CONTENT OF THE NEW PUBLICATION

TITLE: MULTI-CRITERIA BASIS FOR EVALUATION CULTURAL HERITAGE SITES AND THE POTENTIAL VALUES OF TOURISM ATTRACTIONS IN IBADAN METROPOLITAN AREA

DRAFT (SECTION II of the Project)
GIS AND MULTI-CRITERIA ANALYSIS FOR THE NEW OLUBADAN ROYAL PALACE COMPLEX

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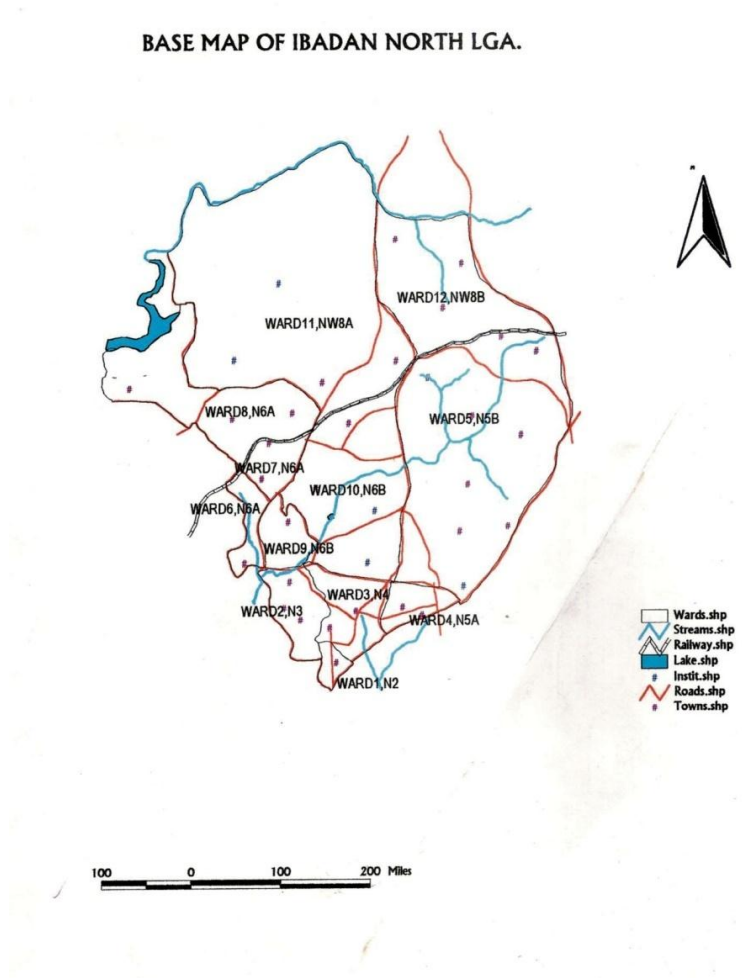
1.0 STUDY AREA:

The focus of the study is Ibadan North Local Government Area, the largest in population and resources in Oyo State, particularly ward 4 as shown in the GIS Map and the spatial data attached.



It was created in August 1991 out of Ibadan Municipal Council

Selected Data of Wards in Ibadan North Local Government Identified for Managing the Council

Postcode District	Ward 10 & Code Number	Communities	Land Area in km^2	Population 1991	No. of property 1996	Land-Use Pattern	
						Health Centre	Primary School
200211	N2 (Ward 1)	Oke-Are Odoye Agbadagbudu Isale Afa	0.25	8,843	1,355	1	2
	N3 (Ward 2)	Oniyarin, Inalende Ode-Olo	1.04	29,794	1,841	0	6
	N4 (Ward 3)	Oke-Aremo Adeoyo Yemetu Aladorin Agbadagbudu Total Garden Agala Estate	1.28	34,542	2,630	0	5
	N5A (Ward 4)	Gbenla, Igosun NTA, Atenda, Idi-Omo	0.62	20,0235	1,469	0	2
200221	N5B (Ward 5)	Agodi GRA, Kongi Ikolaba, Basorun New Bodija, Ashi Oluwo, Idi-Ape	8.90	22,435	7,960	3	1
200282	N6A (Ward 6)	Sabo, Alafia Hospital Sabo Housing Estate, St. Gabriel	0.59	7,483	800	0	3
	N6A (Ward 7)	Oke Itunu Ore-Meji, Cemetery, CAC	0.68	17,741	1,664	1	-
	N6A (Ward 8)	Sango, Okoro Village, Ijokodo, Akere, Agbaje	3.32	40,689	2,303	1	3
200212	N6B (Ward 9)	Mokola Layout, Premier Hotel	0.74	13,014	1,847	1	3
	N6B (Ward 10)	Coca-Cola, Old Bodija Estate, Secretariat Complex UCH	4.33		1,755	2	2
00284	NW8A (Ward II)	Ibadan Poly, University of Ibadan, Sango Police Station, Emmanuel College Trans Amusement Park, Samonda GRA	11.43	8,083	984	1	1
200213	NW8C (Ward 12)	Bodija Market, Agbowo, Ojoo-Express	3.64	60,174	3,213	5	10

Source: *Oyo State Valuation Office, Ministry of Local Government and Chieftaincy Matters (1998). National Population Commission (NPC) – 1991 and UNICEF B Zonal Office*

2.0 SPATIAL MULTI-CRITERIA DECISION ANALYSIS FOR SELECTING OLUBADAN PALACE SITE SELECTION

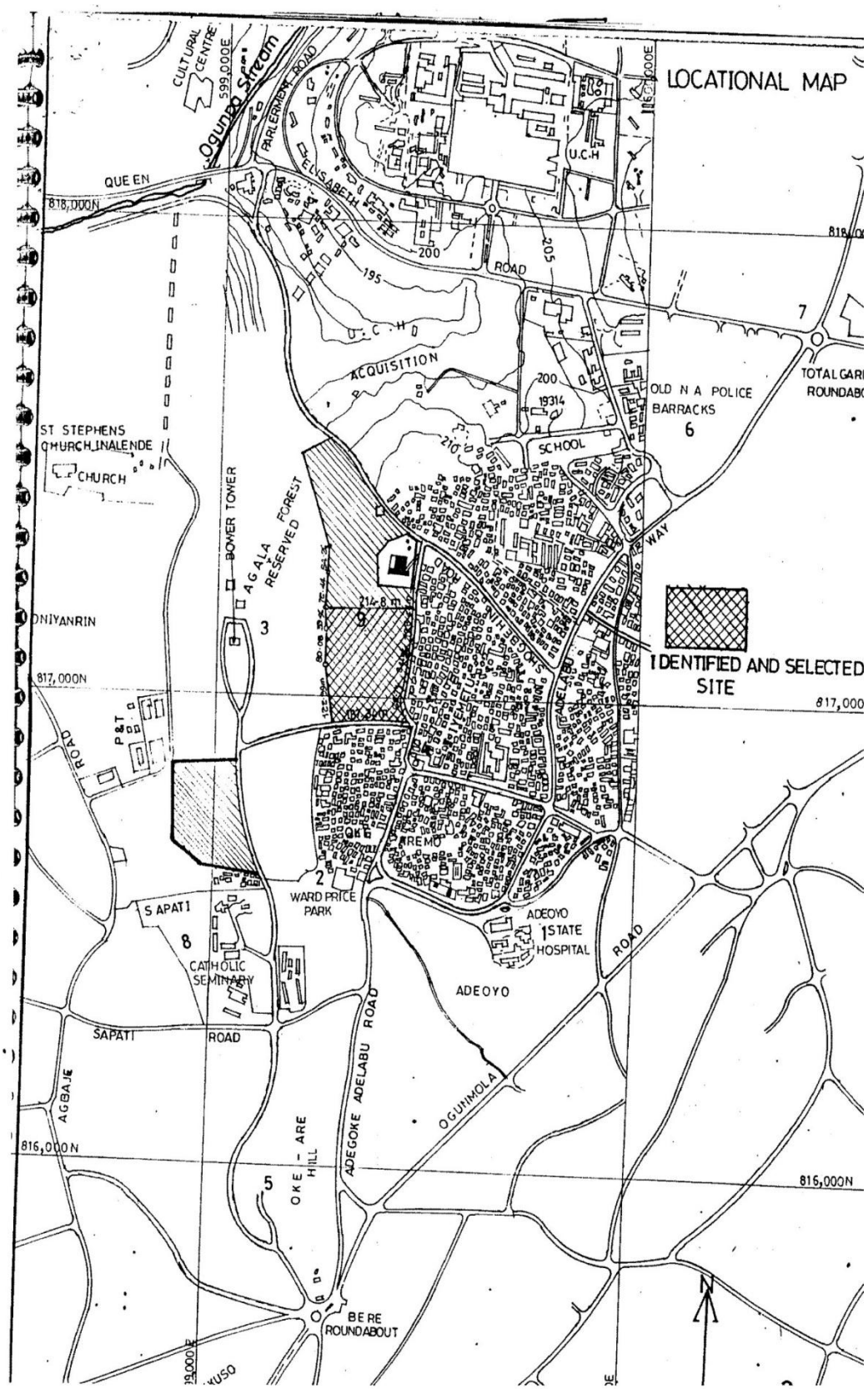
Before a final location of the new site for the construction of the new Olubadan Palace was selected, a further study into the environmental and national conditions of the site was done with respect to:

- Identification of the main features of the new location
- Accessibility and centrality of the new palace at Oja'ba
- The Location is relatively new the Old palace at Oja'ba
- The provision of the Land-Use Act and acquisition and registration of the land
- Relief and climate condition
- Drainage system,
- Environmental pollution and;
- Geology of the area

Unfortunately all of the above mentioned studies were carried out using traditional procedures without any involvement of geographic information system (GIS) analysis. For this reason, the paper explore whether GIS could be a suitable tool to assist in tiding the optimum Borehole location and planning of other infrastructures.

2.1 What is GIS?

GIS combines location data with quantitative and qualitative information about the location, letting you visualize, and report information through maps and charts. Using the technology, you can answer question, conduct what if scenario and visualize results. GIS serves you through the life cycle of your space, from site selection, space planning, and maintenance to lease management, usage, continuing safety issues and continuity planning;


LOCATIONAL MAP
CULTURAL CENTRE
599,000E
Ogunpa Stream
PARLIAMENT ROAD
QUEEN ELIZABETH ROAD
U.C.H
818,000N
ROAD
ACQUISITION
OLD N A POLICE BARRACKS
6
SCHOOL
ST STEPHENS CHURCH INALENDE
CHURCH
BOWER TOWER
AGALA FOREST RESERVED
3
IDENTIFIED AND SELECTED SITE
817,000N
P&T
ROAD
AREMO
2
WARD PRICE PARK
SAPATI
8
CATHOLIC SEMINARY
ADEOYO STATE HOSPITAL
1
ADEOYO
SAPATI ROAD
AGBAJE
ADEGOKE ADELABU ROAD
OGUNIMOLA
816,000N
OKE - ARE HILL
5
BERE ROUNDABOUT
7

3.0 UTILITY MAINTENANCE

With the integration of information from a variety of sources, it is possible to determine important geospatial relationships and factors on which the Olubadan palace complex utility maintenance would be based. For example, water main failure could be cause not only by age, but also by pipe material, surrounding soil, water pressure, and street traffic. By analyzing these factors and other related factors, it would be possible to determine which assets are the **"hot spot"** areas and constitute a priority for maintenance activities.

4.0 RELIEF AND CLIMATE CONCLUSION OF THE PALACE SITE

Ibadan lies within the tropical forest zone but close to the boundary between the forest and the savanna. It is characterized by **rugged terrain** with steep slopes creating a very dense network of streams with **wide valley plains**. The city-ranges in elevation from **150 metres** in the valley area, to **275 meters** above see level on the major north-south ridge which crosses the central part of the city.

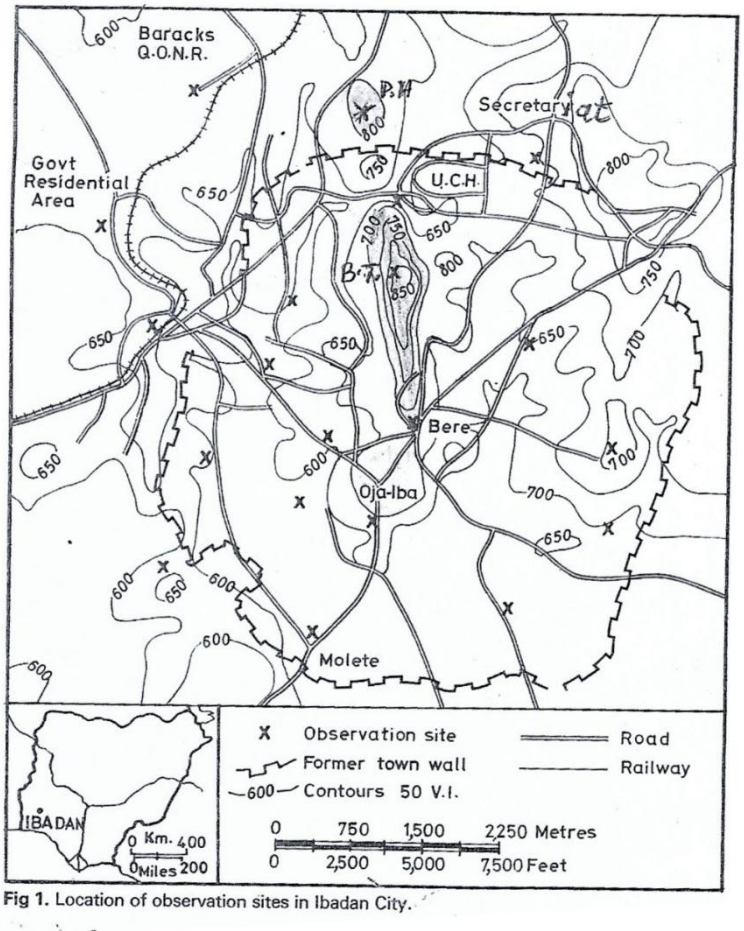
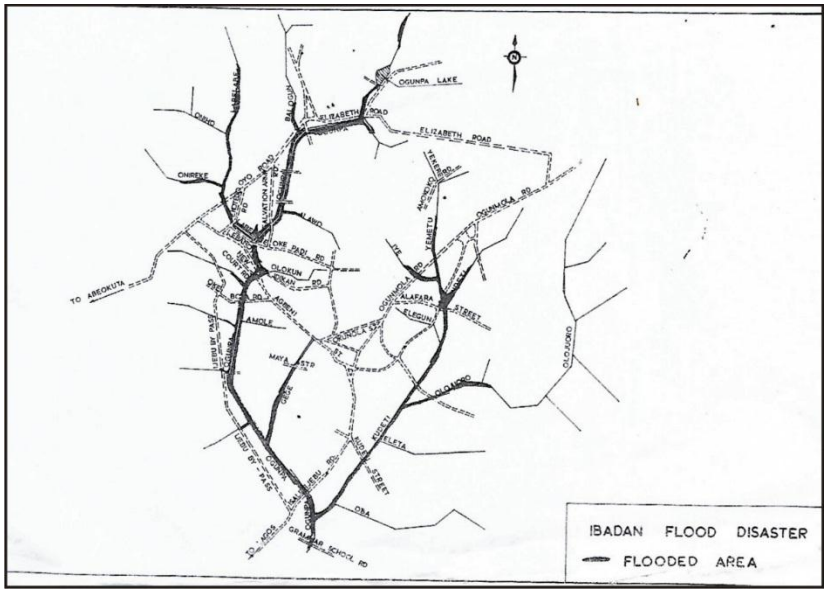


Fig 1. Location of observation sites in Ibadan City.

The early morning temperature were consistently lower on the higher elevation which are exposed to more rapid radiation at night. The Premier Hotel, for instance, recorded temperatures about 0.9^0c lower than those of the built-up areas in the immediate vicinity of Mokola Layout.

The forest reserves, called Agala where Olubadna Palace is built within the city, also recorded lower temperatures and higher relative humidity that the exposed surrounding neighbourhood of Oke-Aremo and Yemetu being on the slope of Are Latosa hill and below Bower's Tower (the highest point in Ibadan).

5.0 THE DRAINAGE CHANNELS



The city is naturally drained by four rivers with nay tributaries

- River Ona on the north and west
- River Ogbere towards the east
- River Ogunpa flowing through the city; and
- River Kudeti in the central part of the city.

However, major tributaries that flow through the city from Oke-Aremo Olubadan Palace neighbourhood are Odoye Stream from Agbadagbudu Lake at the foot of Sapati (Sapati Hill), Yemetu Stream direct from the foot of Palace Complex running through densely built Oke-Aremo Compounds and crossing Yemetu-Total Garden Road, and finallym Yemetu-Baba Sala stream coming out from Omolewa Nursery and Primary School, Oppoiste U.C.H. all flowing eastwards to joining Kudeti River.

Lake Eleyele is located in the north-western part of the city, and the east is bounded Osun River and Asejire Lake. These rivers are the main drainage channels that are causing flooding when nor properly maintained. There is an extensive network of rivers and streams throughout the city as a result of a combination of the **geology** of the area and the tropical monsoon climate

6.0 PALACE BUILDING FACILITY MANAGEMENT;

Since buildings count for halt of the primary energy sources consumption as well as half of all consumed raw materials, produce hundreds of million tons of waste and a third of the world's CO_2 that is (Carbon Dioxide) production, construction and building of low energy, buildings has become an international trend. More than transportation, mining industry, or any other type of industry, it is primarily the used of building industry and building administration that lead to better management narrow resources as well as to the reduction of greenhouses gases emissions. In this area, facility management also play an important role.

Facility management is a term which is closely associated with building management connected with everyday building operation but it should also include long term planning and focus on its users. This should already be essential in the preparatory phase of investment process focused on **construction of building itself. Major part of operation costs and effectiveness of facility management process** is defined already at building. An important factor is also the ecological aspect of building influence on the living environment sue to materials used for its construction as well as energy consumption necessary for its operation

Table: components of Building Elements and Facilities

	Palace Building Elements	**Facilities for the palace**
1.	Entrance Gate	Solar Power
2.	Country Yard	Generating Plant
3.	Palace Wall	Water Pumping Machines
4.	Building Columns	Telecommunication System
5.	Public Area	Security Lights
6.	Car park	Utility Vehicles
7.	Residential Areas	Museum Artefacts
8.	Royal Park	Library
9.	Recreational Area	Electrical Appliances
10.	Meetings Pavilion	

Facility Management (FM) is an effective form of outreach business management which aims to provide relevant, cost effective services to support the main business activities (core-business) and allow them to optimize.

7.0 EFFECTIVE MANAGEMENT OF OLUBADAN PALACE:

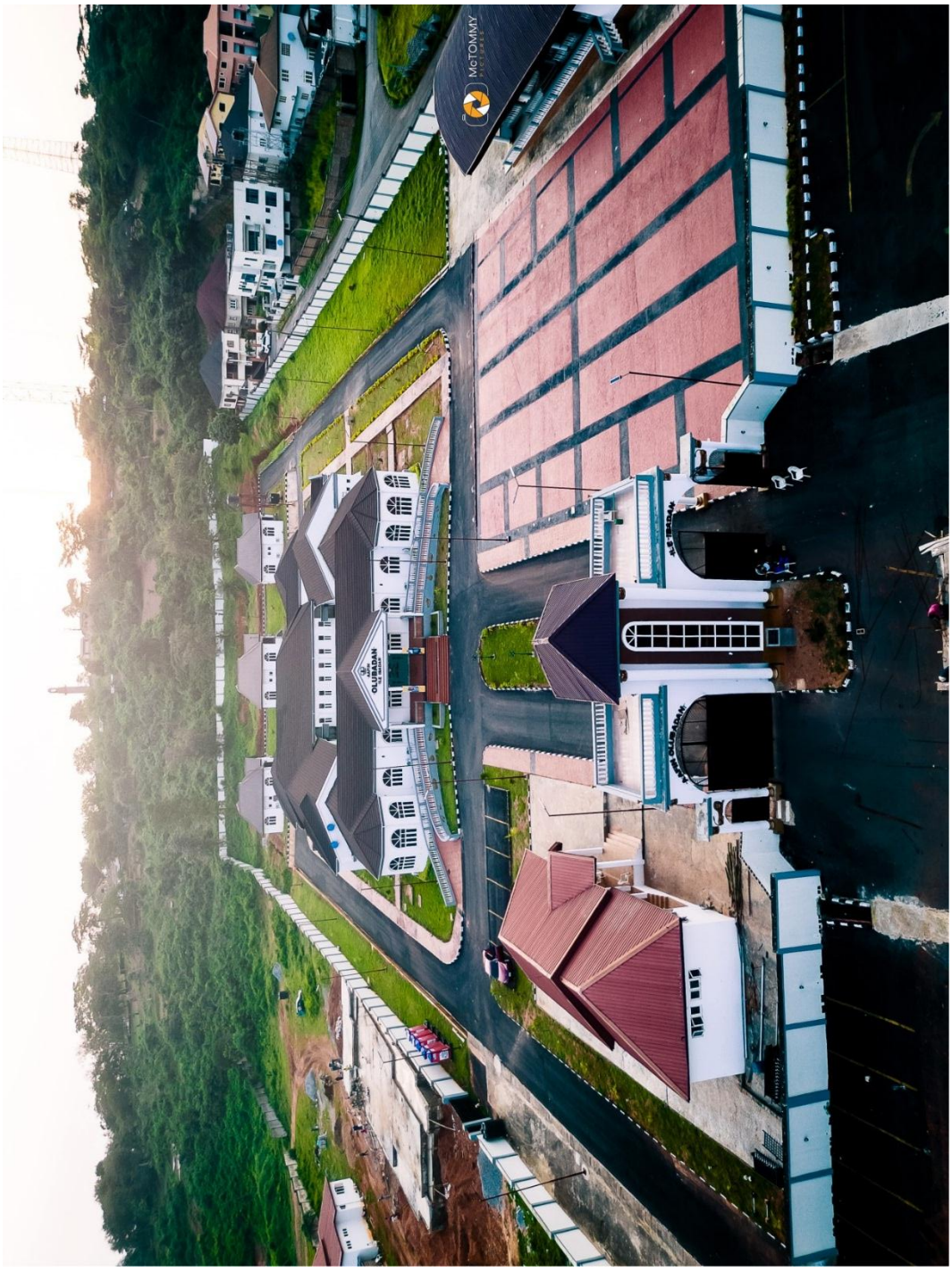
The technique for management of the new Olubadan Palace is the collection, processing and maintenance of extensive information about various types of assets such as equipment, facilities and other resources to plan work to be executed to maintain these assets at an operational level in the most cost-effective fashion.

The priority of the committee managing the palace in this context is making decisions about the effective and efficient development, use, maintenance, repair and retirement or replacement of utility lines, the palace building elements and facilities provided. This why the Governor of Oyo State, His Excellency Engr. Oluseyi Makinde has directed the eleven (11) Local Government to contribute money every month for the management and maintenance of the new Olubadan Palace while the Management Committee comprising representative of Olubadan-in-Council and the Central Council of Ibadan Indigene (CCII) including the President General of CCII should do the needful

7.1 The creation of Olubadan Complex Asset Register

An asset register is a complete and accurate database of the Olubadan Palace Complex. And adequate asset register is integral to effective asset management. **It is the basis of an asset management information system** and should contain relevant data beyond that required for financial reporting.

The **asset register** provides important information required for effective management of the assets as well the detail of the figures disclosed by the **palace committee** in the annual financial statements. This register enables the entity to maintain sufficient, appropriate **audit evidence**. It provides information on each asset, which includes amongst others the cost price, date acquired, location, asset condition and expected life. It can also include information on current replacement costs.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8.0 ACCESSIBILITY TO THE OLUBADAN PALACE;

There is the main dualized road from Kannike through Adeoyo to Total Garden (Adelabu Road) in king the Elizabeth Road from Agodi-Gate to Mokola. Three Roads link the Palace from Agbadagbudu off Adelabu Road, another one from Oje through St. Paul Church passing through Oke-Aremo, and the third on etaking off from Adelabu Road and passing through Yekere and Aladorin linking Oke-Aremo (now Olubadan Palace Road – Elizabeth Road) (see neighbourhood Google map of the Palace).

Currently within the built-up areas of Ibadan, the **road network** is structured around a series of **radial roads** which link the outlying areas with the **urban core** of the city (including Yemetu). The current network allows for vehicular traffic to travel inwards to the urban core but does not connect the outlying areas to each other. With the proposed expansion of Ibadan, imminent and emphasis on creating growth areas under the Ibadan Masterplan project (2015) at the administrative areas of the eleven (11) LGAs, the new road network must address the connectively issues in order to allow easier travel whilst avoiding the core area if desired. However, the GIS used by the

experts understating the Master Plan project has proven useful in aiding the technical design of the road network through a buffering operation using design road widths. Doing so had enables the automatic creation of the road network extent and layout at Yemetu during the Community Improvement Project.

Basic Land-Use and Population Data of Selected Communities in Ibadan North Local Government Area

Zone Identification Number	Communities or Neighbourhood	Population 1996	No. of Property 1996	Land-Use Characteristics
200212	Mokola Layout	19,638	1,847	Comm/Resd. Uses
200212	Coca-Cola	4,515	183	Comm/Resd. Uses
200212	Old Bodija Estate	27,447	2,498	Residential public use
200212	U.C.H	2,450	233	Health care
200284	University of Ib./Poly	7,550	1,571	Educational Uses
200282	Sango/Okoro	46,965	2,303	Sango Mkt./Resd
200282	Village	19,315	1,664	Residential Uses
200282	Oremeji/Oke-Itunu Sabo/Adamasingba	8,637	800	Comm/Resd. Slum
200211	Igosun/Idiomo	16,171	1,469	Core Res. Area
200211	Yemetu/Oke-Aremo	28,491	2,630	Mixed Land Use
200211	Adeoyo/Isale Alfa	9,736	1,355	Hosp/Residential

***Source**: * Oyo State Valuation Office (2997-2000) * Ibadan Postcode Information System*

** National Population Commission (1991/1996)*

Baseline data on land-use changes, infrastructure availability, and population by postcode zones over time can be used to arrive at detailed assessment of the spatial patterns of urban development in a metropolitan area. The data can be tabulated from land-use surveys, aerial photographs, or satellite images. The above property tax information management system (PTIMS) is an integral part of **Land Information System (LIS)** which have various processes and activities that require land information. However, the assembled property tax administrative procedure in the above table was put together in the feasibility study carried out by the Macos Urban Management Consultant which presents some of the processes that such a system can serve.

8.1 A Case Study of Ibadan Masterplan and the New Olubadan Palace

The planning and engineering of infrastructure system is an interactive process whereby the engineer tries to achieve an optimal solution within the applicable engineering design criteria as was done in the urban renewal projects and new towns and cities. An optimal solution will generally have a number of characteristics in terms of costs. On the other hand, the design should be such that all inhabitants have access to a service, that this service is of good quality and that the organization or government responsible is able to take care of the infrastructure once constructed. **Hence, the application of GIS in the planning and design of urban infrastructure in a newly planned urban development is imperative.**

GIS can be an important tool for the success of the Nigeria Government, particularly Oyo State, in urban development strategy to facilitate informed decision-making in its planning process if it incorporates GIS in the planning system.

With the aid of satellite imageries which shows details of Ibadan environment, the Oyo State capital, the World Bank has decided to assist the State Government in the major areas to create economic conditions in an appropriate living environment, while at the same time solving some of the environmental problems of Ibadan Metropolitan Area covering 3,145.96 sq.km. which is about 11% of the area of Oyo State and the largest metropolitan area in Nigeria with eleven (11) Local Government Areas. The population of Ibadan is the third most populous after Lagos and Kano With the assistance of the World Bank, the proposed Ibadan Master Plan Objective will include the followings:

(i) Ibadan City Master Plan covering 315,000 hectare

(ii) Solid Waste Management

(iii) Drainage Masterplan

The World Bank has been able to deploy GIS capabilities and optimization applications for the selection and locations of the existing cultural heritage and historic sites, selection of sites for utilities such as water, electrical, sewage and solid waste dump sites, drainage network. Also included was transportation network and the re-description of electoral boundaries to accommodate changing population distribution and new satellite towns and villages.

In transportation, the consultants had used GIS technology to maintain inventories of signs, traffic signals, and other assets; to plan future facilities in response

to anticipated growth; to provide driving directions to citizens and operators of delivery vehicles; to support intelligent transportation systems (ITS) applications; and to maintain inventories of pavement quality and maintenance.

In order to understand the context of due process and main criteria for selecting the location of suitable sites for urban infrastructure particularly the Olubadan Palace at Oke-Aremo, there is need to follow these criteria as recommended by GIS experts:

(a) The location and extent of the city or site of the new urban development are as already identified;
(b) The network of utilities required and the proposed or existing population of the communities;
(c) The closeness of water and electricity resources;
(d) Does the location offer possibilities for further expansion in the future?
(e) Is land available, which means that the government could carry out plans to be considered for the same land; and
(f) Does the site have suitable topography, which means that the land could be relatively flat and the change in elevation is rather gradual?

Before a final selection of location, a further study into the environmental and natural conditions of the site should be done. This study consisted of 6 main elements:

- Identification of the main features of the new location or entire coverage area of the old city or urban areas due for renewal
- Climate
- Topography
- Geology
- Environmental pollution
- Environmental impact assessment

A new step involved additional studies on the following aspects:

(i) The expected public services needed for the new area according to the expected population.
(ii) The expected housing needed for the new area according to the expected population

(iii) The general planning of an urban centre including limitations of the urban planning such as topographic, demographic, economics, and environmental limitations.

Unfortunately all of the above mentioned studies are carried out in most cases by the government and organizations using traditional procedures without involvement of GIS analysis. For this reason, there is need to explore whether GIS could be a suitable tool to assist in the location selection and impact studies.