iv. Why are zoos considered to be a sanctuary for the conservation of green spaces in urban environment?

1.6 RESEARCH LIMITATION

Some of these challenges encountered during the research are: -

Several challenges were encountered during the research, including the reluctance of institutional authorities to provide information on Gardens and Landscape planning systems, the complexity of interpreting landscape planning terminology to individuals who are not urban planners, and the lack of financial resources to procure advanced technology for data collection like geographic information systems (GIS) and satellite imagery etc.

1.7. DEFINITION OF TERMS

In order to enhance comprehension of the implications of this study, the key terms highlighted and commonly utilized in the research have been defined and elucidated.

Landscaping: This refers to the process of designing, adjusting, and constructing an outdoor setting, aimed at effectively showcasing the functional and supportive characteristics of public spaces in urban areas (Reza Keshtkaran, 2019).

Landscape Planning: This refers to the process of designing, adjusting, and constructing an outdoor setting, aimed at effectively showcasing the functional and supportive characteristics of public spaces in urban areas (Yan Li1, Qingli Sun, 2023).

Assessment: This constitutes the definitive decision on a matter that has been meticulously pondered and evaluated prior to reaching a conclusive outcome (Oxford Advance learner Dictionary, 7th edition)/

Green Area: Green spaces are designated areas within urban planning that consist of green surfaces, trees, and various forms of vegetation (Rita Sousa-Silva , Chad Zanocco, 2023)

Management: Involves the process of formulating the direction of a company and aligning the actions of its workforce (or volunteers) to achieve its goals by utilizing various resources, including financial, environmental, technological, and human resourcesby Simon Tarabon, (Claire Godet et al, 2023).

Urban Green Space: Urban Green spaces refer to those land uses and land cover that are covered with natural or man-made vegetation in the city and planning areas (Li L., Pussella P.G.R.N.I, 2017)/

Conservation: "Conservation" is the preservation, maintenance, repair, restoration, changes in functional operations in immovable cultural and natural properties; and preservation, maintenance, repair and restoration work in movable cultural properties. "Protected area" is an area that must be protected, which is effective in the preservation of immovable cultural and natural assets or their 268 protections in the historical environment (Yayın Yönetmeni et al, 2021).

Urban Parks and Green Spaces: Designing and maintaining urban parks and green spaces offer numerous benefits. They provide areas for recreation, relaxation, and social interaction while improving air quality, reducing urban heat island effects, and mitigating stormwater runoff. These green oases within the cityscape contribute to the overall well-being of residents, enhancing their mental and physical health (Chen Gong et al, 2023).

Environmental Sustainability: Mixed-use development and compact urban planning support environmental sustainability. By reducing urban sprawl, these approaches help conserve natural

resources and protect sensitive ecosystems. Compact urban areas also require fewer resources for infrastructure development, such as roads, utilities, and services, leading to lower energy consumption and reduced environmental impact (Emma S., Colleen E., 2023)

Ecosystem: Ecosystem is defined in the journal Ecosystem and Human Well-being to be planets life support unit for humans and other life forms (Zöhre Polat et al, 2018).

1.8 STUDY AREA

1.8.1 LOCATION AND HISTORICAL BACKGROUND

The present site of Ibadan was established by Lagelu after the destruction of the first settlement near Awotan in the neighbourhood of Apete in Ido Local Government area. The presence of hills makes the site of the city easily defensible while its location close to the boundary between forest and grassland makes it a melting point for people and products of the forests as well as those of the grassland areas. However, Ibadan was resettled in about 1820 as a camp by the soldiers of the Ife, Ijebu and Oyo after they had successfully destroyed the neighbouring kingdom of Owu. The city of Ibadan is located approximately on longitude 3051 East of the Greenwich Meridian and latitude 70231 North of the Equator at a distance some 128kilometers North East of Lagos and 530 km southwest of Abuja, the federal capital, and is a prominent transit point between the coastal region and the areas to the north

1.8.2 POPULATION AND POLITICAL ANALYSIS

Ibadan is made up of 11 local government area in which 5 of the local government area form the urban area and the remaining 6 local government area can be classified as a rural or peri-urban local government area. The core area of Ibadan is comprised of 5 major local government areas which are considered as the urban local governments in the state. These urban local governments are Ibadan North, Ibadan North-West, Ibadan North-East, Ibadan South-East and Ibadan South-west. Basically, the rapid urbanization which has hitherto eaten deep into the city of Ibadan has seriously affected the recreational lands, vacant lands, forest reserves etc. in the study area. The population of the study area (Ibadan North, Ibadan North-West, Ibadan North-East, Ibadan South-East, Ibadan South-west) according to 2024 world population review put the population of the city at 4,005,316.

At Nigerian independence, Ibadan was the largest and most populous city in the country and the third in Africa after Cairo and Johannesburg. Until 1970, Ibadan was the largest city in sub-Saharan Africa (FRN Official Gazette, 2007). In 1952, it was estimated that the total area of the city was approximately 103.8 km2 (Areola, 1994). However, only 36.2 km2 was built up. This meant that the remaining 67 km2 were devoted to non-urban uses, such as farmlands, river

floodplains, forest reserves and water bodies. The land area increased from 136 km2 in 1981 to 210 and 240 km2 in 1988 and 1989 respectively (Areola, 1994). By the year 2000, it is estimated that Ibadan covered 400 km2. The growth of the built-up area during the second half of the 20th century (from 40 km2 in the 1950s to 250 km2 in the 1990s) shows clearly that there has been an underestimation of the total growth of the city. In the 1980s, the Ibadan-Lagos expressway generated the greatest urban sprawl (east and north of the city), followed by the Eleiyele expressway (west of the city).

Figure 1.1: Map of Nigeria, Oyo State.

Source: Google.com

1.8.3 CLIMATE AND RAINFALL

Ibadan has a tropical wet and dry climate, with a lengthy wet season and relatively constant temperatures throughout the course of the year. Ibadan‟s wet season runs from March through October, though August sees somewhat of a lull in precipitation. This lull nearly divides the wet season into two different wet seasons. November to February forms the city‟s dry season, during

which Ibadan experiences the typical West Africanharmattan. The mean total rainfall for Ibadan is 1420.06 mm, falling in approximately 109 days. There are two peaks for rainfall, June and September. The mean maximum temperature is 26.46o C, minimum 21.42o C and the relative humidity is 74.55%.

1.8.4 ECONOMIC BASE

The administrative and commercial importance of Ibadan has resulted in land being a key investment, an asset and a status symbol for the population. According to Ayeni (1994) residential land use is the most predominant among all land uses in the built-up part of Ibadan. The arrival of the railway bringing European goods and personnel for trade and administration marked the beginning of large-scale immigration. The railway system began in 1896 in Lagos and reached Kano in 1911 while the first motor able road in Nigeria was constructed from Ibadan to Oyo in 1906. The growth of Ibadan became more rapid from 1946 when it was made the headquarters of the then Western Region of Nigeria. It then began to attract more Europeans as administrators and businessmen, Yorubas mostly as civil servants but also as traders, and other ethnic groups who came into various un-skilled occupations.

CHAPTER TWO

2.0 LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1. LITERATURE REVIEW

The environment is an interactive, indispensable medium within and through which man's life routine is carried out. Man's life in his present nature is unimaginable without the environment to supply him with his needs such as air (to breathe), water (to drink and wash with), food (to eat), and solid minerals for fashioning weapons, building shelters and clothing (Atolagbe 2002). This brings to bear that some aspects of man's exploitation of the environment are limitless which require a proper landscape planning and sustainable environment.

According to Aluko (2011) Landscape Planning arose from the realization that certain land uses should be separated from one another because of their incompatibility and the need for effective development control and proper allocation of land for different compatible use is essential to prevent abuse, misuse of land, to correct errors rapid urbanization has brought to most urban centres and to ensure compatible use of land as stipulated in the master plan. Carina N ., Janis Fiedler et al, (2023), in Germany, landscape planning is based on the Federal Nature Conservation Act, as the planning instrument for nature conservation and landscape management as opposed to other planning instruments and administrative procedures (The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety 1998). It makes important contributions to the conservation of natural resources at all levels (local, district or entire regional state) and for full-coverage, sustainable conservation and long-term development of nature and landscapes in the built and non-built environment (Jingsen L, Steffen N., Gregory B., et al, 2023 and Bfn, 2002(. Landscape Planning is the development and application of large-scale strategies, policies and plans to create successful environments, in both urban and rural settings, for the benefit of Current and future generations. A natural landscape is a landscape that is unaffected by human activity, still intact when all living and non-living elements are free to move and change. The non-living elements distinguish a natural landscape from a wilderness. A wilderness includes areas within which natural processes operate without human interference, but a wilderness must contain life. Landscape has six main compositional elements:

i. Landform,
ii. Vertical Structures,
iii. Horizontal Structures,
iv. Vegetation, Water,
v. Climate and

vi. The art of arranging these elements is to make good outdoor space which implies putting forward proposals for present and future developments of the landscape.

The analysis of the evolution of landscape, an examination of the basic natural and human processes with ecological interrelationships jointly shapes the landscape and determine values for its uses which generates new patterns of evidence and hypotheses for further strategies, providing an integral link with landscape science and encouraging trans-disciplinary collaborations to build robust knowledge and problem-solving capacity for the present and future (Obiefuna, 2011). God is definitely the first landscape planner who started landscaping when he commands land to surface in the book of Genesis, chapter 1 in the bible, no wonder Aluko in (2011), further reference God as definitely the first Town Planner who created everything in an orderly manner. This implies that landscape planning is as old as man itself since it signifies the beginning of making the environment spatially okay and allocation of land-use (Adedeji, 2011).

The Germans gives a clearer view of what landscape planning is by distinguishing between environmental planning and landscape planning (von Haaren, 2004; Köppel et al., 2004; Jesseland Tobias, 2002). These two are the fundamentals for sustainable planning and the basis for decision-makers to take landscape functions into consideration (Bfn, 2002). Environmental and landscape planning differ in scope and aims, Landscape planning makes important contributions at all levels and full-coverage while environmental planning deals with specific scales (spatial and temporal) and territories (Köppel et al., 2004; Lambrecht et al., 2007; Riedel and Lange, 2001; von Haaren, 2004).

Landscape architects and planners working in landscape planning operate at all contexts and scales, from the international to the local, and on all types of development, advising on or managing proposals for change which may affect the landscape. They assess and resolve environmental, economic and social opportunities and constraints relevant to areas of landscape interest and take these into account in addressing a landscape's potential and capacity to accommodate change. The activities of the two professions include:

i. Preparing and advising on policy and strategy within legal frameworks
ii. Preparing Green Infrastructure plans and implementation strategies (Anna K., Kamyar H., Nora Fagerholm et al, 2023).
iii. Project management, coordination of and contributions to detailed assessments and studies including:
    a) Environmental Impact Assessment and environmental statements

b) Landscape and Visual Impact Assessment

c) Landscape character surveys, assessment and reports

iv. Master planning for development and regeneration schemes

v. Consultation and community/ stakeholder engagement

vi. Contributing to planning appeals and public enquiries and acting as an expert witness

vii. Advising on compliance with relevant policy, legislation, good practice and relevant standards

viii. Managing projects

ix. Providing advice on policy and strategy

x. Contributing to public inquiries and acting as an expert witness (Adedeji, 2011).

2.1.1 CLASSFICATION OF URBAN LANDSCAPE/GREEN OPEN SPACES

There are different ways to classify urban open space and greenspace, such as its size, how people use it, its intended function, its location etc. (Byrne and Sipe, 2010). Types of green spaces that serve different uses over the city, green space systems can be created as a result of efficient organization. In this context, urban green areas were classified different categories, according to the spatial characteristics, service purposes and state of property. Classification of green spaces is seen in the figure 1 according to the property.

2.1.1.1 PARKS/PUBLIC OPEN SPACE

According to Melon , P. Sikorski et al, (2023), nowadays in the cities, there are limited green areas. Parks or public open spaces are very important in the life of urban people. People who lives in the cities want to go outside (especially green areas) whenever they have spare time. They go parks or public open spaces. Parks are designed different type, size, and functions. In the parks, people can do lots of activities. Typically, classification types are based upon the size of the park, its deemed function, it geographic location and the types of facilities present within the park and sometimes the degree of naturalness of the park. Parks can be variously described as urban parks, nature parks, pocket parks, district parks, community parks, neighbourhood parks, sporting fields, urban forests and the like. But there are other ways of classifying parks too. These include factors such as the activities that occur within the park (e. g. cricket oval, skateboard park, bowling green), the agency responsible for managing the park (e. g. national park, state park, city park), the history of the park (e. g. heritage rose garden), the condition of the park, the land use history of the area (e. g. street-corner neighbourhood park), the types of people who use the park, landscaping and embellishments (e. g. dog park, bike park or Chinese

garden) and the philosophy behind the park's development (e. g. recreation reserve or civic square). Combining these various factors can result in all sorts of combinations and permutations, rendering a standardized method of classifying parks virtually impossible and rather pointless. Parks are not the only type of urban greenspace though. In most cities while parks comprise a large portion of green and open space, other types of urban greenspace and open spaces are present too including plazas, urban trails and even well-vegetated streets (Byrne and Sipe, 2010).

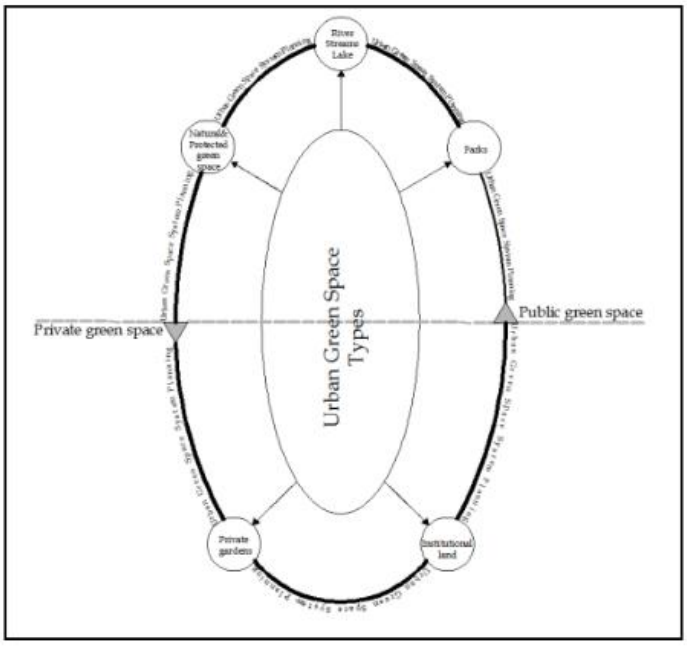

Figure 2.1: Classification of green spaces according to the property

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Plate 2.1: Urban Park in Ankara, Turkey (http://www.anfaaltinpark.com.tr/)

Plate 2.2: Pocket Park in Çorum, Turkey.

Times have changed, somewhat. Sitting in a municipal park, looking at the flowers and listening to the occasional brass band do not feature prominently in surveys reviewing the popularity of leisure-time activities. Rather, people desire access to rich and varied landscapes with scope for many outdoor activities. Park planners responded to the new age by tearing down park railings and planning webs of interconnected green space, originally known as park systems. The diagnosis was correct. The treatment was pathetically oversimplified. Public open space should be planned in conjunction with other land-uses for multiple objectives. New parks and new links should be designed by planning recreational and conservation uses in conjunction with other land-uses: urban reservoirs can make splendid waterparks; ornithological habitats and hides should be designed in conjunction with sewage farms; wildlife corridors should be planned beside roads, railways and streams; flood prevention works can yield canoe courses; public gardens can sit on top of office buildings. New uses and new layers of interest should be brought into public open spaces. Some open spaces could supply firewood and wild food (nuts, berries, herbs); others could infiltrate rainwater back into the ground, instead of allowing the water to accentuate flood peaks; Sunday markets can fit well into parks. Every public open space can have a specialist use, in addition to its general functions. One could be a centre for kite flying one for tennis; one for lovers of herbaceous plants; one for reenacting military battles; one for every special recreational type which has a magazine on your local newsstand (Melon , P. Sikorski et al, 2023, Turner, 1998).

Plate 2.3: National Park, Küre Mountains, Bartın, Turkey.

2.2.0 NEED FOR GOOD GREEN SPACES WITHIN THE BUILT ENVIRONMENT

Urban green spaces have many functions and benefits. These functions and benefits are important for to improve life quality in the urban areas. Green spaces provide linkage between people (who lives in the urban) and nature. So, these areas are very important for the urban people (Pieter F., Silvie D., et al, 2023).

Urban Green Spaces are Important as Functions and Meanings (Huaqing Wang a,*, Louis G. Tassinary , 2023 and Alm, 2007)

i. Urban climate, noise moderation, air cleaning and handle of surface water
ii. As an indicator of environmental changes
iii. As a part of the circulation of nutritive substances
iv. Cultivation of energy plants
v. Biodiversity; to save valuable urban species, as refuges for species from rural biotopes and as spreading corridors.
vi. Social and cultural values; for health, recovering and rehabilitation, to give beauty and comfort, to give room for passivity and activity, as a cultural heritage, as an arena for citizenship, for education.
vii. Gardening and allotments; as history of urban landscapes, as a social function, for life quality and beauty, providing a reserve.
viii. Urban design; to give the city an understandable structure, to connect different scales and parts of the urban landscape.

The benefits of urban green areas were described as detailed below under the main headings.

2.2.1 ENVIRONMENTAL BENEFITS ECOLOGICAL BENEFITS

Urban green spaces provide to cities with ecosystem benefits ranging from maintenance of biodiversity to the regulation of urban climate. Comparing with rural areas, differences in solar input, rainfall pattern and temperature are usual in urban areas. Solar radiation, air temperature, wind speed and relative humidity vary significantly due to the built environment in cities. Urban heat island effect is caused by the large areas of heat absorbing surfaces, in combination of high energy use in cities. Urban heat island effect can increase urban temperatures by 5˚C. Aside from these human benefits, well designed urban greenspaces can also protect habitats and preserve biodiversity. Greenspaces that feature good connectivity and act as 'wild life corridors' or function as 'urban forests', can maintain viable populations of species that would otherwise disappear from built environments (Yan Li1, Qingli Sun, 2023, Haq, 2011; Byrne and Sipe, 2010).

2.2.1.1 POLLUTION CONTROL

Pollution in cities as a form of pollutants includes chemicals, particulate matter and biological materials, which occur in the form of solid particles, liquid droplets or gases. Air and noise pollution is common phenomenon in urban areas. The presence of many motor vehicles in urban areas produces noise and air pollutants such as carbon dioxide and carbon monoxide. Emissions from industrial areas such as sulphur dioxide and nitrogen oxides are very toxic to both human beings and environment. The most affected by such detrimental contaminants are children, the elderly and people with respiratory problems. Urban greening can reduce air pollutants directly when dust and smoke particles are trapped by vegetation (Yi Sun , Yunli C., , Yuanyuan et al, 2023 and Huang Haq, 2011).

According to Chen Gong et al, 2023, noise pollution from traffic and other sources can be stressful and creates health problems for people in urban areas. The overall costs of noise have been estimated to be in the range of 0. 2% - 2% of European Union gross domestic product. Urban green spaces in overcrowded cities can largely reduce the levels of noise depending on their quantity, quality and the distance from the source of noise pollution. In the contemporary studies on urban green spaces consider the overall urban ecosystem, conservation of the urban green spaces to maintain natural ecological network for environmental sustainability in cities. For the cities in fast urbanizing and growing economy, country like China should consider the dynamic form of urban expanding to manage effective urban green spaces which will contribute

to reduce the overall CO2 by maintaining or even increasing the ability of CO2 absorption via natural eco-system (Yi Sun , Yunli C., , Yuanyuan et al, 2023 and Haq, 2011).

2.2.1.2 BIODIVERSITY AND NATURE CONSERVATION

Green spaces do functions as protection centre for reproduction of species and conservation of plants, soil and water quality. Urban green spaces supply the linkage of the urban and rural areas. They provide visual relief, seasonal change and link with natural world. A functional network of green spaces is important for the maintenance of ecological aspects of sustainable urban landscape, with greenways and use of plant species adapted to the local condition with low maintenance cost, self-sufficient and sustainable (Haq, 2011).

Plate 2.4: Green areas are important for biodiversity, Samsun, Turkey.

2.2.2. ECONOMIC AND AESTHETIC BENEFITS

2.2.2.1 ENERGY SAVINGS

Using vegetation to reduce the energy costs of cooling buildings has been increasingly recognized as a cost-effective reason for increasing green space and tree planting in temperate climate cities. Plants improve air circulation; provide shade and they transpire. This provides a cooling effect and contributes to lower air temperatures. A park of 1. 2 km by 1. 0 km can produce an air temperature between the park and the surrounding city that is detectable up to 4

km away. A study in Chicago has shown that increasing tree cover in the city by 10% may reduce the total energy for heating and cooling by 5 to 10% (Meen Chel J., Michael G. et al, 2023 and Haq, 2011).

2.2.2.2 PROPERTY VALUE

Areas of the city with enough greenery are aesthetically pleasing and attractive to both residents and investors. The beautification of Singapore and Kuala Lumpur, Malaysia, was one of the factors that attracted important foreign investments that assisted rapid economic growth. Still, indicators are very strong that green spaces and landscaping increase property values and financial re-turns for land developers, of between 5% and 15% depending on the type of Project (Hanxue Wei, 2023 and Haq, 2011).

Plate 2.5: Green areas provides aesthetically well placesAnkara, Turkey
Source: www. anfaaltinpark. com. Tr

Plate 2.6: Green areas near the housing area, Ankara, Turkey
Source: www. anfaaltinpark. com. Tr

Plate 2.7: Green areas near the housing area, Ankara, Turkey
Source: www. anfaaltinpark. com. Tr

Plate 2.8: Green areas near the housing area, Ankara, Turkey
Source: www. anfaaltinpark. com. Tr

2.2.3 SOCIAL AND PSYCHOLOGICAL BENEFITS

Recreation and Wellbeing People satisfy most of their recreational needs within the locality where they live. Urban green spaces serve as a near resource for relaxation; provide emotional warmth. In Mexico City, the centrally located Chapultepec Park draws up to three million visitors a week who enjoy a wide variety of activities (Hanxue Wei, 2023 and Haq, 2011).

Plate 2.9: Recreational activities on water surface, Altınpark, Ankara, Turkey
Source: www. anfaaltinpark. com. Tr

Plate 2.10: People are sitting in a park for recreational activity, Samsun, Turkey.
Source: www. anfaaltinpark. com. Tr

Human Health People who were exposed to natural environment, the level of stress decreased rapidly as compared to people who were exposed to urban environment, their stress level remained high. Certainly, improvements in air quality due to vegetation have a positive impact on physical health with such obvious benefits as decrease in respiratory illnesses. The

connection between people and nature is significance for everyday enjoyment, work productivity and general mental health (Chen Gong et al, 2023, Haq, 2011).

2.3.0 IMPLEMENTATION MEASURES IN THE CONSERVATION AND SUPPORT THE ENVIRONMENT IN THE URBAN AREA.

Urban landscape depends on the surrounding area, such as suburban, rural, and bioregional landscapes that are seen in ecological watershed units (Arifin et al., 2009). The largest and most visible parts of green areas in the city space are parks and forests. Urban parks can play an important role in the conservation of biodiversity (Cornelis, Hermy, 2004), they also provide a range of ecosystem services for urban citizens (Heyenga, Savill, 2000). Assessing the accessibility of the urban residents to green spaces, most authors have defined that the urban parks should be within 400 m, it means 5 minutes walking distance, from residencies by Herzele, Wiedemann, 2003. According to the standard which was recommended by National Recreation and Park Association, USA, a space of 0.41 km² has to be kept as urban parks for 1000 residents (Nicholls, 2001).

Parks can be designed to perform various functions for city dwellers, so they can be traditional and multifunctional figure below. Research shows that urban parks are visited primarily by residents, but it is also an attractive space for visitors from nearby areas and tourists (Schmidt et al., 2016).

Figure 5. Different types of parks

Source: (Schmidt et al., 2016).

Plate 2.11: Different types of Parks. (Schmidt et al., 2016).

Urban forests play similar role to city space as parks do. General figures for urban open space and urban forests show a wide variance between different European towns and cities. Most woodland is found in the urban fringe. The percentage cover ranges from 1% in Copenhagen to 65% in Stuttgart in the 5 to 10 km ring around the city center (Mohammad A. Rahman, Stefan

A., et al, 2023 and Pauleit et al., 2005). Despite the recognized positive role of forests in metropolitan contexts, a reduction in their functionality has been observed in most urban regions (Tomaoa, 2017). While the percentage of cover of woodlands in Europe's urban areas does not seem to be directly related to their geographic location or the size of urban areas, four different types of urban woodland (figure 6) could be distinguished (Chuandong T., Bo X., Ge H., Xuefei W., 2023, Pauleit et al., 2005) closed woodland surrounding the city (e.g. Oslo, Ljubljana), • woodland islands and belts within the city (e.g. Ljubljana, Munich), • dispersed woodland within an urban matrix (e.g. Black Country), • small woodland areas in parks and gardens within the city, • dispersed woodland in an agricultural matrix around the city (e.g. Florence)

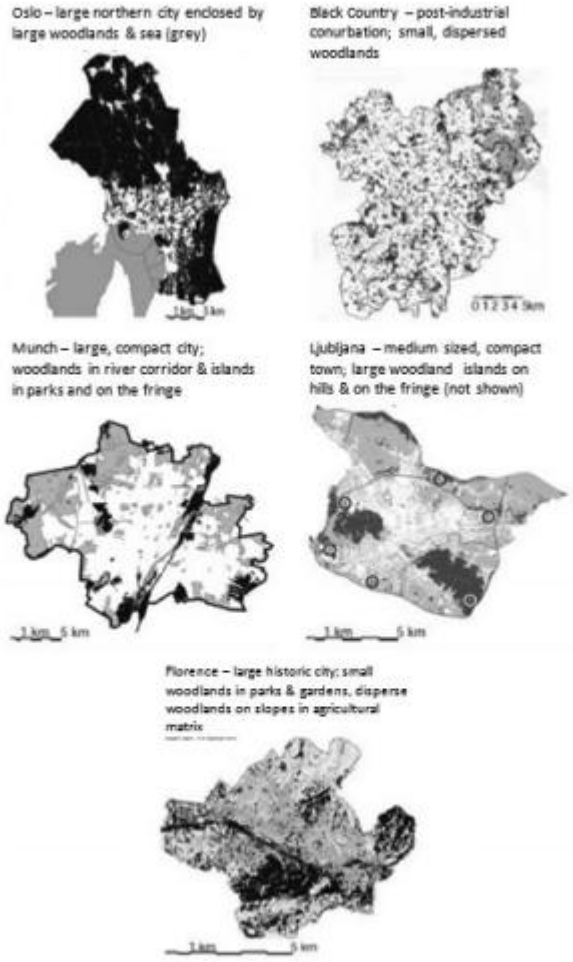


Figure 6. Different types of urban forest (woodlands are shown in black, other open spaces in gray, built-up areas in white)

Source: (Pauleit et al., 2005).

Plate 2.12: Different types of Urban Forest.
(Pauleit et al., 2005)

Another element of urban green spaces are private gardens (private green spaces) and roadside green spaces. Private gardens are very heterogeneous in their size and structure and cover a large proportion of urban areas – for example: between 22–7% of the total area of seven UK cities (Loram et al., 2007) or 36% in a small New Zealand city (Mathieu et al., 2007). As a one of the major component of green spaces, privet gardens have vast potential for creating biodiversity benefits (which can varying depends on size and features of gardens) (Van Heezik et al., 2012). Roadside green spaces consist of linear corridors between sidewalks (figures below. This type of greenery is important not only because its ecological meaning, but it also has aesthetic value. In addition, the design and maintenance of roadside green spaces must comply with the requirements of road safety (e.g. in terms of visibility or roads and pavements contamination) (Ellen O., Marcia S., 2023).

Figure 13. Roadside green spaces in Jakarta, Indonesia
Source by Arifin, Nakagoshi, 2011.

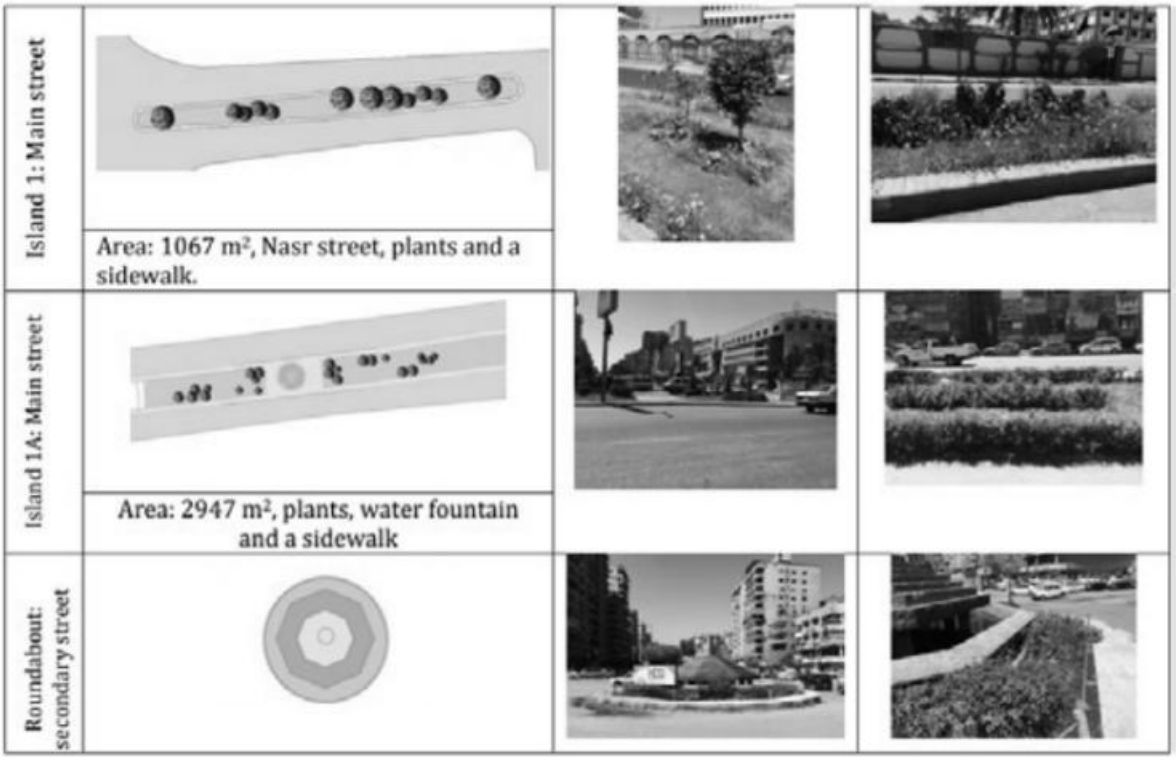


Plate 2.14: Roadside green spaces in in Naser City, Egipt

Source by Abd El Aziz, 2016.

In addition to traditional urban green spaces, alternative solutions are now being proposed that increase the spectrum of possibilities for urban nature. This are: vertical gardens, green roofs (plate 14), green terraces (Plate 2.15) and green graffiti (Plate 2.16). Vertical garden structure was invented by French botanist Patrick Blanc and to build them were started in Paris, London, Tokyo and New York since 1988. Vertical garden structure is garden design which consists of vegetations placed on the wall surface. This kind of green elements can improve the air quality of building and can save energy (Gülgün et al, 2015). Roof and terrace gardens are a multifunctional green roof build-up with high water storage. It is suitable for lawns, perennials, and with deeper system substrate, for shrubs and trees. Two types of roof and terrace garden can be distinguished in terms of features and benefit functions: intensive green roof (Plate 2.14 left) which is appropriate to roam or to do various recreational activities, and extensive green roof (Plate 2.14 right) – not suitable both for recreational activities or walking (Manuel T., Vera J., Karsten S., et al, 2023 and Gülgün et al, 2015).

Plate 2.15. Intensive roof garden (left) and extensive roof plantings (right)
(Gülgün et al, 2015).

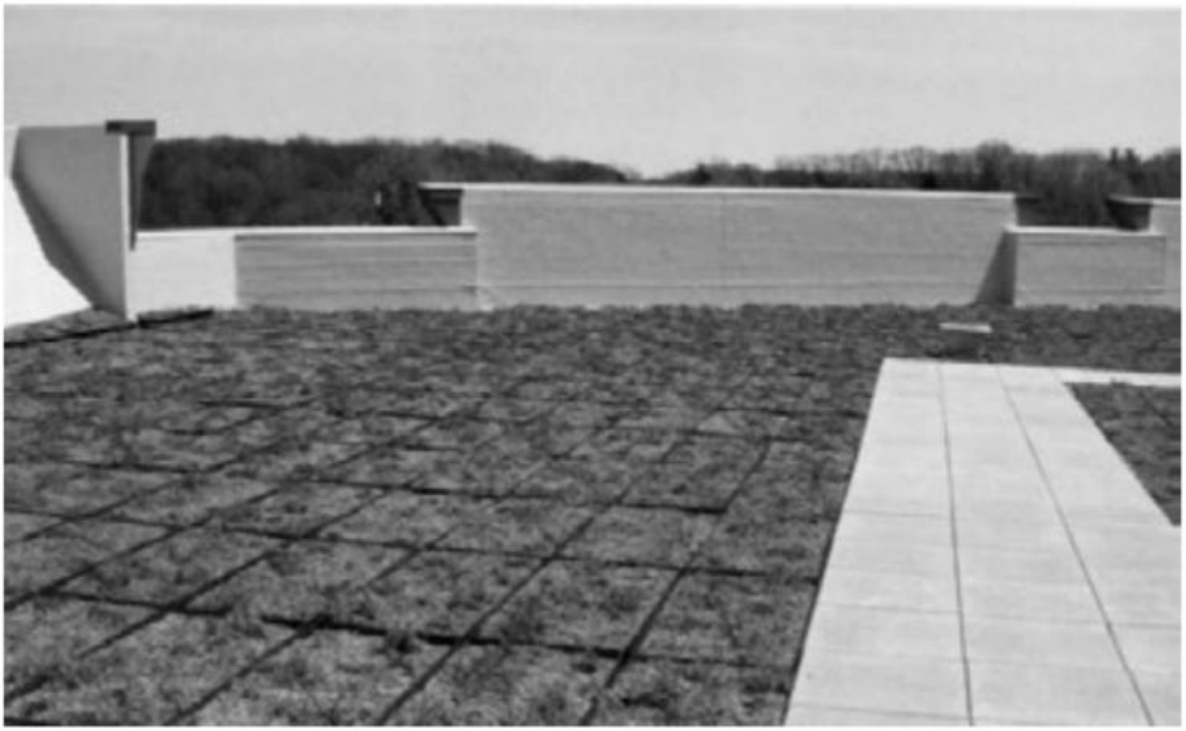


Plate 2.16. Green terrace
(Berkooz, 2007).

Plate 2.17. Green graffiti
(Jansen, Ruifrok, 2012).

Roof gardens are becoming more and more popular in urban spaces, for example in U.S. an increasing number of cities now require green roofs in new construction projects – partly to help mitigate global warming. Green roofs slow the flow of rainwater into a storm water system, reduce the energy needed for heating and cooling, and diminish urban heat island effects. More than two million square feet of Chicago's rooftops have been planted with low-growing sedums, native grasses, herbs, and shrubs. Minneapolis, Boston, and other large cities have various

"green" requirements as well (Kate L., Belinda W., Nicholas S., Williams c, et al, 2023, Berkooz, 2007).

2.4.0 LANDSCAPE PLANNING IN NIGERIA

Christiana O., Oluwole O., (2023) and Fadamiro and Atolagbe, (2006) confirmed that development of human skills in using natural resources to serve human purposes gradually challenged the natural environment at the local level and then at the global level. Aluko (2011), gave us the source of these challenges when man was ironically given the power to subdue the environment, then began to be fruitful, multiply on the surface of the earth and behold the activities that led to the challenges in urban areas However, these challenges did not reach a catastrophic level until the quality of air, water, land and forests gave rise to increasing awareness and the need to control increasing population and stem pollution and degradation to all components of the environment. Christiana O., Oluwole O. (2023) and Fadamiro and Atolagbe (2006) further said that poor quality of the Nigerian urban environment has been attributed partly to the inadequate, misuse, disorderly nature and mismanagement of the urban open spaces.

There has been a phenomenal growth of urbanization resulting in our major cities growing and expanding in an unplanned manner. The central parts or core areas of most cities are decaying while the sections are increasingly becoming slums. Despite the existence of Local Planning Authorities whose portfolio includes development control of urban land use, many buildings have been and are being constructed without approved layouts, illegal structures springing up arbitrarily, open spaces are disappearing fast and many parts of Nigerian cities lack access. This, according to various researchers, has exerted a major strain on the physical outlook of the environment and a negative effect on the welfare and productivity of the residents. This has called for the need to identify and analyze the open spaces in the urban environment and assess the implications of their landscape planning on the status of the city and the development of a healthy and sustainable environment (Christiana O., Oluwole O., 2023, Fadamiro and Atolagbe, 2006 and Aluko 2011).

Human activities on the earth have lots of deleterious (harmful) effects the natural system (e.g. pollution). The destruction of the environment can be arrested and the ill-effects reversed by sound land use and landscape planning principle and techniques (Adedeji, 2011). Conflicts normally arise in land uses and in land use planning, these conflict must be resolved if a coherent and workable plan is to emerge. All these conflicts can only be resolved through

effective landscape and land use planning. Most Nigeria urban centers have urgent need for proper landscape planning even after they have attain a level of development. This is so because of the following factors:

- **Land and urbanization:** The earth and many of its resources is finite and only a small percentage of it surface is capable of habitation and sufficiently fertile for the production of food. The conservation through proper landscape planning is therefore one of the most fundamental principles in sound land use planning to cope with the trend.
- **Erosion and salination:** Overgrazing of land by animals, intensive cultivation of marginal lands, deforestation and forest degradation initiate the erosion of soil. Vast plantations of timber have been removed for more agricultural lands and fuel wood. This has resulted in the erosion and turning of hundreds of thousands of hectares of fertile lands into arid landscapes. Intense evaporation in the dry periods drew the salts from the soil to the surface thus sterilizing the soil.
- **Husbandry and conservation:** To promote good husbandry andthe establishment of a conservation ethics which seeks to preserve the countryside, the widest variety of land uses and landscape, the greatest number of wildlife habitats and the keeping open of all possible options for future action.
- **Comprehensive planning goals:** These goals are likely to be otherwise achieved without planning especially to prevent the harmful results of sporadic and uncontrolled developments.
- **The balance land uses:** To balance the priorities given to the different uses of countryside such as urban development, forestry, mining, recreation, transportation, oil installations, industry and utility services with amenity consideration.
- **Corporate planning:** To encourage a comprehensive multi-disciplinary and corporate approaches to rural and urban planning (Adedeji, 2011).

2.4.1 LANDSCAPE PLANNING AND MANAGEMENT

Management is concerned with efficiency in the conversion of opportunity and resources into wealth. It is a vital aspect of realization of set goals and objectives of any organization, institution or government especially in the case of those in charge of development of open spaces and it is the pre design stage of the park planning process for the effectiveness of the recreational area (Christiana O. Oluwole O. 2023. Akpala, 1992) confirms that management refers to people and also the process by which people do things. As people, management

comprises those who guide actions in organization towards the achievement of the ends or goals for which the organization is established. However, it is observed that inadequate recreational opportunity could be made productive with good administration, but that the best result could not be achieved without it. It goes a long way in influencing the extent and quality of recreational program, services and available opportunities. Allsopp (1979) defined management as the selection of goals and the planning, procurement, organization, coordination and control of the necessary resources for achievement. It is concerned with the dynamite of circumstance and activity as it is generally motivated by the need to economize in the use of resource and the time in activating predetermined objectives.

According Christiana O., Oluwole O., (2023) and Ngene, (1990), in his study saw that good management demands that the needs, aspiration and the interest of people to be served should be taken into consideration. Planning is for people and recreation must be built around the desires and interest of people for effective participation on the park users. Butler (1940) opined that management should extend to the relationship between employers and the employees in, order; to accomplish their set purpose. They must be one in mind and purpose. Poor relationship results in lack of enthusiasm work, indifference in a half heated effort and labour unrest. These result in failure to understand the motives that makes man work, such as their hopes, ambitions and prejudices. Furthermore, design and management are related. Design management involves the initializing organization and control of all these matters to enable effective results to be obtained; this involves a design staff, an organization and a design process, while the whole interaction taking place within design and drawing offices of various kinds (Dennis lock and Nigel Farrow, 1989). It is obvious that management has become an important field in complex modern organization like open space. Since, Fadiro and Atolagbe, (2006), Ahinmba, Dimuna and Okogun, (2008) has identified that the major problem of open space development in Nigeria is the poor quality and mismanagement of open spaces in the built environment. There is need for the formulation of better policies and strategies for managing both new and old ones; preventing further degradation of the environment through proper planning, design and development.

Landscape planning is not about how to ‘freeze’ a landscape in a particular state because landscapes are dynamic and continually changing. It is always about managing the direction and consequences of change, and how to sustain landscape values and attributes over time. An essential part of the planning is the identification of strategies and methods to manage change. The management is the Identification of ways and opportunities to ensure and enable sustainable

landscape management in response to the existing trends and any proposed or anticipated change is very important in landscape planning and this may include (Nzila, 2010):

i. Statutory and non-statutory plan objectives, policies and methods
ii. Consideration of alternatives, and their costs and benefits
iii. Identification of ways to enhance or create values
iv. Actions to avoid remedy or mitigate adverse landscape effects

2.4.1.1. SUSTAINABLE LANDSCAPE MANAGEMENT

According to Simon T., Claire G., et al, (2023), landscape change is inevitable particularly in a rapidly changing world, changing patterns of housing need, work; mobility and recreation will also result in pressures on the landscape for new development. Landscape conservation and enhancement are central aims of this strategy, but it is recognized that the countryside of the future will serve many different purposes. Conservation and change are not alternatives, but different interests which need to be accommodated in an integrated way. This strategy aims to enhance the character, quality and diversity of the landscape throughout the whole county. Numerous agencies, organizations, voluntary groups and individuals continue to contribute significantly towards environmental improvements of all kinds throughout the world. The guidelines in this strategy set out some of the measures considered necessary to help achieve these aims. Such words serve little purpose without effective action on the ground. The awkward reality which lies behind ambitious ideas for the creation or restoration of a diverse and healthy landscape is its cost. This is a significant factor in the present and future condition of the landscape. Financial difficulties brought by changing circumstances will make maintenance of the fabric of the landscape increasingly difficult. All these issues raise questions about the long-term future of the landscape and highlight the importance of finding ways of integrating economic viability with environmental objectives (Nzila, 2010).

2.4.1.2. LANDSCAPE PLANNING AND MANAGEMENT REGULATORY INSTRUMENTS

According to the RMA QP resource, the use of regulatory controls should be responsive to the particular landscape values and natural character that apply to a particular area or feature. According to Christiana O., Oluwole O., (2023), regulatory instruments that are typically used to manage landscapes include:

- Regional Policy Statements

- Regional Plans and Regional Coastal Plans
- District Plans

i. Regional Policy Statements

Regional policy statements provide the overarching policy direction for protecting outstanding landscapes and natural features in a region. Regional Policy Statements may:

- Establish robust criteria for assessing the significance of landscapes;
- Set clear policy direction on the landscape evaluation process and possible management techniques to be adopted by territorial local authorities; and
- Identify significant landscapes. If identified, specific policy direction and tools should be described to ensure territorial local authorities can effectively manage the identified landscapes.

ii. Regional Plans and Regional Coastal Plans

Very few regional plans explicitly address landscape management as an issue. However, landscape can be indirectly managed through other issues, such as erosion management, floodplain management, vegetation clearance, activities in the coastal environment or involving the margins and beds of rivers and lakes. Regional coastal plans apply to the coastal marine area and can provide useful direction and mechanisms for managing coastal landscapes and natural character values in the coastal environment.

iii. District Plans

District plans are a principal regulatory instrument used to manage effects on landscapes. As land use and subdivision are primary issues and drivers of landscape change, they are the focus of objectives, policies and associated methods (including rules) in many District Plans. Landscape assessments should be used to inform the District Plan by providing background on the landscape character of the area, and an evaluation of the landscape's values. It is important there is community input into these assessments through effective engagement and consultation. If particular landscapes are sensitive to landscape change, under higher pressure, or valued higher by the local community, they should be identified in the District Plan and spatially identified on the Planning Maps to provide a high level of certainty about their location and extent.

2.4.1.3. REGULATORY MANAGEMENT APPROACHES

Accurate mapping of landscapes and natural features provides certainty about the areas where landscape management provisions and rules apply. Assessment criteria (e.g. siting buildings

within an outstanding natural landscape or feature) should clearly relate to the important aspects or values of the landscape or feature requiring protection. These are generally more useful if they are area-specific so that the criteria provide some overall guidance about managing a particular landscape or feature. Consideration of differences in scale is essential when formulating rules relating to landscapes and features. Rules for landscapes that cover large areas may need to be more generic, whereas rules for natural features may need to be more site-specific. In either instance, the rules must manage the elements or values recognized and are clearly tailored to the particular landscape characteristics to be managed. The RMA QP resource range of regulatory approaches that can direct the provisions for landscape management (Christiana O., Oluwole O., 2023) are:

a) Landscape categorization and character areas

Under this approach landscape character areas or features are classified according to identified landscape values. The classification and mapping of these landscapes is then supported by a suite of objectives, policies, rules and assessment criteria which align with the values and significance of the different landscape categories defined (e.g. 'general landscape issues', 'protection of outstanding natural landscapes and features', 'maintenance and enhancement of visual amenity landscapes' and 'other rural landscapes').

b) Identification of Special Areas or Zones

This approach is essentially a zoning technique whereby specific areas are identified based on their sensitivity to and ability to absorb landscape change.

c) Ridgeline, View shaft or Feature Protection

This approach involves the identification of particular ridges and/or viewshafts and/or features often highly valued by the community and potentially under threat from forestry, inappropriate tree planting, earthworks, buildings, utilities and vegetation clearance, and the development of appropriate statutory planning provisions to manage the effects of such activities. Accurate mapping and a description of the key characteristics of the landscape being managed are important elements of this process.

d) Structure Plans

Structure Plans are high level plans that illustrate the spatial arrangement of land use types in a defined area, and identify associated infrastructure (e.g. roads, schools) and existing natural features. They can be used, for example, to deter development in areas of high landscape value, or to apply a specific management framework to different areas based on the landscape values.

e) Activity status and thresholds

As a subset of area wide or area specific rules, activity status and associated thresholds are a common method used by regional and territorial authorities to manage effects on landscapes. This typically involves more stringent thresholds or higher activity status being applied to identify areas which are more sensitive to landscape change, under higher pressure, or valued higher by the local community.

f) Resource Consent Conditions

Resource consent conditions often apply or adapt the findings of proposal-based landscape assessment to avoid, remedy or mitigate the adverse effects on the landscape. These Conditions can cover:

- Floor levels and earthworks – floor levels may be specified and details regarding earthworks, final contours and stormwater treatment provided;
- Built form details – specific standards (e.g. maximum height of structures and/or buildings, size and position of building platforms and maximum site coverage, colour of materials, reflectivity of materials);
- Curtilage areas - specific standards (e.g. the size of curtilage areas, the size and heights of decks, patios or fences) and rules regarding the type of activities permitted such as restrictions on the use of exotic plant species outside the curtilage area;
- Landscaping: preparation and implementation of detailed landscape plans. They may require final approval by a design committee or a council landscape architect. They are likely to include lists of appropriate species and conditions regarding ongoing maintenance and the timing of implementation (e.g. implementation of planting may be linked to completion of earthworks);
- Access: the design and maintenance of the access roads; Utilities – power, phone, sanitary pipe work and water tanks may be required to be addressed in terms of their siting and level of visibility;
- Protection of buffer/natural areas: specialist advice may be required to determine appropriate buffer areas; and
- Promotion of ecosystem restoration: this could include the restoration of indigenous ecosystems and processes.

2.4.1.4. NON-REGULATORY APPROACHES

According to Christiana O., Oluwole O., (2023), the best means of protecting and maintaining and enhancing landscapes is to support landowners in protecting and managing recognized

values. Strategic documents linked to annual planning documents are also an effective way for councils to work towards landscape management objectives, through planning and budgeting for land acquisition, education programmes, community projects, and incentives schemes. The ranges of non-regulatory instruments used to achieve sustainable landscape management are:

i. Guidelines/practice notes

Design guides can encourage good design outcomes for a number of activities. Several councils have prepared such guidelines, typically relating to rural subdivision and earthworks. Good design guidelines are based on a robust understanding of the local landscapes and the particular character and features that are important and valued, and how activities can be designed in an appropriate manner.

ii. Design Review Panels

Design panels can be a successful, cost effective approach to sustainable landscape management. Although they are most commonly used in urban situations they can be equally effective in a rural landscape context. Their key strength is that they provide a means whereby the applicant and the design panel can collaborate on proposals that are appropriate to the circumstances and that comply with resource consent requirements.

iii. Non-statutory strategies/plans

Pressures on a particular resource (such as a landscape) may require a targeted management response. A non-statutory document provides a level of flexibility to investigate and understand a particular issue, and develop a suite management mechanism for the particular resource. These management mechanisms can include implementation through statutory tools, such as a District Plan.

iv. Education/Information/Stakeholder Groups

Targeted education programmes and the provision of information can raise community awareness and understanding of the landscape. Additionally, the establishment of landcare groups (e.g. coast care group) provides an opportunity for resources to be pooled to implement specific projects. These groups and projects are not often solely for landscape reasons, but for a wide range of purposes.

v. Land Acquisition/Reserves

Some of the most highly valued landscapes are owned by the Crown and administered by a government department or local authority. The acquisition of land can be an appropriate mechanism where landscape values are extremely high, and/or risks to landscape change is likely to have an irrevocable effect on the landscape. The management of these areas is often

also controlled by other legislation, including the Conservation Act 1987 and Reserves Act 1977. Partnerships between agencies to manage such landscape issues jointly can help ensure efficient and coordinated efforts (e.g. input into conservation management plans for land administered by the Department of Conservation within an outstanding landscape).

vi. Transferable Development Rights

Transfer of Development Rights (TDR) is a tool that involves the exchange of zoning privileges to manage growth. The intention behind the system is to enable subdivision to occur in areas considered more suitable for it while reducing development options in areas that may be less suited.

vii. Incentives

Incentives can be used to encourage landowners to adopt recommended measures to protect landscape values: for example, assistance with the cost of fencing and managing forest remnants and wetlands.

viii. Monitoring landscape change

Environmental indicators that provide a good indication of changes in landscape character can be difficult to capture meaningfully. A comprehensive landscape characterization process can provide a useful base of information to draw upon as specific attributes to be measured should be selected from key characteristics that have been identified in an area (Filipa G., José A., Miguel A., et al, 2023).

2.4.1.5. IMPORTANT OF LANDSCAPE PLANNING AND MANAGEMENT

The landscape meets many human needs. It is a basic social, economic and environmental resource needing sustainable management. This can only be achieved by substantial investment and new mechanisms which integrate environmental conservation and economic policy. Reform of the Common Agricultural Policy and the evolving pattern of global markets create opportunities for the emergence of a radically different system. Such a system aim to ensure that the quality of the landscape is not an incidental by-product of agriculture but a major objective of sustainable land management having equal status to food production. The integration of these different interests would make a significant contribution towards economic prosperity, public appreciation and a healthy landscape. The value of the landscape as a fundamental social, economic and environmental resource is inestimable. Its sustainable management is important for future generations. Its value suggests that it should be treated as a whole and that the 'ordinary countryside', as well as those areas protected for their international or national

landscape or wildlife importance, should be well managed, carefully conserved and treated as environmentally sensitive (Christiana O., Oluwole O., 2023 and Dudley 2008).

2.4.1.6. PROBLEMS OF LANDSCAPE PLANNING AND MANAGEMENT

In practice, Landscape Planning and Management face the following concrete problems:

• Insufficient understanding of environmental interrelationships;

• Prevailing attitude that environmental planning is restrictive and hinders (industrial) progress, which discourages the acceptance of environmental goals;

• Local lobbies rarely promote environmental regulations that would be implemented in their districts;

• The rejection of environmental planning objectives due to the lack of stakeholder involvement in the planning process;

• Decisions about environmental issues must be made, although there is no opportunity or intention to comprehend the necessary, comprehensive information;

• The plan is already out of date soon after it has been adopted because the planning process has stretched over a long period of time;

• Often those responsible for implementing the plan are not involved in the environmental planning process and, therefore, do not identify with the plan, its content or success;

• Environmental planning usually does not consider the evaluation of the successfulness of a project;

• predicting future environmental changes are often very speculative due to the complexity of environmental issues (Moira L. Zellner, 2023 and Von Haaren, 2002).

2.4.2 LANDSCAPE PLANNING IN IBADAN.

Ibadan Gardens: The two prominent gardens that is, Zoological Garden and the Botanical Garden (called Agodi Gardens) are attractive spots hubs that most visitors to the city of Ibadan patronize regularly. Today the two gardens and Trans Amusement Park are fast becoming the tourist attraction centres in the city of Ibadan (Christiana O., Oluwole O., 2023).

Prior to the colonial days and the interest of the colonialists to enhance the livability of Nigerian indigenous cities, very little was probably known about open recreational resource. It may be assumed that because open space is conceptualized in people‟s mind as a „free space for all‟ and the fact that it has less demand threshold when compared with other land uses in the urban centers, therefore little or no attention has been given to its further development. This problem may have held down the advancement of open recreational resources usage and planning. Akin

to this is the paucity of researchers and planning advocacy of open recreational space in African context. The consequences of this as we now crave for international or world best practice, are obvious in the several unmet expectations such as the environmental aspect of the Millennium Development Goals (MDGs) or prescribed planning standard of "one acre of land space per 100 population" prescription for open recreational space planning (Dixon, 2008). Many aspects of open recreational space planning and development are yet to be given a proper treatment in nearly all Nigerian cities. Although pockets of open recreational space (ORS) uses abound in both the traditional and modern cities, however, issues of standard setting, provision enhancement and data management are a mirage, and far from meeting the desired acceptable standard. Evidently, most of the challenges observed have their attendant consequences and these are reflected in the poor uses (distinct abuse) to which Nigerian urban landscapes are being subjected to, such as outright conversion to illegal or unplanned uses, children turning neighbourhood streets to recreational playgrounds are common phenomenon in many Nigerian urban centre (Christiana O., Oluwole O., 2023).

Many researchers like Obateru, (1981), Okewole, (1998) and Tomori, (2010) for instance lamented on the shortage of open recreational space land use in Ibadan city. The severity of recreational facilities provision gap in the city for a long time can make one to describe Ibadan as a city that needs an urgent planning attention. According to Obateru (1981), ideally Ibadan should have at least 500 children playgrounds, 125 neighbourhood parks 31 district parks and 10 city parks." However, investigation revealed a gross inadequacy in all the required facilities. In the light of this fact coupled with realities of the modern era recreational demand, the researcher has considered an investigation into the city prevailing open recreational space system and the probable challenges confronting the system.

Aside the inadequate recreational planning agencies / policy framework and the consistent pressure of urbanization which in effect, has led to the incessant distortion of open space and biodiversity resources that are often perpetuated by profiteers who often create a constant tendency to encroach into public open space that should serve the recreational need of the city populace. Against the backdrop of the observed inappropriateness of Ibadan city's open recreational space engagement (in terms of planning and usage) and the present human interference in open space resources harmonization, this research is set to investigate the prevailing usage and provision of open recreational space in the city. The intention is to proffer good planning by: i. redirection of policy on land use planning and particularly the recreation and open space planning; ii. alignment of Ibadan city planning along the path of sustainability

and world best practice; iii. rehabilitation and adequate integration of existing traditional values system into the current land use utilization, especially in the areas of leisure, recreation and tourism; and iv. managing urbanization effect in order to check the consequences of negative spill over impact on the city population and the natural environment.

2.5.0. CONCEPTUAL FRAMEWORK

The challenge of assessing Landscape planning has been addressed in many studies (Paracchini et al., 2009, Verburg et al., 2008). Landscaping, be it planning or architecture works together to create what is called a center of attraction today. The term landscape clearly focuses upon the visual properties or characteristics of the environment, these include natural and man-made elements and physical and biological resources which could be identified visually; thus non-visual biological functions, cultural/historical values, wildlife and endangered species, wilderness value, opportunities for recreation activities and a large array of tastes, smells and feelings are not. Landscape can be clearly divided into two (2) aspects:

i. Natural landscape which is a combination of living and non-living organism and one can't do without the other.
ii. Wilderness which is a landscape that has no or little impact of living man activities, it is still refers to as fresh landscape (Falade and Oduwaye 1998).

According to Chen Gong et al, (2023), the categorization above, Landscape can be further classified into various types base on the shape, form and functions they took after and supply like Cultural Landscape, Agricultural Landscape, Industrial Landscape and so on. Landscape planning is very wide and that why it is the foundation of all project and not ending there but properly monitored and review. Understanding how landscape changes, affects people's appreciation, health and well-being which is high on the political agenda. Many studies have addressed landscape preferences, identifying key aspects and elements of the visual landscape important for people's appreciation. Information about these characteristics of landscapes has then been used as bases for indicator frameworks and tools for planning and policy which are being applied in monitoring and assessment of landscapes, as well as support in decision-making (Chen Gong et al, 2023, Botequilha Leitão, Miller, Ahern, and McGarigal, 2006).

Through exploring the conceptual common ground between landscape aesthetics and other landscape qualities, indicator frameworks can provide a starting point for landscape assessment encompassing multiple landscape qualities (Filipa G., José A., Miguel A., et al, 2023, Ode, Fry, Tveit, and Miller, 2009). However, such frameworks have been developed primarily in rural

contexts, and as the majority of the population are living in urban areas, there is a need to expand and develop these frameworks to be relevant for assessment of urban landscapes. The expanded frameworks include different urban landscapes, with varying degrees of green cover, although focusing on the urban green structure. These include urban green structure, residential neighborhoods, streetscapes, historical and modern townscapes as well as zones surrounding buildings such as corporate campus or hospital grounds. Urban green structure ranges from pocket parks and other small and large parks, gardens and greenery in residential areas to greenways including riverine vegetation and urban woodlands (Filipa G., José A., Miguel A., et al, 2023 and Ode, Tveitand Fry, 2008).

2.5.1. AESTHETIC THEORY

Tveit and Ode Sang, (2014) provide a concept framework based on a literature review of landscape aesthetic theory and identify nine (9) key concepts describing landscape. These nine (9) concepts helps identify the condition of landscape in an area, the types of landscape in the area and measures needed in such areas after thorough Strategic Environmental Impact Assessment Research and study of them.

a. Naturalness

Most of the papers in the review identify naturalness as an important characteristic that urban green space contributes with in a metropolitan area and the concept is identified as a strong contributor to preference as well as health benefits (Chen Gong et al, 2023, Ellis, Lee, and Kweon, 2006). It's a concept that is identified for a wide range of green spaces including urban sidewalks (Lee, Jang, Wang, and Namgung, 2009) and streetscapes (Todorova, Asakawa, and Aikoh, 2004). A main defining aspect is the presence of vegetation which makes a contrast to the surrounding built up area. Several Strategic Environmental Impact Assessment Researchers address to what degree urban green space could be described as wild or wilderness (Caspersen and Olafsson, 2010). Others address naturalness in relation to park styles, e.g. naturalistic style in contrast to a more formal or manicured type of urban green space. An important element of naturalness is natural vegetation (Kil, Stein, Holland, and Anderson, 2012), species richness (Dallimer et al., 2012), tree and shrub coverage (Ellis Lee, and Kweon, 2006; structure and presence of Heyman, 2012), but also the lack of human activity (Schaumann and Salisbury, 1998). Another important aspect of naturalness is the ass (wildlife Gobsterand Westphal, 2004; Kil et al., 2012 and the richness of different type of habitat by Dallimer et al., 2012.)

Plate 2.I8: The Yozgat Pine Grove National Park, Turkey (www.milliparklar.gov.tr).

b. Stewardship

The concept of stewardship implies that the landscape appears been well-kept (Cengiz et al., 2012), maintained (Hofmann et al., 2012), clean; looking nice (Kaplan et al., 2004). The appearance of stewardship has been found to relate to preference and particularly tranquility as well as enhancing acceptance for ecological restoration. The concept could also be seen as being associated with formal parks which includes flowerbeds and hedges, straight and manicured. A key term used in this context is artificial, as opposed to natural (Hofmann et al., 2012)

For urban green structure several different contexts are identified in relation to coherence. These include the surrounding built up environment (Voelkerand Kistemann, 2013) , the surrounding landscape (Caspersenand Olafsson, 2010; Zhang and Lin, 2011) but also the correspondence to the style of the green area (Özgünerand Kendle, 2006). Several authors stress the importance of harmony (Voelkerand Kistemann, 2013; Zhang and Lin, 2011).

c. Disturbance

Disturbance deals with what detracts from preference and is in this context not just visual but can also be noise (Voelkerand Kistemann, 2013).The concept of disturbance is often linked opposite to naturalness, where a high level of disturbance could be argued to decrease the sense of naturalness (Peckham et al., 2013). Human impact increases the impression of disturbance (Heyman, 2012; Zhang and Lin, 2011). Here it is mostly design and addition of human elements that are not fitting in the landscape context, which could include buildings and roads (Voelkerand Kistemann, 2013).

d. Visual scale

In the context of urban green structure visual scale is mostly focusing on openness and vastness as opposite to closeness (Heyman, 2012; Qureshi et al., 2010; Voelkerand Kistemann, 2013;

Vogt and Marans, 2004; Zhang and Lin, 2011). Important for preference is the sense to be in a park or forest (Van Herzeleand Wiedemann, 2003) but also to have spatially defined areas by Sullivan, 1994. Another important aspect linked to openness is visibility, relating to what degree we could see through an area (Cengiz et al., 2012), which is often related to tree and shrub density (Heyman, et al, 2011; Hofmann et al., 2012) or tree cover (Dallimer et al., 2012; Hofmann et al., 2012). Limiting the visibility are also visual obstacles such as walls, hedge, fences, gates (Folteteand Piombini, 2010). Within the urban green structure several authors stress the importance of views and specifically panoramic and scenic views (Caspersenand Olafsson, 2010; Qureshi et al., 2010). The concept of visual scale is closely linked to safety (Jorgensen et al., 2002) but also our ability to move and to recreational activity (Bjerke, Ostdahl, Thrane, and Strumse, 2006).

e. Complexity

Complexity deals with the diversity and varieties of urban forests and green space (Özgünerand Kendle, 2006; Peckham et al., 2013) often with the implication that a diversity of types provides us with places for different types of activities. Several papers highlight the importance of diversity of man-made elements (Folteteand Piombini, 2010; Zhang and Lin, 2011) as well as plant species and habitat richness (Dallimer et al., 2012; Zhang et al., 2013) in relation to preference and use. But complexity is also discussed in relation to pattern, colour, style and texture (White and Gatersleben, 2011; Zhang and Lin, 2011)

f. Historicity

Historicity is discussed as important for providing a sense of continuity as well as for sense of place and traditions (Caspersenand Olafsson, 2010; Han et al., 2011), where an opposing concept mentioned is artificiality (Hofmann et al., 2012). Several of the papers highlight the importance of historical buildings and artifacts by Kil et al., 2012; Voelkerand Kistemann, 2013 for providing an historical context for the area while old and archaic trees are seen as important for providing continuity (Peckham et al., 2013; Zhang et al., 2013).

g. Image ability

The concept of image ability focuses on the uniqueness and the sense of place, with several authors identifying it as an important contributor to preference (Voelkerand Kistemann, 2013; Zhang et al., 2013). Contributing elements in the urban green space context includes different types of garden ornaments (Qureshi et al., 2010; Zhang et al., 2013), historical elements (Kil et al., 2012), public art (Zhang and Lin, 2011). Another aspect of this concept is provision of

landmarks which helps both for orientation and making the place more memorable (Voelkerand Kistemann, 2013).

h. Ephemera

Strategic Environmental Impact Assessment seasonal change is part of urban green structure and several papers highlight this as an important aspect (Eroglu, Muderrisoglu, and Kesim, 2012; Han et al., 2011; Voelkerand Kistemann, 2013). An important aspect of Strategic Environmental Impact Assessment sonal change is the associated wildlife (Dallimer et al., 2012; Kil et al., 2012). Ephemera could also refer to other type of changes, such as those related to weather, where the effect of wind is specifically identified as important (Peckham et al., 2013; Voelkerand Kistemann, 2013).

i. Safety

Several of the reviewed papers identify safety as an important factor for landscape preference in the urban setting (Cengiz et al., 2012; Peckham et al., 2013; Qureshi et al., 2010; Voelkerand Kistemann, 2013; Zhang et al., 2013; Zhang and Lin, 2011). Some papers report a relationship between density of vegetation and visibility and feeling of safety. If the vegetation becomes too dense, it can hinder visibility and overview of potential dangers, which can induce feelings of un-safety in parks and other urban green areas (Jorgensen et al., 2002; Shroeder, 1990; Zhang et al., 2013). Also related to visibility, lighting is identified by other Strategic Environmental Impact Assessment as important for perceived safety (Herzog and Flynn-Smith, 2001; Nikunenand Korpela, 2012; Qureshi et al., 2010).

Other aspects of safety relate to the sense of care and maintenance. Sense of care and maintenance have a positive impact on perceived safety, while litter and waste, graffiti, lack of maintenance and lack of care can have a negative impact (Gobsterand Westphal, 2004; Peckham et al., 2013; Shroeder, 1990).

Apart from the above variables of assessing Landscapes, Daniel (2006) also outlines his concept and steps in assessing landscape. The relationship between these concepts and their role in the whole landscape character assessment process is presented below:

Figure 3: Overview of Landscape Assessment Process

Step 1:

Classify Landscape Character

- Landscape Character Types: Generic types occurring in different parts of the country. e.g. Limestone Pavement.

- Landscape Character Areas: Geographically specific examples of a given landscape type. e.g. The Burren Limestone Pavement.

Step 2:

Classify Landscape Values and Quality

- Landscape Values: Scenic Beauty, Relative importance, Quality, Rarity, Representativeness. e.g. The Burren is of international significance, whereas the Glen of Aherlow is of Regional significance.

Step 3:

Classify Landscape Sensitivity and Capacity

- Landscape Sensitivity: Inherent sensitivity to change of a landscape resource, including reference to visual sensitivity. e.g. The Burren is inherently sensitive to change and attracts a high number of visitors.
- Landscape Capacity: the degree to which a particular landscape can accommodate change without significant effects on its character depends on type of change being introduced. e.g. A given landscape might be capable of accommodating scattered one-off housing but not wind farms

i. Landscape Character

Landscape Character is the recognizable pattern of physical elements which makes an area distinct from other types of landscape and gives it its particular sense of place. It is the combination of geology, landform, soils, vegetation, land use, field patterns and human settlement that creates landscape character.

ii. Landscape Character Type

Landscape Character Types are distinct landscapes that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but where ever they occur they broadly share similar combinations of geology, topography, drainage patterns, vegetation, historical land use and settlement pattern. For example, drumlins and mountain moorlands are recognizable and distinct landscape character types.

iii. Landscape Character Areas

Landscape Character Areas are unique, geographically-specific examples of a particular landscape type. Each has its own individual character and identity, even though it shares the same genetic characteristics with other areas of the same type. This distinction is reflected in the naming of such areas. Landscape character types have generic names, but landscape character areas take on the names of specific places. Example might be the south Leitrimdrumlins and the Wicklow mountain moorlands.

iv. Landscape Value

Landscape Value is concerned with the relative importance that is attached to different landscapes. Highly valued landscapes may be recognized through designation or may simply be valued locally without any formal designation. Criteria or reasons why a landscape is valued may include its landscape quality, scenic beauty, rarity or representativeness, conservation interests, wildness, tranquility and cultural or historical associations. The existence of a consensus about importance, either nationally or locally, may also be relevant. The Consultants conclude that it is the issue of Landscape Values that is of central concern to this project and will thus be the focus of much of this report.

v. Landscape Quality

Landscape Quality (or condition) is based on judgments made about the physical state of the landscape and about its intactness, from visual, functional and ecological perspectives. It also reflects the state of repair of individual features and elements which make up the character in any one place. An example of a high and low quality landscape is depicted in Figure below:

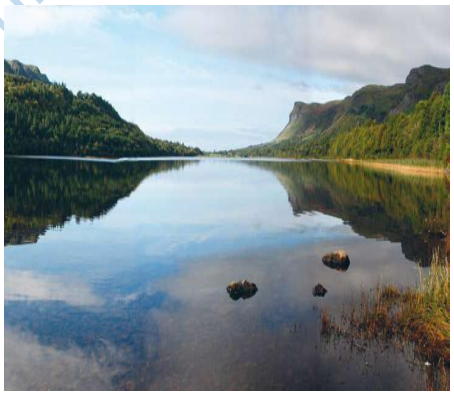


Plate 2.19: High quality Lakeland landscape compared to low quality landscape with quarrying and abandonment of farmland.
(Daniel, 2006).

vi. Landscape Sensitivity

Landscape Sensitivity refers to the inherent sensitivity to change of the landscape resource, in terms of both its character as a whole and its individual elements as well as the visual sensitivity of the landscape in terms of views, visibility, number and nature of viewers and scope to mitigate visual impact. Landscape sensitivity is usually classified in relation to a specific development type.

vii. Landscape Capacity

Landscape Capacity refers to the degree to which a particular landscape is able to accommodate change without significant effects on its character, or overall change of character. Capacity is likely to vary according to the type and nature of change being proposed. It should reflect the inherent sensitivity of the landscape itself, its sensitivity to the particular type of development in question, and the values attached to the landscape or elements within it. The capacity of different landscapes to accommodate change through, for example, the introduction of wind farms can be explored through the use of photomontages. Landscape capacity is normally assessed by firstly examining the inherent sensitivity of the landscape itself, but more specifically its sensitivity to the particular type of development in question. This means that capacity will reflect both the sensitivity of the landscape resource as well as the value attached to the landscape or to specific elements in it.

viii. Forces of Change

This is a description of natural or land management trends that may affect the landscape character of an area. These issues are identified by information gathered during the Landscape Planning assessment process, including knowledge gained through stakeholder participation.

ix. Historic Landscape Character and Historic Landscape Assessment

There are two approaches are used in the UK to record areas with historic landscape character; Historic Landscape Character which is used in England and Historic Landscape Assessment which is used in Scotland. Historic Landscape Character helps to explain how the combination of natural factors and human activity that have influenced the present-day landscape. The difference between Historic Landscape Character and Landscape Planning assessment process is that the former is based mainly on types rather than on the discrete heterogeneous areas that form Landscape Planning assessment's main output. Historic Landscape Assessment tends to work at a finer grain than Landscape Planning assessment.

The findings of historic landscape character are typically incorporated into character area descriptions. Historic Landscape Character is therefore complimentary to the Landscape Planning assessment process (Daniel 2006).

2.5.2. GIS IN LANDSCAPE PLANNING

Astrid, Mara-Magdalena, (2023) and Matthias, (2012) talks about the use of Geographical Information System Information (GIS) technologies especially on the fact that it helps to improve the landscape planning process as a concept, used inform of a tool to capture the data in existing area to provide information systems for future use or as part of environmental information or decision support systems (Gontier et al., 2007). Geographical Information System Information (GIS) can be used in the different working steps of the landscape planning process. At the beginning data capturing in all planning tasks is necessary. This can be done by fieldwork, using existing thematic datasets (e.g. via Web Services) or by converting from existing databases or other monitoring systems (e.g. remote sensing). Checking the data quality is one of the most important tasks in the first step, to appreciate the necessity of data conversion, field work or usability of the existing material. After analyzing the existing situation for the defined scope, the evaluation of potential of development, environmental functions, ecosystem services, scenic qualities, conflicts, previous and future impacts must be evaluated.

Methods and tools analyzing datasets in different formats (raster and vector) or scales like spatial (resolution, grain, 2D, 3D) and temporal (historic, present, future conditions) are available. Some of them can be used for different purposes (e.g. evaluation, scenario and planning objectives) or they are only comfortable for a specific level or topic. Afterwards in landscape planning (e.g. local level) a guided vision or alternative futures should be planned and discussed (BfN, 2002; von Haaren, 2004). Monitoring of the landscape transformation must be done to

check if it is really doing what it is expected to do (Opdam et al., 2002). Information management and a basic standardization are necessary to make sure that the life cycle works and, in all work, steps the right information in the right quality is available (Heinsand Pietsch, 2010; Schauerte-Lücke, 2008; Opdam et al., 2002).

a. Data capturing

Nowadays mobile devices are used for data capturing using Global Navigation Satellite Systems (GNSS) in a standardized and formalized way (Astrid, Mara-Magdalena, 2023 and Dangermond, 2009; Brandt, 2007) to reduce effort in data conversion to implement and use the results in the planning process. They are used e.g. to create tree cadaster (Pietsch, 2007; Brandt, 2007; Galk-DST, 2006), to collect species presence datasets (Dangermond, 2009), to reduce time and costs capturing land use types or habitats and for monitoring (e.g. checking mitigation measures). Images with coordinates are stored and some cameras and applications are able to analyze the viewing direction automatically. Using techniques like that enable the planner to create automatically documentations based on the existing images to present them e.g. online via Google Earth or to use them in the planning process (e.g. visualization, sketches, participation).

b. Data Analyzing

In the landscape planning process, landscape functions like regulation, carrier, production and information functions must be analyzed (Von Haaren, 2004; Lang and Blaschke, 2007). For nature conservation the regulation function is the most relevant (Weiers et al., 2004). Therefore, landscape ecology defined as a problem-oriented science can provide methods for the different planning steps. But to optimize the knowledge-transfer between landscape ecology and spatial planning landscape ecology must co-evolve i.e. in decision-making on future landscapes, landscape planners, landscape managers and politicians are involved in a cycling process (Opdam et al., 2002). That means that different models and methods are needed to integrate science in the planning process (Astrid, Mara-Magdalena, 2023, Blaschke, 1997; Lang and Blaschke, 2007; Schwarz-v. Raumerand Stokman, 2011).

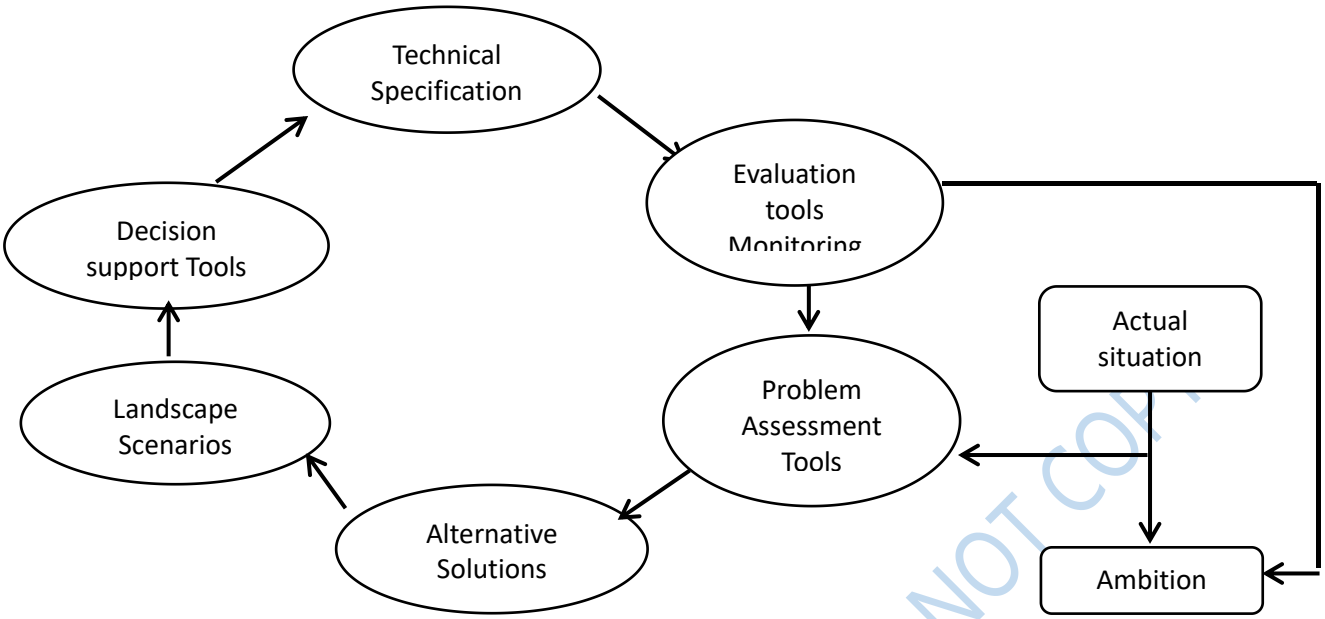


Figure 2.2: Planning Circle
(Harms et al., 1993).

c. Participation

The results of the landscape planning process are planned objectives or planned measures to be implemented into town and country planning, sectorial plans or executed by executive agencies. (e.g public institutions, conservation authorities, private individuals) (BfN, 2002; Riedel and Lange, 2001). Therefore, landscape planning must be extended from an expert planning to a process-oriented planning where the participation process is one of the most important topics (Steinitz, 2010; von Haaren, 2004; Wissen, 2009). Based on the communication model of Norbert Wiener (Steinitz, 2010) the process has three elements:

- The message,
- The medium and
- The meaning in landscape planning which that means that the planner has a vision (a plan), the landscape is the medium and the viewer (public, stakeholder etc.) gains an impression of the changed landscape.

In existing planning processes,the communication start by the designer and ends by the viewer. But there must be a two-way alternate communication between the designer and the viewer to improve the results and the acceptance (Wissen 2009; Steinitz 2010) Communication and information are the basic elements of participation (Warren- Kretzschmarand Tiedtke, 2005; Wissen, 2009). The advantages of computer-generated visualizations (plans, photomontages, 2D

visualizations, 3D visualizations, real-time visualizations) in decision-making processes have been recognized for a long period by Warren-Kretzschmarand Tiedtke 2005; Wissen 2009. There are a lot of different media or visualization techniques that can be used for citizen participation. For non-experts it's often difficult to understand the planning ideas. On the other side it's necessary for the planner to express and communicate his thoughts in order to promote more sensitive landscape managing (Buhmann et al. 2010).

The implementation and adoption of these concepts as tools and planning models has worked well and yield result and also should be used in Nigeria landscape planning which lack physical assessment and shows the lack and unsatisfactory quality of open spaces Ibadan inclusive. One important need in many urban areas in Nigeria today is availability of open space to balance the seemingly over-built environment as stated (Matsuka, 2008) public open space is an important aspect of an urban environment. Although some exist in few capital cities, and are still lacking in many, while some are being lost gradually as a result of lack of care, management and not even knowing such problems exist (Ayeni, 2012).

2.5.3 IN EXTENSION: PROBLEMS OF MANAGING OPEN SPACES

i. Conversion and misuse of open spaces

There is an increased demand of land from the public for the various human activities. This has led to open spaces being misused by being converted illegally for other uses like refuse dumps, corner shops, mechanic workshops, residential buildings, squatter homes and other uses other than that which it was initially developed for, (Alabi, 2010, Ayatamuno,2010). It could become a security problem to people around such open spaces as criminals and wild animals perceive it to be a hideout.

ii. Lack of coordination

The inadequate coordination of physical planning activities within cities has resulted in the unpleasant and unattractive quality of open spaces. There is lack of harmony in carrying out their individual and cooperate task in planning, development and protection.

iii. Urbanization

There is an increase in the demand for higher levels of development by urbanization in developing countries like Nigeria. This has sponsored to a large extent the ineffective use of open spaces (Daramola and Ibem 2010).

iv. Illegal development

Majority of the private developers are involved in illegal development of their buildings. They build without relevant approval from authority and hardly measure up to the stipulated statutory regulations while developing their lands. This has defeated the management plan, design and landscaping (Arigbola 2008, Aluko, 2011).

v. Poor Organization

Most Nigerian cities are poorly organized in terms of physical planning and, hence, characterized by inadequate open spaces. The available ones have been over-taken by un-organized and haphazard planning resulting from weak development control (Olotuah and Babadoye, 2009).

2.6.0 ZOOSCAPE ECOLOGY: A CONCEPTUAL ANALYSIS OF ZOOS AND GREEN SPACES IN THE URBAN LANDSCAPE

Zoos as a unit: According to Ingrid V., Luca B., Davide A., et al, 2023, green spaces in the urban landscape America's earliest zoos developed closely alongside the first major cities. The Philadelphia Zoo, traditionally considered America's first zoo, opened in 1874 after the American Civil War delayed the establishment of a facility envisioned by a local zoological society founded in 1859 (Kisling 2000). These first zoos were often created in tandem with the American Urban Parks Movement in the early 1900s by Henson 2018. Many zoos were even initially managed by cities' park departments (Braverman 2012). The famed American landscape architect Frederick Olmsted, known best for his co-design of New York City's Central Park, was one of the giants of this movement and was even involved in the design of several major zoos by Hanson 2002. Thomas Jeferson had earlier advocated for the park movement's core concept of pastoral utopianism, leading to the idea that life in the city represented some kind of moral hazard to people, and that the consumption of a manicured, tamed nature was necessary in order to counteract those harms (Baratay 2002). To achieve this, the proper kind of nature had to be curated in these urban parks and in zoos. Ideally, these parks would provide a delicate taste of a romanticized nature, one that would be safe enough to explore but still beautiful enough to make it worth enjoying (Uddin 2015). In these early pastoral zoos, animals were organized in a very clear fashion in large typically single-species exhibits where the animal didn't overwhelm the visitor's view of the greenery (Hanson 2002). Animals were to ft within the scene, but not dominate the image as a centerpiece (Uddin 2015). The controversial founding director William T. Hornaday of the Bronx Zoo was very particular in what he allowed in his zoo. Animals were to be presented as a perfect picture, with realistic social groups and painted backgrounds.

Hornaday even prohibited guest photography to ensure that the only public photos of his zoo would be carefully curated (Hanson 2002). Zoos have long considered themselves through the lens of a landscape, albeit a highly contrived and artificial one by Figure 2.3

Figure 2.3: Landscape, albeit a highly contrived and artificial
(Hanson 2002)

The zoo landscape is designed for people, but for much of their history zoos have been exclusionary institutions. Some of the first formal Western zoos, such as the London Zoo, began as expensive entertainment-focused member-only institutions (Ingrid V., Luca B., Davide A., et al, 2023 and Rothfels 2002). This stockholder-based zoo structure quickly fell out of favor when several institutions adhering to the model, such as the Rome Zoo, went bankrupt in the late 1800s and early 1900s (Baratay 2002). As the middle class grew in affluence, they suddenly had the time and wealth necessary to attend expanding zoological institutions, choosing to imitate the promenade of aristocrats at the zoo rather than attend the theater, an act that was considered morally degradative (Baratay 2002; Hanson 2002). Hornaday considered the Italian immigrants who collected firewood in the woods around the Bronx Zoo to be delinquents and carried a pistol with him at all times as a result (Bender 2016). While Hornaday actively killed and

collected avian specimens himself, he considered immigrants who hunted native song-birds for food to be less than human and called the police in to shoot at them (Uddin 2015). Hornaday actively fought against a disordered zoo landscape. During one day of Hornaday's war against littering visitors, 126 visiting men, women, and children were arrested (Bender 2016). While segregation was present at many zoos, zoos were typically less segregated than many other urban institutions (Levy 1992; Baratay 2002; Wells 2018). Still, the racist views of their leaders were clearly visible in messaging about biological European superiority or their colonial conservation approaches. One of the most visible of these instances was the brief exhibition of Ota Benga, a young Congolese Pygmy tribesman at the Bronx Zoo in 1906 (Howard 2018). Despite this lack of a warm welcome, many minorities flocked to the zoo given few alternative sites for recreation. For decades until the 1960s, African Americans would come to roll eggs on Easter Sunday in the National Zoo because black children were excluded from the event at the White House (Baratay 2002). Zoos are mirrors of society, including collective views toward not only animals but also groups of people. As a result, zoos have actively engaged with and contributed to racist historical frameworks of science and conservation. Simultaneously, they have been an important restorative landscape for city-dwelling humans for decades. By equitably considering all community members in urban landscapes through inclusive frameworks such as landscape ecology, zoos may be better able to disentangle themselves from their colonial past for a more inclusive future.

2.6.1 BENEFIT OF ZOOS IN CREATING A BUILDING SUSTAINABLE ENVIRONMENT.

According to Ingrid V., Luca B., Davide A., et al, (2023), today's zoos are increasingly recognized for the value they pose to native species and human visitors as a reservoir of natural surroundings in urban settings. One recent study demonstrated the value of zoos as habitat for small mammal species (Elwell et al. 2021). The authors suggested that because zoos often are located in cities but not immediately adjacent to residential areas and additionally utilize barriers such as perimeter fencing, zoos indirectly may have smaller local populations of feral cats than that of the surrounding area by (Elwell et al. 2021). This suggests that zoos act as valuable urban green spaces for native small mammals. Small mammals are not the only species to benefit from zoos, however. Zoos, with their generally significant amount of horticulture, shelter, and perennial water sources also act as stopover sites for the migration of many species of birds by Totha 2019. The Phoenix Zoo was even the site of the first known sighting of a Trumpeter Swan

in the Phoenix Metro area in 2018 by 12 News 2018. India's Delhi Zoo has long acted as a crucial nesting ground for hundreds of wild, near-threatened Painted Storks, and one study even used the site to research the species' reproductive behavior and threats (Meganathan and Urf 2009). Though currently underutilized, it is possible that many zoos around the world offer similar study sites for species of conservation interest.

Through cultural ecosystem services, even human beings benefit from the green space provided by zoos. Journalist Richard Louv has coined the term "nature deficit disorder," a theoretical ailment in many children today those results from a substantial disconnection from nature due to Americans' increasingly urban and technological lifestyles (Louv 2006). Studies have found that visits to the zoo can be beneficial for young children in terms of educational and moral outcomes (Fraser and Switzer 2021), though these kinds of claims often are debated (Kahn et al. 2008; Marris 2021). Some zoos have found very simple natural elements to be an especially charming part of the zoo experience. Constructed with the surplus dirt from a publicly funded excavation project in the 1930s, "Monkey Hill" at the Audubon Zoo in New Orleans, has long been—albeit somewhat falsely— credited as the tallest point in the famously low-lying city, standing a meager 26 feet above sea level by Campanella 2014. Nearly a hundred years later, the children of New Orleans continue to find endless joy log-rolling down the hill, one of the few points of geographic elevation in the region by Campanella 2014. Sometimes, very simple elements of heterogeneity, such as relatively minor differences in plant density or elevation can make a world of difference for people's connection to the natural world.

2.6.2 WITHIN THE ZOO: APPLICATION OF LANDSCAPE ECOLOGY SYSTEM IN CREATING EXHIBITS SPACES.

The principles of zoo exhibit design have also changed drastically over the decades, with notable developments in the 1970s and 1980s, allowing one to draw some fascinating parallels with the history of landscape ecology. Today, landscape ecologists are continuing to study the impact of spatial planning and landscape design in order to create more sustainable landscape arrangements and uses (Milovanović et al. 2020; Hersperger et al. 2021). During the foundational period of modern landscape ecology signified by the 1983 Allerton Park Workshop (Wiens 2008), zoo exhibits were similarly developing towards a spatially aware ecological mindset. By the 1980s, American zoos began recognizing the interconnections between humans and nature and represented that through exhibit messaging (Uddin 2015). At the same time, zoos faced increasing scrutiny about animal welfare by Jamieson 1985. Zoos suddenly realized the

need for change within the institution, and began developing more meaningful and effective conservation programs, though the measures for success in this area still often lack consensus. Zoos could no longer stand on the sidelines, claiming to act as "Noah's Ark" by protecting species from the storm of species extinction; the world was changing too quickly and the Zoo Ark did not have the space necessary to protect all the creatures facing destruction (Keulartz 2015). All zoos could do was buy threatened species some extra time (Conway 2011). Zoos had to improve the care of their animals while also creating meaningful change to support species in the wild.

One meaningful innovation that helped address both of these issues was the new zoo exhibit design approach called "landscape immersion" (Hyson 2000). Seattle's Woodland Park Zoo pioneered this approach during its redesign in the late 1970s while under the directorship of David Hancocks, a zoo architect. These exhibits were a drastic change from the harshly modern, cement-forward, barred exhibits of the mid-twentieth century (Hancocks 2001). Such former "sanitary modernism" style exhibits sought to meet animals' needs without any natural features; they were bare, quick to hose down, and often placed the viewer far above the animal (Hyson 2000). Landscape immersion built in the reverse by seeking to achieve necessary biological functionality through natural forms; this school of thought contended that the best way to meet every known and unknown need of an animal was to make as accurate of a recreation of their natural habitat as possible (Braverman 2012). Consequently, landscape immersion exhibits were lushly planted and placed the animals at or above visitor eye level (Hanson 2002). Defining the term in 1975, leading zoo architect John Coe explained that a landscape immersion exhibit places the animal in the context of nature, rather than the context of architecture, and that it makes the visitor feel part of nature rather than an outside observer of it (Braverman 2012). The approach quickly became the standard for new exhibits built at American zoos in the 1980s (Hanson 2002). The rapidly growing field of ecology inspired not only landscape ecology, but also landscape immersion. The value of ecosystems was suddenly blatantly obvious, and the former architectural styles that ignored such benefits were quickly replaced by new designs that included more meaningful natural features.

Landscape immersion style exhibits provide a very direct way to consider the landscape ecology of zoo exhibits. All landscapes are made up of patches and corridors within a particular matrix (Forman and Godron 1981). Why should zoo landscapes be any different? When architects Jones and Jones were in the design process for the first major landscape immersion exhibit in America at Woodland Park Zoo, they measured tiny differences in environmental conditions at the site in

order to map out microclimates (Hancocks 2001). Minor heterogeneity matters greatly when considering the scale of a zoo exhibit, which is typically much smaller than an animal's natural range. There are some unique factors present in zoos that create patch types we might not expect to find in other landscapes. One is the element of public viewing. Individual animals are differentially affected by this presence, leading to preferences in different areas throughout an exhibit. One study measured the favored spaces for individual okapi within an exhibit, and the factors that influenced those choices (Troxell-Smith et al. 2017). Another fascinating element is that of multispecies exhibits. In the wild, animals would be able to move away from one another easily enough to find private spaces or food sources only accessible to them. Even in large, enclosed areas, this is less feasible. One way that zoos get around this is by creating species-specific barriers. Like a backyard bird feeder targeting finches as opposed to pigeons through careful perch and dispenser design, zoos create food containers that ensure only the target species can access them. In the same vein, zoos will establish barriers that only smaller or more nimble species can navigate, thus ensuring that gazelle have a space they do not have to share with giraffe, for example. Thus, even the areas that animal species are found within a zoo exhibit can take the form of small discrete patches as opposed to the large gradients we might expect in nature.

Some zoos have now even begun to experiment with the use of habitat corridors as exhibits. The Philadelphia Zoo, given its central urban location and small size, has had to become creative as it's worked to improve its exhibits. Their solution: Zoo 360, a collection of mazelike passages that allow a wide number of animal species to move around the zoo for different sights, smells, and experiences by Philadelphia Zoo 2016. The trails have been continuing to expand since the first set opened in 2011: now lemurs and monkeys have access to a treetop trail and tower, great apes have a climbing path, big cats have an overhead passageway, and gorillas have an elevated walkway (Philadelphia Zoo 2016). Opened in 2014, the Indianapolis Zoo's Simon Skjodt International Orangutan Center includes a network of massive cables suspended 80 feet in the air that the great apes climb in order to visit a number of satellite areas (Beard 2014). In so doing, the zoo has utilized vertical space and corridors to maximize animal welfare by giving the animals the opportunity to choose who they spend their time with and where in the complex they prefer to reside (Beard 2014). This represents the unique spatial configuration of zoo landscapes.

For many species, the ability to travel longer distances than what is typically possible in a traditional exhibit can be a medical necessity. Captive elephants in particular can suffer from major infections in their feet if they are not walking around enough and fail to receive the proper

maintenance to support their foot health (Mehren 2003). To combat this, some new elephant exhibits have provided pathways for elephants to explore and thus increase their walking distance. When the National Zoo reopened their renovated elephant exhibit in 2013, it included a one third of a mile uphill walking trail for the elephants to use to exercise and explore a different part of the zoo (Associated Press 2013). Corridors can drastically change the behavior and opportunities for many species; by thinking more about the social and ecological interconnections between animal individuals and species, zoos may be able to further expand the use of these structures in zoo exhibits.

Patches and corridors also shape visitors' experience of a zoo. As discussed, recreation areas within a zoo represent an important opportunity for people to connect with their local environment. Patches of parking lots, food venues, and animal exhibits are all connected through public pathways. As they go along, families collectively decide their path through the zoo that day. The exploratory space within a zoo offers valuable opportunities for individuals to connect with one another as groups make shared meaning through their interactions with wild animals (Clayton et al. 2009). Paths are also useful dividing tools for the sake of managing foot traffic. Careful path design allows visitors to have a more personal experience with the animals. Zoos hope that this these shared and private moments with wildness inspire visitors to act for biodiversity and sustainability.

So far, we've seen how zoos have embodied the concepts of patches and corridors, but what about matrices? Depending on the scale of concern, we could consider zoos as green space patches in a matrix of urban centers, or we could see zoo exhibits as wild patches within a matrix of public recreation space. Some zoos even blur the line between where we end and where wildlife begins. In any case, landscape ecology can contribute to a conversation about diversifying the types of patches, corridors, and matrices in zoos. What might it look like for a zoo where the matrix is wild space, and only the patches and corridors are areas and paths for people to move around in? Safari parks, which appeared in America in the second half of the twentieth century, give us some idea of what an 'inverted cage' might look like (Baratay 2002; Bender 2016). Some other facilities, such as the Arizona-Sonora Desert Museum outside of Tucson, has used traditional zoo techniques with a beautiful backdrop with great success. By controlling sightlines, minimizing the visible barriers between visitors and animals, and by incorporating exhibit infrastructure seamlessly into the beautiful desert surroundings, the Desert Museum makes it easy to suspend disbelief to a whole new degree, and actually leaves visitors startled when they suddenly find themselves face to face with a coyote (Grazian 2015). Granted,

this same effect will likely be more difficult to achieve in zoos located directly within cities, but perhaps it is still possible. More work needs to be done as we strive to create these wild spaces in city centers where they can be more easily accessed by the growing numbers of urban families.

2.6.3. ZOOS AS A RESILIENT ESTABLISHMENT: PAN SITU APPROACH AND ONE HEALTH

Zoos may be able to model sustainable means through which people and animals can safely coexist in the Anthropocene, even as habitat loss, climate change, and pandemics prove to be existential threats to our way of life. As we begin to understand the full complicated impact of habitat fragmentation on biodiversity, it's important for us to take measures to reinforce natural systems against new anthropogenic disturbances (Joshua J. Cousins, 2023 and Wilson et al. 2016). Zoos may have some valuable approaches that have yet to be fully utilized.

Researchers are recognizing the potential catastrophes of isolated populations. Metapopulation ecology provides a means to examine the degree of interaction between two or more distinct populations (Van Nouhuys 2016). Landscape genetics takes things one step further to understand how landscape structure interacts with population genetics and evolutionary change (Holderegger and Wagner 2006). Zoo animals, simply labelled as ex situ populations, have long been ignored in the discussion of fragmented wild in situ populations. Yet, in a growing number of cases, zoo populations may amount to a large portion, if not the entire population, of a threatened species (Mendelson 2018). There is a need to re-integrate zoos' captive populations within the conversation of metapopulation management in what have some have termed a "pan-situ" approach (Minteer and Collins 2013). There is no denying that zoo animals are an isolated metapopulation, however, in an increasingly fragmented world, wild populations are also becoming similarly limited. In such a situation, re-integrating zoo populations with wild ones through re-introduction, head-starting, and cross-fostering programs may not only supplement the continued recovery of threatened species, but it may also provide the high genetic few necessary for species to adapt to the dynamic environment of the Anthropocene (Scharis and Amundin 2015). The Association of Zoos and Aquariums' by AZA Species Survival Program by SSP for Mexican Wolves recently partnered with the United States Fish and Wildlife Service by USFWS in order to cross-foster twenty captive-born Mexican wolf pups into several wild packs in Arizona and New Mexico (Arizona Game and Fish Department 2020). By more effectively integrating captive zoo populations into wildlife management, zoos can become a genetic reservoir for wild populations. Instead of culling a particularly problematic wild animal that

cannot be effectively relocated, perhaps wildlife managers can place the animal in an accredited zoo or wildlife center. There, that animal can be included in a breeding program that aims to release their offspring, ensuring that its genes can still support the species' survival in the wild. Working with the World Association of Zoos and Aquariums and the IUCN Red List, the Conservation Planning Specialist Group is seeking to make these kinds of comprehensive conservation efforts, which they term the "One Plan Approach," more widespread (Joshua J. Cousins, 2023 and Byers et al. 2013). Several endangered species, including the golden lion tamarin, have already benefited from this novel approach. Through creative and innovative partnerships, zoos can help conservationists preserve genetic diversity in wild populations even as human disruption to their habitat increases.

Zoos have long had to navigate animal health using longstanding common practices such as quarantines for animals arriving from different facilities and continents (Hanson 2002; Bender 2016). Great ape exhibits started to implement glass rather than open air bars in large part due to a growing understanding of the possibility of humans passing minor ailments that became virulent diseases in captive apes (Baratay 2002; Braverman 2012). This virological awareness in zoos has only grown as zoo veterinarians have incorporated a growing number of responsibilities, often becoming population managers, wildlife rehabilitators, and reintroduction specialists (Braverman 2021). Some American zoos are now even part of a Center for Disease Control by CDC sponsored program where they report any cases of West Nile virus in their bird collections. Wild birds can be expensive to monitor due to the challenge of permitting and capture while zoos regularly carry out bloodwork and examinations on their avian collections. In open air aviaries, wild birds infected with the virus can easily pass it to zoo birds. Through this monitoring network, zoos act as sentinels for local outbreaks of West Nile (Nolen 2003).

Zoos have begun to embrace the One Health concept, best described as the growing understanding that wildlife health is directly related to human public health (Braverman 2021; Sulzner et al. 2021). The One Health concept is closely related to landscape connectivity and landscape epidemiology in particular (Meentemeyer et al. 2012). Given their unique operational practices providing frequent interspecies interaction, zoos not only have the space to develop and test transdisciplinary One Health solutions, but they also have an audience that can be educated regarding the epidemiological impacts of animal–human interactions (Robinette et al. 2017). In early 2021, the AZA began the "Reduce the Risk" initiative, a joint effort between the AZA, experts in safe animal transport, and their partner, the Wildlife trafficking Alliance (Association of Zoos & Aquariums, n.d. 2021). The goals of this initiative include advocating for

new legislation by such as the Preventing Future Pandemics Act, educating the public of the dangers of the wildlife trade, and contributing to efforts to halt wildlife trafficking.

Research within the field of landscape ecology is coming to conclusions that only further encourage this public health initiative for zoos. Landscape epidemiology is emerging with a focus on the socio-ecological interactions of pathogens at a variety of scales, including the habitat conditions that put global health at risk (Cumming et al. 2015). For example, new research demonstrates that habitat fragmentation can increase the risk of future pandemics (Azevedo et al. 2020). By raising funds and public support for habitat protection, zoos can come alongside other conservation organizations, international governments, and local communities to reverse the progress of global habitat fragmentation. Other researchers in landscape ecology have recognized that pandemic risk is not only dependent on habitat fragmentation, but also the ways in which people interact with wild places and the wildlife that lives there. Bloomfeld et al. (2020) found that certain behaviors brought people to the core of fragmented habitat, such as pole cutting by from large trees that nonhuman primates often reside in along with hunting and foraging, increased the likelihood of humans encountering non-human primates. These encounters provide opportunities for zoonotic diseases to jump between the two parties, with potentially devastating impacts for both species' populations. Perhaps, through partnerships with local communities and organizations, zoos can provide the personal protective equipment and behavioral techniques necessary to reduce the risk of disease transfer when community members need to engage in these high exposure risk activities. Zoos have decades of experience establishing clear and healthy boundaries for the benefit of ourselves and wildlife. It seems like, amidst the ongoing COVID19 pandemic, it's time to include zoo managers in the conversation around practical zoonotic disease prevention measures.

One recent editorial in Landscape Ecology has noted the value of green infrastructure for societal resilience to the growing risks of climate stress and public health crises (Anna K., Kamyar H., Nora Fagerholm et al, 2023 and Pamukcu-Albers et al. 2021). They define green infrastructure as "a system of natural and artificial green spaces that provide ecological and social functions in urban areas" by Pamukcu-Albers et al. 2021. Zoos ft naturally into this network. As we discussed earlier, zoos represent an important ecological reservoir for many wild species in urban areas by Elwell et al. 2021. Zoos are also a clear social resource. They provide key opportunities for connections to wildlife that can foster action for conservation by Skibins and Powell 2013. Zoos may also be a very valuable site to understand the local and global relevancy of climate change and our actions to mitigate it (Grajal et al. 2017). As the pandemic

has shown us, outdoor green spaces provide immensely valuable spaces for safe recreation to support good mental health (Pamucku 2021). Zoos, given their primarily outdoor situation, have proven to be an especially valuable local activity amidst the COVID-19 pandemic. The Phoenix Zoo, for example, was able to reopen for regular drive-through "Cruise the Zoo" events during the peak of COVID-19 lockdowns (AZ Family 2020).

2.6.4 ONE HEALTH PRINCIPLE

The One Health principal ties together zoos' mission to serve their visitors, care for their animals, and support global conservation efforts.

Even beyond the One Health principle, zoos pose an important forum to discuss the proper relationship between humans and the natural world. The wildness of zoos is constructed and artificial, and the zoo itself is ultimately built for people (Hancocks 2001; Rothfels 2002). By embracing rather than concealing the human-ness inherent in the institution, zoos can provide a space to explore what more environmentally sustainable landscapes might look like, both in terms of our environmental ethics and geography. Zoos must bring a human-aware sustainability approach into their design and operation (Cerezo and Kapsar 2018; Norton 2018). As landscape sustainability science suggests, not all landscape patterns are equally effective at contributing to global biodiversity, ecosystem services, and human wellbeing (Wu 2021). Landscapes are complex, with unique interactions between scalar levels and often unpredictable disturbances from outside the systems (Wu 2013). As zoos create architecture and exhibits, they can model green infrastructure to a wide public audience (Anna K., Kamyar H., Nora Fagerholm et al, 2023). For example, the Cincinnati Zoo constructed their Hippopotamus exhibit by home of the famous prematurely born hippo "Fiona" with a cistern to collect 400,000 gallons of rainwater, as well as a series of advanced and natural filtration systems, for use in exhibits around the zoo. Signage in the exhibit communicates to the public how various natural components, such as tilapia fish in the hippo pool, all contribute to clean water for the hippos and human viewers to enjoy (Meek 2017). By applying landscape ecology principles, zoos can not only illustrate ecosystem function and biodiversity, but also human wellbeing and flourishing.

2.6.5 THE ZOO AS A GARDEN

Buildings, like gardens, gain their age value due to time (M. Salwa, 2014). This temporal dimension and its influences cannot be ignored in the context of preservation. Time in the concept of gardens not only represents death and decay but also the emergence and development

of new life. Time for gardens holds more meaning than deviating from the original form. The conflict between age values and present-day values is inherent to the concept of gardens compared to architectural concepts. For gardens, the age value is based on our ability to interact with earlier versions of the garden by noticing and appreciating the various changes that the plants have undergone over time. Here, the age value cuts across temporal, cultural, and natural history, as well as continuity dimensions. Gardens are thus hybrids of natural and architectural monuments.

According to Rua Alshaheen, Sarah Malek Kuwait (2023), one can see traces of zoos in almost every garden Nurseries have plastic tags that provide information about the nomenclature and cultures of plants found within the gardens. Some tags are similar in size and visibility to the actual plants, while others are larger than the plants that they represent. The predilection for labeling merges the garden with the categorization motifs seen in zoo exhibits, thus embodying scientific taxonomy. If one has been to a zoo within a city space, then it would be relatively easy to envision the zoo as a garden. Zoos have for a long time maintained that their floral displays are equal to their fauna displays with regard to their significance, exoticism, and diversity. Even those zoos with landscapes that play a more functional role, rather than an exotic one, pay attention to their floral exhibits, and they label them similarly to the attention and labelling given to the fauna exhibits. There are zoos that have dedicated entire sections to horticultural exhibits. One such zoo is the San Diego Wild Animal Park in Escondido, California.

defining a zoo as a garden is an interesting concept since animals are not usually welcome in the basic concept of gardening. Michael Pollan Rua Alshaheen, Sarah Malek Kuwait, (2023) expressed his “liberal position” on this matter in his book Second Nature. He stated, “To make a garden with insecticide, to level a rifle sight at the back of a woodchuck in flat- footed retreat, to erect an electrical barricade around a vegetable patch: such measures, I felt, were excessive, even irresponsible.” He furthered his point by claiming, “Animals had arrived long before the gardener, so who was the interloper here? And what was gardening about if not working out a more harmonious relationship with nature?” Publications on gardening are brimming with tips on how to keep away or eradicate animals, such as woodchucks, moles, gophers, and voles, from one’s garden (Rua Alshaheen, Sarah Malek Kuwait, 2023). Even pets, such as dogs and cats, are not spared. They are seen as elements that are potentially damaging to gardens due to their love of scratching and digging, which could potentially damage the plants. It is common to find gardeners keeping panther scat and coyotes as deterrents against deer. Some gardeners resort to bedecking their orchards with swaths of floral-scented bar soaps, or they encircle their trees with

fishing line. Others, including local zoos, have installed seven-foot-high deer fences, over which deer still manages to leap. It seems rather counterproductive to go to such great lengths to keep animals out of gardens, only for us to curate our gardens to attract specific species, such as hummingbirds or butterflies, back into them. We further compensate for the absence of animals in the garden by installing carvings of the very animals that we have endeavored to keep out, such as deer, toads, and rabbits. This compensation is a convenience for most gardeners, who want to enjoy the aesthetic appeal of nature but would rather avoid the consequences.

Rua Alshaheen, Sarah Malek Kuwait (2023), in a bid to foster a harmonious relationship between gardens and animals, proposed that we view the "garden as pet." He argued that, unlike farming, in which cultivation is primarily for crop production, in gardening, cultivation is primarily for grooming purposes. He likened the process of gardening to that of caring for a pet. In the same way that we enjoy having a pet due to the control that we have over it, "we value the garden because it allows us to maintain control over a piece of land, to shape it, foster it, nurture it, and even punish it, according to our feelings, ideas, and whims." Treib failed to consider the power tradeoffs that occur between pets and gardens and their owners. In the same way in which we control pets and/or gardens, they equally control us. To control our pets' diets and feeding times, we must be physically present at those times. Similarly, we must be present to control our pets' movements. It is this interdependence between pets and their owners that inspires the concept of "pet gardens." The more that we emphasize shaping the various elements within the garden, the more driven that we are to see the imperfections in our gardens, which others consider to be perfect.

Animals within zoological gardens should not be viewed as pets. However, it is important to exercise a level of control over the animals, as well as their landscapes, to provide necessary care. To protect both the humans within the zoos and the zoo animals, caging is necessary due to the latter's wild nature. Animals within the zoo are also used to entertain and evoke the curiosity and emotions of human beings. Clear structural similarities can therefore be found between gardens as zoos and gardens for horticultural undertakings. There is a need to control various aspects of gardens and create order to achieve the desired aesthetic appeal. A perennial garden maintained by a gardener may appear messy; however, it is a testament to the programmed plant organization, based on bloom color, leaf color, character, times of sprouting and budding, and height.

Modern-day zoos have moved away from imposing cages and other barred enclosures, which were common in the past, and have embraced more naturalized settings (Rua Alshaheen, Sarah

Malek Kuwait, 2023). However, animal displays within zoos still employ rather obvious subterfuges. The fulfillment of specific pedagogical desires, as well as spectatorship, is the driving force behind the taxonomical categorization of animals within the zoos. Similarities between gardens and zoos can also be drawn from the practice of eliminating individuals and species that are considered to be undesirable. For gardens to achieve their beauty, death and exclusion must occur. The only difference between the two gardens is that undesired or dead plants are often used to recycle nutrients within gardens, while undesired animals are likely to end up on sports hunting grounds, euthanized, or in lowly menageries and zoos.

Zoos, similar to gardens, are established for viewing purposes. Designs for all gardens consider the garden's vantage points, perspective, and visual experience. Views within landscape gardens offer a long and broad expanse into nature, while those within zoo spaces are tapered and direct. Zoological gardens are designed to draw visitors to every aspect of the space. In contrast, landscape gardens may offer their visitors' hidden views that act as sources of excitement upon discovery. The concepts of elusiveness and spectatorship are constantly in conflict when it comes to zoological gardens. Within the zoo, it is considered a design flaw that animals are often hiding within their enclosures. While the design of modern-day zoos is highly naturalized, in nature, animal traces are more common than actual animal sightings.

It is interesting that zoo visitors fail to stand out as the garden's dominant species. This fact is attributable to one being required to walk a great deal to fully explore zoological gardens — something that does not sit well with a majority of today's population. Despite the various forms of transportation provided within zoo spaces, to fully experience the zoo, one is still required to walk. If one were to watch the visitors from the animals' perspective, one would see many tired individuals suffering from sore feet. Visitors tend to be more bewildered and captivated in zoos than in any other tourist attraction. Animals captivate zoo visitors. The visitors marvel at the animals as they extend their gazes toward the animals. They are seemingly engrossed in the experience, becoming completely unaware of that which is around them.

CHAPTER THREE

3.0. INTRODUCTION

3.1. RESEARCH METHODOLOGY

According to Chinelo I. (2016), who defined research methodology as the various processes, procedures, steps, guideline and principal measure by which data are sourced, define, collected, processed, and analyzed. Research strategy in this context refers to the methodology to be adopted in relevant data gathering, coding and analysis to facilitate attainment of research aim and set objectives. This chapter looks into different methods used for data collection. These methods apply for sourcing out data includes study population, field observation and survey, interview, relevant literatures, case studies and methods of analysis and anticipated results.

3.2 DATA ANALYSIS

Data is the necessary information for carrying out research aim and objectives in order to make an in-depth assessment and conclusion in the study (Okoko, 2003). The research methodology and methods of data collection in conducting project is qualitative analysis of case studies and review of some relevant literature from documented works as published, unpublished literature as started above and

3.3 INSTRUMENTS OF DATA COLLECTION

The instruments of data collection are the tools that assist in carrying out the research, for assessment of the variables used in the research are:

i. Physical Observation,

Data on landscape classification (Parks, Garden, Recreational etc.) in the study area.

ii. Questionnaires

These were obtained with the aid questionnaires Effort of the government and individual on Landscape planning of the study area via Effort of the government and individual on Landscape planning of the study area.

iii. Spatial Analysis of Case Studies

Physical survey is being used to obtain basic information about the proposed site. It was used to acquire a good knowledge about the site context. The technique used to achieve this purpose was personal observation.

iv. Literature Review

A good understanding of the building type was acquired through the use of past literature which include books, past projects on the building type, journals that were considered resourceful to the designs of the proposed facility and information on the building type as acquired from available literature.

v. Interview

The end user's management staffs which include students of some institutions visited were interviewed on their perceptions about existing faculty buildings.

Others are: Schedule, Sketches, Notes and Photographs.

3.4 DATA COLLECTION

i. **Primary Data**: Primary data was obtained through physical observations, photography and interviews.

ii. **Secondary Data:** Desk-based research was carried out to summarize the key principles that apply to sustainability in academic buildings by reviewing existing literatures. These principles were considered to guide sustainable design of academic buildings globally. These include the review of documented literature from peer reviewed journals, thesis, reports form, agencies, and other information downloaded from the internet.

3.4.1 CASE STUDIES ANALYSIS

3.4.2. COMPARATIVE STUDY

Comparative study carried out by looking and comparing with similar objects. Comparative study conducted at the Q-Brat Zoological Garden, Federal University of Technology, Akure (FUTA) Wildlife Garden, Paris Zoological Park / Bernard Tschumi Urbanists Architects + Veronique Descharrieres and Öhringen Petting Zoo. This process is done to provide information on the advantages and disadvantages of the object which is used as a comparison. At the end of the strengths of the object will be considered in the design process, so the result will be better designed.

From the below observation are expected to be used as insight towards the object and also as a material consideration in the design process, so that what is expected to be achieved and implemented.

Table 3.1: ASSESSMENT OF THE ZOOLOGICAL GARDEN'S SUSTAINABILITY FEATURES AND CHARACTERISTICS INCLUDES:

i. Case One: Q-Brat Zoological Garden

Strategies:

S/N	Design Strategies		Degree of Adoption			
			High Priority	**Moderate Priority**	**Low Priority**	**Not a Priority**
1	Authenticity	Style			✓	
		Setting			✓	
		Furniture			✓	
		Vegetation		✓		
		Information			✓	
		Barriers			✓	
		Visitor's Viewing area			✓	
2	**Aesthetics**	Style			✓	
		Setting			✓	
		Furniture			✓	
		Vegetation			✓	
		Information			✓	
		Barriers			✓	
		Visitor's Viewing area			✓	
3	**Recreation**	Style			✓	
		Setting			✓	
		Furniture			✓	
		Vegetation			✓	
		Information			✓	

		Barriers			✓	
		Visitor's Viewing area			✓	
4	**Education**	Style			✓	
		Setting			✓	
		Furniture			✓	
		Vegetation			✓	
		Information			✓	
		Barriers			✓	
		Visitor's Viewing area			✓	
5	**Exploration**	Style			✓	
		Setting			✓	
		Furniture			✓	
		Vegetation			✓	
		Information			✓	
		Barriers			✓	
		Visitor's Viewing area			✓	

ii. Case Two: Federal University of Technology, Akure (FUTA) Wildlife Garden,
Strategies:

S/N	Design Strategies		Degree of Adoption			
			High Priority	**Moderate Priority**	**Low Priority**	**Not a Priority**
1	Authenticity	Style		✓		
		Setting		✓		
		Furniture		✓		
		Vegetation	✓			
		Information		✓		
		Barriers			✓	
		Visitor's Viewing area				
2	**Aesthetics**	Style		✓		
		Setting		✓		
		Furniture		✓	✓	
		Vegetation		✓		
		Information		✓		
		Barriers			✓	
		Visitor's Viewing area		✓		
3	**Recreation**	Style			✓	
		Setting			✓	
		Furniture			✓	
		Vegetation	✓			
		Information			✓	
		Barriers			✓	

		Visitor's Viewing area			✓	
4	**Education**	Style		✓		
		Setting		✓		
		Furniture			✓	
		Vegetation	✓			
		Information		✓		
		Barriers			✓	
		Visitor's Viewing area		✓		
5	**Exploration**	Style		✓		
		Setting			✓	
		Furniture			✓	
		Vegetation		✓		
		Information		✓		
		Barriers			✓	
		Visitor's Viewing area		✓		

iii. **Case Three:** Paris Zoological Park / Bernard Tschumi Urbanists Architects + Veronique Descharrieres

Strategies:

S/N	Design Strategies		Degree of Adoption			
			High Priority	**Moderate Priority**	**Low Priority**	**Not a Priority**
1	Authenticity	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information	✓			
		Barriers	✓			
		Visitor's Viewing area	✓			
2	**Aesthetics**	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information	✓			
		Barriers	✓			
		Visitor's Viewing area	✓			
3	**Recreation**	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information	✓			
		Barriers	✓			

		Visitor's Viewing area	✓			
4	**Education**	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information	✓			
		Barriers	✓			
		Visitor's Viewing area	✓			
5	**Exploration**	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information	✓			
		Barriers	✓			
		Visitor's Viewing area	✓			

iv. **Case Three:** Öhringen Petting Zoo

Strategies:

S/N	Design Strategies		Degree of Adoption			
			High Priority	**Moderate Priority**	**Low Priority**	**Not a Priority**
1	Authenticity	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information	✓			
		Barriers		✓		
		Visitor's Viewing area	✓			
2	**Aesthetics**	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information	✓			
		Barriers		✓		
		Visitor's Viewing area	✓			
3	**Recreation**	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information	✓			
		Barriers		✓		

		Visitor's Viewing area	✓			
4	**Education**	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information		✓		
		Barriers		✓		
		Visitor's Viewing area	✓			
5	**Exploration**	Style	✓			
		Setting	✓			
		Furniture	✓			
		Vegetation	✓			
		Information		✓		
		Barriers		✓		
		Visitor's Viewing area	✓			

3.5.1 CASE STUDY ONE: Q-BRAT ZOOLOGICAL GARDEN

3.5.1.1 GENERAL DESCRIPTIONS

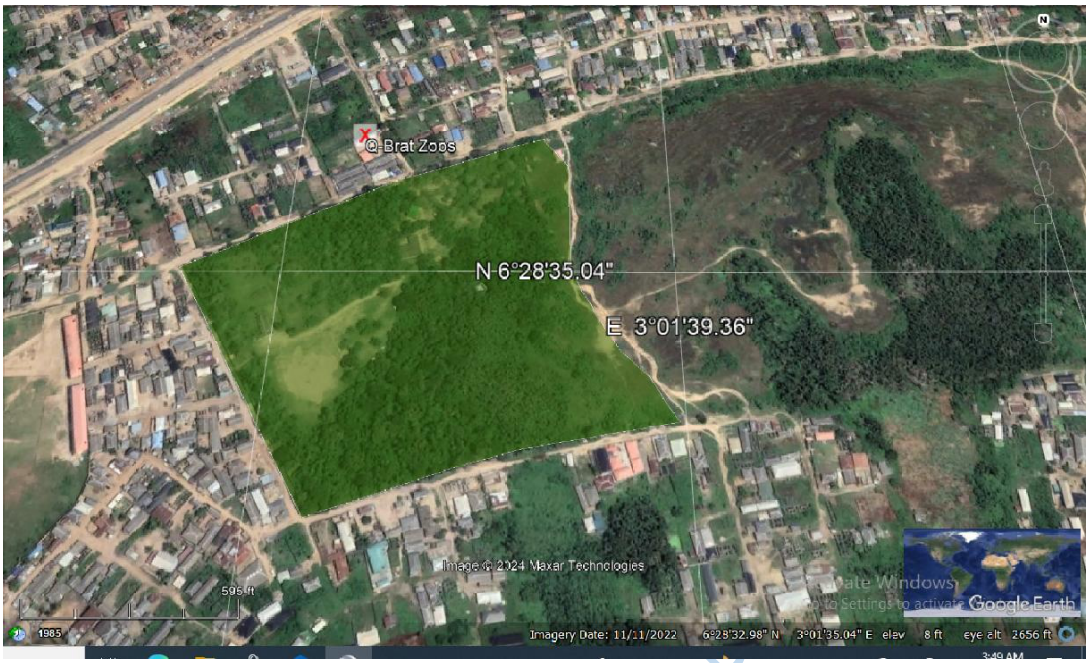


Plate 3.1: Ariel view: Q-Brat Zoological Garden.
(The Author, 2024)

Plate 3.2: Ariel view: Q-Brat Zoological Garden
(The Author, 2024)

- **Location:** Q-Brat Zoos and Gardens, located close to \Oko-Afo on the Badagry Expressway, Lagos State.

- **Land Area (Approximately)**
    i. Perimeter: 1,432
    ii. Area: 118,989 sqm
- **Building, Services and Components**
    i. Keeper's House
    ii. Motel/Relaxation Centre
    iii. Administrative Building
    iv. Cage/Exhibit
    v. Borehole

3.5.1.2 ZOO APPRAISAL

Q-Brat Zoos and Gardens, located close to \Oko-Afo on the Badagry Expressway, Lagos State. Assorted playground equipment such as bouncy castle, trampoline, swings, slides, merry go-round, rockers and seesaw. On a sun-drenched afternoon when the earth was baking from scorching heat, Q-Brat Zoo was a welcome haven. Cool.
A sanctuary protected by leafy canopy and dense undergrowth.

- **Animals Description**

The zoo's crop of domestic and wild animals includes a bale of turtles, a tortoise (177-year-old Methuselah called Papilo), a baboon called Asabe, a monkey whose name is Blessing and a vulture that is as old as the zoological garden. Other reptiles are crocodiles, pythons and monitor lizards. There is also an assortment of waterfowl— ducks, geese, swan and herons, guinea fowl––and a lone jackal.

- **Landscape and Vegetation**

The zoo has been groomed into a nature reserve, mostly by preserving its vegetation in its natural state, verdant and luxuriant, as to create a Garden of Eden. It is one of the best parts of the zoo, the Garden of Eden. As you moved through the dense forest you feel the drop in temperature. The air becomes cooler. To your left, to your right, footpaths branch off the main artery, with signpost bearing animals' names. Tiger Road. Zebra Road. Lion Road. Monkey Road. Wooden seats under the shade invite you to a brief stop as the footpath carves its way through the dense vegetation. In the end, you arrive at a massive, cool, welcoming open space called Aso Rock. When children come visiting, this is their village square. Mats are laid on the ground and they sit to listen to a master storyteller spin yarn of African folklore. Thereafter, drums are

brought out and they sing and dance. Children who were impressed returned another day with their parents.

Plate 3.3: Main Entrance

Plate 3.4: Signage

Plate 3.5: Concrete Seat

Plate 3.6: Administrative Building

Plate 3.7: Aver Exhibit

Plate 3.8: Second Gate (Towards Relaxation House)

Plate 3.9: Carnivorous Exhibit

Plate 3.10: Primate Exhibit

Plate 3.11: Reptile Exhibit

Plate 3.12: Primate Exhibit

Plate 3.13: Rodent Exhibit

Plate 3.14: Exhibit

Plate 3.15: `Ungulate Open Moat

Plate 3.16: Children Playground

Plate 3.17: Relaxation Pool

Plate 3.18: Conservation Room

Plate3.19: Open Moat/Game Arena

Plate 3.20: Garden of Eden/Crocodile Route

i. **Authenticity:**

- Style: All exhibits are designed in a new way that is rarely seen in zoos. There is no naturalistic design of the exhibit. The exhibit style does not allow for authenticity.
- Setting: The exhibits are very simple. There is no water feature rather dilapidated artificial pool. The large open space makes the some ungulated animals such as camel stand out, but offers no connection to their origin or existing habitat.
- Furniture: The environment is less rich with innovative furniture elements. One of the innovative elements are some concrete statues of a snakes, camel and crocodile along the course of Garden of Eden. Although interesting, there is no sense of authenticity. There are other regular concrete seats elements and rocks placed in separate areas. Although some natural elements give the gives the environment some sense of authenticity, but it is minimal. Some elements tree-like construction stands out as an unrelated element.
- Vegetation: Good and dense vegetation within the environment.
- Information panels: Not applicable and poor signage system.
- Barriers: Barriers are minimized, but there is no attempt to make them authentic. Barriers are not integrated in the landscape. They are made of steel and are reinforced with electric fences. The barriers are not hidden from view, which make them less authentic.
- Visitor viewing area: It is not really comfortable and has a deteriorated look, yet is not authentic.

Aesthetics:

- Style: While the exhibit style is not the regular naturalistic style.
- Setting: The setting is very simple and nothing unique. There is no water feature. There are also no hidden landscape features for animals.
- Furniture: Dead trees within provide the exhibit with perceived beauty.
- Vegetation: The dense planted ground plane is not aesthetically pleasing. It is very simple with no clear composition.
- Information panels: The few available signage/road map is constructed using local material (Earth). There are no bright colors to attract children and adults. The graphic design used in these panels is relatively simple unattractive.

Recreation:

- Style: The Zoo is not of a typical naturalistic style; it cannot be assumed that it is recreational.

- Setting: There is minimum and exhibit setting is poor, making it less recreational.
- furniture: There is no attractive furniture recreative seating within or close by.
- Information panels: The Panels have no questions to starts initiating conversation between groups or personal individual entity.
- Visitor viewing area: The viewing area is big enough to allow for socialization and viewing the animals but not as much as expected.

Education:

- Style: The memorial style of the of historical data been told that there was an elephant is uniquely educational in the way it alerts people to the destruction of habitat and species extinction. The public may be more aware of the importance of conservation.
- Setting: The barren exhibit setting is very important for unconscious education, as visitors realize that the animal's natural habitat is being destroyed and that these animals are at the risk of extinction.
- Furniture: Some concrete seats and trees construction is designed to enrich visitors and animals' behavior. The possible complexity of interaction with the concrete and trees construction exhibits the animal's intelligence and educates the public. Naturalistic furniture elements such as trees and rocks allow for natural animal's behavior. But a limited number and dilapia
- Information panels: Panels are designed in the form of memorial plaques. That might work well with the main idea of the historical background exhibit that revolves around the idea of the extinction of some animals. It serves a slightly different educational purpose.
- Visitor viewing area: The viewing area conveys the message of emptiness and barren life as does the exhibit. Less animals to view.

Exploration:

- Style: The memorial exhibit style does not allow for much exploration.
- Setting: The open dry spaces and poor maintenance setting allows for almost no exploration. Visitors can visually access everything and there is no mystery or complexity.
- Vegetation: Despite that the vegetation is dense yet there is at minimum with no complex composition or variety of plants.

- Information panels: No information panels which discourage intellectual or cognitive exploration using exciting questions about the existing animals.
- Barriers: No Barriers for the available animals, as this does not provide any opportunities for exploration for visitors.
- Visitor viewing area: Not applicable.

The state of Q-brat at the Badagry has less accomplished with poor educational experience for its visitors with the treacherous appearance/design that did not attempt to hide or disguise the exhibit features. This however was at the expense of the other visitor experience components, as the exhibit offered very little in terms of exploration or authenticity

3.5.2 **CASE STUDY TWO: FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE (FUTA) WILDLIFE PARK**

3.5.2.1 **GENERAL DESCRIPTION**

Plate 3.21: Ariel view: FUTA Wildlife Park. Source: The Author, 2024

Plate 3.22: Ariel view: FUTA Wildlife Park. (The Author, 2024)

Location: Federal University of Technology, Akure, Ondo State.

3.5.2.2 Zoo Appraisal

This study was carried out at Prof. Afolayan Wildlife Park located in the Federal University of Technology, Akure (FUTA), Ondo State, Nigeria. Akure, the capital of Ondo State is situated about 430 Km driving distance from Abuja, the capital city of Nigeria and one of the fast-growing cities in Nigeria, Adekola et al. 2019. It lies on latitude7.25 N and longitude 5.19°E. The city is located on 396 meters high above sea level (Odewumi et al. 2020). The Park is located between the mini Obakekere and main Obanla campus of FUTA. It is a lowland tropical rainforest ecosystem with a total area of 8.91 ha, (Afolayan and Agbelusi, 1987). Some of the indigenous tree species found in the Park include Parkia biglobosa, Acacia seyel, Anogeissus leicocarpus, Ficus spp, Manihot glaziovii, Alchornea laxiflora, Musa spp, Bombax bunopozense, Chrysophyllum albidium, Gliricidia sepium, Magnifera indica, Milicia excelsia, Mikania spp, Bambusa vulgaris, among others, (Idowu 2010).

- **Building, Services and Components**

  Keeper/Gate's House

  Laboratory/Conservation House

  Cage/Exhibit

  Water System

  Picnic Area

Plate 3.23: Alphart Road Led to FUTA, Wildlife Park

Plate 3.24: Figure: Main Entrance

Plate 3.25: Conservation/Laboratory House

Plate 3.26: Information Plane/Signage

Plate 3.27: Children Playground

Plate 3.28: Pathway into Zoo/Concrete walkway

Plate 3.29: Concrete Seat (Picnic Area)

Plate 3.30: Primate Moat

Plate 3.31: Primate Moat (Red Capped Mangabeys)

Plate 3.32: Aves Moat (Ostrich)

Plate 3.33: Water System

Plate 3.34: Information Plane/Signage

Plate 3.35: Primate Moat

Plate 3.36: Primate Moat (Baboo)

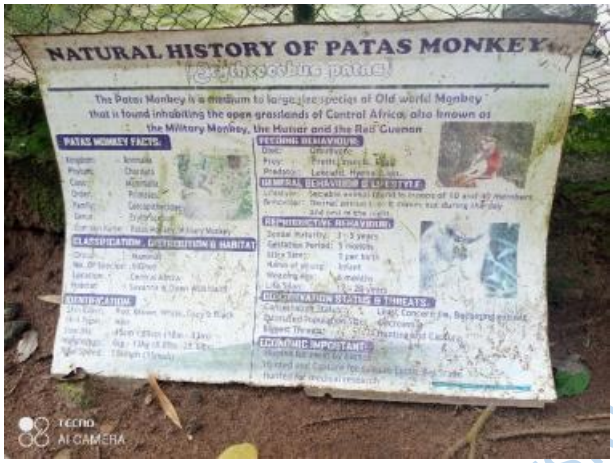


Plate 3.37: Information Plane/Signage (Steel)

Plate 3.38: Prime Close Moat (Baboo).

Plate 3.39: Zoo Pathway

Plate 3.40: Conservation room (Showing dead animal)

Plate 3.41: Earth Road Leading to the Zoo

Plate 3.42: Aves (Goose Open Moat)

Plate 3.43: Conservation room (Showing dead animal)

Plate 3.44: Aves (Exhibit) Parrots

Plate 3.45: Conservation room

Plate 3.46: Open Air Moat (Tortoise)

(Showing dead elephant skull)

Plate 3.47: Reptile (Crocodile Open Air Moat)

Plate 3.48: Aves (Goose Open Moat

Authenticity:

- Style: The little naturalistic style within the moats promotes for authenticity.
- Setting: The exhibit is designed to resemble the natural environment of the animals but lack maintenaces. The pond around aves is designed to look natural, which adds to the aesthetic feel of the exhibit. The exhibit ground is covered with a type of natural sand/earth. The inner materials of the exhibit/moat is lined with artificial materials.
- Furniture: The furniture setting is authentic to the to the visitor due to the natural elements around it such as bamboo.
- Vegetation: Plants are chosen carefully to resemble African vegetation. Tall grass, wild flowers, thorny plants and bamboo emphasize the naturalistic feel of the savanna forest
- Barrier: Barriers are minimized. They are made out of steel with strings that are stretched horizontally across the barrier, making them feel less natural.

Recreation:

- Style: The naturalistic style of the animals exhibit/Moat is inherently recreational.
- Setting is naturalistic. The presence of the pond provides animals with the opportunity to bathe and play with water and splash it, enriching the animal behavior and giving the visitors the opportunity to watch the animals practicing their everyday life activities

- Furniture: Dead trees in the around the moat/exhibit allow animals to move them from one place to another, thus providing the visitors with a feeling of the natural behavior of the available animals and its motion within the environment.
- Information panel: Panels have questions that enable social interaction in order to find answers, either within or among groups in front of the exhibit/moat.
- Viewing area: The viewing area is at the average level, enough to allow small group of people to observe the animals together.

Aesthetics:

- Style: The style is naturalistic, allowing for a good aesthetic experience.
- Setting: The exhibit is characterized by its complexity and harmony. This is provided through Reptile, Aves etc like the pon, the plant island and the vegetation at the perimeter, all of which contribute to a good aesthetic scene.
- Furniture: Using artificial materials like concrete and other nature elements adds to the beauty of the exhibit.
- Vegetation: A good aesthetic experience is seen in vegetation through the complex composition of plants at the perimeter of the exhibit, dense vegetation in the small region, and the variety of plant species.
- Information panels/Signage: Using elements of graphic design and colored images makes information panels look appealing.

Education:

- Setting: The setting highlights the animal's natural environment as the savannah forest which the visitors learn unconsciously throughout their visit.
- Furniture: The presence of furniture elements within the zoo such as bamboo and concrete seating system allows the public to observe the picnic experiences in action while learning about animals' natural behavior.
- Vegetation: Using tall grass, wild flowers, and thorny plants is a way to educate the public about the different plant species that are found in the African forest (unconscious education).
- Information panels: Colorful information panels, full of illustrations with minimum text, encourage visitors to read — especially young children. Information panels are hung on barrier handrails (conscious education).

- Barriers: Although barriers are minimal, they still visually separate the visitors and animals.
- Visitor viewing area: Part of the educational message of the zoo however is enhanced by the presence of zoo personnel at scheduled times to talk to visitors about the animals and their behavior.

Exploration:

- Style: The zoo is naturalistic, providing visitors with visual exploration.
- Setting: Elements such as, water and dense vegetation all give the exhibit a sense of mystery and complexity which stimulate visual exploration.
- Vegetation: Dense vegetation at the perimeter of the exhibit implies that there is more than the eye can see, thus providing visitors with a sense of mystery.
- Information panels: Panels incorporate questions about the animals, thus allowing for exploration.
- Barriers: Even though barriers are at a minimum they still exist, thus reducing the sense of visual exploration.

FUTA Wildlife Park provides a good visitor experience with respect to authenticity, aesthetic and recreation. Regarding education thou lack maintenance and the approach/entrance is not attractive at all, yet helping microclimate of immediate region.

3.5.3 CASE STUDY THREE: PARIS ZOOLOGICAL PARK / BERNARD TSCHUMI URBANISTS ARCHITECTS + VERONIQUE DESCHARRIERES

3.5.3.1 GENERAL DESCRIPTION

Plate 3.49: Ariel view, Paris Zoological Park.
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014).

ARCHITECTS: Bernard Tschumi Urbanists Architects + Veronique Descharrieres

Year: 2014.

LANDSCAPE ARCHITECTS: Atelier Jacqueline Osty

CONSTRUCTION: Bouygues Batiment

PROJECT AREA: 34 acres

LOCATION: The Zoological Park of Paris is an urban zoo located in the Bois de Vincennes on land belonging to Paris City Council. Built on approximately 15 hectares on a triangular plot, the site is bordered by Avenue Daumesnil, Avenue de Saint-Maurice and the Lake Daumesnil ring road.

STATUS: Established in 1934, the zoo is attached to the National Natural History Museum, a public establishment overseen by both the Ministry of Higher Education and Research and the Ministry of Ecology, Sustainable Development and Energy. The Museum manages two other animal parks: the Ménagerie (zoo in the Botanical Garden) and the Réserve de la Haute-Touche in the Indre department of France.

3.5.3.2 ZOO APPRAISAL

Three essential objectives:

- Conservation
- Building Awareness

- Research

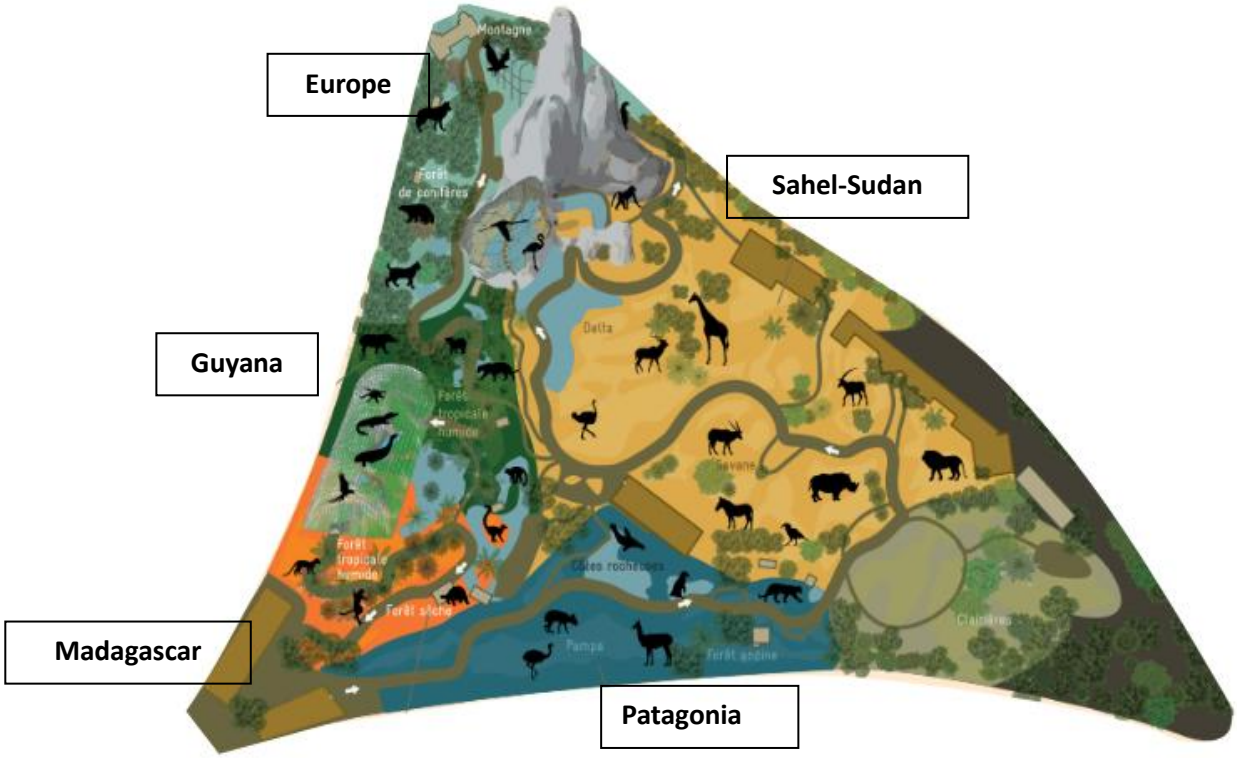


Plate 3.50: Ariel View of Paris Zoological Park
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014).

Five Zone

The Zoological Park has been structured around 5 distinct biozones. The five biozones are geographically distant: Patagonia, Sahel-Sudan, Europe, Guyana and Madagascar. Showcasing a variety of different ecosystems within these biozones allows for diversity in terms of species presentation and educational approaches to help introduce visitors to the different threats facing animal diversity and the action taken to safeguard it. Patagonia is a conservation hotspot for marine mammals, the Sahelian-Sudanese steppe is an example of a fragile ecosystem, while the forests of Guyana and Madagascar with their high numbers of endemic species are home to animals used in breeding programmes or targeted by funding policies for programmes for species conservation in their habitats.

- **Europe**

Land Area 10,800 m ²

4 Environments: coniferous forest and in the vivarium: garigue, marsh and cold mountain. 28 species including the Iberian wolf, the Eurasian lynx, birds of prey, the cinereous vulture and numerous amphibians.

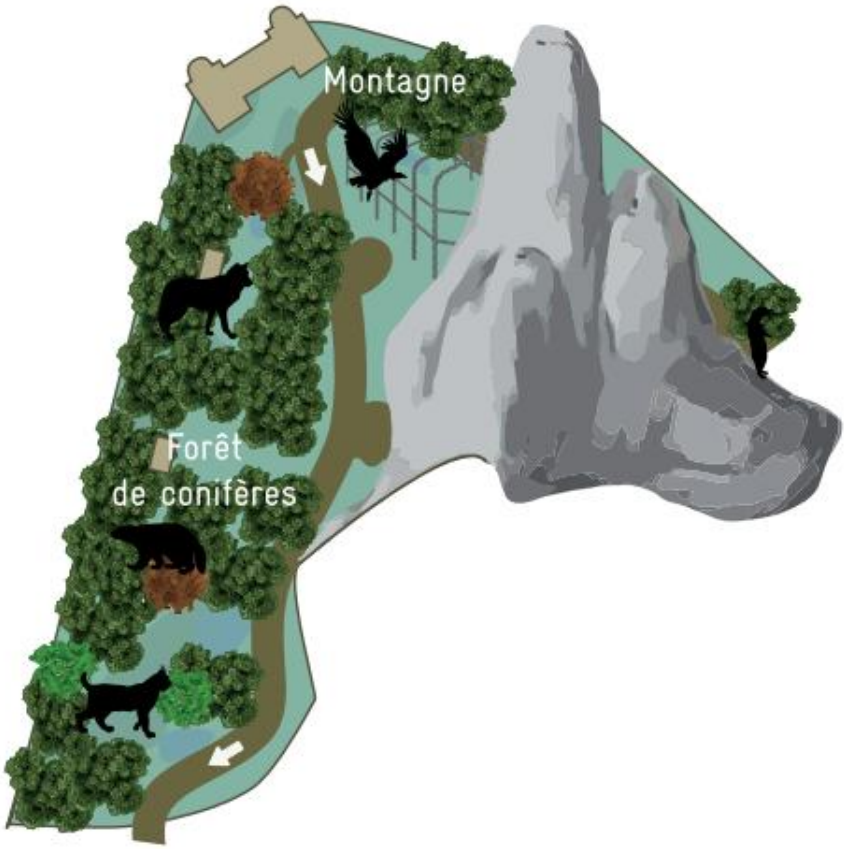


Plate 3.51: Europe Zone
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014).

The European biozone is located at the foot of the Great Boulder. The area's identity is enhanced by its shady vegetation and the presence of the old renovated aviary. The Great Boulder houses the vivarium, boasting three different biotopes (swamp, garigue and cold mountain) to accommodate representatives of small European animals: frogs, tritons, toads, turtles, lizards and snakes. In a forestland atmosphere, wolves, lynxes and wolverines can be watched through viewing windows as they slink through the vegetation.

- **Guyana**

Land Area 12,530 m^2

3 Environments: the equatorial forest, creek and river. 67 species including Cuvier's dwarf caiman, the manatee, the hyacinth macaw, the anaconda and many small primates.

Plate 3.52: Guyana Zone
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014).

The Guyana biozone lies both outdoors and under the glass bubble of the Great Greenhouse, and showcases a huge variety of species. In the three habitats of the Guyana zone - equatorial forest,

creek and river – over 60 species can be spotted. Jaguars, tapirs and bush dogs can be seen in the outdoor pens, and within the equatorial climate of the greenhouse visitors can observe a number of small primates and newcomer species, notably reptiles and the manatee housed in its large freshwater pool.

- **Madagascar**

Land Area 9,655 m^2

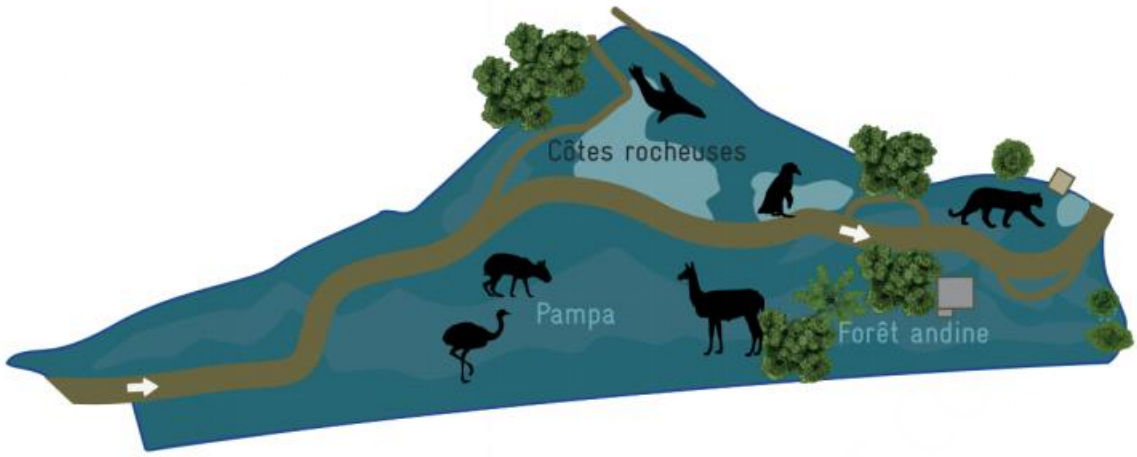
2 Environments: rainforest and dry forest. 30 species including lemurs, the fossa, the radiated tortoise and the grey-headed lovebird.

The Madagascar biozone continues on from the Guyana biozone. The Zoological Park is deeply involved in preserving species that are native to the island, showcasing around thirty species including numerous lemurs covered by breeding programmes, birds and sloths that roam freely, and for the first time, a number of reptiles and amphibians.

Plate 3.53: Madagascar Zone
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014)

Upon leaving the Great Greenhouse that recreates the atmosphere of the rainforest, visitors are invited to discover species that are characteristic of the dry forest of Madagascar, including the fossa and radiated tortoises.

- **Patagonia**



Land Area 16,570m^2

Plate 3.54: Patagonia Zone
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014)

3 Environments: Patagonia's La Pampa, rocky coastline and the Andean Forest. 7 species including otters, Humboldt penguins and the puma.

4.2km of main and secondary paths form the discovery trail that runs through the Park. The trail crosses through five biozones: Patagonia and Sahel-Sudan up to the foot of the Great Boulder. Beyond lie more densely planted areas - Europe, the tropical forests of Guyana and Madagascar, inside the Great Greenhouse with the dry forest of Madagascar outside. The loop leads visitors back to the entrance. Secondary paths lead off towards micro landscapes (such as the terrarium housing smaller species of reptiles, insects and amphibians) and observation posts: an indoor walkway in the giraffe house, a bay window overlooking the veterinary clinic, a panoramic viewpoint close to the big aviary.

- **Sahel-Sudan**

Land Area: 45,215 m^2

4 Environments: wooded savannah, savannah shrubland, dry savannah and delta. 44 species including the West African giraffe, the white rhinoceros, the ostrich, the Guinea baboon, the gemsbok, the greater kudu, the addax and the marabou stork.

Plate 3.55: Sahel-Sudan Zone
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014)

The Sahel-Sudan biozone is the park's biggest space. Located in the central section, it is comprised of a vast plain that offers spectacular, unbroken views of the Great Boulder. Four environments are recreated here: the dry savannah, wooded savannah, savannah shrubland and the delta of the great African rivers. The pens and runs on the plain are home to a lion and three females, a pair of addaxes, oryx algazels and zebras living alongside white rhinoceroses, as well as the herd of sixteen giraffes and the baboons. The trail leads visitors up to the big aviary that is crossed aboard a wooden pontoon amidst pink flamingos and uncaged birds.

Site Layout

With the exception of the Hub, all of the buildings were built around the edge of the site to form a border, thus leaving a wide, airy space in the centre of the park. This layout means visitors, zoo logistical teams and animal traffic are separate from one another. The overall design was part of

Bernard Tschumi and Véronique Descharrières' architectural vision: integrating all public, technical and animal living spaces into the landscapes, thereby reinforcing the idea of immersion while providing for operational and security requirements.

Envelopes made from Wood, Plants, Rocks and more.

Materials

- Wood,
- Plants,
- Rocks

Solid structures are never seen as such, thanks to their architectural envelopes that melt into the landscape and provide a link with their environment, providing relief in the background no matter where visitors look. At the entrance to the zoo, a giant arbour appears as a breath of fresh air in the heart of the urban area, enveloping all of the visitor reception services. Stacks of larch wood logs and a towering wall of imitation rocks make up the façades of buildings used for technical areas and the animal lodges. Standing out from the walls, the envelopes create an illusion of depth and allow the animals and handlers to move around discreetly.

Mesh and Netting

More than twenty aviaries and pens are home to very different species (lynxes, jaguars, lemurs, birds, etc.). As an example of the concept of immersion, the big aviary in the "Deltas of the Great African Rivers" zone welcomes visitors and uncaged birds in the same space. Welded to the Great Boulder, the aviary hugs the contours of the old cat house, soaring up to 13.5m under netting pulled tightly across tilted poles.

A Glass Bubble

The transparent, airy semi-cylindrical greenhouse with its impressive dimensions (100 metres long and 40 metres wide) is set to become one of the zoo's must-see spots. This is the most technologically sophisticated of the zoo's buildings, with 22 three-dimensional galvanised steel arches interconnected by a network of purlins that form a regular framework within which 6,000 sheets of glass have been set. Under this breathable, 16 metre tall see-through membrane lies a surface area of 4,000m2 in which the atmosphere of the Guyana and Madagascar tropical rainforests has been restored, with temperatures of 20°C to 25°C and 75% humidity, perfect for plants from tropical forests. The sun on the glass combines with the plant density to create a

greenhouse effect. Temperatures are controlled by adjusting air intake and output and spraying water at the roots and tips of plants. Ventilation, misting, lighting and maintenance equipment are all integrated into the framework without adding bulk to the structure. The greenhouse is the perfect illustration of the zoo's founding principal: provide the visitor with a full immersion experience that allows him or her to observe animals in their natural habitats

Animal Description

Plate 3.56: Tschumi's Team Used a Kit of parts to Create Different Geometries for each of the Zoo's
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014).

Freestanding Aviaries.

Drawing up the animal collection plan for the new zoo (the species and sub-species list as well as their numbers), is a lengthy and complex process and was carried out by zoo technicians from the Museum and external experts over many years prior to the zoo's reopening. A number of ethical criteria and standards of comfort to ensure animal welfare had to be taken into consideration. This explains why those species that could not be comfortably kept in captivity for technical or space reasons were not included. Species from the different biozones were

selected based on their appeal, their educational and scientific value and in compliance with conservation criteria from the International Union for the Conservation of Nature* (IUCN).

Plate 3.57: Animal Contact in a Breathtakingly Beautiful Setting
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014).

Animals are shown in their 'recreated' natural environments, allowing the public to be immersed in the setting. Cut off from the outside urban world, the visitors' trail is a winding path that takes visitors on a leisurely meander through nature that has been staged with the utmost precision. No wide, angular, urban-inspired roads are to be found here. The twists and turns of the trail are dotted with contoured formations, rocky outcrops, water features and rich vegetation. No animals are viewed through wire mesh or fences. Observation facilities have been designed to ensure visitors get that little bit closer to the animals, offering a variety of viewpoints thanks to glass bay windows, balustrades in open pens and underwater views in pools.

Plate 3.58: Close Moat Under construction
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014).

Each biozone is characterized by its topography, fauna and flora as well as the specific features of the different ecosystems it comprises. The work and art carried out by landscape designers Atelier Jacqueline Osty involved designing a mosaic of landscapes, recreating natural environments and creating atmosphere while taking into account technical, security and animal

constraints and rendering them invisible to the public eye. The zoo is a prolific stage on which the actors (the animals) improvise against an almost perfectly natural backdrop. Yet the landscapes are the result of sophisticated, meticulous design in which every shape and colour has been considered. From plant choices to soil types, design and positioning of rocks, pools, waterfalls, shelters and troughs, every element is designed to create the illusion of a different world while offering optimal views of the animals.

Plate 3.59: Paris Zoological Park, Natural Elements such as Rocks
Source: Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014.

Plate 3.60: Paris Zoological Park, showing Dense Vegetation
(Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014).

Plate 3.61: Paris Zoological Park, large open air moat

Plate 3.62: Paris Zoological Park, Jaguar

Plate: Paris Zoological Park, Section

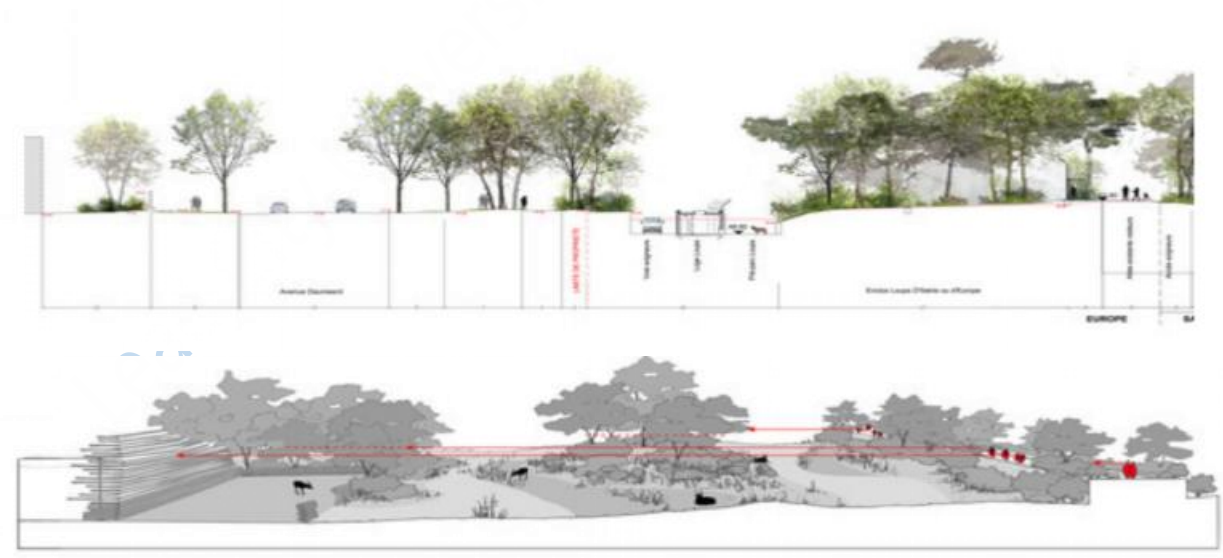


Plate 3.63: Paris Zoological Park, island

Plate 3.64: Paris Zoological Park, Avieries Closed Moated/Exhibit

Source: Claud Cieutat, Martin Argyroglo, Mikael Mugnier, 2014.

Authenticity:

- Style: This exhibit is immersed's cultural landscape, allowing for a very authentic landscape.
- Setting: The setting is completely authentic. The exhibit includes a aviaries moat, Jaguar, natural rocks and other natural elements. These all allow for a very authentic visitor experience.
- Furniture: Furniture is authentic to the culture and environment.
- Vegetation: Vegetation is quite less dense but serving its purposes.
- Barriers: Barriers are reasonably kept to a maximum. Natural materials such as wood, steel and rope nets are used.
- Visitor viewing area: The immersion exhibit that reflects the originality of the region culture which is very authentic. Despite its natural and artificial elements visitors feel that they are actually walking in the forest.

Aesthetics:

- Style: The immersion exhibit style of the regional culture is an aesthetically pleasing experience.
- Setting: The design of the forest increases the aesthetic design of the exhibit.
- Furniture: This is enhanced by using natural materials that originated from nature like, rock, dead trees, logs, saddles, tack and bells.
- Vegetation: Less dense vegetation with a wide variety of plants in a complex arrangement.
- Information panels: Not enough information.

Recreation

- style: The immersion in immediate environment which is recreational by itself, as visitors experience a new culture.
- Setting: The immersion setting offers a unique experience and different opportunities to express their natural behavior.
- Furniture: Using saddles, tack, bells and logs enriches animal behavior.
- Information panels: Not enough information.
- Visitor viewing area: The viewing area is designed as a culturally-themed environment with enough space for social groups to interact.

Education:

- Setting: The culturally-themed exhibit is a great educational opportunity to learn about the way of life of the immediate environment.
- Furniture: Furniture initiates animals' natural behavior, resulting in public education about several species and their behaviors.
- Vegetation: Plantings introduce the public to the vegetation found in that part of the world.
- Information panels: Not enough information.
- Barriers: Barriers are minimal. With the immersion exhibit, there is the illusion that both visitors and animals share the same place.
- Visitor viewing area: Positioning visitors in the same setting as the classes of animals/mammals educates the public about their environments. It also inspires people to respect animals and conserved our natural environment.

Exploration:

- Style: The immersive exhibit allows for both physical and visual exploration.
- setting: The exhibit cannot be seen as a whole from one place. There is always something hidden that can be revealed when viewed from another point.
- Vegetation: The wide variety of vegetation and its complex arrangement implies that there is more than the eye can see.
- Information panels: Not enough information.
- Barriers: Visitor exploration opportunities increase in cases where there are no barriers.
- Visitor viewing area: Park enriches the visitor experience in terms of authenticity, aesthetics, recreation and exploration. It also offers educational opportunities.

3.5.4 **CASE STUDY FOUR:** ÖHRINGEN PETTING ZOO

3.5.4.1 **GENERAL DESCRIPTION**

Plate 3.65: Öhringen Petting Zoo, Ariel View
(Öhringen Petting Zoo)

Ariel view: Öhringen Petting Zoo

- **Architects:** Kresings Architektur
- **Year: 2015 Photographs:** Roman Mensing
- **Landscape Architect:** RMP Stephan Lenzen Landschaftsarchitekten

- **Architect In Charge:** Rainer M, Kilian Kresing Design Team: Kilian Kresing, Raul Zinni-Gerk, Nicolas Oevermann
- Location: Öhringen, Germany

3.5.4.1 ZOO APPRAISAL

Plate 3.66: Öhringen Petting Zoo, waterscape/Landscape elements
Source: Öhringen Petting Zoo

The ensemble's formal shape interacts strongly with its particular use as well as with its urban context. The exposed site, which is situated in the southern portion of the "Schlossgarten" and in the immediate vicinity of the pond, allows the two volumes of the buildings in combination with the fence to be conveyed easily. Also multiple views from all directions are offered to people walking by and in especially to the little visitors to the petting zoo.

Plate 3.67: Öhringen Petting Zoo, Aviaries Exhibit

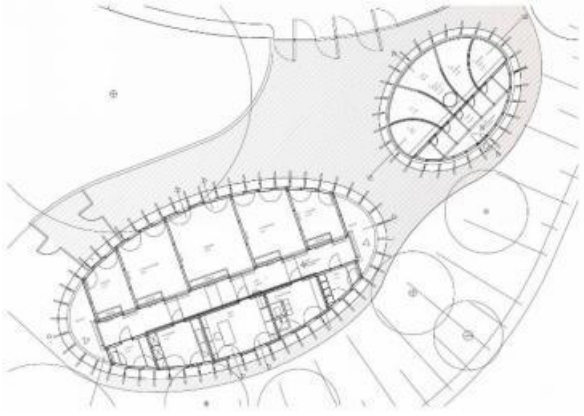


Plate 3.68: Öhringen Petting Zoo, Aviaries Plane

- In this manner, the three elements emerge very much as a whole, yet still appear subdivided and delicate in the natural surroundings. In addition, the lamellar-like facade of the aviary and stable reinforces this vivid effect and lends a second level of complexity and depth to the ensemble. Furthermore, the appealing nature of the buildings

is adjusted to the eye level of children and should serve as an inviting place to visit and spend time.

Plate 3.69: Öhringen Petting Zoo, Open Moat, Ungulated Animals
Source: Öhringen Petting Zoo

The site was developed as part of the 2016 State Horticulture Show (Landesgartenschau 2016) and replaces the aging animal enclosure within the "Schlossgarten". The construction and orientation of the buildings, however, are particularly designed for the time following the State Horticulture Show. In coordination with the veterinary office, much attention was paid towards keeping the various animals (alpacas, cangarus and nadus) in an environment as natural as possible.

Plate 3.70: Öhringen Petting Zoo, Aviaries Close Moat.
Source: Öhringen Petting Zoo

The usage of larch wood is one outcome of the close cooperation with the veterinaries. Moreover, the wood is not only resistend and therefore sustainible, but more importantly, it does not need to

be treated. As a result, there is no danger of inadvertently poisoning the animals. To ensure that the animal enclosure continues its longstanding tradition in the Schloss Garten, all timber joints are sturdily and replacably constructed.

Plate 3.71: Öhringen Petting Zoo, Ungulate Animals Moat. Approach View.
Source: Öhringen Petting Zoo

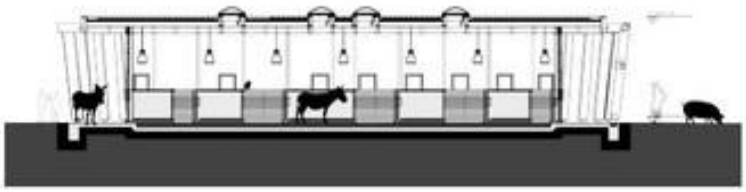


Plate 3.72: Öhringen Petting Zoo, Ungulate Animals Moat. Approach View.
Source: Öhringen Petting Zoo

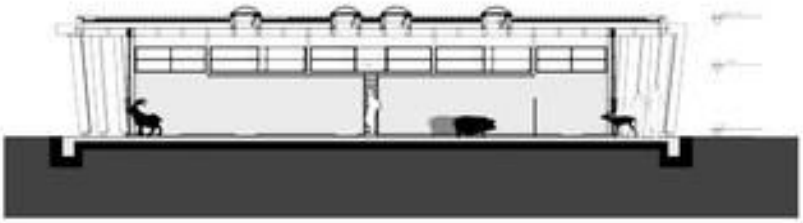


Plate 3.73: Öhringen Petting Zoo, Ungulate Animals Moat. Section x-x.
Source: Öhringen Petting Zoo

Plate 3.74: Öhringen Petting Zoo, Aviaries Moat. Approach View.
Source: Öhringen Petting Zoo

Plate 3.75: Öhringen Petting Zoo, Aviaries Moat. Section y-y
Source: Öhringen Petting Zoo

Authenticity:

- Style: The less naturalistic style of the exhibit is an attempt by the designer to make it authentic.
- Setting: The setting is authentic to the immediate environ, including, natural pond.
- Exhibit furniture: The exhibit furniture depends on natural materials such as dead trees and rocks, adding to the authenticity to the exhibit.
- Vegetation: Vegetation is authentic.
- Barriers: Barriers are minimal and are constructed of wood and rope.
- Visitor viewing area: This area is designed to mimic the natural environment.

Aesthetics:

- Style: The exhibit style is naturalistic, providing visitors with a high level of complexity and mystery, and which makes the exhibit look aesthetically pleasing.

- Setting: Setting is well detailed. The large rock placed in the center of an open landscape increases the focus on the lion as the master piece of the exhibit.
- Furniture: The use of natural materials inside the exhibit is aesthetically pleasing.
- Vegetation: The complexity, density and variety of plants is aesthetically pleasing.
- Information panels: Not enough information.

Recreation:

- Style: The naturalistic style is inherently recreational.
- Setting: Different features are included in the exhibit, such as the pond and the different rock outcrops. The complexity of the design enriches animals' behavior, increases the animal's motion and offers different activities.
- Furniture: Furniture includes elements such as rocks, increase the animal's activity and gives visitors the chance to see the animal's natural behavior.
- Information panels: This engages people in social activities.
- Visitor viewing area: The area is less enough to accommodate a group of people.

Education:

- Setting: The natural setting educates children about Ungulate and Aves classes of animal along with their natural hapital.
- Exhibit furniture: The furniture elements increase animal activity, allowing the public to watch available animal's natural behavior.
- Vegetation: Vegetation is a very important tool to inform the public about the multitude of plants and their different shapes and colors.
- Information panels: Not enough infomation
- Barriers: Wooden barriers. This increases their awareness that humans and animals share the same space. Other barriers in the exhibit include regular rope, trees.
- Visitor viewing area:.

Exploration:

- Style: The immersive style of the African savannah encourages visual and physical exploration.
- Setting: The naturalistic exhibit style allows for visual exploration. The entire exhibit is not revealed from one viewing area. The complexity of the exhibit implies that there is more than the eye can see.

- Vegetation: Vegetation is less dense but contains a complex composition and arrangement. Hiding parts of the exhibit adds a sense of mystery.
- Information panels: Not enough information
- Barriers: The exhibit has two kinds of barriers: a regular barrier made of wood and rope that allows for visual exploration. The feel of this invisible barrier increases the visitor's sense of exploration.
- Visitor viewing area: Park enriches the visitor experience in terms of authenticity, aesthetics, recreation and exploration. It also offers educational opportunities.

The Öhringen Petting Zoo contains nice degree of authenticity, aesthetics, education, recreation and exploration.

CHAPTER FOUR

4.0 SITE ANALYSIS AND DESIGN SYNTHESIS

4.1 DESIGN GOAL

University of Ibadan is aiming of providing a place that will pass many messages and experience to inspire visitors to conserve and build respect for wildlife, ensuring highest possible standard of animal welfare, captive breeding are put in place to catalyze progress and effectiveness in wildlife conservation with a view of knowing if it is aesthetically pleasing to the eye and foster sense of community engagement in a good landscape practice.

4.1.1 THE CLIENT

The client is the management of the University of Ibadan, Oyo State. The project is to be financed by the management of the institution. The beneficiary of the zoo aside administrative staffs, students, lecturers are the visitor (people across the world that would be coming for leisure/pleasure) and researchers.

4.1.1.1 CLIENT'S OBJECTIVES

- To provide a friendly environment aimed at obtaining aesthetic and pleasant environment with good pedestrian connections and traffic arterials.
- To develop a functional zoological garden rendering a maximum satisfaction for the tourist.
- Site Location: University of Ibadan, Oyo State, Nigeria, West Africa, Africa.
- Site Exiting: Build Land University of Ibadan.
- Land Area: 32,107 sqm

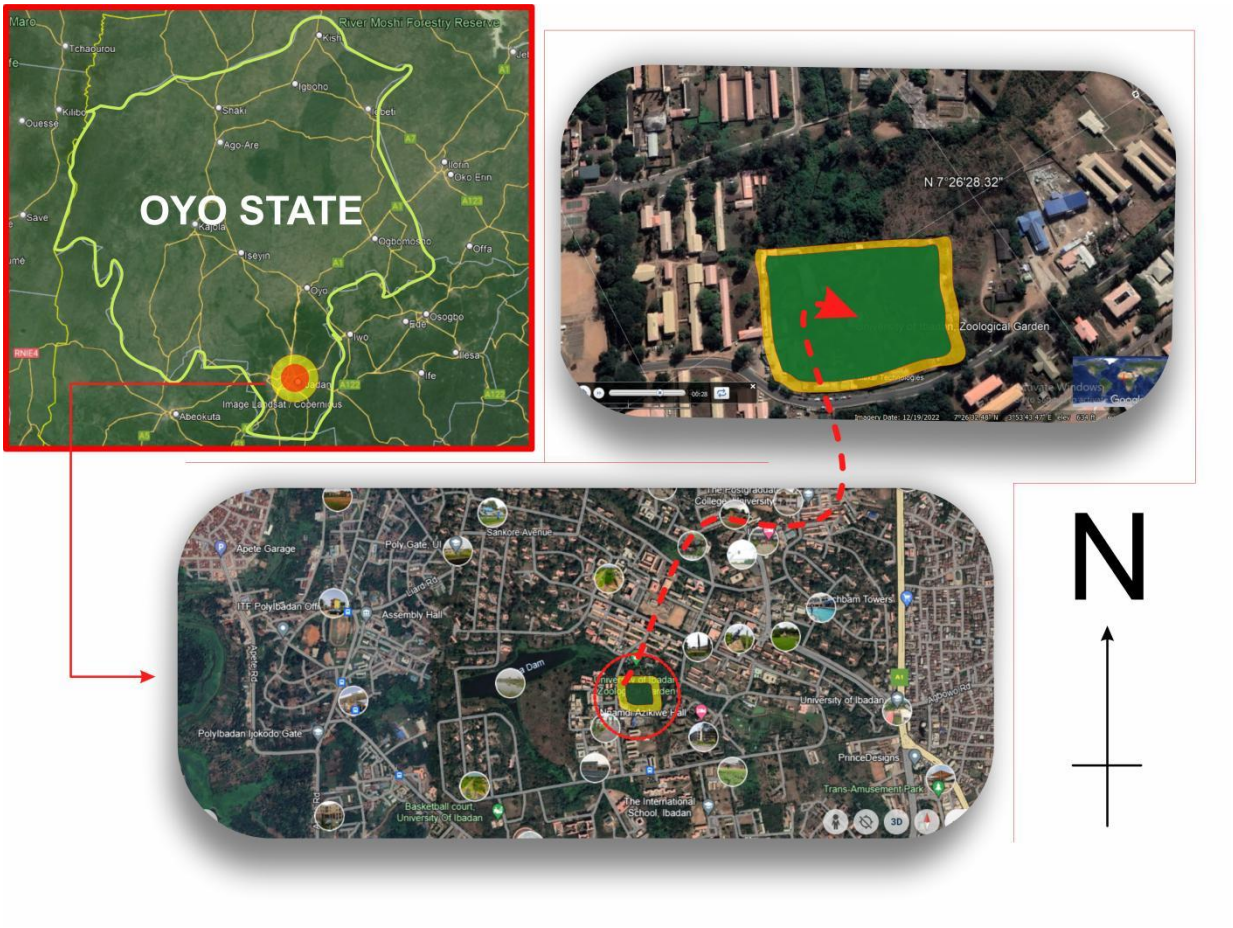
Some of the merits from the location of the site are as follows:

- Access is easy to reach from visible direction via south-west and especially within the institutions where the zoo is located.
- Ease of facilities and infrastructure in the form of public transportation such as small shuttles and tricycle transport means.
- Information network that is easy on the object as well as information about the conditions around the site, due to the location of the site, which was in the middle of town.

Some of the deficiencies form the site are as follows:

4.2.1 SITE LOCATION

4.2.1.1 SITE EXISTING CONDITIONS



The Univeristy of Ibadan zoological garden is sutuated at the base of the city in the historical region of ibadan.

Plate 4.1: Site Location of University of Ibadan, Zoological Garden

(Source: Google Earth, 2024)

- The location of the site does not allow for additional facilities such as parking lots, additional space for animals, picnic spaces for visitor and general expansions because the site is built around faculties and administrative buildings.

4.3. BOUNDARIES AND EXITING DIMENSIONS OF THE SITE.

The following site boundaries University of Ibadan Zoological Garden.

- **North:** Zoology Faculty buildings (offices, class and laboratories)

- **South**: Centre for entrepreneur, LPI Innovation Hub, Petroleum Department Building
- **West**: Unproper channel Damn/River, Administrative Office.
- **East**: JCR Hall and Gym House.

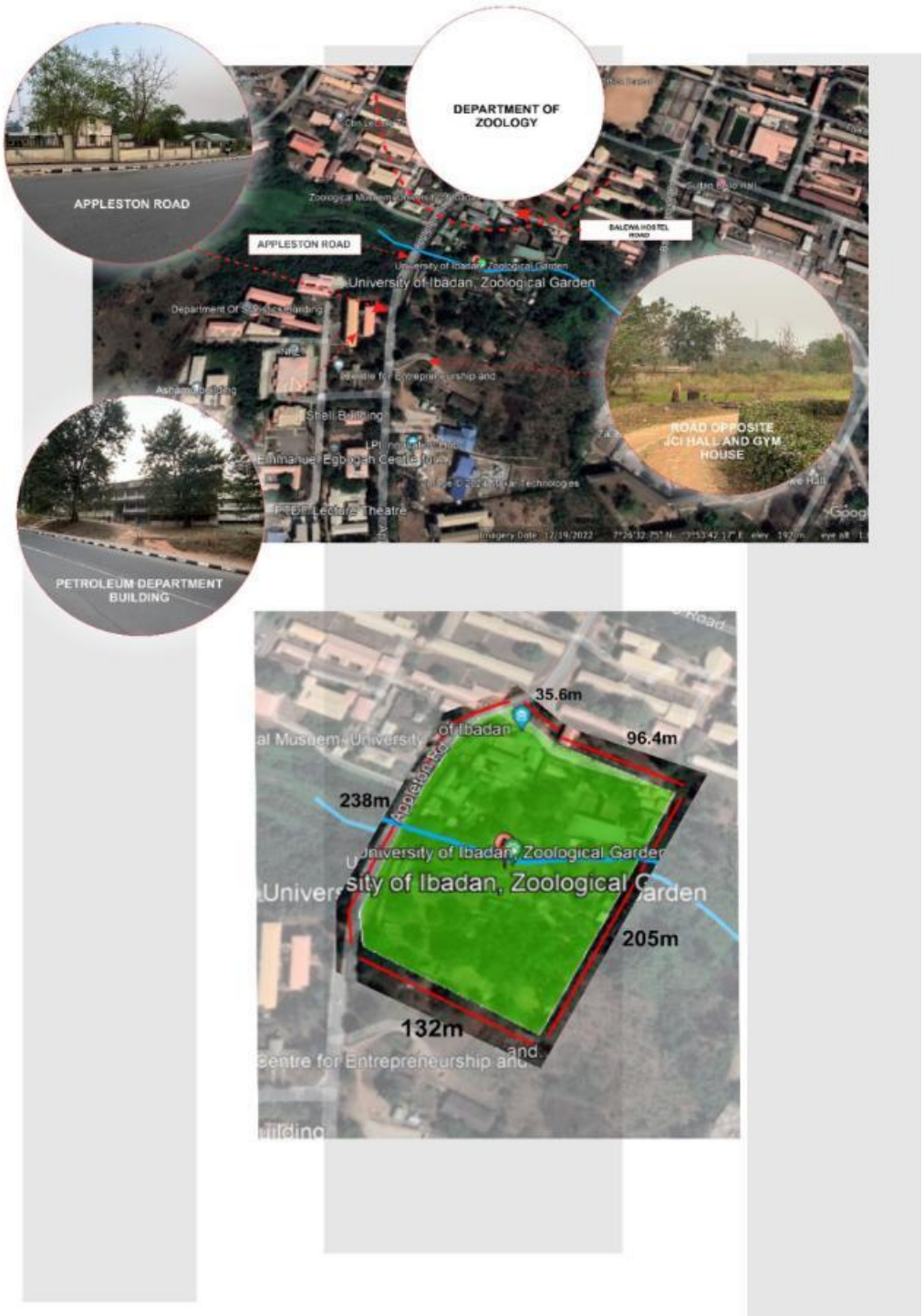


Plate 4.2: Boundaries and Existing Dimension of the Site.
(Source: Google Earth, 2024)

4.4.0 EXISTING PATHWAYS ANALYSIS

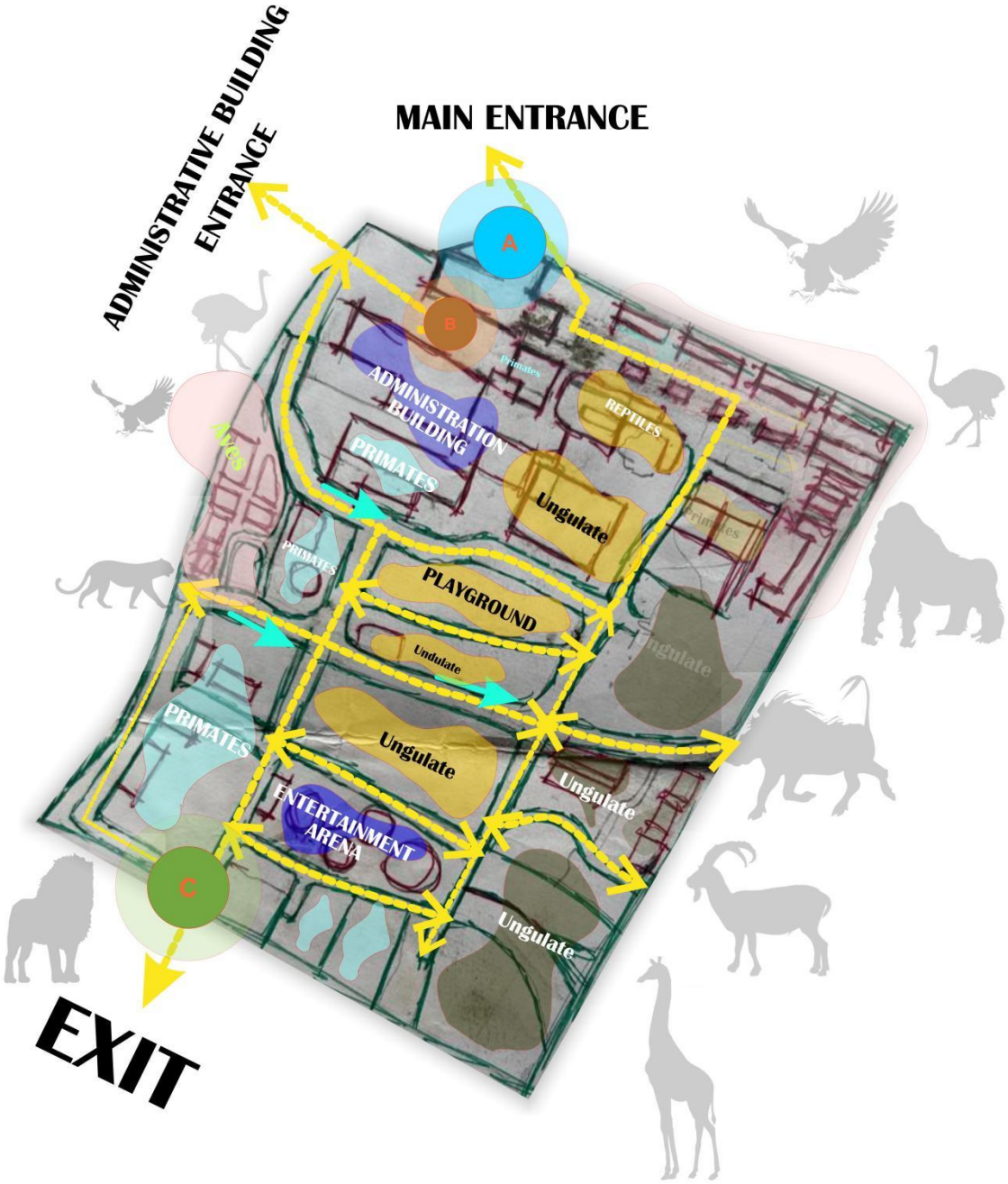


Figure. 4.1: Pathway Analysis of the Existing

(Source: Researcher, 2024)

- At point A, is a circulation path has a high traffic flow. This is because the road is a road that connects the University of Ibadan, Zoological Garden.

- At point B, is low because it is a circulation path branching from the main road to the administration building.
- At point C, is low traffic flow. This is because the road is an exit route that connect the zoological garden to the immediate environment.

4.5.0 EXITING FACILITIES AND STRUCTURES

- **Building and Structures (Facilities for Management and Visitors)**
    - Parking lots
    - Gate/Entrance.

(a) Buildings/ Structures

- Administrative offices.
- Mini complex.
- Restaurants.
- Visitors' amenities - Toilets, Domestic water tap & troughs)

- **Enclosures (Facilities for Animals)**

(a) Animal Enclosures

- Paddock
- Moat / Barrier
- Feeding cubicles / night
- shelter / retiring cell
- Stand-off barriers
- Ancillary structures

(b) Service Structures

- Electric substation (Only Diesel Generator sighted)
- Pumping station
- Overhead water tanks

- **Services**
    - Water supply pipes
    - Electrical cables
    - Secure digital
    - communication
    - Water retention pools (Dilapidated)

- **Elements**

a) Railings and Fences

- Along stand-off barriers
- Along road and paths
- Signage

- **Circulation**
  - Zoo Parking - inside the Zoo (None)
  - Vehicular circulation (None)
  - Pedestrian circulation
- **Landscape**
  - Existing vegetation
  - Gardens, planting beds, trees, plantation (Not well addressed)
  - Vegetation buffers/ Screens (between spaces and between enclosures)
  - Peripheral planting (Limited)
  - Grade change devices (ramps, steps, stepped planters, etc.)
  - Green pavers areas (None)
  - Landscape Art and Sculptures (None)

4.5.1 PARKING AND ENTRANCE ANALYSIS

- **Parking lot Analysis**

Parking areas are a necessary component of Zoos and requires professional design input which is often disregarded. This results no designated parking lots for U.I Zoological Garden and it could chaos at the entrance.

- **Entrance Analysis**

Initial conditions of University of Ibadan, Zoological Garden, located at the front entrance directly opposite the road. On the initial conditions the flow in and flow out illustrious, located at the entrance into the flow, while the channels in-out other side leading to the administrative building.

At one entrance which is directly related to the administrative building while main entrance allows visitors into the zoo and other adjoining facilities.

Entrance area in a zoo has to accommodate large crowds; both those entering and departing does not connote enough attributes to accommodate large crown during entry. It has to be designed and not ignored and left to be a part of the roadside at the entrance.

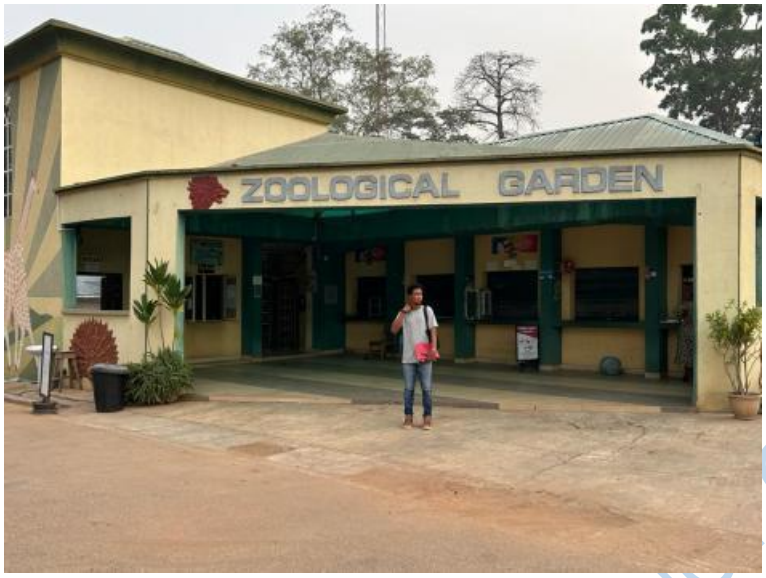


Plate 4.3: U.I Zoological Garden Main Entrance.
(Source: U.I Zoological Garden, 2024)

- Planting design for approach and entrance areas help gradually transform the outside environment to the naturalistic surroundings inside the zoo unlike U.I Zoological Garden which lack these attributes.
- U.I Zoological Garden should have some kind of parity in terms of entrance design to fulfil the minimum requirements of entrance area activities as well as visual appeal to welcome the visitor.

4.5.2 PURPOSELY BUILT BUILDING AND STRUCTURE ANALYSIS

- All buildings on site were purposely built however some space allocated to designated activities in an administrative building should be relocated to newly proposed educational building.
- Improper location of mini complex. These visitor's facilities should be built in a place where there is a maximum security for both users and visitors.
- The designer should have incorporated general conveniences in each allocated building.

4.5.3 ENCLOSURES (FACILITIES FOR ANIMALS) ANALYSIS

Plate 4.4: Eves Enclosure.
(Source: U.I Zoological Garden, 2024)

- Both the outside and inside of the enclosure it should give a feel of unadulterated natural habitat setting with the use of carefully selected material and plants of which the existing enclosures does not possess.

Plate. 4.5: Eves Enclosure.
(Source: U.I Zoological Garden, 2024)

- All enrichment elements should be derived from the natural habits of the animal in the wild. Habits will include chewing, basking, climbing, digging, scratching, wallowing etc. Every enrichment component should cater to one or more habits of specific animals.
- Enclosure enrichment ought to have done effectively using natural on-site materials such as rocks in their original form, indigenous plants and local rocks in a dressed form for stone masonry.
- Enrichment ought to use artificial materials like fibre glass rocks and logs in conjunction with integrated hot wires.

4.5.4 SERVICES/STRUCTURE ANALYSIS

Services are as important in a zoo as in any other modern architectural or landscape project.

Plate. 4.6: Service (Water Station, Generating Plant, CCTV Camera)
(Source: U.I Zoological Garden, 2024)

- Drain design requires hydrological and hydraulic inputs and an essential design input to make it less conspicuous and merge with the overall design.
- Attention to design, colour and construction detailing has made this storm water drain in Singapore zoo an element of appreciation. It can be otherwise to as can be seen from the examples given above!
- Waste management requires attention towards design & infrastructural improvements and mechanisation.
- It is time that every bit of work in all disciplines related to zoo (architectural, landscape, structural, fabrication, security systems etc.) are done professionally otherwise the attempt to economise may result in major expense later. The pic is an example of unacceptable work.

4.5.5 ELEMENTS ANALYSIS

- These include railings, stand-off barriers, waste bins, seats, pavements, toe walls & walls, gates, curbs, animal replica etc., as some of these things are not proper position and blend with immediate and natural environment.

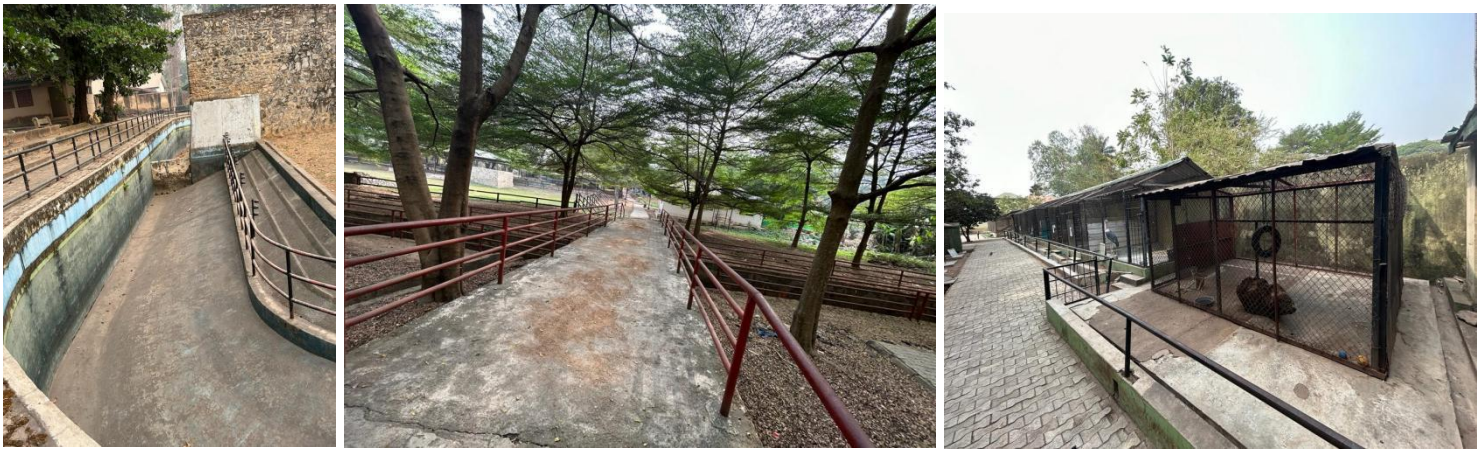


Plate. 4.7: Elements (Primates and Eves stand-Barriers, Walkway)
(Source: U.I Zoological Garden, 2024)

Plate. 4.8: Elements (Hard Pavement, Administrative Approach and Seating Area)
(Source: U.I Zoological Garden, 2024)

- The detailing and finishing should be of professional standard so that each element merges with the natural environment of the zoo and works perfectly in all seasons.

4.5.6 CIRCULATION ANALYSIS OF THE EXISTING SITE

All parts of the zoo are required to be accessed by 'vehicles' and by 'pedestrians. Vehicles include zoo vehicles, battery operated trolleys and pedestrians include the zoo staff and the public. This describes the circulation within the zoo.

- Vehicular circulation is an accepted fact in any zoo because of long distances required to be traversed by children, elderly and handicapped (which includes women carrying infants in their arms!) however the exiting zoo does not accommodate vehicular circulation in any form related.
- The designer should have designed the walkway pavement in the sense that he or she should have used more curvilinear alignment rather than grid or linear pathway. This improves the aesthetics and reduces the radiated heat by shade of plants.
- It is essential that connecting paths should be as well and natural designed and detailed as any other part of the zoo.

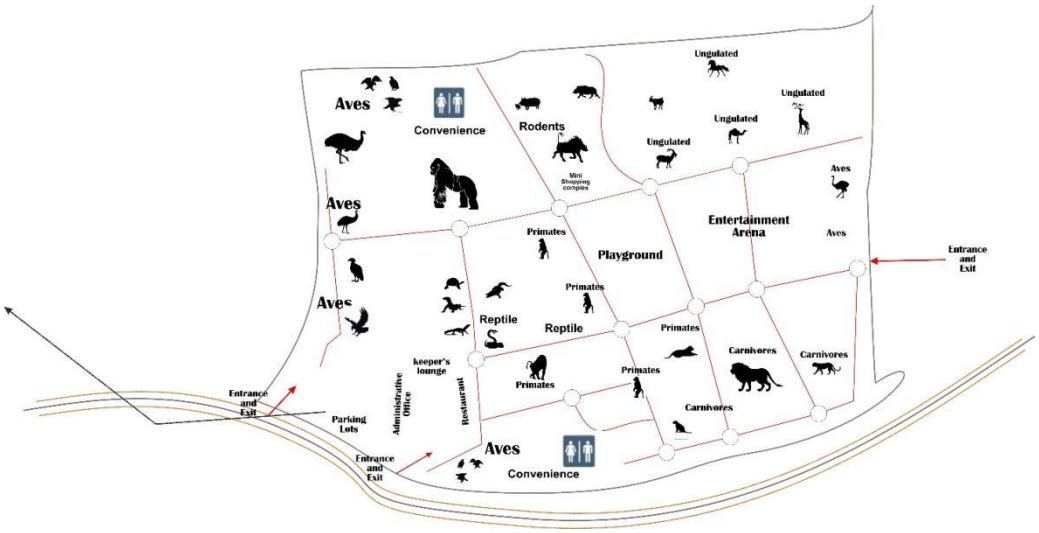


Figure. 4.2: Initial circulation Analysis of the Site.
(Source: U.I Zoological Garden, 2024)

4.5.7 LANDSCAPE ANALYSIS OF THE EXISTING SITE

- Every zoo in any location has some kind of existing natural vegetation at the site. The term 'vegetation' includes trees, shrubs, grasses and any other plant material.
- Entire area, where hardscape is not extended to should have be been covered with grass and plants.

Plate. 4.9: Pedestrians Path
(Source: U.I Zoological Garden, 2024)

Plate 4.10: Pedestrians Path
(Source: U.I Zoological Garden, 2024)

Plate 4.11: Pedestrians Path
(Source: U.I Zoological Garden, 2024)

4.6.0 SITE SELECTION CRITERIA

Based on the findings from the existing documents gathered and analysis, it is important to establish a thorough understanding of the area in order to formulate a suitable approach in redesigning the zoo that could benefit the community socially and economically. There are several factors in solving the site problems which should be implemented in the proposed development.

4.6.1 LAND USE AND SITE ACTIVITIES

Land use and activities play the major role in organizing the changes of area and activities inside it. For the research in U.I Zoological Garden, the potential of the land uses and site activities can be seen through the existing activities that occurred.

From inventory, the overall layout of U.I Zoological Garden, seven major space activities namely Buildings/ Structures, Animal Enclosures, Service Structures, Services, Elements, Circulation, Landscape.

The activity, if enhanced and upgraded will not only serve the nearby community but also attract outsiders as well besides maintaining the image of U.I Zoological Garden, as a zoological park. It also generates income and improves the living environment of the community thus ameliorating them socially and economically. Although these site activities are fully utilised, but there is no proper planning to fully manifest it for the benefit of the community, public and visitors.

4.6.2 TOPOGRAPHY AND HYDROLOGY

The ambience of U.I Zoological Garden is naturally formed where 85% of land area is highly undulating slope, while 15% is slightly flat land. This provides various experiences for visitors. The diversity of terrain also could be taken advantage of to develop microclimates and established a variety of remarkable views. Different gradient of land brings different interpretation experience to the visitors. As for this potential, the ambience of the undulating landform will became an important factor to consider in designing the area towards for making it unique.

Water body which is high sensitivity area able to support learning process such as understanding on lake ecosystem, the important role to accommodate the balance in the ecosystem and its vicinity as well as diversity of aquatic species plays a major role in sustain the environment.

- For animals - for drinking, for enclosure pools, for water animals for cleaning of
- enclosures, etc.
- For staff and visitors - for drinking and use in toilets.
- For landscape irrigation.
- Water jets for emergency purposes including animal restraint and fire control.
- For operation and management of various services

4.6.3 CIRCULATION AND ACCESSIBILITY

U.I Zoological Garden easily accessed from Appleston Road with two ways of which one is primary route that allows visitors and secondary is via administrative building. Laying out exhibits and facilities happens simultaneously with determining how people will move from location to location or through the zoo experience from start until the end.

In addition to the visitor's experience, circulation and building layout (exhibit) must take others users into considerations such as service and maintenance staff. Clearly identifying the main entrance is of prime importance especially if special events to be held in the zoo compound.

They may require special entry or circulation consideration without disrupting flow and organization.

From the inventory, circulation system in this zoo compound can be categorize as main circulation, pedestrianize systems only.

4.6.4 BUILDINGS AND STRUCTURES

The architecture of the building and structure especially in certain exhibit likes „Ungulate Village" and „African Savanna for other species of animals" show the character and the design intentation. Development of the buildings must blend together with their surroundings to provide the dramatic environment. Here the landscape architect have play their role because the function and character of the building and structures is more meaningful through the landscape design.

The design of each building and structure include supporting facilities and amenities such as shelter and benches must consider the characteristics of the image or period of architecture for a particular area and should improve on the character of the area as a whole. In other words, all the building and structures should not be designed as though it was the only building or structures on the site. Grouping of buildings should create comfortable environments for the people's movement.

Municipal space for the gathering of intellectuals such as researcher and others specialist should be sensitive to the external environment around the building and preferably bring nature into the space or merge it together. The architecture, façade and selected uses of material must take into consideration. In particular, the grouping, orientation and location of building and structures should simply to socialize.

4.6.5 VISUAL QUALITY

The scope of landscape architectural in zoo design was trained to design spaces with emphasizes the quality of spatial design, specific on the three-dimensional aspects of planning such as the image, sense of place and character. These concepts emphasize the quality of architecture and axis design that are significant and able to fulfil the aesthetic and comfort needs for the everyday activities.

To further exploit the high visual quality of U.I Zoological Garden, multiple viewing platform should be provided especially when merge with the existing varying landform to enable the users to enjoy the scenery quality to the fullest. This will contribute to creating an amiable atmosphere for the area where it allows direct view towards the greens and lake without obstruction or barriers.

4.6.6 VEGETATION

An exceptionally important prerequisite to zoo designing is the recording of information about the existing vegetation at site; particularly the trees. This is to ensure that the design is done to ensure that no tree will need to be cut; and if some trees are required to be removed then the design has full information about them to allow him to take the requisite statutory permissions for felling/ lopping of the tree as per the local rules/ guidelines/ instructions applicable in the area. No tree can be cut without the mandatory prior permission; whether the tree is located within public land or a private plot.

Today, plants in zoos are used outdoors and indoors, in animal's enclosures and visitors areas. The evolutions of zoos may shift towards zoological-botanical gardens as the interdisciplinary approach is thriving. The total values of plants in many zoos far exceed the total numbers of the animal's collection.

Primarily along water edge, vegetation of the wetlands species helps to slow the flow of water. This means that sediment in water is deposited and toxic element removed as it enters such wetland areas. In addition, the diverse vegetation and adjacent water provide unique wildlife habitat and the setting for many interpretation pursuits. Others than that, plants in zoos functions as a supplementing food, feeding, defining spaces, creating microclimates, occupying animals, building nest as well as educating visitors by planting exotic and rare plants that are labelled.

As a Coe (1988) mention, the success of elaborate planting in zoo compound can be attributed into two things, firstly improved technology in plant support system (irrigation, drainage, supplemental lightning and so on) and secondly the staffs who has trained horticulturists.

4.6.7 SOIL SURVEY

- The significance of soil in the designing of zoo is three-fold. Soil information is required for selection of planting material- trees, shrubs, ground covers & creepers planting in zoo. While observation of existing vegetation in the vicinity may give a fairly good idea about the plants which will do well in that area but site-specific soil data is still required since the site may have different characteristics; sometimes significantly different. It may just be that the site may have been a landfill area or the geological horizons (the parent rock may have dipped or risen suddenly, thereby increasing, decreasing the soil depth available for planting. The planting design will relate to the depth and type of soil available. In relatively large areas such as that of a zoo, there is no possibility of replacing unsuitable soil with select

earthen large quantities. Therefore, the plant selection will need to be such that it suits the existing soil.

- The second reason for soil study will be to ensure that the soil has the bearing capacity and is suitable for building foundations. The soil should not be susceptible to any kind of erosion especially in undulating terrain.
- Thirdly soil texture and structure is significant because it affects the movement of surface water and contracts infiltration besides determining the potential of zoo area for water harvesting; in the large context for water management.

4.6.8 MASTER PLAN REGULATIONS

In case the zoo site falls within urban limits or an area which is controlled by master plan regulations, it becomes incumbent on the designer to be aware of them and follow the statutory mandate.

Some related master plan information which will help the designer is:

- Proximity of major travel and commuter routes, both existing and planned
- Planning zoning and related development information
- Aircraft flight paths / flight funnel area and noise contours

4.6.9 CLIMATE AND MICROCLIMATE

Climate, in the form of precipitation, relative humidity, wind speed and direction, pressure and temperature, influences human and animal comfort, vegetation and activities. As zoo designer we are concerned with providing comfortable outdoor environment throughout the year for animals primarily, and also visitors. Cost of providing comfort within buildings by artificial means is prohibitive. Therefore, zoos should be designed in the most comfortable environments, and if necessary, the site should be modified to achieve comfort.

4.6.10 MONUMENTS/ HERITAGE STRUCTURES WITHIN THE SITE (OR IN CLOSE PROXIMITY)

Many zoo sites may have monuments or heritage structures within the site or in close vicinity. If some of them are protected monuments then any development or construction will have to conform to the related laws. Otherwise, these structures should be integrated in the layout of the zoo. Areas around the monuments which are within the site should be suitably designed so that the visitors are able to view them and learn about the historic context of the site. Those heritage structures/ monuments which are in visual proximity of the site should be integrated in the

layout so that the monument integrates with the layout. Infact, if well designed, it should enhance the aesthetic value of the zoo when historic / heritage structure is made visible from various roads, paths and other open areas within the zoo.

4.7.0 PROJECT ANALYSIS AND DESIGN SYNTHESIS

4.7.1 BRIEF DEVELOPMENT

(a) Entrance/Gate House

- Parking lots
- Gate House
    - Ticketing room
    - Security room

(b) Buildings/ Structures

- Administrative offices (Existing Building)
    - Receptionist
    - Clinic (Additional)
    - Conveniences
    - Office(s)
    - Conference
    - Storage
- Restaurant
    - Entrance
    - Dining Area
    - Servery Area
    - Kitchen
    - Storage (Wet and dry)
    - Office
- Educative House
    - Entrance
    - Wailing Area
    - Elevator
    - Staircase
    - Life-size Specimen exhibition space
    - Conservation Gallery

- Gallery Exhibition Space
- Rainwater Harvest
- Convenience
- Observation Balcony
- Interactive space
- Museum
- Office
- Laboratory and Research Centre
- Conference
- Animal Library
- Relaxation Space
- Store

- Refreshment Station
  - Game Arcade
  - Snack and drinks bar
  - Observation desk
  - Maintenance space
  - Seating area
  - Ramp
  - Staircase
- Conveniences
  - Male Toilet
  - Female Toilet
- Reptile Exhibition House
  - Receptionist space
  - Office
  - Staircase
  - Conservation room
  - Convenience
  - Exhibition Area
  - Green roof
  - Observation Pathway

- Primate Exhibition/House
    - Enclosure Area
    - Gallery Area
    - Feed Cubicles
    - Keepers' Gallery
    - Feed window
    - Drinking Water Area
    - Trough
    - Storage
    - Squeeze Area
- Ungulate Exhibition/House
    - Enclosure Area
    - Gallery Area
    - Feed Cubicles
    - Keepers' Gallery
    - Feed window
    - Drinking Water Area
    - Trough
    - Storage
    - Squeeze Area
- Carnivores Exhibition/House
    - Enclosure Area
    - Gallery Area
    - Feed Cubicles
    - Keepers' Gallery
    - Feed window
    - Drinking Water Area
    - Trough
    - Storage
    - Squeeze Area

- Aviary Exhibition/House

- Walk-in aviary
- Uplands birds
- Raptors
- Water fowl
- Cockatoo
- Bird of paradise

(c) Animal Enclosures and Elements

- Paddock
- Moat / Barrier
- Feeding cubicles / night
- shelter / retiring cell
- Along stand-off barriers
- Along road and paths
- Signage

(d) Service Structures

- Electric substation (Only Diesel Generator sighted)
- Pumping station
- Overhead water tanks

Services

- Water supply pipes
- Electrical cables
- Secure digital
- communication
- Water retention pools

(e) Circulation

- Vehicular circulation
    - Driving Path
- Pedestrian circulation
    - Walkway

(f) Landscape

- Green Space
    - Vegetation
    - Gardens, planting beds, trees, plantation
    - Vegetation buffers/ Screens

- Peripheral planting
- Green pavers areas

- Relaxation/Rest
  - Landscape Art and Sculptures
  - Playground
  - Pool
  - Ungulate show Area

4.7.2 DESIGN CONSIDERATION

- Safety and health of animals and visitors: The general security of any zoo covers both the sensitive and non-sensitive areas of the zoo.
  - Secure animal cages;
  - Cold rooms and all food stores;
  - Visitor safety;
  - Animal safety from public feeding etc;
  - Safety of other buildings and structures.
  - fencing**:** Fencing of the perimeter must be adequate to keep animals and unauthorized persons from getting in or out.
- Exhibit size and shape.
- Exhibition orientation - normally the greatest dimension should be parallel with the public
- Orientation of enclosure to avoid glare, excessive sun and rain while getting adequate breeze and ventilation.
- Materials to be used should be selected for hygiene and ease of maintenance.
- Eye level of visitors for best viewing, exhibits must be carefully considered including the provision of step ups to assist children and other features.
- Props and decorations to impart a natural (or artistic) setting.
- Shift cages to enable animals to be seen and easily moved or treated.
- Barriers which include cortical wires under tension, bars, rails, moats, fencing, walls, glass, psychological, electrical (shock fences), and thermal (refrigerated coils or hot water lines)
- Layout of other Amenities in a Zoo: Features not specifically related to the display of animals in a zoo layout but highly essential in the layout of any permanent zoo.
  - Adequate parking facilities.

- Entrances and exits which should be limited but able to cope with peak periods.
- Landscaping with proper horticultural treatment to make the zoo an attractive habitat and not a prison for animals.
- Sculpture: Zoos are ideal settings for sculpture gardens; especially sculptures of animals which cannot be exhibited because they are extinct or too difficult for the zoo to keep.
- Public Amenities: These range from adequate and clean toilets and refreshment kiosks to hotel accommodation, amusement parks, etc. They should also relate to the appropriate forms of building design and construction as visitors may be intrigued by the human artefacts for a region as the animals.
- Method of Circulation: By footpaths, bridges, railways etc; with adequate places for resting. Gentle ramps should be used in preference to steps and loose surface such as gravels which can be used as missiles by the public (children) should be avoided.
- Administrative offices, animal hospitals, research laboratories, maintenance workshop, etc

4.7.3 CONCEPTUAL DEVELOPMENT AND DESIGN STRATEGIES

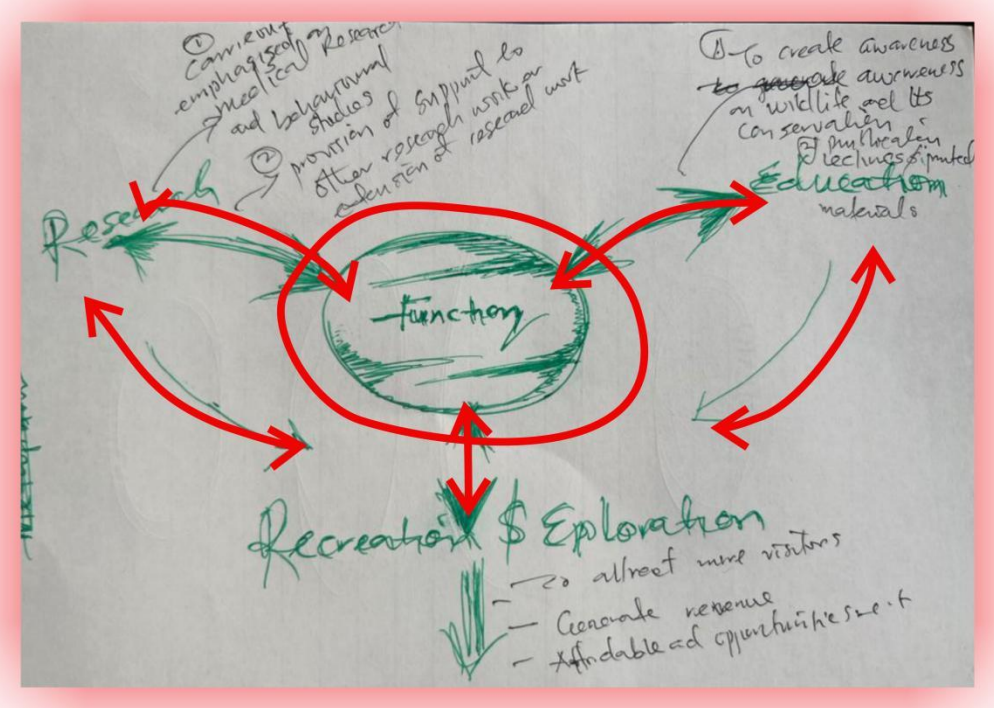


Figure 4.4: Conceptual Development Step One
. (Source: Researcher, 2024)

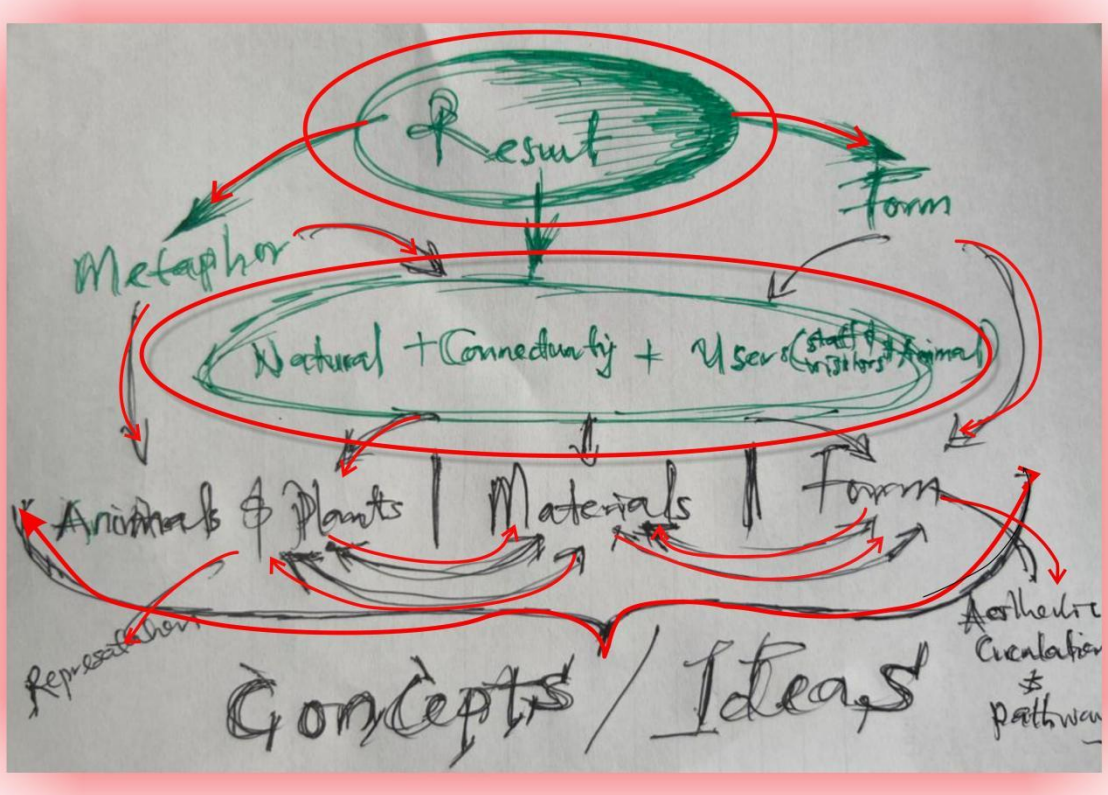


Figure 4.5: Conceptual Development Step Two
(Source: Researcher, 2024)

Flow chart of Conceptual Development Process starting from the Function of U.I Zoological Garden as a Zoological Park, come out with finding from Research, Education and Recreation, followed by nature, connectivity and users (Metaphor and form) as well as finally the concept that are suitable for the development.

Implementation metaphor and functions makes a design concept more accurate with the conditions and environment of the site. This is because it will be blend and merge together through the site and the outcome will be encouraging because it will take all aspects and factors.

Selection of metaphor and functions derived from the various aspect and effect that will be facing in the future. However, it more based on the overall layout by the story that the zoo is trying to deliver.

4.7.3.1 DESIGN STRATEGIES

Landscape architectural approach is concerned with order in a design process includes design principles and composition. The ultimate visual objective in any design is to balance unity with diversity and to respect the spirit of the place. The patterns and structure of a design, composition or landscape result from the organization of the basic elements in their endless variations.

Certain pattern so created seems harmonious and unified others discordant and chaotic. It is necessary to examine some detail for the concepts of unity, diversity, and genius loci before looking at the various means by which elements can be organized in the design process. Particularly McHarg (1969), said that creativity becomes stifled by the method in which form follows function and there is little room for either a conscious desire to achieve a beautiful result or for sensitive emulation of natural processes in a directed way.

These organizational principles can be grouped into three categories:

- Spatial: nearness, enclosure, interlock, continuity, similarity, figure and ground
- Structural: balance, tension, rhythm, proportion and scale
- Ordering: axis, symmetry, hierarchy, datum, and transformation.

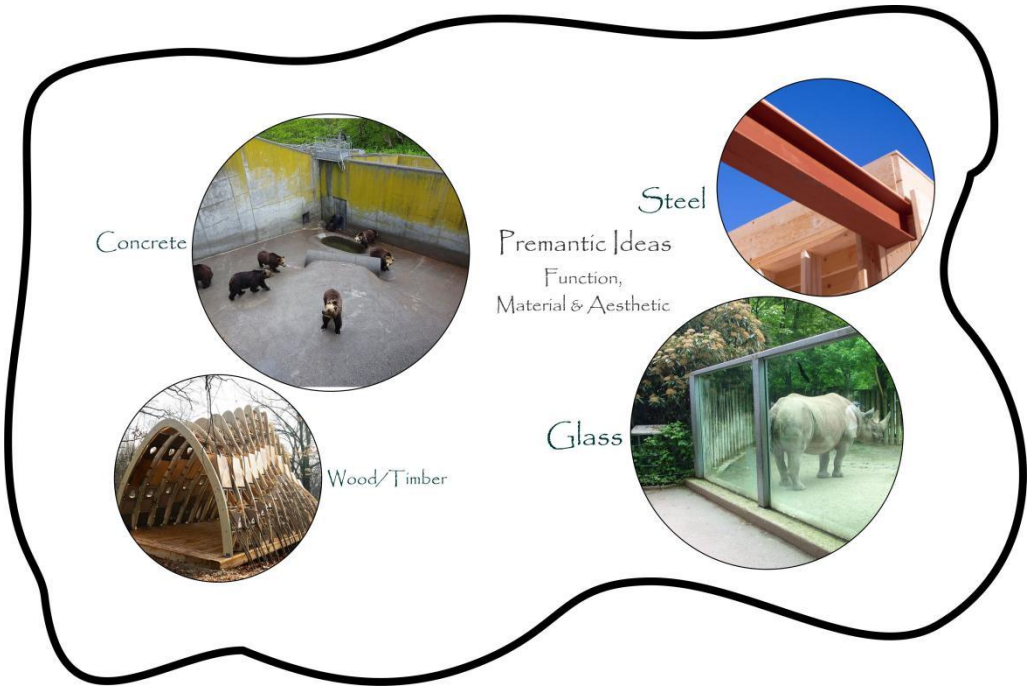


Figure 4.6: Conceptual Development for buildings and structures (Materials)
. (Source: Researcher, 2024)

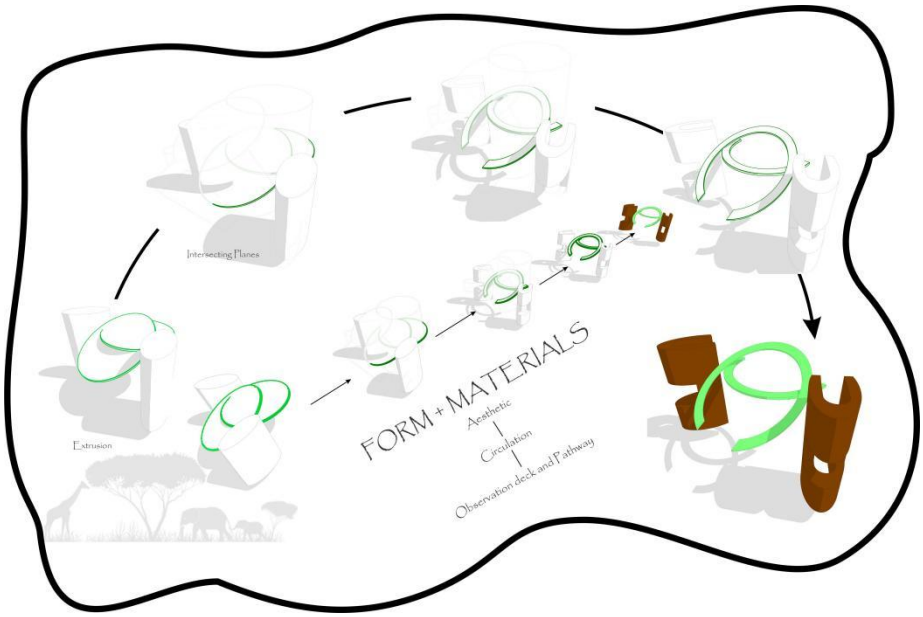


Figure 4.7: Conceptual Development for buildings and structures (Form and Materials) . (Source: Researcher, 2024)

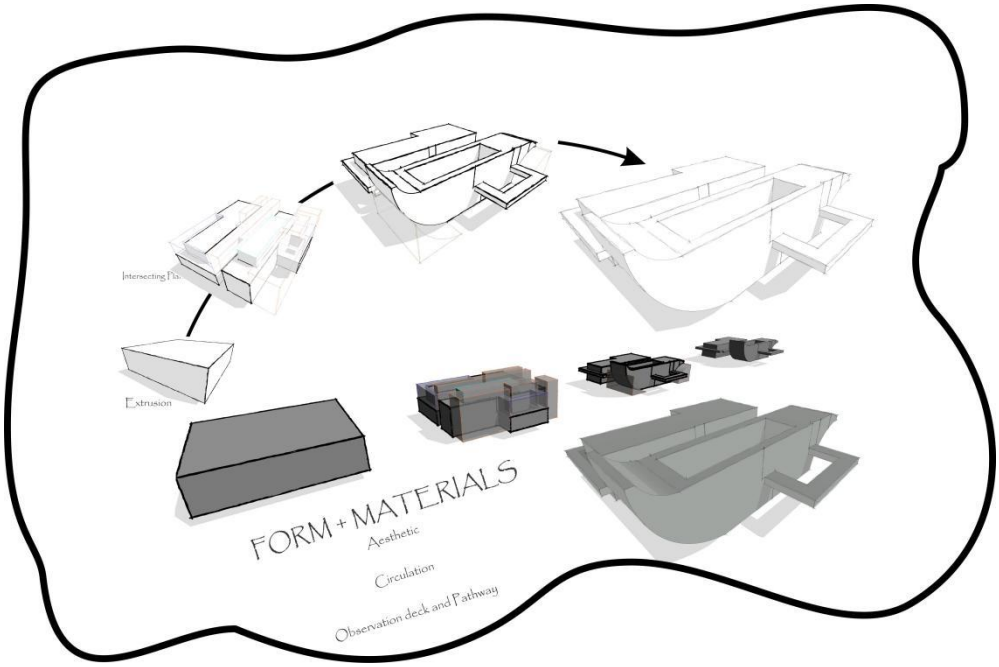


Figure 4.9: Conceptual Development for buildings and structures (Form and Materials) . (Source: Researcher, 2024)

The motive for the overall design is a combination of all natural elements that can contribute to balancing the ecosystem as well as comfort to all creatures of nature which is harmony between a straight line and curve. In addition, in view of above descriptions, the redesign project would serve as the centre for preservation and conservation, the proposed landscape design will contribute substantially to the legibility of the site overall character and identity of this zoo.

4.8.0 SITE ANALYSIS

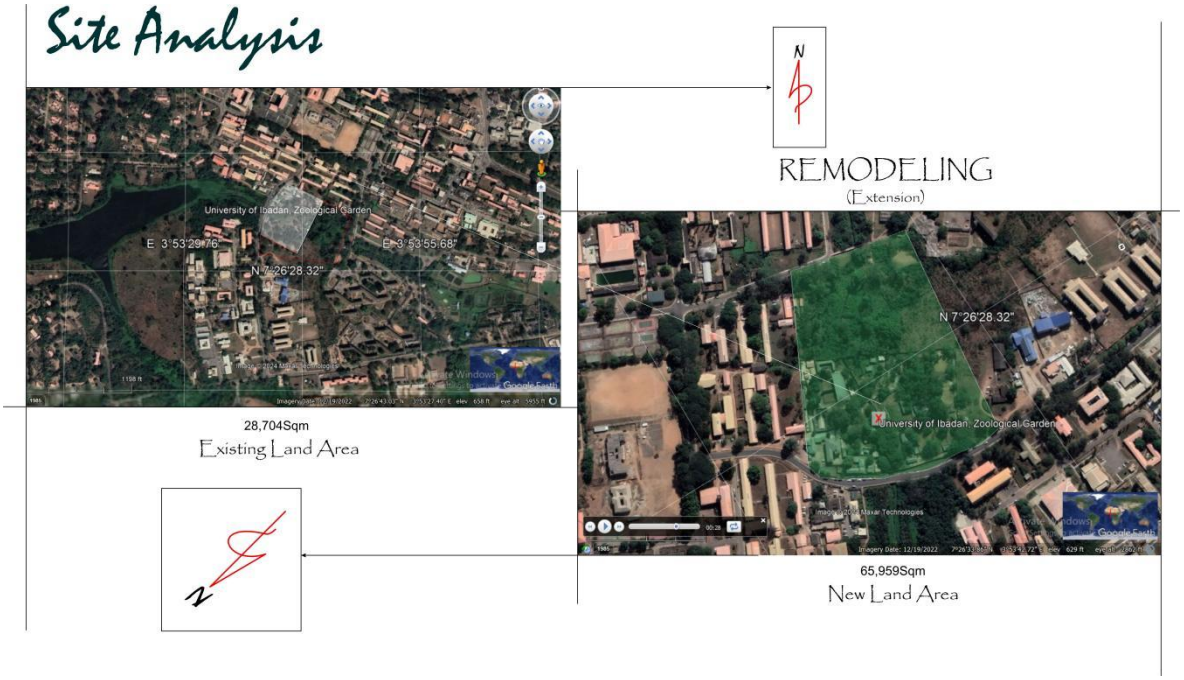


Figure 4.10: Land Expansion for Redesign of U.I Zoological Garden.
. (Source Google Earth, 2024)

4.8.1 VEGETATION

At some site there is no vegetation, only in the western part of your included vegetation, and its existence as well as the greening of the freeway. While on the site there are many trees whose existence as a replacement for the original habitat of animals that are on it. The existing vegetation can be recycled into better; this is a potential for the site.

Set the untreated vegetation and then combine it with other elements, thus becoming a new and better. At the U.I Zoological Garden is the amount of vegetation and there are many parts that

are not processed which will then be utilized and processed into a better than ever. In the redesign, the presence of vegetation as a reference for determining the location determinants of animal cages. Little vegetation on the conditions that will be placed cages of animals that require a high sun, while there are many areas of vegetation will be place cages, tropical animals in the forest habitat.

Vegetation types used in accordance with the functions of the vegetation. Some of these vegetation types include directional tree, shrub tree/grass and shade trees. At the U.I Zoological Garden existing vegetation will be maintained and arrange the parts that are not maintained.

Figure 4.11: Illustrate the condition Showing Existing River passing through the Lake (Source Google Earth, 2024)

4.8.2 HYDROLOGY

Hydrology is the study of the movement, distribution, and quality of water. U.I Zoological Garden gain their sources of water, Mainly from Artificial Water system.

- Water Tank

Located right in the centre of the zoo compound, the water is channelled through the piping system and used specifically for daily use such as visitor facilities and staff.

4.8.3 DRAINAGE

Variety of drainage systems and the flow of water runoff in the zoo compound are different between each other‟s based on their location, topography, steepness, as well as types of soils. From the observation, drainage systems can be divided into two main systems, namely:

- **Drain system**

This type of irrigation systems used widely in the area of the zoo across the entire exhibit and it‟s surrounding. **4.8.4SOIL**

Setting in the natural tropical rainforest with the sundry tree cultivation, U.I Zoological Garden varied landscape presents an equally rich cross section of soils, which in turn support specific vegetation types. Types of soils such as clay, peat, limestone, or granite derived are affected by regional climate, altitude, topography, and parent rock. U.I Zoological Garden with the diversity of topography also forming different types of soils. The land that already disturbed should be treated for animals and plants suitability.

The existing soil contained in this site is from the type of laterite and peat soils with low organic matter or supporting nutrients for tree growth. Peat soil contain fibrous organic components derived from decomposing woody matter and can be several meters in depth. Generally poor chemically or acidity and badly drained, they support peat swap trees and palms which have adapted to the harsh conditions. Thus, almost all land within this zoo compound has been treated and formed into new mixture accordance with the original habitat by E. Pioltelli , L. Guzzetti , M. Ouled Larbi et al, 2015.

4.8.5 WIND ANALYSIS

The analysis was conducted to the wind to get the best design in the utilization of wind. On the condition of site existing of the wind blowing east to west. On the opposite side of the highway directly with eastern winds will experience mush faster and cleaner greater than on the inside. While on the inside of the air filter has experienced quite a lot of vegetation on the site, so that in the cage was no need for special measures for the wind.

4.8.6 TOPOGRAPHY

Topography provides important information on the biophysical and cultural context; and significantly influences the type of soil, vegetation, and the land use pattern. Most of the terrain in U.I Zoological Garden is naturally formed in which 85% is hilly and undulating slopes, while 15% is almost flat. This diversity of terrain provides an opportunity for the formation and development of various types of exhibit habitat according to the climate and their environment.

In addition, the diversity of terrain also provides potential for the development and establishment of a variety of remarkable views. The areas of undulating slope that provide potential for design have been rounded for the following families of animals:

- Mini safari
- Primate Kingdom
- Water Fowl
- Big Cat Complex

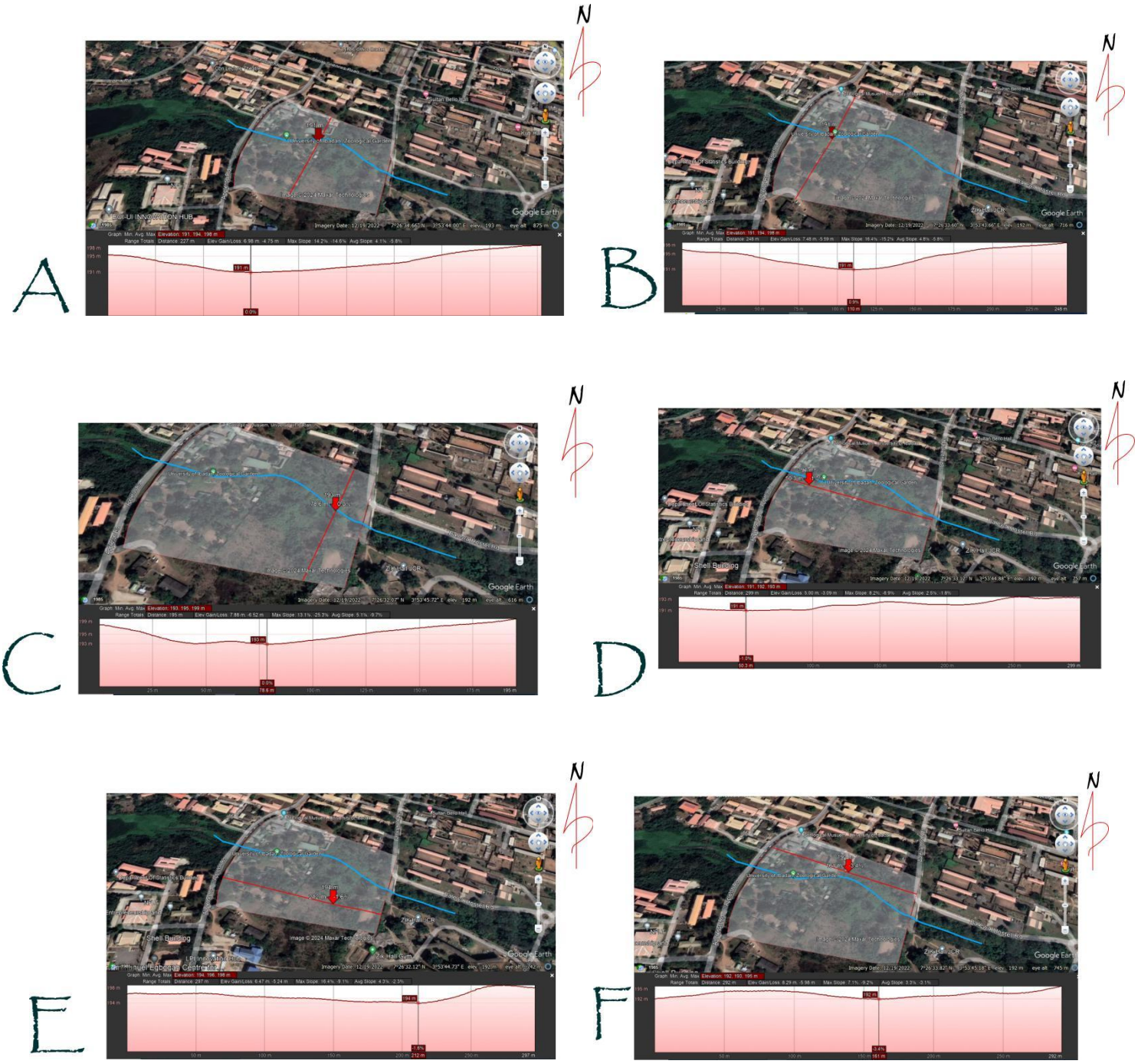


Figure 4.12: Views existing undulating landforms easily transform as an exhibit habitat.
. (Source: Researcher, 2024)

4.8.7 ANALYSIS OF TEMPERATURE AND HUMIDITY

The higher the temperature the higher the ability of air to absorb water. Temperatures in the city of Ibadan is quite high, especially during the dry season. This makes the higher the air to absorb water. Therefore, the city of Ibadan to humid heat. With state of the temperature and humidity as it may determine appropriate areas with animals in it. As in areas of high temperature will put the cages of animals that require high temperatures such as camels and savannah animals (Zebras, horse, lions etc).

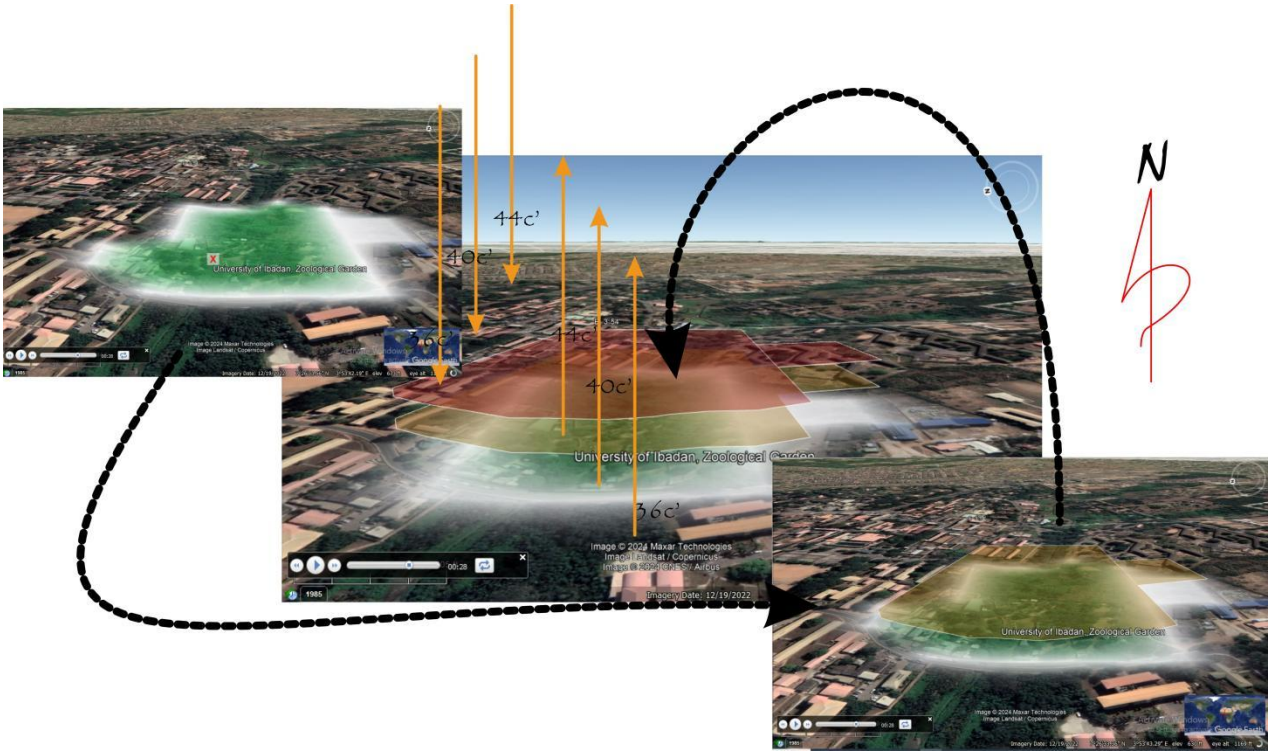


Figure 4.13: Analysis of Temperature and Humidity

. (Source: Researcher, 2024)

4.8.6.1 AN ALTERNATIVE TO IMPROVE COMFORT:

- Equipment in the building that produces direct cooling by evaporation.
- Installation on the outside and around the building that can assist in cooling the room. Cooling occurs by a decrease in wall temperature, air conditioning or roof of the building touches.
- Placement of the cage according to the type of animals that require high temperatures or low.

4.8.6.2 APPLICATION OF THE DESIGN

- Vegetation in the area around the exploited and do not close the air flow
- The area around the building given the flow of water such as ponds, artificial river but the water must flow around the site.
- In the cages were given some vegetation as a shade, as well as some cages without vegetation adapted to the wildlife therein.

While the treatment cages to temperature and humidity adjusted to correspond with the animal's natural habitat. The analysis can be performed as follows:

- Veterinary tropical placed on areas with more vegetation because the humidity will be higher and the sun just coming from the crevices of the tree. In the cage can be added to the water/pool as.
- Animals will be placed on the savannah areas with less vegetation so that the sun can be entered directly into the enclosure so that the lower humidity and higher temperatures. Reduce or without the addition of water/swimming a lot.

Figure 4.14: Analysis of the Sun and Wind Paths
. (Source: Researcher, 2024)

4.8.7 SUNLIGHT ANALYSIS

- Areas exposed to sunlight in the morning, the area is maximized openings for morning sunlight into the room to its full potential. In this area also be maximized for public facilities for visitors so that comfort can be felt.

- Areas affected by the afternoon sun, in this area-not avoid the use of a wide aperture, or also use a barrier or shading to avoid the blinding afternoon sunlight and heat. In this area can be used for animals that require a high sun and placement of vegetation along the circulation for visitors.
- Areas affected by the afternoon sun is not too hot. Neutral area that can be enabled for visitor activities.

4.6.8 NOISE ANALYSIS

Noise is one of the main obstacles that must be resolved, because the presence of noise can interface with the activities in the areas that need quiet, so there should be a controller for such noise. At the U.I Zoological Garden there are areas that require no noise and there are areas that do not affect the noise.

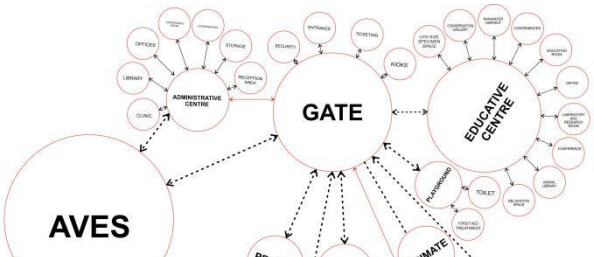
At high noise areas are places that need peace like the administrative building and other buildings, while in the middle of the zoo are busy and exhibits area or animal cages.

4.9.0 FUNCTIONAL RELATIONSHIP

Functional and relationship diagram is a way to know the suitability and the relationship between the spaces that were proposed. These indentify functional area and the links between them in an abstract form. Alternative layout can be quickly tried out on the site plan in the midst of relationship diagram acting as a checkers to ensure that the necessary links and the relationship between the proposed activities inside the spaces are maintained.

4.9.1 SCHEMATIC PLAN

Schematic plan derived after the final relationship diagram to determine the most effective placement of the proposed idea. Base on conceptual zoning that be done before, all the programmes merge together with the zoning area.



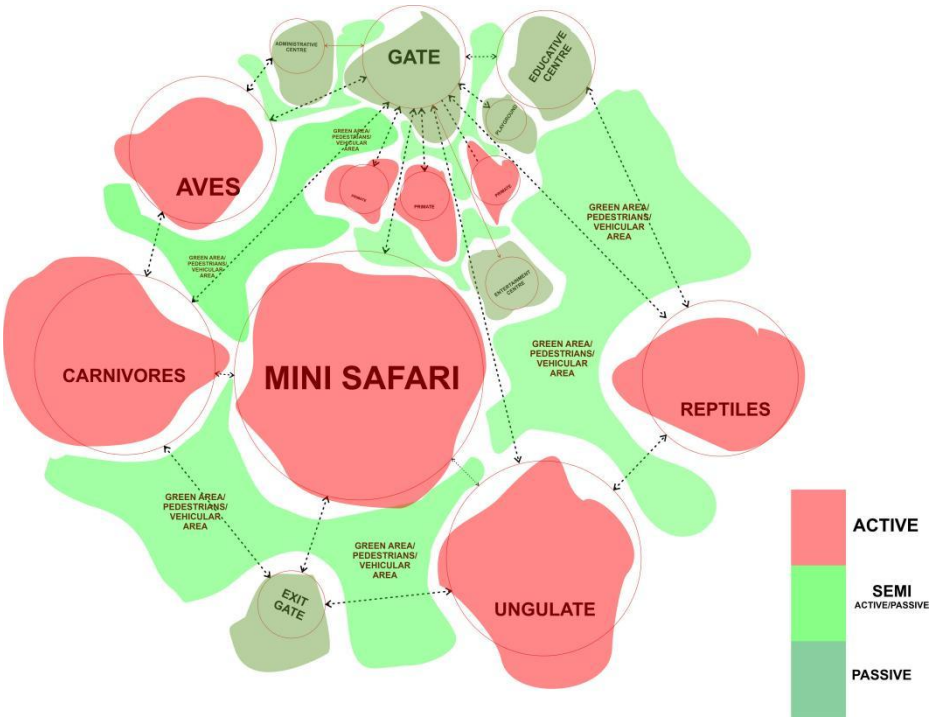


Figure 4.17: Illustration of Functional Diagram
. (Source: Researcher, 2024)

4.10.0 CONCEPTUAL ZONING ANALYSIS

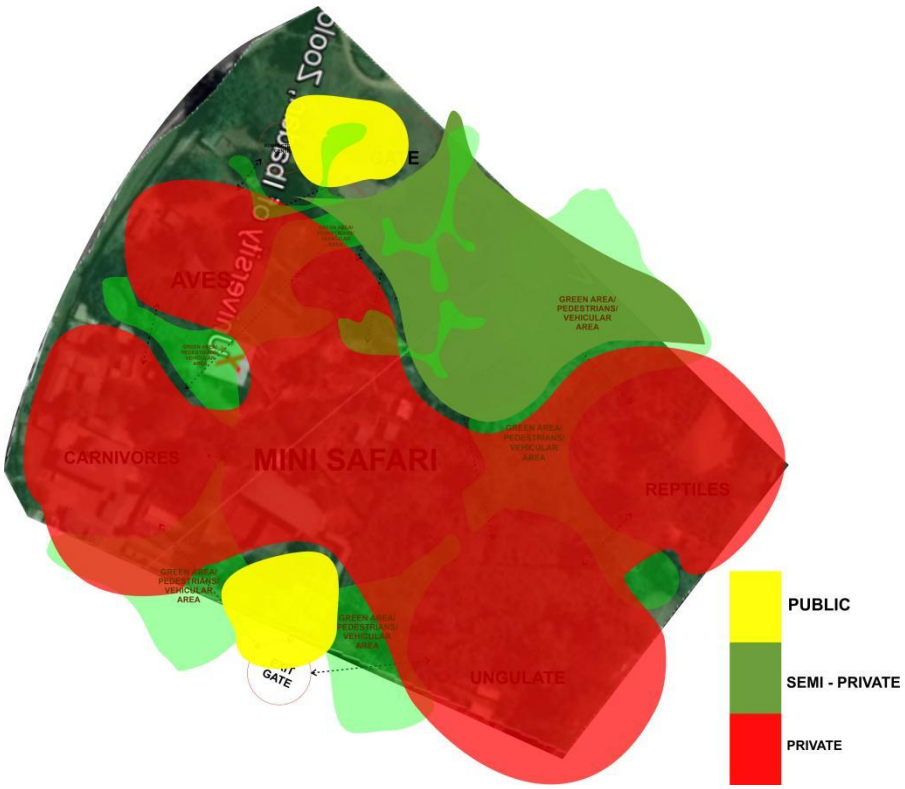


Figure 4.18: Illustration of Relationship Diagram for site spaces and connectivity.
. (Source: Researcher, 2024)

- **Zoning Analysis**

Zoning analysis done in order to place or classify area according to function.

- Public: Parking, Ticketing, Security house.
- Semi Public: Administrative Building.
- Private: Exhibit, Educative building, Refreshment building, Animals/Exhibitions house

4.11.0 SCHEDULE OF ACCOMMODATION

Table 4.1: Schedule of Accommodation

	Spaces	No	Meter	Sqm
A	**Entrance/Gate House**			
	i. Parking lots	50	5.0 x 3.0	750.00
	ii. Ticketing room	2	3.3 x 3.0	19.85
	iii. Security room	2	3.3 x.30.0	19.85
B	**Buildings/ Structures**			
	Administrative offices (Existing Building)			
	i. Receptionist			22.68
	ii. Clinic (Additional)			38.88
	iii. Conveniences	12	1.9 x 0.9	19.44
	iv. Office(s)	1	3.6 x 4.2	15.12
	v. Conference	1	6.0 x 5.4	32.45
	vi. Storage	2	3.6 x 1.2	8.65
	Restaurant			
	i. Entrance			7.20
	ii. Dining Area			27.05
	iii. Servery Area			12.60
	iv. Kitchen			18.05
	v. Wet Storage	1	3.0 x 1.2	3.60
	vi. Dry Storage	1	3.0 x 1.2	3.60
	vii. Office	1	3.0 x 3.0	9.05
	Educative House			
	i. Waiting Area			31.05
	ii. Elevator	3 (Ground, 1st and 2nd floors)		26.70

iii.	Staircase	6 (Ground, 1st and 2nd floors)	98.40
iv.	Life-Size Specimen Exhibition Space		40.50
v.	Conservation Gallery Space		Add
vi.	Gallery Exhibition Space		44.10
vii.	Rainwater Harvest	3 (Ground, 1st and 2nd floors)	8.70
viii.	Convenience	6 (Ground, 1st and 2nd floors)	120.78
ix.	Observation Balcony		Add
x.	Interactive Space		Add
xi.	Museum		54.00
xii.	Office		44.00
xiii.	Laboratory And Research Centre		66.25
xiv.	Conference		22.20
xv.	Animal Library		47.90
xvi.	Relaxation Space		27.00
xvii.	Store		17.20
xviii.	Teaching Space		27.00
Refreshment Station			
i.	Game Arcade		34.20
ii.	Snack and drinks bar		10.82
iii.	Observation desk		Add
iv.	Maintenance space		18.05
v.	Seating area		64.40
vi.	Ramp		Add
vii.	Staircase		16.20
Conveniences			
i.	Male Toilet		40.50
ii.	Female Toilet		40.50
Reptile Exhibition House			
i.	Receptionist space		14.80
ii.	Office	2 x 15.1	30.20
iii.	Staircase	2 x 10.5	21.00
iv.	Conservation room		46.40

	v. Convenience		2 x 21.7	43.40
	vi. Exhibition Area			36.10
	vii. Green roof			Add
	viii. Observation Pathway			Add
	Carnivores Exhibition/House (Standard Analysis)			
	i. Enclosure Area			Add
	ii. Gallery Area		12.0 x 2.4	28.80
	iii. Feed Cubicles	4	3.0 x 2.5	30.00
	iv. Keepers' Gallery		12 x 3.2	38.40
	v. Feed window			add
	vi. Drinking Water Area			18.00
	vii. Trough		2.4 x 0.9	2.16
	viii. Storage		2.4 x 1.2	2.88
	ix. Squeeze Area		3.0 x 1.8	5.40
D	**Service Structures**			
	i. Electric substation (Only Diesel Generator sighted)	1	3.6 x 3. 6	12.96
	ii. Pumping station	1	3.0 x 3.0	9.00
	iii. Overhead water tanks	1	2.4 x 2.4	5.76
F	**Circulation**			
	Vehicular circulation i. Driving Path			Add
	Pedestrian circulation ii. Walkway			Add
G	**Landscape**			
	Green Space			
	i. Vegetation			Add
	ii. Gardens, planting beds, trees, plantation			Add
	iii. Vegetation buffers/ Screens			Add
	iv. Peripheral planting			Add

	v. Green pavers areas	Add
	Relaxation/Rest	
	i. Landscape Art and Sculptures	Add
	ii. Playground	Add
	iii. Pool	Add
	iv. Ungulate show Area	Add
F	**Mini Safari**	

4.12.0 CONSTRUCTION METHODS AND MATERIALS

4.12.1 CONCEPT OF SHAPE AND VIEWS

The concept of the building will be used, use of materials that are environmentally friendly, so memorable one with nature. Will be displayed at the entrance while the reliefs of animals, as if the main entrance is a large boulder.

In the cages will be used an open and close concept so that animals in it seemed to be in the wild.

4.12.2 ROOF GARDEN SYSTEM

Use of roof garden on the roof of a building intended to replace some pavement area, but the aims to accommodate the roof garden and rain water flow into underground water tank that can be used as a water reserve for utility/sanitation are also building for the purpose of watering plants. At this zoo to be used on the roof garden of trustees of refreshment buildings, reptiles, educative buildings and with some auxiliary buildings

4.12.3 OPENING SYSTEM

The use of wide openings in the facade of the building aims to sunlight can enter the building so that the use of artificial lighting can be reduced.

4.12.4 MATERIALS

The used of building materials that are environmentally friendly and comes from nature as follows:

Natural brick or brick fabricating lightweight has fire resistant characteristics, strong high pressure and low water absorption.

The use of alumimum as a material anodize doors and windows because it has the advantage can be recycle, free of toxins lead to cancer, and practically maintenance-free design with special insulation to reduce heat transmission and noise, more powerful, durable, and antirust.

4.13.0 BUILDING SERVICES

4.13.1 AIR SYSTEM

Air in this building using the natural and artificial systems. However, emphasis on the natural system with less how to create openings large enough for air circulation, it is supported also by the planting of vegetation that mush that it makes the microclimate inside that eliminates hot air and dust. While the use of artificial such as air conditioner (AC) is placed in spaces that require artificial.

4.13.2 WATER SYSTEM

System used for water supply is bore hole. Water pump for their own needs or the needs of small amounts ranging from 5-15m depth. Clean water system uses a storage system. Clean water is stored in over-head tant.

4.13.3 WASTEWATER SYSTEM

Wastewater system is a closed system. Channel depth is now branching with rain water drainage channel is located at the bottom. At certain distance made manhole as a maintenance channel.

4.13.4 ELECTRICITY DISTRIBUTION

Power source used is the source of electricity and generating plant. Scheme of the power source will be used int the concept design and planning of the U.I Zoological Garden.

4.13.5 INFORMATION SYSTEM

Information systems to be used is the telephone network, CCTV and Security.

The tools used in CCTV and security are as follows:

- Camera
- Monitor TV
- Security room, the room is fitted with the monitors and equipped with air conditioning, separate toilet and lighting.

CHAPTER FIVE

5.0 PROJECT APPRAISAL

This design thesis examines the role of landscape planning in the development of sustainable environments, focusing on the innovative use of zoological gardens as an approach in landscape architecture and valuable resource for addressing the difficulties encountered in inadequate urban landscape planning. By exploring the integration of zoological gardens as a unique element within landscape planning, the study highlights the potential for creating sustainable and ecologically sensitive environments that support wildlife conservation, environmental education, and public engagement.

The proposed zoological garden is located in the western region of Nigeria, the University of Ibadan zoological garden accommodates a variety of animals and plants. This establishment not only impacts the resident animals but also influences the neighboring environment, which functions as a green space. Aside Zoo vital contributions within urban system, several challenges affect the welfare of the zoo animals and the satisfaction of its visitors. These issues include neglecting hygiene standards, the absence of suitable natural habitats for the animals, disorganized visitor pathways, limited vegetation, among others. To address these obstacles, the University of Ibadan zoological garden requires a restructuring effort. This process involves data collection through observation, surveys, literature reviews, comparative analyses, and the development of design concepts. The theme of green/open space and landscape architectural approach is utilized to formulate an environmentally-friendly design. The concept of openness aims to streamline the design process to achieve objectives such as harnessing local energy sources, creating microenvironments for the animals that mimic their natural habitats, and enhancing visitor experiences.

Furthermore, landscape architectural approach was formulated and applied. This has ensured a comprehensive and complete development which injected with new activities and image which could support future alterations of the surrounding needs and be dynamically integrated to the ever-changing landscape.

5.1 CONCLUSION

The evaluation of landscape planning in Ibadan, Oyo State, Nigeria emphasizes the crucial integration of sustainable methods into urban development strategies to tackle the specific issues posed by rapid urbanization and environmental deterioration. This study offers a thorough assessment of existing landscape planning endeavors, highlighting substantial deficiencies in ecological consciousness, civic engagement, and strategic alignment with sustainability objectives.

A key discovery of this study underscores the imperative for a more cohesive approach to landscape planning. The current disjointed planning procedures often constrain the efficacy of interventions, leading to missed opportunities for synergistic effects that could enhance urban sustainability. For example, the creation of green spaces should not only prioritize visual appeal but also fulfill essential functions like enhancing air quality, managing stormwater runoff, and promoting biodiversity. The absence of integration of these elements into the planning structure indicates a necessity for educational campaigns to raise awareness among decision-makers and urban planners regarding the comprehensive advantages of sustainable landscape approaches.

Additionally, community involvement stands as a pivotal foundation for successful landscape planning. The research suggests that residents in Ibadan hold valuable insights about their local surroundings, which can significantly guide planning determinations. Engaging community members in the planning and execution processes not only nurtures a sense of ownership but also generates culturally suitable and contextually relevant solutions. Collaborative planning strategies that integrate local perspectives can result in landscapes that mirror the community's identity and values, while concurrently addressing sustainability concerns.

As brought to light in this study, green infrastructure emerges as a potent tool for establishing sustainable urban settings in Ibadan. The integration of parks, communal gardens, and green roofs can alleviate the negative impacts of urbanization by supporting biodiversity, enriching recreational opportunities, and enhancing public health. The implementation of such infrastructure not only tackles environmental issues but also delivers tangible social benefits, rendering urban spaces more habitable and enjoyable for residents by Anna K., Kamyar H., Nora Fagerholm et al, 2023 and Chen Gong et al, 2023.

Moreover, the study stresses the importance of adopting zoological gardens as a landscape architecture approach underscores the multifaceted benefits of such integration. Zoological gardens serve as vital repositories of biodiversity, providing opportunities for environmental

education, conservation, and research. Through careful landscape design and architectural integration, these gardens contribute to sustainable environments by fostering ecological awareness, habitat preservation, and cultural appreciation. The unique synergy between landscape architecture and zoological gardens has the potential to enhance urban green spaces, promote biodiversity, and advance the principles of sustainable development within the built environment.

5.2 RECOMMENDATION

i. Ecological Integration: Promote the integration of zoological gardens within landscape planning to create interconnected habitats that support indigenous flora and fauna, encourage biodiversity, and rehabilitate degraded ecosystems.

ii. Environmental Education: Develop interpretive trails, educational exhibits, and immersive programs within zoological gardens to foster public awareness of ecological conservation, wildlife protection, and sustainable living practices.

iii. Sustainable Design Principles: Implement sustainable design strategies within zoological gardens, such as water conservation, energy efficiency, and waste reduction, to minimize environmental impact and showcase best practices in landscape architecture.

iv. Biodiversity Conservation: Emphasize the role of zoological gardens in the conservation of endangered species, preservation of genetic diversity, and support for breeding programs aimed at species recovery and reintroduction efforts.

v. Community Engagement: Foster partnerships with local communities, schools, and conservation organizations to promote participatory planning, citizen science initiatives, and social responsibility in environmental stewardship.

vi. Research and Collaboration: Encourage collaborative research initiatives between zoological gardens, landscape architects, and ecological experts to advance knowledge in sustainable habitat management, wildlife conservation, and greening urban landscapes.

This assessment highlights the potential for synergistic collaboration between landscape planning and zoological gardens, emphasizing the capacity of this approach to enhance ecological sustainability, support wildlife preservation, and promote public advocacy for the environment within the realm of landscape architecture.

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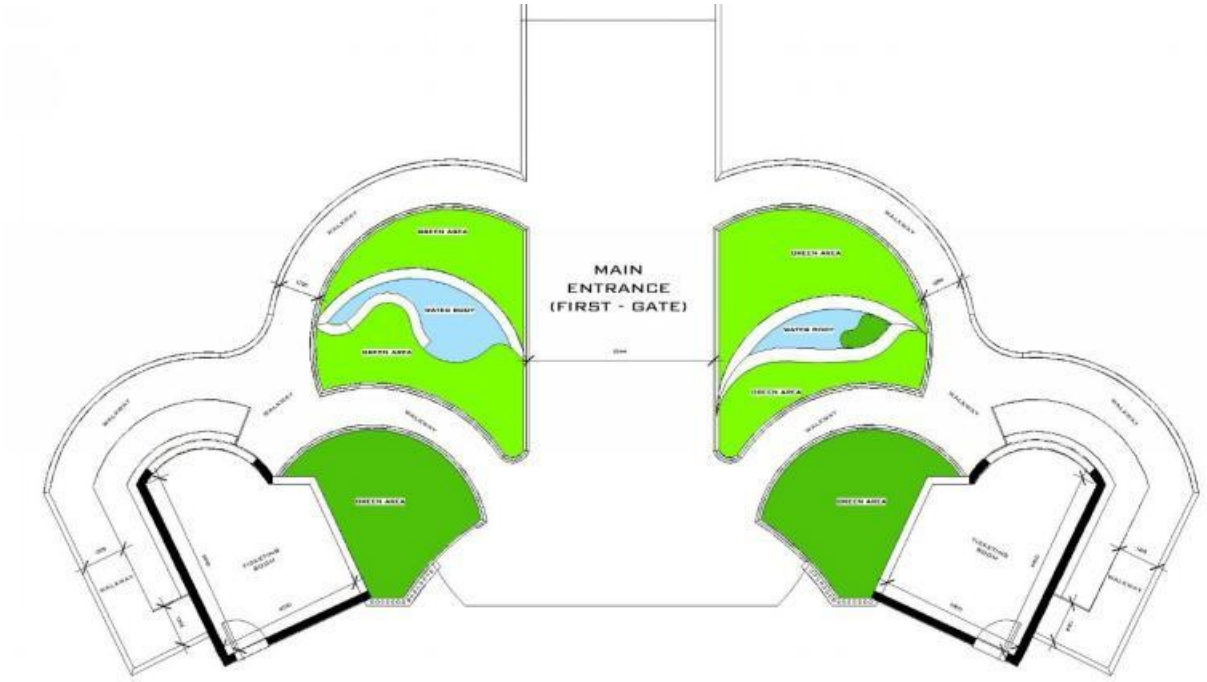
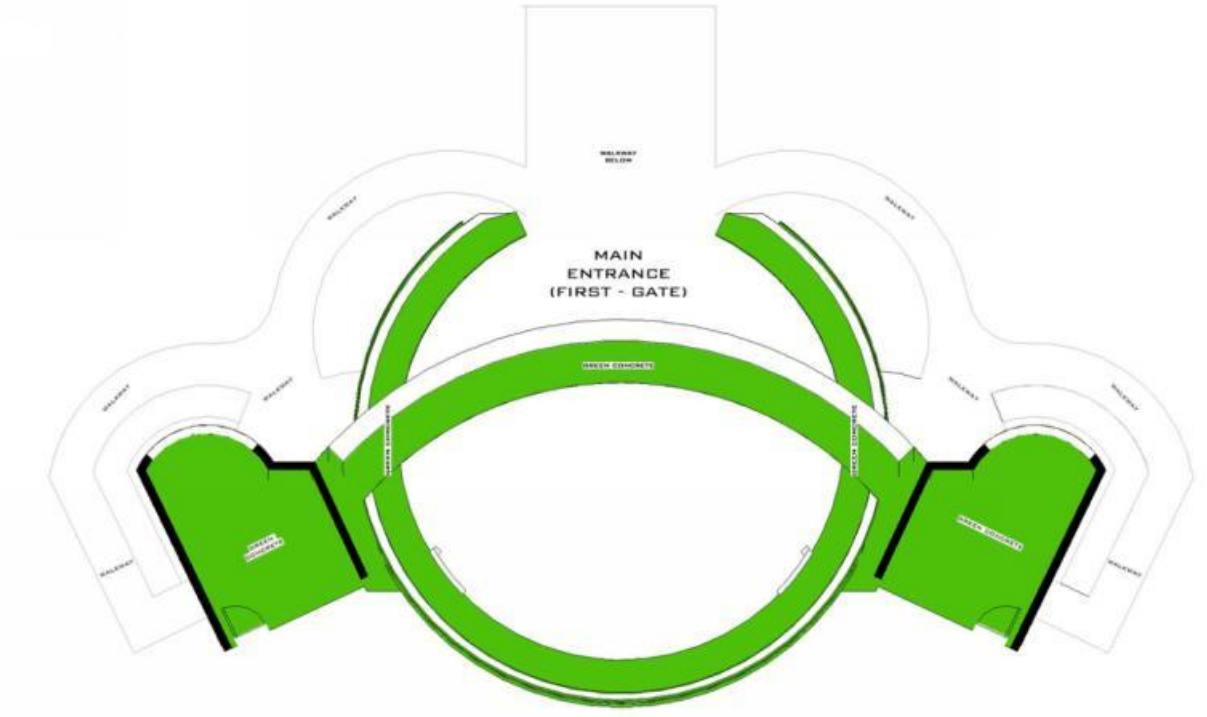
APPENDIX

SITE PLAN

MAIN ENTRANCE (FIRST PLAN)

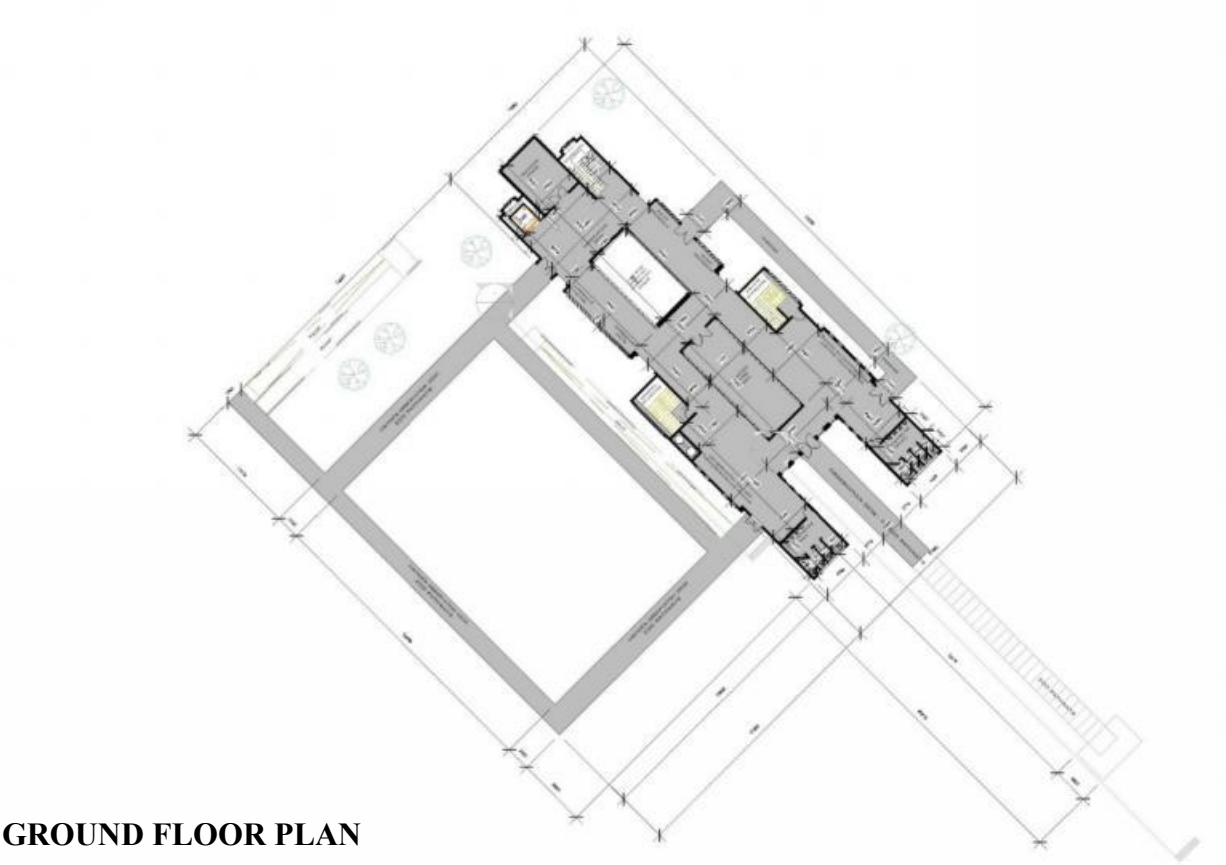


FLOOR PLAN

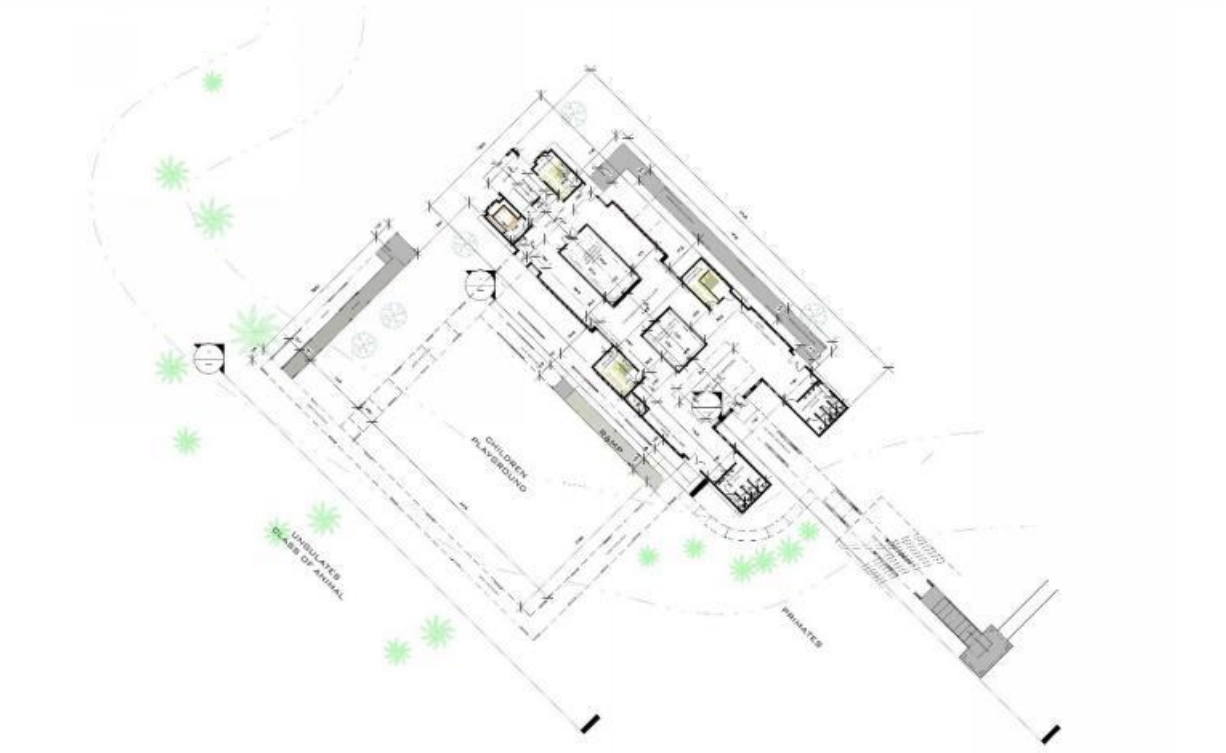


ROOF DRAINAGE PLAN (GREEN ROOF)

EDUCATIVE BUILDING

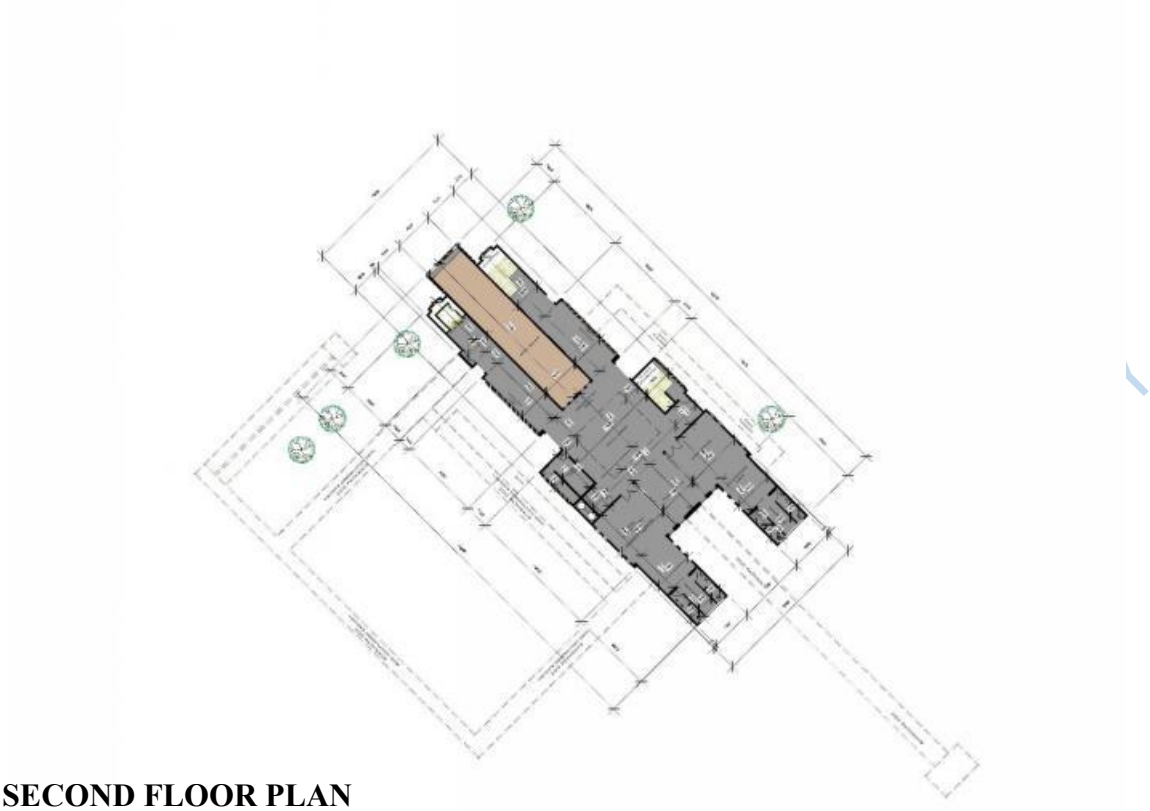


GROUND FLOOR PLAN

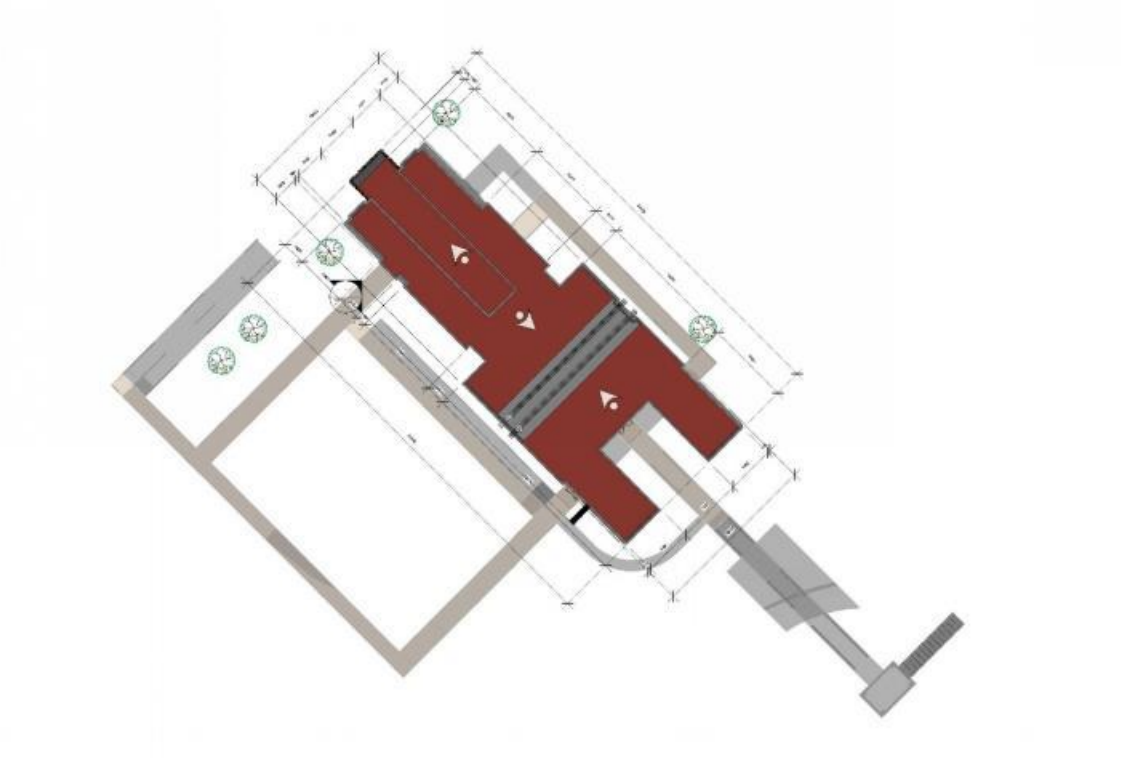


FIRST FLOOR PLAN

EDUCATIVE BUILDING



SECOND FLOOR PLAN



ROOF DRAINAGE PLAN

EDUCATIVE BUILDING

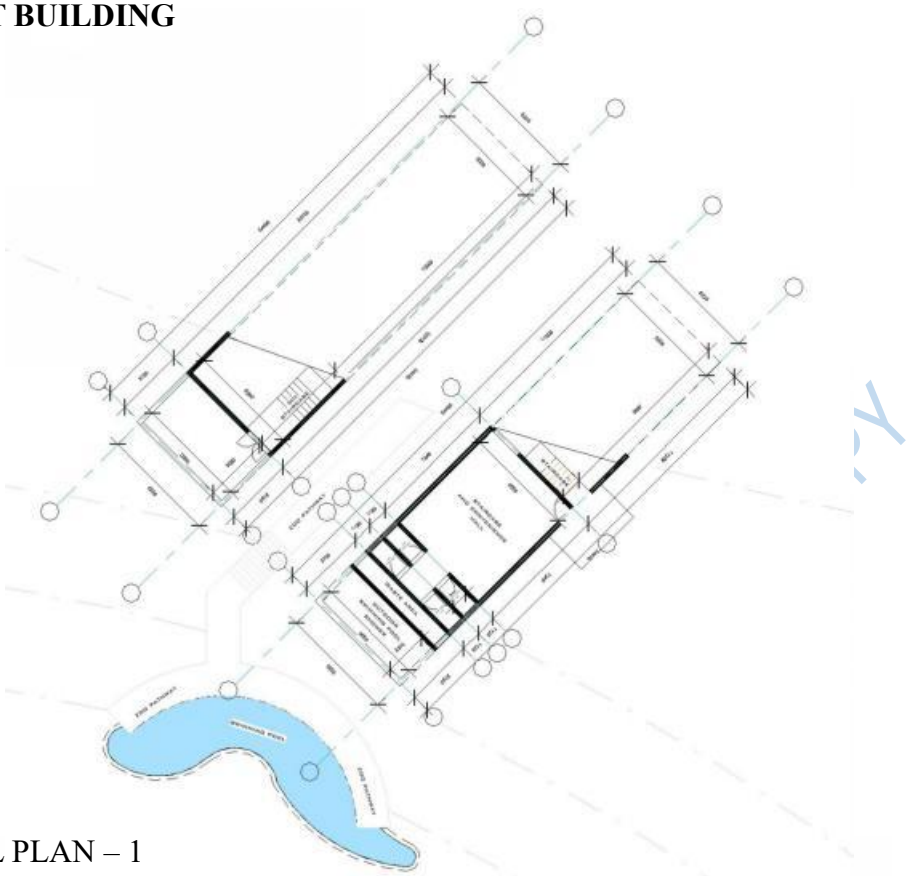
APPROACH ELEVATION

REAR ELEVATION

LEFT ELEVATION

RIGHT ELEVATION

REFRESHMENT BUILDING

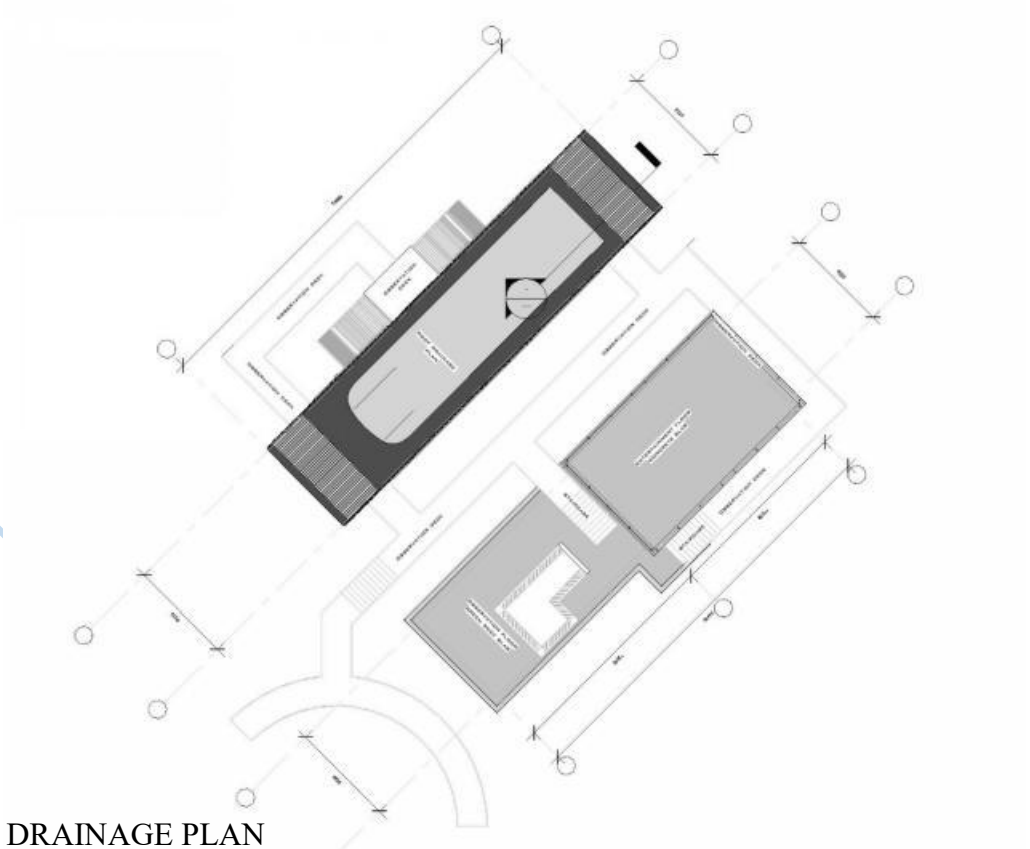


GROUND LEVEL PLAN – 1

GROUND LEVEL PLAN – 2

REFRESHMENT BUILIDNG

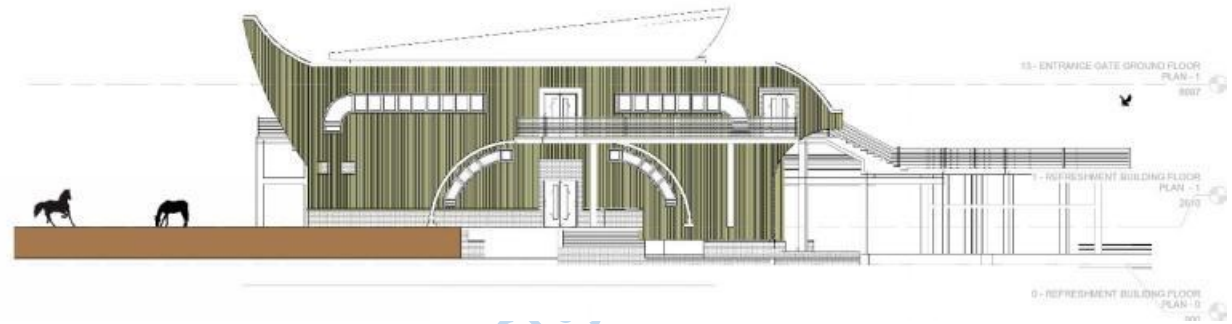
FIRST FLOOR PLAN



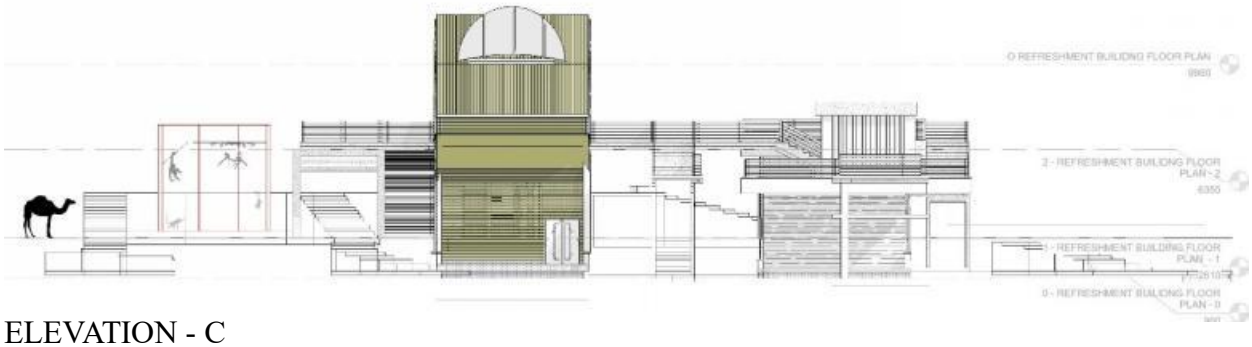
ROOF DRAINAGE PLAN

REFRESHMENT BUILDING

ELEVATION – A



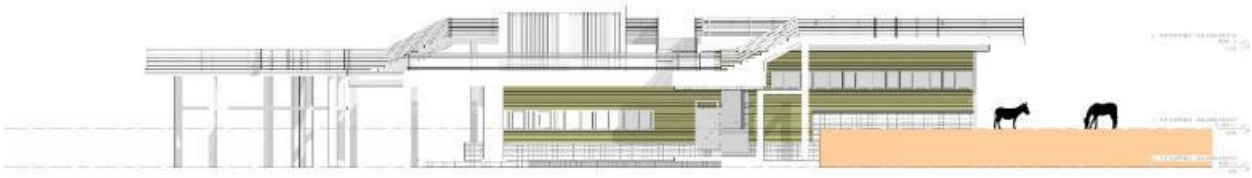
ELEVATION – B



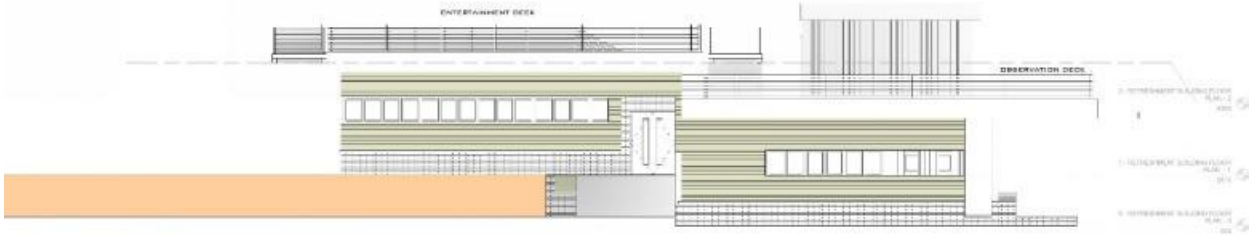
ELEVATION - C

REFRESHMENT BUILIDNG

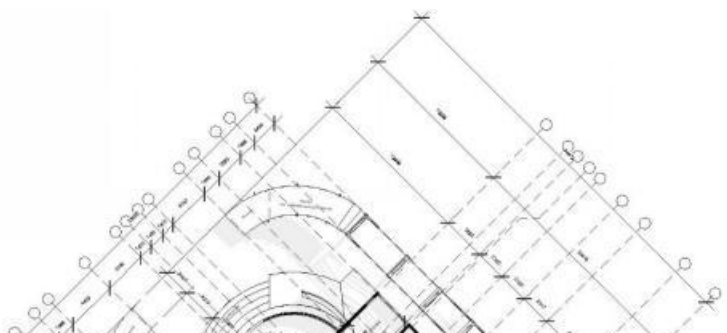
ELEVATION - D



ELEVATION - E

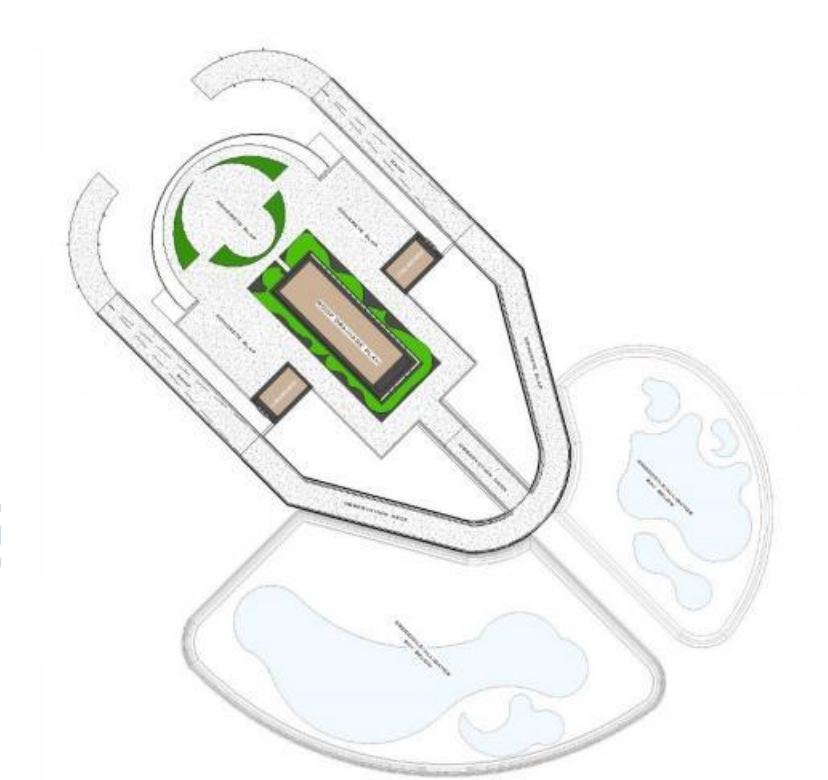


ELEVATION - F



REPTILE BUILDING

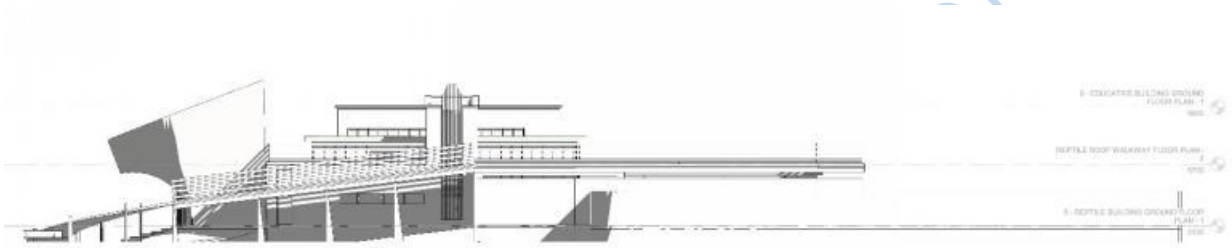
GROUND FLOOR PLAN



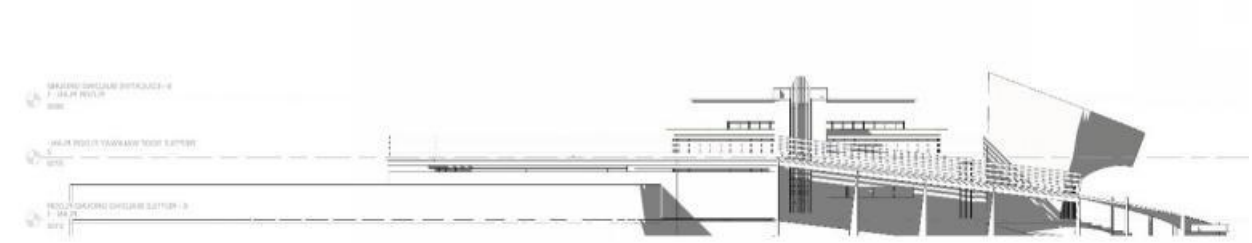
ROOF DRAINAGE PLAN

REPTILE BUILDING

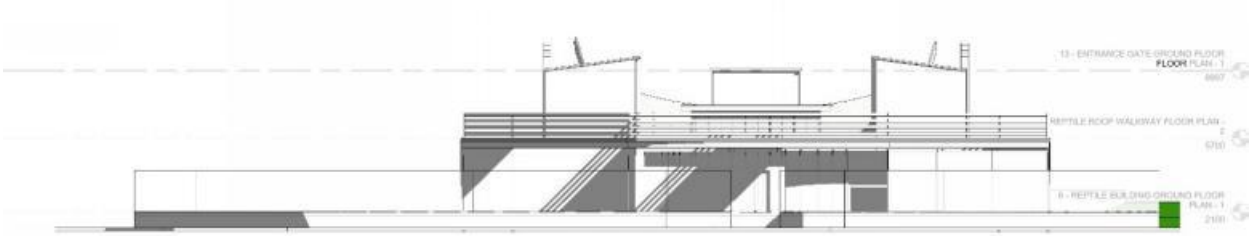
APPRAOCH ELEVATION



LEFT ELEVATION



RIGHT ELEVATION



REAR ELEVATION

PERSPECTIVES

MAIN ENTRANCE

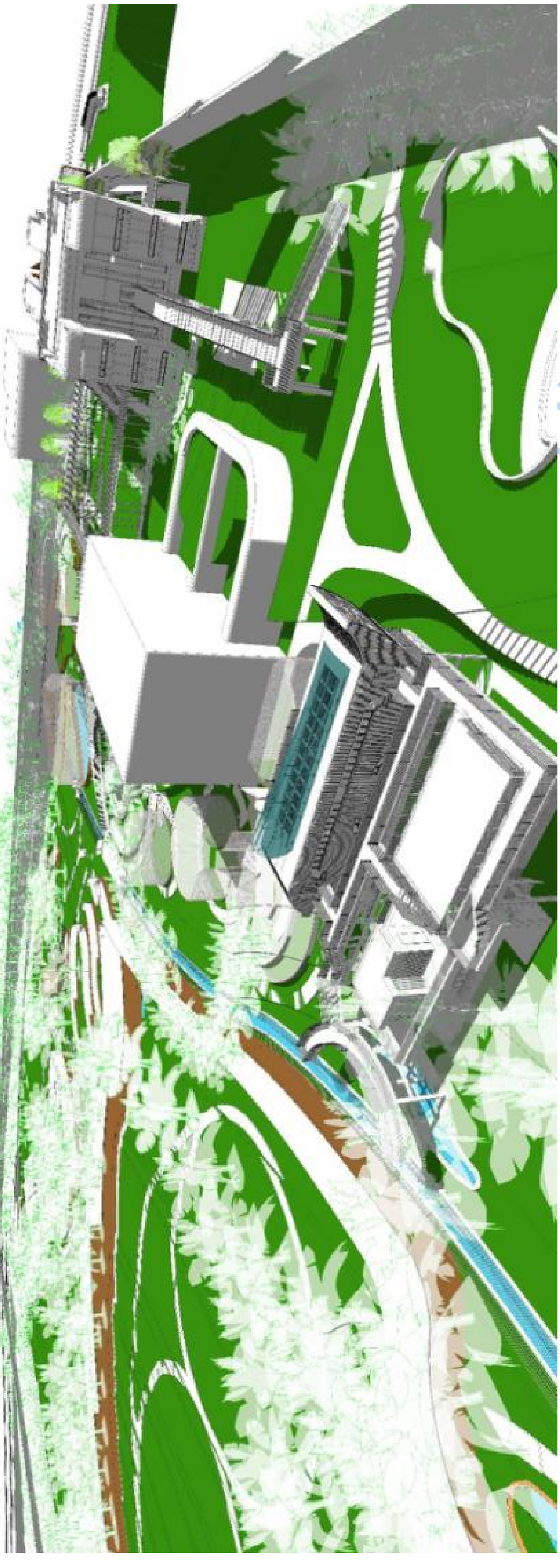
EDUCATIVE BUILDING

PERSPECTIVES

REFRESHMENT BUILDING

REPTILE BUILDING

PERSPECTIVE SITE



MAYOWA AYODELE OLAYEMI

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Phone: (+234) - 8069403998 | olayemimayowa@live.com | linkedin.com/in/o-m-enoch-57a530146

EDUCATION

Lead City University, Ibadan (LCU), Oyo State, Nigeria
Bachelor of Science (BSc). Undergraduate scholars (Awarded) **2019 - 2022**

Relevant Courses: Landscape Architectural and Conservation, Building Materials' Technology, Sustainable Architecture, Computer & Software Laboratory.

- Grade: **First Class (4.71/5.00) – Top 1%**
- Vice Chancellor's Prize for the Best Graduating Student in Faculty of Environmental Design and Management
- Head of Department' s Prize for the Best Graduating Student in Department of Architecture, Faculty of Environmental Design and Management

Federal University of Technology, Akure, Ondo State, Nigeria
Bachelor of Bachelor of technology (B.Tech). Undergraduate scholars (Awarded)
2010 - 2015

Relevant Courses: Building Technology and Town Planning, Feasibility and Viability Appraisals, (Environmental Impacts Assessments – EIA), Land Economics.

- Grade: **Second Class**
- Best Student in Graphic Communication – **(Course)**
- Best Student in Building Construction and Components – **(Course)**

TEACHING AND RESEARCH EXPERIENCE

Academic Tutor, Department of Architecture, Faculty of Environmental Design and Management **2019 – Till Present**

• Tutor undergraduates' students (Virtual/Physical) in Second, Third and Fourth years on Figure Illustration, Design Computing and CAD

Research Assistant, Department of Architecture, Faculty of Environmental Design and Management **2022 – Till Present**

- Assisting a prospective PhD scholar in conducting a digital research study on a landscape's status of Six Private universities across south-west region – using Google Map Satellite/Map

Academic Tutor, Department of Architectural Technology, Faculty of Environmental Studies, Rufus Giwa Polytechnic, Owo, Ondo State. **2017 – 2018**

- Tutor undergraduates' students (Virtual) in First and Second years on a Design Concept and CAD

PUBLICATIONS/THESIS RESEARCH IN PROGRESS

A. On-going research:

- **Mayowa A., Daniel O., Olusegun O.,** and **Usman S.** (2023). Potential on virtual Reality Technology in Improving Architectural Studio Performance **(Under Review)**

B. Research completed:

- **Olusegun I.** and **Mayowa A.** (2023). Accessing the role of biophilic integration strategies in institutional buildings **(Manuscript: Yet to be published).**
- **Ogechukwu E.** and **Mayowa A.** (2023). An Assessment of Circulation in a Public Place Design, Case Study of Shopping Mall in Ibadan, Oyo State **(Design Thesis).**
- **Mayowa Ayodele** (2022). The use of balance and symmetry in the architecture of Faculty Building. **Accepted and available** to Department of Architecture, Faculty of Environmental Design and Management, Lead City University, Ibadan, Oyo State, Nigeria. **(Design Thesis).**
- **Mayowa Ayodele** (2022). Analysis of Collateral Risks in Residential Mortgage Defaults in Lagos State. **Accepted and available** at to Department of Estate Management, School of Environmental Technology, Federal University of Technology, Akure, Ondo State, Nigeria

WORK EXPERIENCE

FEBA Construction Limited (Freelance/Junior Architect) **January, 2023 – Present**

- Assigned the role of Site Safety Engineer/Architect which required the preparation of site safety guidelines and ensuring their compliance by all workers.
- Produced architectural sketches during site investigations for proposed refurbishments of existing structures.
- Exposed to the modeling and designs of complex structures such as multi-stories commercial, residential, and mixed-use buildings
- Produced architectural sketches during site investigations for proposed refurbishments of existing.

Urban Upgrade (Freelance) **July, 2021 – August, 2022**

- Exposed to the interpretations of Architectural drawings. o Work closely with team to communicate project needs - Revises drawing and renderings
- Preparation of material and labour schedule, preparation of financial statements and cash flow and tender evaluation and analysis.
- Produces graphic presentations and builds study models
- Reviewed specifications of job site plans to determine construction needs

Muyiwa and Associate, Onikan, Lagos State. (Estate Surveyor) **February, 2018 – March, 2019**

- Actively involved in the valuation of properties ranging from schools, flats, shops.
- Scouting for properties and prospective buyer
- Sourcing of properties for the company
- Carrying out Inspection of Properties
- Increase the income level of the firm by establishing additional link in securing valuation briefs for the firm and other duties assigned.

Henry Odigwe and Company, Abakaliki, Ebonyi State. (Estate Surveyor) **June, 2016 – September, 2017**

National Youth Service Corps (NYSC)

- Building and Maintaining Good Clients Relationship
- Management of the Company Properties Portfolio (Multitenated Properties) such as All-Seasons Plaza Agidingbi Ikeja and All-Seasons Plaza Ojodu, Lagos.
- Prompt Collection of Rent
- Regular review of rent, both Residential and Corporate Properties.
- Manage Customer Information.
- Apportioning of Service Charge
- Co-ordination and Supervision of Cleaner, Security and Gardeners.
- Co-ordination and Supervision of all Maintenance Work
- Letting and Sales of Properties
    - Sourcing / Scouting for Direct Properties

Alpha and Omega Engineering (Nig) Limited (Apprentice) **January, 2016 – April, 2016**

- Trained on the interpretations of electrical drawings, measurement and marking of electrical appliance points
- Laid conduit pipes for electrical connections during constructions of residential buildings
- Actively engaged in the preparations of Bill of Quantities for numerous live projects

Bamigbola Consulting, Ikeja, Lagos State. (Intern - Industrial Attachment) **February, 2014 – August, 2014**

- Daily report of general duties in the firm & other duties as assigned by my immediate supervisor.
- I was part of the Valuation Team employed by the Lagos State Valuation Office (Alausa) in 2014 for the Valuation for Taxation of Parks and Gardens in all the Lagos state metropolis. • Involved in Carrying out Feasibility & Viability Study
- General information records.

Doyin Computer affiliated to Rufus Giwa Polytechnic Owo, Ondo State. **April, 2009 – December, 2009**

(Cad/Computer Teacher Instructor)

- Keeping and provision of day-to-day with educational technology and software needed along with hardcopy resources by the student
- Delivered lessons to CAD/Computer students
- Assessed students' progress and provide feedback

MEMBERSHIP OF PROFESSIONAL BODIES:

The Nigeria Institute of Architects – NIA (Graduate Member)

The Nigerian Institution of Estate Surveyors and Valuers – NIESV (Graduate Member)

PROFESSIONAL/ACADEMIC TRIPS

Department of Architecture, Faculty of Environmental Design and Management **June, 2023**

- The Ark Legacy Project, 109,345 Seaters Capacity Religious Auditorium and roughly one Hundred and Sixty Billion Naira.

CERTIFICATIONS

- Pro-chancellor's community service certificate 2022
- Who wants to be an Architect: Positioning for Future Trends 2022
- Civil Engineering/Infrastructural Development Training. Omega Engineering (Nigeria) Ltd 2017
- Skill Acquisition and Entrepreneurship Development Training (SAED) 2017
- Urban Regeneration as a catalyst for National Development. 2015

VOLUNTEERING/LEADERSHIP EXPERIENCE

- NYSC Programme on HIV/AIDS and Reproductive Health to Secondary Schools in Abakaliki, Ebonyi State, Nigeria. 2017
- Tennis Club, Abakaliki Branch, Ebonyi State, Nigeria. 2016
- Certificate of Honour, Mountain of Fire and Miracles Ministries (MFM) Youth Corpers' Fellowship (Interdenominational Corpers' Fellowship), Abakalik, Ebonyi State, Nigeria. 2015
- Outstanding Member of Estate Management students Association (EMSA), Federal University of Technology Akure, Ondo State, Nigeria. 2014
- Prolific Member of Glorious Youths Fellowship, Glory of God, Christ Apostolic Church Akure, Ondo State, Nigeria 2014

RELEVANT SKILLS

Software Skills	**Personal Strengths**	**Interests**
Autodesk Revit	Project Management	Research and Innovation
Autodesk CAD	Writing and Communication	Sustainable Development
Lumion	Leadership	Environment Sustainability
Adobe Illustration	Emotional Intelligence	Resilient Insfrastructures
Microsoft Word, Excel and Power point	Intellectual	Uncertaintty Quantification

REFERENCES

Available upon request

…….. ……

Signature Date

The University Compliance Certification

This is to certify that the Thesis by Olayemi Mayowa Ayodele with matriculation number LCU/PG/005094 in the Department of Architecture, Faculty of Environmental Design and Management Lead City University, Ibadan, is in full compliance with the University format and style of Thesis.

…… ……

Signature Date