

Chapter One

Introduction

1.1 Background to the Study

A Land Information System (LIS) is a framework that manages land data. It is designed for the acquisition, storage, checking, manipulation, processing, and presentation of spatially referenced data related to land parcels, including ownership, boundaries, tenure, use, and valuation. In Lagos, the adoption of Land Information System (LIS) and Geographic Information System (GIS)-based platforms aims to streamline land administration processes, improve tenure security, and facilitate property development. The effectiveness of LIS in Lagos is critical to addressing issues like land speculation, informal settlements, and urban flooding, which have been exacerbated by unplanned urban expansion. Property development (also called real estate development) is the business process of creating, improving, or renovating buildings and land to increase their value and generate profit⁴. Property development, often interchangeably referred to as real estate development, is the multi-faceted process of acquiring, planning, financing, constructing, and managing land or existing properties to transform them into functional residential, commercial, industrial, or mixed-use assets, typically aimed at generating economic value or meeting societal needs⁴.

Effective land management is crucial to support sustainable development, economic and improve quality of life. However, Lagos faces significant land management challenges, including; Inefficient land allocation and registration processes, land disputes and conflicts, insecurity of tenure, limited access to land information, corruption and bureaucratic bottlenecks. To address these challenges the Lagos State Government implemented the Land Information System in 2012, which aim is to provide accurate and up-to-date land information, streamline land allocation and

registration processes, enhance transparency and accountability, support sustainable property development and improve revenue generation⁵. Land Information System is a specialized type of Geographic Information Systems designed to collect, store, manage, analyze, and disseminate spatially referenced data related to land parcels, ownership, tenure, use and associated attributes⁶. Land use allocation determines where residential buildings, other uses should be located. Besides, land use allocation determines how raw materials can be transported to them, and their products distributed to market, where the employees should live, how they would get to work, where schools and other institutions should be suitably situated⁷. Therefore, this study defines Land Information System as a tool necessary to gather information related to land data such as, information on land ownership, in other to avoid future conflict and dispute relating to land.

1.2 Statement of the Research Problem

With the implementation of the Land Information System (LIS) in Lagos, the effectiveness of LIS in enhancing property development outcomes remains uncertain, with lingering issues of: Persistent land disputes and conflicts, Insecurity of tenure, limited access to land information, and unnecessary bureaucratic bottlenecks. The potential benefits of Land Information System, its effectiveness in improving property development outcomes in Lagos remains uncertain. Inefficient land management practices continue to hinder property development, undermining the state's economic growth and development goals. Another problem of property development in Lagos Nigeria are: regulatory and administrative challenges, environmental concerns, social and economic issues, infrastructure deficits, limited access to finance. Limited access to land information (hindering investment), insecurity of tenure, and land disputes and conflicts. This project seeks to assess the impact of the existing LIS on property development in Lagos,

identifying its strengths, weaknesses and barriers to adoption, as well as its role in facilitating efficient land markets, reducing corruption, and supporting sustainable urban planning.

1.3 Research Questions

1. How has the historical evolution of Land Information System influenced property development

In Lagos, Nigeria?

2. To what extent does LIS supports urban planning and regulation in the study area?

3. How can an effective and sustainable framework for a Land Information System (LIS) be developed in the study area?

4. What are the challenges and limitations of LIS implementation in the study area?

5. How structural digital solution affect the challenges and limitation of LIS in the study area.

1.4 Aim and Objectives of the Study

The aim of the study is to assess the impact of effectiveness of Land Information System on Property Development in Lagos Nigeria, with a view to proffer strategies to reduce associated land disputes and conflict.

1.5 Objective of the study

The objectives are to:

1. examine the historical evolution of Land Information System on property development in Lagos, Nigeria.

2. assess how effectively the Land Information System supports urban planning and regulation in the study area.

3. develop a framework for Land Information System in the study area.

4. examine the limitations of Land Information System on Property Development in the study area.
5. to proffer a structural digital solution to the challenges and limitation of LIS implementation in the study area.

1.6 Scope of the study

The Study focus on the officials of Lagos State Land Registry, specific Local Government Areas (LGAs), real estate professionals and developers. This work covered only Ikeja Local Government Area of Lagos State, Nigeria.

1.7. Significance of the study

This study will provide valuable insight into the effectiveness of Land Information System (LIS) in Lagos, informing policy decisions and contributing to improved land management practices. The findings will benefit policymakers, property developers, investors, and researchers, local communities and stakeholders, sustainable economic growth and improve living standards in Lagos, aid in job creation, by facilitating employment opportunities, provide digitalization of land records: LIS modernizes land record-keeping, and reduces errors to the barest minimum. Hence, LIS minimizes land related conflicts or court related litigation on land matters, streamlines data management, enhances accessibility integration with other systems, and promote interagency collaboration.

1.8 Limitations of the Study

This study faced challenges related to data availability, accessibility, and respondent willingness to participate.

1.9 Study Location

Ikeja, the study area is the capital of Lagos State, hosting key government institutions, including the Lagos State Ministry of Physical Planning and Urban Development, Lagos State Lands Bureau, and other relevant planning and cadastral agencies. This makes it a central location for the implementation and monitoring of Land Information System LIS initiatives. It is one of the most urbanized parts of Lagos, with a mix of residential, commercial, and industrial developments⁸. The language Yoruba, English and Pidgin English is widely spoken, and it is dominated by Christian and Islam religion. Ikeja economic activities is major commercial, and industrial hub, it hosts several shopping complexes e.g., Ikeja City Mall. There is presence of financial institutions like hotels, and service businesses in Ikeja. The road network is well-developed, but often congested, key roads are Obafemi Awolowo Way, Allen Avenue, Mobolaji Bank Anthony Way, and it is close to Murtala Muhammed International Airport. Served by public transport including BRT buses, taxis and minibuses. Ikeja hosts several public and private schools, institutions like Lagos State University (LASU) annex, and various polytechnic, training centers, and IT academies are found there. Also, major hospital (LASUTH) and numerous private clinics and pharmacies, social welfare services coordinated through the local government are all found in the city. High rate of urbanization, mixed residential, industrial and commercial land use are in Ikeja. Ikeja is relatively secure due to government presence and active policing, it hosts zonal police headquarters and military installations, there are occasionally petty crimes and traffic-related issues⁸. The population data of Ikeja shown in the table below showed that the population kept increasing yearly.

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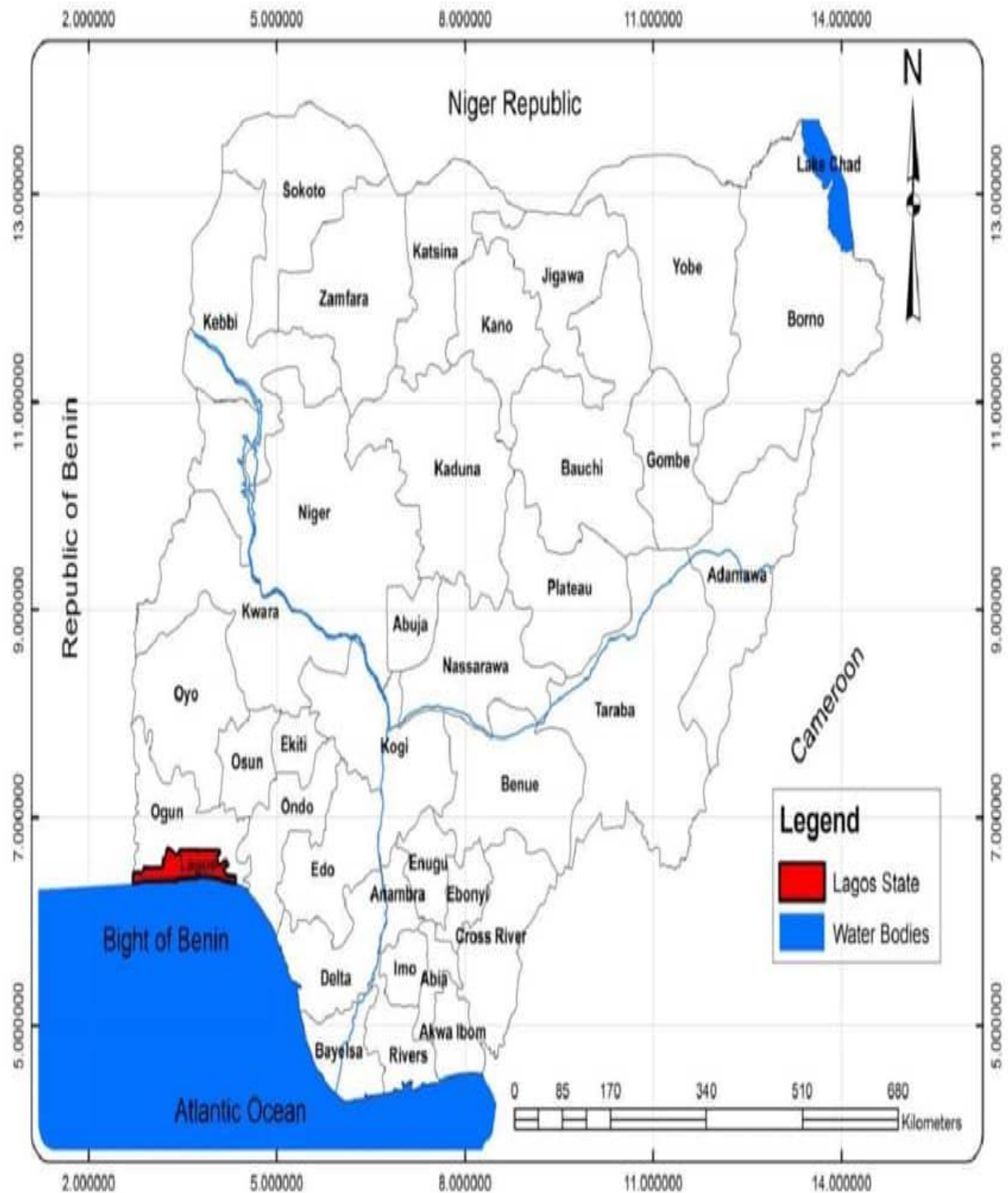


Fig 1.1. Map of Nigeria Showing Lagos State.

Source: Lagos State Government and News Reports. 2022-2025.

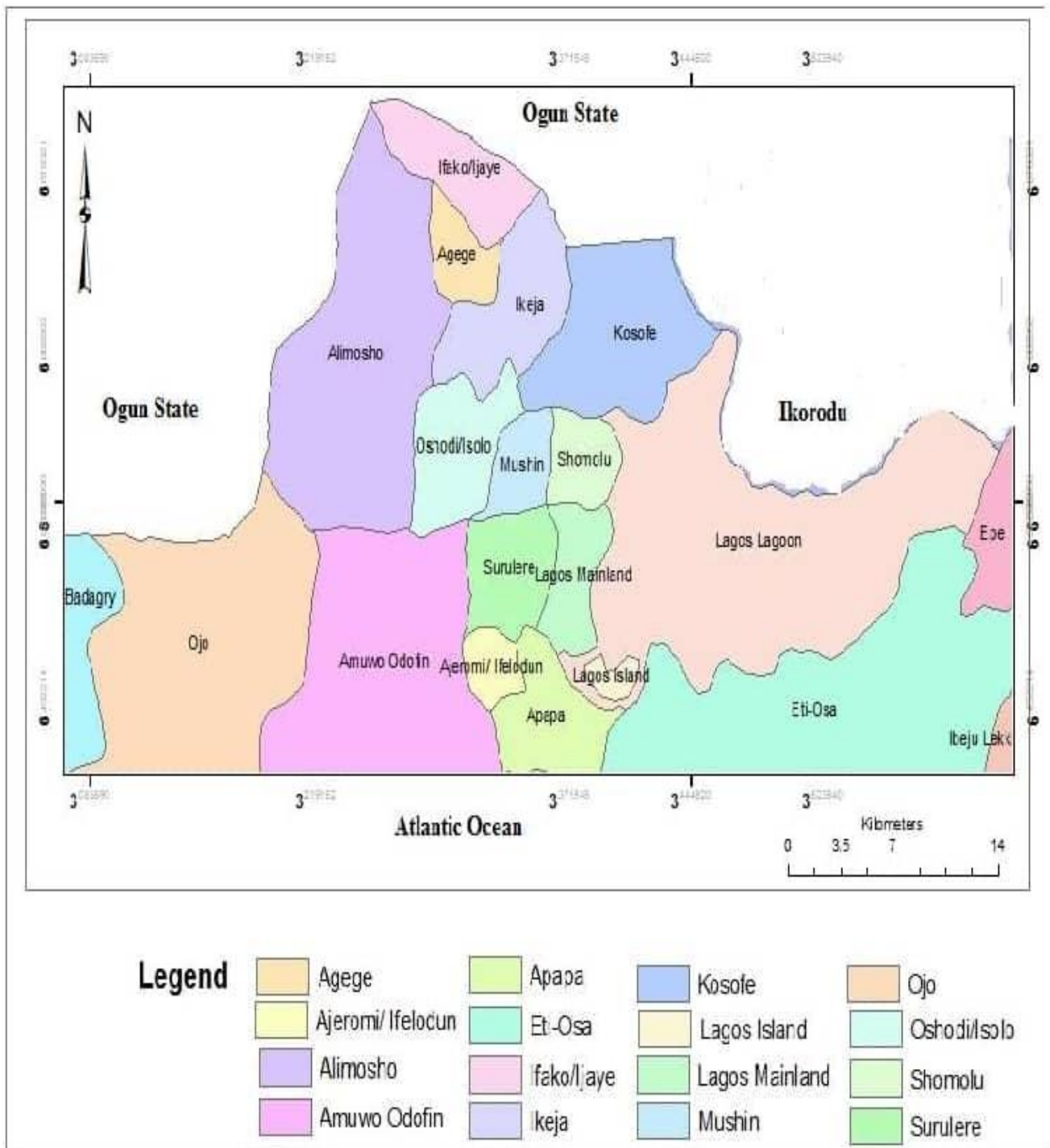


Fig. 1.2: Lagos state map showing Local Government Area in Lagos including Ikeja.
Source: Lagos State Government and News Reports. 2022-2025.

Table 1.1 Population Data of Ikeja Local Government in Tabular form

Year	Population	Source
1991	203, 383	Census
2006	317, 614	Census
2016	437, 400	Estimate
2022	470, 200	Projection
2025	506, 500	Projection (calculated using annual growth from 2022)

Source: Lagos State Government and News Reports. 2022-2025.

1.9 Operational Definition of Terms

LIS: LIS stands for Land Information System. It is a computer-based system that captures, stores, updates, manipulates, analyses, and displays land-related data, including spatial and non-spatial information. The primary purpose of a LIS is to provide accurate and reliable information about land ownership, use, and management, supporting decision-making, planning, and management of land resources.

Data refer to the process of creating and managing spatial data related to land ownership, boundaries, and use.

Bureaucratic Bottleneck: it refers to delays, inefficiencies, and obstacles caused by complex administrative processes, excessive red tape, or lack of coordination within government systems.

Endnotes

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Chapter Two

Literature Reviews

2.1 Introduction

This chapter gives an insight into various studies conducted by researchers and concepts on the development and effectiveness of Land Information System on property development in Lagos Nigeria. The main Objective of this section is to examine and present the literature reviews on Land Information System and their effectiveness in Property Development, with a focus on Lagos, Nigeria. Land administration and management are crucial for sustainable urban development. Lagos, Nigeria, faces significant challenges in land management, including inefficient record-keeping, disputes, and unregulated development. The implementation of Land Information Systems (LIS) aims to address these challenges.

2.1.1 The Concept of Land Information System

A Land Information System (LIS) is a digital framework that integrates spatial and non-spatial data to manage land-related information, including ownership, land use, valuation, and cadastral details. LIS is a subset of Geographical Information Systems (GIS) designed to support land administration by providing accurate, accessible, and up-to-date data for decision-making¹. Land Information System is a spatially referenced information system that captures, stores, updates, and analyzes data related to land ownership, land use, land value, and other land-related attributes, with the aim of supporting land administration, management, and decision-making processes. This definition emphasizes the spatial component of a Land Information System, highlighting its ability to integrate geographic information with land-related data to support effective land management and decision-making. A Land Information System LIS is a computer - based system that captures, stores, analyzes, and disseminate land-related data and information.

LIS integrate spatial and non-spatial data to support land Administration, property development and Urban Planning. Effective LIS implementation enhances land ownership security, reduces disputes and improves decision -making. Land Information System (LIS) is a geographic information system for cadastral and land-use mapping, typically used by local governments. The multi-purpose cadastral is a key component of LIS, enabling efficient land market operations and effective land use administration². A Land Information System consists of an accurate, current and reliable land record cadastral and its associated attribute and spatial data that represent the legal boundaries of land tenure and provides a vital base layer capable of integration into other geographic systems or as a standalone solution that allows data stewards to retrieve, create, update, store, view, analyze and publish land information³. Land Information System can be defined as a comprehensive collection of land-related data banks that are coordinated and standardized to provide an integrated methodology for collecting, maintaining, updating, and utilizing land-related information. It encompasses various land recording systems, such as cadastral surveys, land registration systems, and other relevant public, private, and mixed land information sources⁴.

A Land Information System is a broad-reaching and complex concept that easily eludes any simple definition. By its very nature it includes, all those unofficial procedures undertaken by individuals or small groups aimed at identifying and categorizing distinct units of property over small extensions of territory, for private and restricted purposes. On the other hand, it describes the enormous undertaking required for the identification and categorization of every single unit of property (parcel) within a nation, under the direction of a single public authority on a permanent and continuous basis, for the purpose of providing the necessary information among other things, the taxation of property and the provision of land use information required for the

preparation of urban and regional development plans. In between these two extremes lie numerous manifestations of 'how,' 'by whom,' and 'for what end' the collection and maintenance of data concerning land is undertaken⁵. A Land information system is a system that integrates spatial and non-spatial data to support land administration, property development and Urban Planning. A Land Information System LIS is a system that provides a framework for the collection, storage, analysis, and dissemination of Land related data and information⁶. The concept of the Land Information System was first developed during the 1980s, but its roots go far back to ancient times. Over time, as societies grew in numbers and in complexity, accompanied by the conscious setting aside of spaces or units of land within which to perform specific activities or functions, the task of preparing an accounting system designed to establish formally and govern these activities or functions became an inescapable necessity. LIS facilitates efficient land administration by providing accurate, accessible, and up-to-date information for decision-making in urban planning, property development, and governance⁷.

2.1.2 Concept of Property Development

Property development relies heavily on accurate land information to ensure secure tenure, streamline transactions, and support urban planning. Real estate developers are the people and companies who coordinate all of these activities, converting ideas from paper to real property. Property development means the construction, reconstruction, or other alteration or improvement of residential or commercial buildings or the subdivision or replating of a subdivision of residential or commercial property. Property Development as a process entails changing or intensifying the use of land to produce buildings for occupation and investment. Property Development refers to the process of transforming raw land or existing property into

economically viable and functional assets, such as residential, commercial, industrial or recreational spaces. Property development is the process by which buildings are erected for occupation or for sale/investment. Owners may build premises for their own occupation, for example major retailers may erect supermarkets; alternatively, property developers may construct the same type of buildings for lease or sale. The process may be the same although some aspects of the financial appraisal may be different. A building offered for sale or investment is driven by a profit motive, a building for owner-occupation may be related to the profitability of the enterprise within the building and thus profit motivation may be redirected or constrained⁸.

Real Estate development, or property development is a process encompassing activities that range from the renovation and re-use of existing buildings to the purchase of raw land and the sale of developed land or parcels to others. Real Estate is the land along with its natural resources, that which is fixed to the land, that which is appurtenant to the land and which is immovable by law. Property development can be thought of as an industry that produces commodities in the form of built spaces such as houses, offices, or factories. The commodities so produced are not only productive assets, as they provide a flow of benefits that includes the provision of accommodation as well as income, but also financial assets, in that they have capital value and can be realized by sale⁹. Urban economic activity generates requirements for land and property which might be met by the existing stock of buildings or through new development. These requirements are mediated through a property market process which, amongst other things, determines property values, allocates space in buildings between competing users, and stimulates the production of new space through development and re-development¹⁰.

Over the last two decades, the demand for land resources has changed significantly⁹. This has

been brought about by changes in the size, income and preferences of the global population, the rate of growth of economic activity, methods of transport, and techniques of production and distribution. On the supply side, existing buildings wear out or becomes less suitable to present uses, and the cost of constructing new buildings or adapting old buildings changes significantly⁹. Development is the response to such changes and property developers performs a range of functions, acting as entrepreneurs who recognize development potential and bear the risk of the project⁹. Everywhere you walk, whether it's residences, offices, stores, hotels, warehouses, or educational or healthcare institutions, you're surrounded by real estate. All of these structures are the result of property development. Property developers essentially construct the world around us, shaping and transforming the places in which we live and work. Property development, often known as real estate development, is the process of improving the use-value of buildings or land. It's a multi-faceted business that can encompass any of the following: Buying land and building property on it, renovating, expanding, or enhancing a structure, property conversion from one use type to another. Property development or Real Estate Development refers to the process of transforming land or buildings for a specific purpose, such as residential, commercial, or industrial use. This involves various activities, including land acquisition, planning, design, financing, construction, and project management⁹.

Property development is the process by which buildings are erected for occupation or for sale/investment. Owners may build premises for their own occupation, for example major retailers may erect supermarkets; alternatively, property developers may construct the same type of buildings for lease or sale. The process may be the same although some aspects of the financial appraisal may be different. A building offered for sale or investment is driven by a profit motive, a building for owner-occupation may be related to the profitability of the

enterprise within the building and thus profit motivation may be redirected or constrained. Property development means carrying out work for any or all of the following activities in relation to land (whether by its owner or by someone else with the owner's consent) with a view to obtaining a reward from selling or leasing the land¹⁰. Therefore, this study will adopt the definition of property development to be a process that involves the transformation of land or existing buildings to create new or refurbished buildings or spaces for residential, commercial, or industrial purposes, typically with the aim of generating financial returns⁶.

2.1.3 Stakeholders in Property Development

Stakeholders in property development are individuals, groups, or organizations that influence or are impacted by a project's process or outcome. Property development also called real estate involves a wide range of professionals and stakeholders, each playing specific roles throughout the development process. Property Developers; drive the project, coordinate land acquisition, financing, design, construction, and sales/leasing. They manage, and finance the development project, acquiring land, securing funding, hiring the project team, managing timelines and risks, and overseeing the sale or leasing of the finished property. Investors and Financiers; provide debt financing, provide equity or joint venture capital, supplying capital in return for interest, profit share, or ownership stake. Architects and Designers; Design, construct, and manage aspects of development. Architects may focus on sustainable design, while engineers address structural and environmental challenges, they deliver quality projects, enhance professional reputation, and meet client/regulatory requirements. Design the building's structure, aesthetics, and layout, the interior designers handle the look, and functionality of interior spaces, while the urban planners are involved if the development affects zoning, infrastructure, or community design. Engineers, the structural Engineers ensure buildings are safe and structurally sound, the Civil Engineers plan

roads, drainage, utilities, and other infrastructure. There are a variety of persons involved in the property development process, each with a unique set of talents and knowledge that contribute to the success of development projects. Those with a thorough grasp of the regulations that will apply to the development project, as well as how to secure planning permission, construct the actual home, and so on, are examples of such talents. Developments will bring together an entire team of professionals trained in the several diverse jobs required in effective property development in order to achieve all of this and much more. A project can only function smoothly and successfully if everyone in the development team works together. In this respect, the list of the various different individuals that forms development teams will be made up of; a planning consultant, a quantity surveyor, an accountant, a solicitor, an architect, an interior designer, housebuilders, Contractors, Manager – overseeing the project. While these are all typical people that work on development projects, they are not the only professions a project could require. More commercial ventures, for example, may necessitate the hiring of a site finder, an agent, and a marketing department to ensure the project's success¹¹. Stakeholders in property development, such as developers, investors, government agencies, planners, and community members, rely on Land Information System (LIS) to access accurate and comprehensive data about land for effective decision-making¹¹.

Developers and Investors, use LIS to identify suitable land parcels, assess zoning regulations, land use restrictions, and ownership details to evaluate development feasibility and financial viability. Government Agencies, utilizes LIS to manage land records, enforce regulations, issue permits, and ensure compliance with urban planning policies, streamlining interactions with developers. Urban planners and surveyors depend on LIS for spatial data, topography, and infrastructure details to design sustainable developments aligned with city plans. Community

members access LIS to understand proposed developments, provide input on projects, and ensure transparency in land use decisions affecting their areas. Financial institutions leverage LIS to verify property titles, assess collateral value, and mitigate risks when financing development projects. LIS integrates data like cadastral maps, property titles, land use, and environmental constraints, serving as a centralized platform that supports stakeholder collaboration, reduces disputes, and enhances efficiency in property development processes⁵¹.

2.1.4 Relationship Between Land Information System LIS and Property Development

A Land Information System LIS is a digital framework for collecting, storing, managing, analyzing, and distributing information related to land. It includes spatial data, such as maps, parcel boundaries and legal data such as ownership, rights, and restrictions. In the context of property development, LIS plays a crucial enabling role by enhancing efficiency, transparency, security, and planning capacity across the entire property development cycle. Land may be defined as the solid part of the earth's surface. Land covers every part of the planet earth, because it also exists under the sea. It is a significant asset of any country. Without land there will be no country. The significance or wealth of any country or nation and its economic benefit and development are dependent on the stage of land and its usage. Every human being needs a personal sphere to survive. The main topic of traditional cadastral systems was the identification, verification, and sufficiently precise localization of the boundaries separating property rights of differing owners. The result of this process was a description of the characteristic of the parcels to be recorded in the Land Register. The restriction of the traditional cadastral systems to the handling of parcel boundaries is felt everywhere in the world. The impacts of laws restricting the property rights cannot be documented appropriately. In many countries it is a big problem to deal

with the buildings, especially with those not complying with the construction law requirements. A Land Information System (LIS) consists of an accurate, current and reliable land record cadastral and its associated attribute and spatial data that represent the legal boundaries of land tenure and provides a vital base layer capable of integration into other geographic systems or as a standalone solution that allows data stewards to retrieve, create, update, store, view, analyze and publish land information¹².

The need for Land Information System (LIS) is important as land records, such as nature of the soil, vegetation cover, land used and capability, ownership, and all the topographical features, etc., are needed daily for many public and private purposes such as property assessment, physical planning sustainable development, the development of transportation and utility infrastructure and natural resources management. In essence, land records are the basic more especially relevant for information that relates to land ownership and rights that is collected and mapped in a cadastral, in fact the earliest map produced were cadastral, and for this reason, most developed countries have evolved effective systems of keeping land records and with the advent of the computer, these records are digitally processed and kept for easy reference and updating¹². Land administration is the process whereby land and information about its ownership is effectively in the control of a central authority that regulates the structure and patterns of land ownerships, land use. Land management also give access of the public to land resources in such a way that it is used in a sustainable manner from both environmental and economic perspectives. A Cadastral/Land Information System is a tool for legal, administrative and economic decision making and an aid for planning and development. A key component to the improvement and management of land is the use of Land/Cadastral Information System. In most developed

countries, over 80 percent of national and prospective allocation and environmental management decision is based on quality and accurate information¹².

Ways LIS Influences Property Development

Facilitates Secure Land Ownership and Transactions; LIS provides accurate and verifiable land records, reducing the risk of fraud, multiple claims, or title disputes. Developers can confidently verify ownership, encumbrances, and property rights before investing. For instance, in Lagos where land title issues often delay or derail property investments, LIS can help developers quickly confirm legal ownership. Speeds Up Planning and Approval Processes; LIS enables faster access to zoning information, land use plans, and cadastral data, which are essential for obtaining development permits. Digital platforms reduce manual paperwork, shortening approval timelines. Enhances Urban Planning and Infrastructure Coordination; LIS integrates land data with planning systems, helping city authorities and developers align property projects with infrastructure provision such as roads, drainage, utilities. Prevents uncoordinated or illegal developments in high-risk zones such as floodplains. Informs Land Valuation and Investment Decisions; LIS provides accurate land and property data for valuation, tax assessment, and feasibility analysis. Investors use LIS to analyze land potential, proximity to infrastructure, and market value. This improves the transparency and predictability of land markets, making it easier to attract private and foreign investment. Reduces Land Disputes and Legal Risks; With up-to-date cadastral maps and ownership records, LIS helps prevent conflicts over boundaries and land rights. Encourages dispute resolution based on factual, digital records. Supports Sustainable

Development Goals (SDGs); LIS supports efficient land use, equitable access, and environmental planning, which are aligned with the SDGs, such as sustainable cities and communities, equal access to ownership and control over land, infrastructure and innovation. The Land Information System is not just a land records, it is a strategic enabler of property development. It provides the foundation for secure, transparent, and efficient development by linking land rights, planning, valuation, and regulation. In fast-growing urban area like Lagos, strengthening LIS is essential for unlocking sustainable and equitable urban development^{13,14, 15}.

2.1.5 Uses of Cadastral Management

Cadastral management plays a vital role in land administration and governance. It involves maintaining records of land ownership, boundaries, and usage, often using geospatial technologies.

Cadastral Information System is capable of producing an accurate computer-aided cadastral map and can cope with large volume of spatial and non-spatial data. Cadastral systems address equity, economic and social needs, and are equally applicable in both the urban and rural sectors^{16,17}.

Cadastral is the method of registering land, designed to ensure the rights of individuals and the state of their property. GIS as a subset of information systems enables capturing, storing, checking, integrating, analyzing and displaying data about the earth that is spatially referenced. Therefore, for planning purpose all land-associated information should be available in the form of a computer database, which can be easily accessed, manipulated by decision-makers while formulating and executing work. Such a database system is called Land information system. Cadastral applications will include cadastral index maps and land registration data in a digital format. A cadastral map is a map which provides detailed information about real property within

a specific area. A complete set of maps is necessary to perform this function. Maps help determine the location of the property, indicate the size and shape of each parcel and reveal geographic relationships that affect property value. Maps and map data are important not only for assessors, but also for other governmental agencies, the public at large, and the land information community (such as realtors, title companies, and surveyors). For mapping systems, the primary identifier for assessment purposes should be a location identifier. A location identifier is a symbolic representation for the name and the location of an airport, navigation aid, or weather station, and is used for manned air traffic control facilities in air traffic control, telecommunications, computer programming, weather reports, and related services¹⁷.

Spatial data contain the coordinates and identifying information for various map features. These types of features can be represented in the map, viz., point, line and areas/polygons etc. The various physical aspects of the map, viz., political boundaries, roads, waterways, and so forth are organized into different layers according to their common features. Data used in a GIS is an attribute data associated with any particular land area. Data views can be associated with the map through links to the spatial data. For instance, the spatial data might represent a county and contain information for city boundaries, census tract boundaries, streets, and so forth. The primary uses of cadastral management includes: Land Ownership and Tenure Security; cadastral systems provide a legal framework for recording land ownership, which helps secure land tenure. This reduces disputes and encourages investment in land^{16,17}. Land Use Planning and Development; Cadastral data supports urban and regional planning by providing accurate information about parcel boundaries and ownership¹⁸. Property Taxation; Cadastral systems underpin property valuation and taxation by linking spatial data with ownership and land use information¹⁹. Environmental Management; Cadastral data is critical for monitoring land

degradation, managing natural resources, and protecting environmentally sensitive areas²⁰. Disaster Management and Risk Reduction; Cadastral maps and databases help identify land at risk such as flood zones, and plan for disaster preparedness and recovery²¹. Investment and Economic Development; Secure land records stimulate private investment, facilitate real estate markets, and promote credit access through land collateralization^{22, 23}. Land Dispute Resolution; Accurate cadastral records help resolve land disputes by providing legal and spatial evidence of boundaries and ownership²⁴.

2.1.6 Benefits of Land Information System

A Land Information System (LIS) is a geographic information system for cadastral and land-use mapping, typically used by local governments. A LIS consists of an accurate, current and reliable land record cadastral and its associated attribute and spatial data that represent the legal boundaries of land tenure and provides a vital base layer capable of integration into other geographic systems or as a standalone solution that allows data stewards to retrieve, create, update, store, view, analyze and publish land information. Land parcel is the basic unit for access and control of land, land use decisions. Current, reliable land information necessary for many public programs: land planning, infrastructure development and maintenance, environmental protection and resource management, emergency services, social service programs and so forth. LIS provides a base for land markets, development, and other economic activity. LIS helps in updating of the maps, improves data accuracy, eliminates redundant data entry, Streamlines and simplifies the land and lease management process. An efficient and effective land information system is critical for national development. Land information systems drive decision making and policy creation in government, manage and appropriate property taxes and revenue which is integral to a country's economic viability and secure land tenure for the citizens of a country¹.

“A Land Information System is a tool for legal, administrative and economic decision-making and an aid for planning and development. A land information system consists, on the one hand, of a database containing spatially referenced land-related data for a defined area and, on the other, of procedures and techniques for the systematic collection, updating, processing and distribution of the data. The base of a Land Information System is a uniform spatial referencing system, which also simplifies the linking of data within the system with other land-related data. The two key elements in this information system are the geographical/spatial element and linked enterprise data.

Locally, Land Information Systems are siloed, and this creates inherent inefficiencies in the system which hinder customer transactions and ultimately limit the potential gains the government can reap from these powerful. The cadastral system is the basis used for the protection of the property by means of registration procedures and cadastral plans made from geodetic operations and surveying. Each parcel or property and its owners are registered and all the spatial structures consisting of location, boundaries and contents are graphically described in a cadastral map or digitally stored in a database. It may be a systematic or a sporadic and official description of properties affording information on real estate. The cadastral data need to be collected, managed, analyzed, and rationally stored to facilitate their retrieval. After being processed, these data become land information that allow users to make analysis and plan future projects. Recently, there is pressure to develop a modern cadastral system based on the information technology to create a unique reference for land properties as geometrical features and land tenure as attribute information. For many reasons, the cadastral system is a fundamental key providing accurate information about the lands and their attributes. It is a basis for establishing national geo-information infrastructure. The data are the basic resources of the

information that is the fundamental key for all decision-making. The collected data in a manual or digital form are stored and processed in order to produce information, which may be analytical or graphical result. The aim of the information is to facilitate analysis, retrieval, and updating processes. The quality of the information depends largely upon both the quality of data and the quality of processing systems. The technological tools used to manage and process data include the Geographic Information System (GIS) that facilitates collecting, modeling, and managing, analyzing and storing spatial and non-spatial data. Spatial data are lines, surfaces, or volumes and they have their positions located by a coordinate system. Whereas non-spatial data are specific attributes characterizing spatial data. The GIS tools enable spatial searching, overlay operations, spatial analysis and modeling. Several GIS applications have been developed dealing with many different data. A kind of applications or computerized systems based on this technology is Land Information System (LIS). The land information systems have the benefits to serve society on a long-term basis and on a long-term return on investment by taking in account both the static and dynamic components of land. The static aspects are the norms and values adopted in society to define rights and to record existing land tenure, value, and use ascertained by adjudication process and mapping. While dynamic aspects are the changes that affect the relationship between man and land according to the changing nature of land rights, land value; and land use³.

Land information is crucial for planning and development. The rapid pace of development in many of the cities in Nigeria, while bringing about high growth rates also brings with it heavy burden on land utilization. To ensure that the high growth rate can be sustained, it is imperative to plan for an effective land information system to plan the utilization of its land resources for development while at the same time, protect the environment. Land has been identified as a

function of virtually all forms of production². Land is required for various uses in both the urban and rural areas of all society. As nations grow in size and rural areas become urban centers and urban centers become large metropolitan areas, there is always increased competition as well as demand for land for different purposes. This requires adequate planning and control to ensure harmonious development and functional efficiency of these uses and settlements. A nation's natural resources form the basis of economic growth in most developing nations. Raw Materials required for the manufacturing industry which drives the economy are extracted from the land resource. This renders good governance of land crucial in any country as it is also the basis of sustainable development. Land is undoubtedly one of the most valuable resources of any nation¹. Land information management forms an integral part of urban development. Thus, public land management is, expected to among other things, guarantee equitable distribution of land rights on the basis of non-commercial criteria, empower government to ensure a more judicious, orderly and healthy development of urban areas, guarantee easier and cheaper access to land for both public and private land development and curb speculation which was believed to be the main cause of escalating land prices in the periphery of urban areas. From the planning perspective, land represents a mosaic that ought to be regulated to ensure conformity and balance of the built environment. However, the general inefficiency associated with majority of the developing countries land policies, and the absence of secure tenure, adequate land management capacity among others, have been cited by Bernstein²⁵, as serious problems precipitating existing land crises in these countries. A land information system needs to be coupled with accurate and complete information if sound decisions are to be made. Land management is the process whereby land resources are put to good effect. This essentially leads to the concept of the computerization of land information system, which is a tool for managing information about land.

It is usually an up-to-date public register containing different aspects relating to the land unit such as form of tenure, use and value. The whole world is becoming information and technology compliant. The use of computer and other electronic devices to solve problems and store information is becoming a *modus operandi*³.

Unfortunately, today very few countries have a working Land Information System as has been defined. The required steps that lead towards achieving this goal involve significant economic investments and a determined political will on the part of the society and government. Many would argue, and with some reason, that the larger and more unified an information system is the greater the dangers to individual privacy and liberty will become. But the world we live in today cannot afford to be without well-designed land recording systems and to continue as it has with inadequate land management strategies. With the proper measures in place, it is possible to realize an acceptable balance between individual rights and the public good. Without a working Land Information System, nations individually and collectively will be ill-adapted to manage future population growth with its ever-increasing demands on the planet's limited land and natural resources. The first quarter of the twenty-first century will be crucial to this end, and should be a period of human history in which governments give land recording systems high priority in order to be better prepared to face the challenges of growth and development in the years ahead²⁵.

2.1.7 Benefits of Property Development

Property development involves the process of transforming land or existing buildings into new or improved residential, commercial, industrial, or mixed-use real estate. It delivers a range of economic, social, and environmental benefits, especially in urbanizing regions like Lagos or

other growing cities. First of all, let's start by explaining exactly what is meant by property development. In brief, property development is the purchase of real estate (property or land) with the intention of adding value by renovating, refurbishing and/or extending to generate a positive return on investment. It really is that simple. However, getting it right is not always quite as straightforward. Whilst there are numerous potential financial gains to developing property, it is also important to understand the other side of the story, and the possible risks involved for inexperienced or first-time developers. Here we explore the pros and cons of property development whilst highlighting the advantages of working with an experienced development company. Some real estate developers only do it for the money, but the good ones do it well and make money because they love what they do. Having a positive impact on the world around them is their goal, and that is why real estate development is important. That positive impact can be far-reaching for local communities, turning small hamlets into sustainable towns. Without real estate development, we would not have homes, shops, schools, hospitals, and other essential buildings to protect us from the elements and service our needs. The reason why real estate development is important is because it supports progress in our society. The benefits span across economic, social, environmental, and urban development dimensions. Economic Growth and Job Creation; property development stimulates the economy through construction activity, investment, and job creation²⁶. Urban Renewal and Infrastructure Improvement; Redevelopment of deteriorated urban areas improves infrastructure, services, and aesthetics²⁷.

Our cities and towns are in a constant state of change. Whether the trend is people moving away from cities to smaller towns and suburbs or to cities from small towns, these areas need to be able to support the changing population. This means there needs to be enough housing. Along with housing comes shops, food outlets, schools, hospitals and more. Real estate development is

how developers grow local economies in small towns and big cities to meet the needs of the people. With more homes, shops and essential facilities, towns can grow, and their inhabitants can thrive.

As technology has improved, so has our ability to save water and electricity. Building standards have changed to support more sustainable and environmentally conscious design. Whether real estate developers are building new properties from the ground up or renovating old ones, they can take these new standards into account. This enables them to produce buildings that are cooler in summer, warmer in winter and place less strain on the electrical grid. In addition, newer buildings are typically safer and more resilient against the elements owing to advances in engineering.

Real estate development helps communities on an economic level too²⁷. The act of building alone provides employment, which trickles down and helps people live more prosperous lives. With new commercial developments, people can open shops and other necessary infrastructure such as schools and hospitals, which all employ more people and help the community grow and improve their economic circumstances. In small towns, real estate development attracts more residents, and in urban areas, real estate development can rejuvenate regions that have lost their earlier appeal. These developments help maintain or even improve local property prices, which also aids the local economy²⁷.

Property development can offer significant potential returns on investment, particularly in markets with high demand for new properties. Property development can offer the potential for long-term capital appreciation, particularly in markets with strong property price growth. Property development offers the ability to control the design, construction, and marketing of a property, allowing developers to create unique and attractive properties that can differentiate

themselves in the market. Rental income from developed properties can provide a steady stream of cash flow. Property developers can generate rental income from tenants. Developers can sell properties, generating a one-time cash inflow. Well-developed properties can appreciate in value, increasing the developer's net worth. With a diversified portfolio, developers can better predict and manage cash flows. Property development can contribute to economic growth by creating jobs and stimulating demand for goods and services. Property development has long been considered a good investment for individuals and companies alike. Although it comes with its own set of risks and challenges, many investors know that property development can be a viable means to generate substantial returns and build wealth over time²⁷.

2.1.8 Property Development as a Tool of Investment

Property Development is not just a construction activity- it is a strategic investment tool that allows individuals, companies, and governments to generate long-term returns through capital appreciation, rental income, and portfolio diversification. Unlike other forms of investment, such as stocks or cryptocurrencies, property is a physical asset with inherent value tied to its location and potential for use. This provides a sense of security to anyone investing. Land and buildings have a value that can be measured in both financial and practical terms. This underlying value can provide a level of stability and reassurance to investors, especially during times of economic drops.

Over time, well-located properties tend to increase in value. This can be down to lots of factors like population growth, urbanization, area investment, and infrastructure. By developing or buying properties in areas with strong growth prospects, investors can benefit from substantial appreciation in property value. This can lead to significant returns on investment. As the owner

of a property, it is you, not someone else that makes decisions that impact its value and profitability. This control allows investors to explore different development options, such as renovating or expanding properties to suit changing market demands. This can increase the property's value and therefore your return on investment. As well as the potential capital appreciation, property development can also generate ongoing income through rent. Investors who choose to rent out their developed properties can benefit from a steady stream of cash flow, which can help cover mortgage payments, maintenance costs, and other expenses related to the property. Rental income can provide a level of financial stability, making property development a more resilient investment option. Developers and investors benefit from capital gains when properties are sold at higher prices post-development²⁸. Income-generating property developments; residential, commercial, or industrial, provide consistent cash flows via leases and rents²⁹.

Property development can offer various tax advantages to investors. It can be exempt from inheritance tax under specific circumstances as the property can be left to a spouse or trusts. Or if you buy property as a company, not an individual, higher-rate taxpayers save on income tax by paying corporation tax instead. There are also some tax benefits for landlords who rent out their properties including the replacement of domestic items relief. This allows landlords to claim tax relief on the actual costs of replacing certain furnishings and appliances. While property development can be a lucrative investment opportunity, you should carefully consider if it is right for you. Each property development project is unique and comes with its own set of risks and challenges, including market fluctuations, regulations, and construction costs. You should research the local market, understand the demand and supply dynamics, and assess the potential risks and rewards before embarking on any property development endeavor. We strongly advise

seeking advice from financial advisors, real estate experts, and legal professionals to make sure that property investment is right for you before buying or developing any property for financial gain. This guide is intended only for information and does not constitute financial or investing advice. Property development can be a rewarding venture, but to be successful, you need to plan and seek expert advice. The property development process is vital for various reasons. Firstly, it meets the increasing demand for housing, commercial spaces, and infrastructure, fostering economic growth and urban development. Secondly, it enhances urban planning by creating well-designed, sustainable spaces that improve quality of life. Moreover, property development generates job opportunities in construction, architecture, and related sectors, contributing to local economies. It also serves as an investment avenue, offering potential returns for developers and investors. Furthermore, thoughtful property development can revitalize neighborhoods, attract businesses, and foster community development. Developers can access tax incentives such as depreciation, interest deductions, and capital gains tax deferrals³⁰.

2.1.9. Land Titling

Land titling is the legal process of officially recognizing and registering ownership rights to a specific piece of land. It involves identifying, documenting, and recording who owns the land and under what conditions. Land titling is the process of registering and documenting land ownership, rights, and interest. It provides a clear and secure record of land ownership, helping to prevent disputes and ensure property rights. Land titling is a critical aspect of land governance, and its effectiveness can have a significant impact on economic development, social stability, and environmental sustainability. Land titling refers to the process by which governments or

legal authorities officially record and recognize land ownership and rights through a land title document. This title becomes proof of ownership or a legal claim to land³¹. A Land Title is a legal document that proves ownership and rights over a piece of land, it shows who owns the land, the size and location of the land, any conditions or restrictions e.g., easements, leases, or mortgages³².

Titling in Lagos refers to the process of obtaining official documentation for land ownership or property rights. In Nigeria, the Land Use Act of 1978 vests all land within each state in the State Governor, who holds it in trust for 99 years. Here are some key aspects of titling in Lagos:

- ***Certificate of Occupancy (C of O):** A legal document issued by the government to convey occupancy rights. This is considered the most important title document in Lagos. One of the most criticized provisions of the Land Use Act is that it vests all land within the territory of each state in the State Governor, who is expected to hold it in trust and make it available to the citizens through the grant of a 99 years rights of occupancy. Technically, this means that every land holder in Nigeria is considered a leaseholder and a Certificate of Occupancy is a legal document issued by the government to convey occupancy rights to the person. On any piece of land in Nigeria, only one Certificate of Occupancy can be granted. The implication of this is that when a property owner decides to sell, the Governor is not expected to issue another C of O on the same property. What is usually required is that the original title holder would secure the Governor's consent to sell. This consent document will then serve the purpose of transferring ownership to the new buyer and need to be documented with the state government authority.

- ***Deed of Assignment:** A proof of transfer of title or ownership in a property from one person to another. This document is prepared by the buyer's lawyer and executed by both parties. Deed of Assignment is a proof of transfer of title or the ownership in a property from one person to

another. In this case, the original holder is known as the assignor, while the other party is known as the assignee. In Nigeria, where a party is buying from a holder of a certificate of occupancy, it is expected that the transaction should be followed with a deed of assignment. Deed of assignment is usually prepared by the buyer's lawyer and then executed by both parties once properly vetted. Typically, a deed should contain information about the parties, and description of the subject property being sold. Additionally, a deed of assignment is only tenable in law if it has been duly registered with the consent of the Governor. Prior to the Land Use Act this was known as the Deed of Conveyance and some properties still have this title till date.

- ***Registered Survey Plan:** A document showing the boundaries and geocode of a property. This is usually prepared by an estate surveyor and registered with the Surveyor General.

***Governor's Consent:** A document signed by the Governor as proof of consent to the transfer of a right of occupancy on a landed property. This is a crucial document, and any title transfer without it is invalid. Because land is a property of the government, a transfer of such interest according to the Land Use Act is only permitted when the consent of the State Governor is sought and duly obtained. "Governor's consent" is usually signed by the Governor as a proof that he has consented to the transfer of a right of occupancy on a landed property from one person to another. This document is very crucial and any title transfer that is not consented to by the Governor is considered invalid. The importance of land titling in Lagos cannot be overstated. A study found that land titling is the third most important factor affecting land pricing in the city, after buyer's preference and lot size. However, the study also noted that the importance of conventional variables like land titling may be declining. To ensure smooth titling in Lagos, it's essential to work with experienced professionals, such as lawyers and estate surveyors. They can guide you through the process and help you obtain the necessary documents. By understanding

the titling process and working with the right professionals, you can ensure that your property rights are protected and your investment is secure³².

Relationship Between Land Titling and Land Information System in Lagos State

Land Titling and Land Information Systems (LIS) are closely interconnected, as both are critical components of effective land administration and management. Land titling relies on accurate, organized, and accessible data to establish and secure property rights, reducing land disputes, and promoting efficient land transactions. In Lagos State, Nigeria, this relationship is critical due to the state's rapid urbanization, high demand for land, and complex land administration challenges³². Land Titling involves registering land ownership or interests to establish legal rights, typically through a Certificate of Occupancy (C of O) or Deed of Assignment in Lagos, governed by the Land Use Act of 1978 and Lagos State Land Registration Law, 2015. It requires Governor's consent, stamping, and registration at the Land Registry to secure property rights and enable transactions. LIS provides the database for recording and verifying titles. LIS helps resolve conflicts by providing verifiable records, critical in Lagos's high-demand land market³². Lagos has made significant strides in integrating land titling with its LIS through the e-GIS portal, launched by Governor Jide Sanwo-Olu in 2024. This portal provides digitized access to land data, enabling buyers to verify titles before purchase and reducing fraudulent transactions³².

Benefits of Land Titling

Land titling provides clear evidence of ownership, reducing disputes and insecurity, and protect owner's rights. Secure land ownership encourages investment in land and property, prevents fraudulent transactions. Land titling helps governments manage land resources more effectively. It enables access to credit; a clear title can be used as collateral for loans. It provides clear,

legally recognized proof of ownership, reduces land disputes, encroachments, and illegal claims, offers protection in courts and formal legal systems. It can be used as collateral for loans, encourages financial inclusion, especially for farmers and small landholders, owners are more likely to build, improve, or farm their land when ownership is secure. It boosts long-term planning and property value. Land titling helps governments manage land use, zoning, and public services, enables structured city expansion and rural development. It makes it easier to sell, lease or transfer land, it promotes a more active, transparent, and reliable real estate market. Land titling give recognition to indigenous or community land rights, it prevents exploitation or displacement by powerful interests. Land titling is a foundation for economic development, legal protection, and social stability, especially in countries where land disputes and informal landholding are common^{32,35}.

Cadastral in Land Titling

A cadastral is a comprehensive register of the real property or real estate within a specific country or jurisdiction. It typically includes details about ownership, boundaries, location, dimensions, and value of land parcels. In the context of land titling, the cadastral plays a critical role in establishing and maintaining clear and secure land ownership records. It provides the foundational spatial and legal data needed for issuing land titles, resolving disputes, facilitating land transactions, and implementing land-related policies. Cadastral refers to the systematic

registration and mapping of land parcels, including their boundaries, ownership and value. In land titling, cadastral systems play a crucial role in; Identifying and recording land parcels, defining property boundaries, establishing ownership and rights, facilitating land transactions and registration, supporting land administration and management. Cadastral system can be digital or paper-based and are essential for secure land tenure, reducing disputes and promoting efficient land governance³². Cadastral maps identify and delineate land parcels, which are essential to issue accurate and dispute-free land titles¹⁷. A cadastral supports the land registration system by linking spatial data with legal land rights, enabling the formal issuance of titles¹⁸. A reliable cadastral system helps governments and landholders ensure that land titles are secure, legitimate, and enforceable in law³⁶. Cadastral data is a core component of Land Information Systems, which manage land titling processes digitally and efficiently³⁷. In summary, cadastral systems are fundamental to land titling because they provide; accurate land parcel identification, legal linkage to ownership and rights, foundational data for land registration systems, mechanisms for dispute resolution and tenure security³⁷.

Cadastral maps accurately define and record parcel boundaries, which are essential for legal certainty in land ownership. The cadastral system forms the basis for delineating property rights and serves as a reliable reference in land transactions. The cadastral supports the legal status of titles by linking spatial data with legal data. The cadastral is a core component of land administration systems that supports formal land titling and property rights registration.³² By providing clear, officially recognized property boundaries and ownership records, cadastral systems help reduce disputes. A well-functioning cadastral enhances tenure security and facilitates conflict resolution. It clears land records reduce conflicts between individuals, communities, and institutions³³. Cadastral information is critical for land taxation, zoning,

infrastructure development, and real estate markets. The cadastral underpins land market operations and supports public administration in land management³⁴.

2.1.10 Urban Spaces Innovation Intervention in Lagos Housing Crisis

Lagos, Nigeria's economic hub and one of the fastest-growing megacities in the world, faces a severe housing crisis driven by rapid urbanization, population growth, and inadequate infrastructure. To address this, urban space innovation- the creative rethinking of how land and space are used has become an essential tool in housing interventions. Here are overview of urban space innovations addressing the Lagos housing crisis, with practical examples; Vertical Housing Development, Lagos has limited horizontal space due to geographical constraints such as coastal land, and lagoons. The Eko Atlantic City Project incorporates high-density vertical structures to house businesses and residents on claimed land, affordability and exclusivity remain concerns³⁸. These objectives are to provide affordable and quality housing to the poor and low-income groups and to institutionalize a social housing policy that will enhance access to quality and affordable housing by the vulnerable groups, However, these two objectives are complimented by various implementation strategies that include research into all aspects of urban and housing policies of the federal, state and local governments, create awareness among poor, marginalized and low-income groups about important housing and urban planning and development policies that concern them, economic empowerment of the target populations, technical skills transfer, engage in the physical and structural renovation of existing houses, and undertake construction of new houses, explore and utilize modern technological advances to source, generate and provide basic material inputs for construction of durable and affordable houses for the poor and

collaborate with the public and private sectors; mortgage institutions, building societies, banks, financial institutions and other stake holders in the realization of these goals³².

The growing determination of slum communities to tackle their housing situation and the government's delay and in most cases refusal to provide compensation or resettlement to victims of forced eviction such as the Maroko community [that was demolished in July 1990 without due process] propelled USI and its partner communities to engage social housing development as a possible vehicle for exploring solutions to the enormous land and housing challenges that they face. Maroko community was adopted as a pilot target group by virtue of its relative cohesiveness, strong structures of community organization, past successes with advocacy and gender mainstreaming initiatives, and above all, a strong quest for housing and improved living conditions. Small, affordable, prefabricated housing units; Low-income earners cannot afford conventional housing, micro-units reduce cost and construction time. Scalable for young professionals, low-income families, or emergency housing³⁹.

2.1.11 Urban Spaces Innovation Intervention in Lagos Housing Crisis in Relation to Land Information System (LIS)

The housing crisis in Lagos, Nigeria, characterized by a deficit of over 3.3 million housing units and widespread informal settlements, has prompted innovative interventions by organizations like Urban Spaces Innovation (USI). These efforts aim to address the acute shortage of affordable housing, exacerbated by rapid urbanization, population growth, and limited land

availability. A critical component of these interventions is the integration of Land Information Systems (LIS), which provide a structured approach to managing land data, improving access, and facilitating equitable urban development. A Land Information System (LIS) is a geospatial tool that integrates data on land ownership, use, value, and development potential to support urban planning and policy implementation. In the context of Lagos' housing crisis and Urban Spaces Innovations Intervention, LIS plays a pivotal role in land tenure and ownership clarity, Lagos faces challenges with unclear land tenure, often leading to disputes and fraudulent transactions. An effective LIS can formalize land ownership by digitizing records, reducing fraud, and ensuring secure titles^{52,53}.

LIS also help in efficient land use planning, Lagos' limited landmass, characterized by marshy wetlands and a high-water table, makes suitable land scarce and expensive. LIS, coupled with remote sensing and GIS, enables planners to map and analyze land use changes, identifying suitable sites for housing development. LIS, also help in addressing informal settlements, housing a majority of Lagosian, lack formal land titles and infrastructure. LIS can map these settlements, integrate them into urban plans, and facilitate upgrading programs. LIS also help in policy and decision support, by providing data on land availability, population density, and housing needs^{52,53}.

2.1.12. Land Regularization in Lagos State

Tenure security is the core of the 'new urban regeneration' that is being implemented in many developing countries with emphasis on securing property rights by giving formal property rights to informal landholders, majority of whom belong to group known as the low – income earners

or the poor. Land Regularization, therefore, provides a platform for this formalization to be delivered to the end users. Lagos State Government having realized the historically low levels of statutory titling among many citizens has engaged in reforming its land administration system to enable it play a pivotal role in promoting pro-poor economic growth in Lagos. In particular, land regularization strategy has been introduced to facilitate better access to formal land title for those who illegally occupy government acquired and non – committed areas in the state⁴⁰.

Real estate development is the business of building new structures and modifying existing ones to increase their value. Developers may specialize in commercial or residential buildings, ranging from apartment complexes or single-family homes to restaurants, office buildings, warehouses, and retail spaces. Most developers handle a project from the earliest planning stages to the product completion. They plan, design, and finance the venture, assemble a team, and manage the project to its completion. Once the project is completed, the developer usually sells the property to a real estate investor. An exception is the single-family home. Many developers sell houses directly to consumers. While property development can be a particularly lucrative area of the real estate industry, developers face numerous risks and challenges that can derail projects and profits. In the real estate development world, it can be a costly mistake to assume "If I build it, they will come." Developers should pursue projects driven by current market needs—not by hoping to create a need. To get a good read on the market, developers study a wide range of factors including economic, educational, employment, and environmental data that determine what kinds of structures are needed by a community⁴⁰.

Every successful real estate development project starts with a site that aligns with the developer's target market and main demographics. Because choosing the right property can make or break a project, developers must find the best real estate opportunities. To help assess potential sites,

developers consider factors including: Accessibility, Competition, Environmental risks, Applicable fees, Design requirements, planned improvements, Responding to Opposition. Property must be accessible and satisfactory to the purchaser, it must satisfy the environmental needs of the purchaser, some buyers may prefer noisy environment, while another may want a quite serene environment⁴⁰.

2.1.13. Stages in Property Development Process

The property development process involves a series of stages that transform an idea or land into a completed real estate project. Below is an overview of the key stages in the property development process, supported by insights from recent sources available on the web as of July 2025.

Concept and Feasibility Study: This initial stage involves identifying the project idea, defining objectives, and assessing its viability. Developers evaluate market demand, site suitability, financial feasibility, and regulatory constraints. A feasibility study includes cost estimates, revenue projections, and risk analysis.

Site Acquisition and Due Diligence: Once a site is identified, developers conduct due diligence to assess legal, environmental, and physical conditions. This stage confirms the site's suitability and secures ownership or control.

Planning and Design: This stage involves creating detailed plans, including architectural designs, engineering plans, and obtaining necessary permits. Collaboration with architects, engineers and planners ensures compliance with local regulations.

Financing: Securing funding for the project, which may involve equity, loans, or investor partnerships. Developers prepare detailed financial plans to attract lenders or investors.

Construction: The physical development of the project, where the site is prepared, and buildings are constructed according to plans. This stage requires coordination among contractors, suppliers, and project managers.

Marketing and Sales /Leasing: once construction nears completion, developers market the property to potential buyers or tenants. This stage involves pricing strategies, advertising, and lease/sale negotiations.

Handover and Operation: The completed property is handed over to buyers or tenants, and the developer may manage or outsource property operations such as maintenance, tenant relations. For commercial properties, this includes ongoing management.

Post-Development Evaluation: Developers assess the project's success against initial goals, analyzing financial returns, tenant satisfaction, and lessons learned for future projects^{41, 42}.

2.1.14 Challenges in Property Development

Property development in Lagos, Nigeria, faces numerous challenges that impact the efficiency, cost, and success of projects. It is a complex and multifaceted process that faces numerous challenges, ranging from financial and regulatory hurdles to market dynamics and construction risks. Property development in Lagos is fraught with challenges, including complex land titling, regulatory hurdles, infrastructure deficits, and financial constraints. The integration of a robust LIS, like the e-GIS, with efficient titling processes is critical to addressing many of these issues, as it enhances transparency, reduces disputes, and streamlines approvals⁴³.

I. Market Risks and Economic Factors

Property development is subject to various market risks and economic factors. Fluctuations in the economy, interest rates, and property demand can impact the success of a development project. Developers need to conduct thorough market research and economic analysis to mitigate these risks. Market risks also include competition from other developers and changes in consumer preferences. Developers need to stay updated on market trends, conduct feasibility studies, and adapt their projects to meet the evolving needs of the target market. Real estate markets are volatile, and misjudging demand can lead to unsold or unleased properties, reducing profitability. Economic downturns and shifts in consumer preferences add further complexity.⁴³

ii. Legal and Regulatory Challenges

Property development involves navigating complex legal and regulatory frameworks. Developers need to comply with zoning regulations, building codes, environmental laws, and other legal requirements. Failure to comply with these regulations can result in delays, fines, or even project cancellation. Working with experienced legal professionals and engaging early with local authorities can help developers navigate legal and regulatory challenges effectively. Conducting due diligence, obtaining necessary permits, and addressing any community concerns are crucial aspects of managing legal and regulatory risks. Navigating a complex web of zoning laws, building codes, and regulatory approvals is time-consuming and costly. Delays in obtaining permits or addressing regulatory changes can derail project time.

The real estate sector in Nigeria plays a significant role in the country's economy, contributing to job creation, infrastructure development, and wealth creation. However, the sector faces numerous challenges that hinder its growth, sustainability, and competitiveness. In this comprehensive guide, we will explore the major challenges facing the real estate sector in

Nigeria, including regulatory, economic, infrastructural, and market-related issues. We will also provide insights, analysis, and solutions to address these challenges and drive the growth and development of the real estate sector in Nigeria⁴³.

i. Regulatory Challenges

1. Inconsistent Policies and Regulations: One of the major challenges facing the real estate sector in Nigeria is the inconsistency and unpredictability of policies and regulations governing land use, property development, and real estate transactions. The lack of clear, transparent, and stable regulatory frameworks hampers investment, planning, and decision-making in the sector, leading to delays, disputes, and uncertainty for developers, investors, and stakeholders.

2. Land Title and Ownership Issues: The issue of land title and ownership is a significant challenge in the Nigerian real estate sector, with issues such as multiple ownership claims, land disputes, fraudulent practices, and lack of proper documentation affecting property transactions, investments, and development projects. The lack of a reliable land registry system, title verification process, and enforcement of property rights undermines the security, integrity, and value of real estate assets in Nigeria.

ii Economic Challenges

1. High Cost of Construction: The high cost of construction materials, labor, and financing is a major economic challenge facing the real estate sector in Nigeria, making property development, renovation, and maintenance expensive and unaffordable for developers, investors, and homebuyers. The rising inflation, exchange rate fluctuations, and supply chain disruptions further exacerbate the cost pressures on construction projects, limiting the affordability, profitability, and viability of real estate investments.

2. **Limited Access to Finance:** Limited access to finance is a significant economic challenge for real estate developers, investors, and homebuyers in Nigeria, with issues such as high interest rates, stringent lending criteria, and lack of long-term financing options constraining investment, growth, and expansion in the sector. The lack of affordable, flexible, and accessible financing options hinders property development, acquisition, and affordability, restricting the participation and contribution of small and medium-sized enterprises (SMEs) in the real estate market.

3. **Economic Instability and Uncertainty:** Economic instability, political unrest, and macroeconomic challenges pose risks and uncertainties for the real estate sector in Nigeria, affecting investor confidence, market sentiment, and business decision-making. Factors such as inflation, exchange rate volatility, fiscal policy changes, and global economic trends impact the demand, supply, and pricing dynamics of real estate assets, leading to market fluctuations, investment risks, and financial vulnerabilities for stakeholders in the sector.

iii. Infrastructural Challenges

1. **Inadequate Infrastructure:** The lack of adequate infrastructure, such as roads, water supply, electricity, and sewage systems, is a critical challenge facing the real estate sector in Nigeria, impacting property development, urban planning, and quality of life for residents. The inadequate infrastructure hinders the accessibility, connectivity, and functionality of real estate projects, limiting their attractiveness, value, and competitiveness in the market.

2. **Urbanization and Overcrowding:** Rapid urbanization, population growth, and rural-urban migration have led to overcrowding, congestion, and informal settlements in major cities and urban areas in Nigeria, creating challenges for urban planning, land use management, and infrastructure development. The strain on existing infrastructure, services, and resources

exacerbates social inequalities, environmental degradation, and urban sprawl, affecting the liveability, sustainability, and resilience of urban environments in Nigeria.

iv Market-Related Challenges

1. **Oversupply and Undersupply:** The real estate market in Nigeria faces challenges of oversupply and undersupply, with imbalances in supply and demand leading to market distortions, price volatility, and investment risks. The oversupply of certain property types, such as luxury apartments, commercial spaces, and high-end developments, can lead to vacancy rates, price corrections, and financial losses for developers and investors. Conversely, the undersupply of affordable housing, social amenities, and infrastructure creates housing shortages, affordability issues, and social inequalities in the market.

2. **Lack of Data and Market Information:** The lack of reliable data, market information, and research on the real estate sector in Nigeria is a critical challenge for investors, developers, and policymakers, hindering informed decision-making, market analysis, and risk assessment. The absence of accurate data on property prices, rental yields, market trends, and consumer preferences limits the transparency, efficiency, and competitiveness of the real estate market, leading to information asymmetry, mis-pricing, and inefficiencies in transactions and investments.

3. **Limited Transparency and Accountability:** Limited transparency, disclosure, and accountability in the real estate sector in Nigeria pose challenges for stakeholders in terms of property transactions, contract negotiations, and dispute resolution. The lack of standardized practices, ethical standards, and regulatory oversight in the sector can lead to fraud, misrepresentation, and legal disputes, undermining trust, credibility, and integrity in the real

estate market. Nigeria is a country with almost 200 million occupants, and also due to the economic and political issues, it has had a negative impact on the real estate market. Some people will claim that they don't have the knowledge to invest in real estate and manage it effectively, especially Nigerians in the diaspora who want to invest in Nigeria's properties. The rate at which naira is depreciating has been a major setback for the real estate market. The cost of building on the increase adds salt to the injury. The government not regulating the prices of building material will make it worse and the increase of naira depreciation will continue to be a major setback. Cases of collapsed buildings in the country have been due to poor building quality in which some contractors have been insensitive about. A recent example is the Ikoyi building collapse in which many lives were lost and injured. Most Nigerian contractors are majorly about the profit they will make from a project, not giving quality services. This has become a concern for most people and the only solution to this brouhaha is to ensure that adequate, qualified professionals with the right certification are given the projects to do. To succeed in the Nigerian real estate market, it's important to plan carefully and know the local situation well. This means studying things like how the economy is doing, if there's enough infrastructure like roads and electricity, and what the rules are. Navigating the Nigerian real estate market effectively necessitates strategic planning and a comprehensive understanding of local dynamics⁴⁴.

The process of getting building permits and land titles can take a long time and involves a lot of paperwork, sometimes can be complicated. To make the process easier, one could consider hiring experts. Get lawyers and consultants who know Nigerian real estate laws well, they can help you navigate the paperwork and avoid mistakes, example, by hiring a local lawyer who knows the ins and outs of the Lagos state permit system, you can get your building permits faster than expected.

If you're considering venturing into the Nigerian real estate Industry as a key player, one important thing you want to consider is building good relationships with government officials. This can help speed up certain processes for you. Another challenge is difficulty in accessing affordable financing for projects. Financing availability continues to be a significant obstacle for developers and prospective homes. The real estate market is not expanding because of high interest rates, strict lending standards, and a lack of financing facilities. Due to this, there are few opportunities for homeowners, particularly for those with middle-class and lower-class incomes. To solve this, one could consider Partnerships. Form strategic partnerships with financial institutions for better financing terms.

Poor infrastructure in many areas of Nigeria can significantly hinder real estate development. This includes bad roads, unreliable electricity, and inadequate water supply. These deficiencies make it difficult to attract buyers or investors, as they prefer areas with better amenities. For example, if a new housing development lacks proper road access, potential buyers might be discouraged. Similarly, frequent power outages and lack of clean water can lower the appeal of properties. Developers often have to invest extra funds to improve these infrastructures themselves, increasing overall project costs and complexity. Many people consider the Nigerian real estate market's regulatory framework to be burdensome and complicated. This perception stems from several key issues, including ineffective land and property registration procedures, ambiguous property rights, and a lack of a cohesive regulatory framework. The process of registering land and property is often slow and inefficient, creating significant delays for developers and investors. Additionally, property rights in Nigeria can be unclear, leading to disputes and legal challenges that further complicate real estate transactions.

The absence of a unified regulatory framework means that regulations can vary widely between different regions, creating confusion and inconsistency. These challenges collectively hinder the growth and efficiency of the real estate market. Simplifying and streamlining these procedures could greatly enhance the industry, making it easier for developers and investors to navigate the market, reduce delays, and resolve disputes, ultimately fostering a more robust and dynamic real estate sector. Transparency issues are a significant concern in the Nigerian real estate market. The lack of transparency in property transactions often leads to problems such as fraud, land grabbing, and other unethical practices. When transactions are not clear and open, it erodes trust and confidence among investors and property owners. This lack of trust makes the market less attractive, hindering growth and development.

Environmental concerns, such as flooding and erosion, significantly impact the Nigerian real estate market, especially in coastal regions. Climate change exacerbates these issues, leading to frequent and severe weather events that can damage properties and lower their value. Flooding can render areas uninhabitable and erode land, making it unstable for construction. This not only affects existing properties but also discourages new developments due to the increased risk and potential financial loss. Addressing these environmental challenges is crucial for maintaining property values and ensuring the safety and viability of real estate investments. Implementing sustainable building practices and investing in infrastructure to mitigate the effects of climate change can help protect properties and make them more resilient. Additionally, comprehensive planning and regulation are needed to manage environmental risks effectively. By taking proactive measures, the real estate market can better adapt to environmental changes, safeguarding investments and supporting long-term growth. Political instability in Nigeria poses a significant challenge to the real estate market. The potential for political unrest creates a sense

of insecurity among investors, both local and foreign, who may hesitate to commit to long-term real estate investments. For example, shifts in government priorities or regulations can affect property values and development plans, causing uncertainty and delaying projects. Additionally, periods of political tension can disrupt business operations and deter potential buyers or tenants from entering the market. Navigating political instability requires real estate developers and investors to stay informed about current events and maintain flexibility in their strategies. Building strong networks and maintaining good relationships with local stakeholders can also mitigate risks associated with political fluctuations, ensuring a more stable environment for real estate activities.

Construction costs, including materials and labor, have been steadily increasing, posing a significant challenge for property developers. These rising expenses can discourage new development projects and lead to higher property prices for consumers. As the cost of materials like cement, steel, and timber continues to rise, developers may face budget constraints that limit their ability to initiate or complete projects on schedule and within budget. Nigeria is a country with almost 200 million occupants, and also due to the economic and political issues, it has had a negative impact on the real estate market. Some people will claim that they don't have the knowledge to invest in real estate and manage it effectively, especially Nigerians in the diaspora who want to invest in Nigeria's properties. The rate at which naira is depreciating has been a major setback for the real estate market. The cost of building on the increase adds salt to the injury. The government not regulating the prices of building material will make it worse and the increase of naira depreciation will continue to be a major setback.

Poor Building Quality: Cases of collapsed buildings in the country have been due to poor building quality in which some contractors have been insensitive about. A recent example is the

Ikoyi building collapse in which many lives were lost and injured. Most Nigerian contractors are majorly about the profit they will make from a project, not giving quality services. Property development can have significant environmental and community impacts. Developers need to consider sustainable design practices, minimize environmental footprint, and contribute positively to the surrounding community. This may involve incorporating energy-efficient building materials, implementing green infrastructure, and engaging in community outreach. Balancing economic development with environmental and social responsibility is a key challenge in real estate development²⁰.

2.1.15 Factors that Influence the Success of Property Development in Nigeria

The success of property development in Nigeria is shaped by a complex interplay of economic, social, regulatory, and infrastructural factors. Several factors can significantly influence the success of property development projects. Some of these factors include:

i. Market Demand: Urbanization and Population Growth in Nigeria, particularly cities like Lagos, Abuja, and Port Harcourt, drives demand for residential and commercial properties. Understanding the demand for specific types of properties in the market is crucial. Developers need to conduct thorough market research to identify trends, preferences, and potential buyers or tenants.

ii. Location: The location of a development project plays a pivotal role in its success. Factors such as proximity to amenities, transportation hubs, schools, and employment centers can significantly impact the attractiveness and value of the property. Location significantly influences property values, rental yields, and appreciation potential. Cities like Lagos, Abuja, and Port Harcourt are hotspots due to economic opportunities, administrative importance, and

infrastructure development. Suburban areas like Kubwa and Lugbe in Abuja are gaining traction for middle-class housing. Land zoning and accessibility also play critical roles. Investors must verify zoning regulations to avoid issues with agricultural or government-acquired land.

iii. **Regulatory Approvals:** Land Tenure and title issues, the land use act of 1978 vests land ownership in state governors, leading to bureaucratic delays and disputes over titles such as Certificate of Occupancy, Deed of Assignment. Lengthy licensing processes and inconsistent regulatory frameworks hinder development. Policies such as the elimination of gasoline subsidies and unified exchange rates have created fiscal space but also increased costs, impacting affordability. Supportive policies, like incentives for public-private partnerships, can enhance development success. Nigeria's real estate market lacks transparency, with over 70% of land transactions occurring informally, complicating legal processes. Compliance with planning regulations is critical for market maturity and project success. Obtaining necessary permits and approvals from local authorities is essential for project commencement and completion. Delays or complications in the regulatory process can lead to increased costs and project delays.

iv. **Financial Feasibility:** Adequate financing is essential for the successful execution of a real estate development project. Developers need to ensure that the project is financially viable and that sufficient funds are available for land acquisition, construction, and other associated costs. High Construction Costs; The reliance on imported building materials and rising costs due to inflation and transportation expenses strain developers' budgets. High interest rates and limited access to credit constrain development scale. Strategies like building on demand, selling units before construction and exploring alternative financing, such as women's cooperative savings groups, help mitigate funding challenges.

v. Quality of Design and Construction: The quality of design and construction directly affects the appeal, functionality, and durability of the property. High-quality design and construction can enhance marketability and long-term value, while poor quality can lead to dissatisfaction among buyers or tenants.

vi. Project Management: Strong project management skills, including timeline and budget oversight, are critical to avoiding delays and cost overruns. Poor strategic planning and bureaucratic hiccups often lead to project abandonment. The use of substandard materials and inadequate supervision contributes to building collapses, undermining project success. Engaging competent contractors and ensuring quality control are essential. Employers prioritize soft skills like responsibility, communication, and administrative capabilities among real estate professionals, which influence project outcomes. Effective project management is critical for ensuring that development projects are completed on time and within budget. Skilled project managers oversee various aspects of the project, including scheduling, budgeting, procurement, and coordination of subcontractors.

vii. Risk Management: Real estate development involves inherent risks, such as market fluctuations, construction delays, and unforeseen expenses. Developers need to identify potential risks and develop strategies to mitigate them, ensuring the project's success despite uncertainties.

viii. Sustainability and Environmental Considerations: Increasingly, stakeholders are prioritizing sustainability and environmental considerations in real estate development. Developers who incorporate green building practices, energy-efficient technologies, and sustainable design features into their projects may gain a competitive edge and appeal to environmentally conscious buyers or tenants.

ix. Community Engagement: Engaging with local communities and stakeholders can positively impact the success of a real estate development project. Collaboration with residents, community organizations, and government agencies can help developers address concerns, build positive relationships, and gain support for their projects.

x. Economic and Market Conditions: Economic factors and market conditions, such as interest rates, inflation, and supply and demand dynamics, can significantly impact the success of real estate development projects. Developers need to adapt to changing market conditions and economic trends to maximize opportunities and mitigate risks⁷.

2.1.16 Challenges of Land Information System LIS in Lagos, Nigeria

The implementation and management of Land Information System (LIS) in Lagos, Nigeria, face significant challenges, driven by rapid urbanization, population growth, and infrastructural limitations. The Land Information System (LIS) in Lagos, Nigeria, is critical for effective land administration, management, and planning, yet it faces significant challenges that hinder its efficiency and adoption. The Lagos State Governor, Mr. Babajide Sanwo-Olu, recently unveiled the Lagos State Land Administration e-Portal system, marking a significant advancement in the digitization of land administration in the state. This groundbreaking initiative integrates advanced technologies into land administration processes, signaling a new era for the State's land management system. The e-portal is a key component of the Governor's agenda to make Lagos a 21st Century Economy, enhancing the Ease of Doing Business and bringing public services closer to citizens. By adopting the Aumentum Land Administration solutions, Lagos is positioning itself as a global leader in technology-driven land administration processes.

Poor Power Infrastructure: Inadequate and unreliable electricity supply hinders the digitalization of land administration processes. Many land administration offices lack consistent power to operate digital systems effectively, which affects data storage, retrieval, and real-time processing. This was identified as a major barrier in a 2016 study examining the digitalization of land administration in Nigeria.

Low Internet Connectivity: Limited internet access and poor network infrastructure in Lagos impede the adoption of web-based LIS platforms. This restricts online access to land records and real-time update, making it difficult for stakeholders to engage with digital systems efficiently. The same 2016 study highlighted low internet connectivity as a critical challenge to implementing Geographic Information System (GIS) for land administration. Slow transition from analog to digital systems due to poor internet connectivity, unstable power supply, and reliance on paper-based records⁴⁵

Paucity of Trained Personnel: There is a shortage of skilled professionals capable of managing and operating advanced LIS technologies, such as GIS, and blockchain-based systems. This lack of expertise slows down the transition from analogue to digital systems and affects the accuracy and efficiency of land administration. Training and motivation of personnel were suggested as solutions in the 2016 study. Shortage of skilled GIS and LIS professionals, with many staff untrained in modern land administration technologies⁴⁵

Inadequate Geospatial Data Infrastructure: Lagos lacks robust Spatial Data Infrastructure (SDI) to support effective land use planning and management. A 2011 study noted that city planners often lack access to geospatial technology portals, leading to an information gap that hampers intelligent urban management. This issue persists, as many local government agencies remain unaware of existing SDI resources.

Fragmented and Haphazard Implementation: Efforts to implement LIS in Lagos are often uncoordinated and top-down, resulting in fragmented systems that fail to integrate across multiple scales. A 2013 study on climate change challenges in Lagos highlighted similar issues with governance, noting that policy responses are often disjointed, which can be extended to LIS implementation.

Resistance to Digitalization and Corruption: The transition from manual to digital land records faces resistance due to entrenched interests and corrupt practices. A 2016 study on the Abuja Geographic Information Systems noted that digitalization reduced corrupt practices in land administration, suggesting that similar issues in Lagos such as manual record-keeping, enable fraudulent activities like multiple land allocations.

Inadequate Funding and Resources: The development and maintenance of LIS require significant financial investment, which is often limited by budgetary constraints. The Federal Land Information System (FELIS) initiative, for instance, has progressed slowly due to reliance on government budgets, a challenge also applicable to Lagos.

Urbanization and Population Pressure: Lagos's rapid population growth and urban sprawl exacerbate land management challenges. Unplanned settlements and slums, which account for over 60% of the city, complicate land titling and registration processes.

Complex Land Tenure Systems: The coexistence of customary and statutory land tenure systems in Lagos creates conflicts in land ownership and administration. Customary systems, managed by traditional rulers, often clash with statutory systems designed to protect individual land rights, leading to disputes and delays in land registration. This was noted in a 2004 study on land use changes in Lagos.

Environmental and Climate Change Impacts: Lagos's vulnerability to climate change, including flooding and coastal erosion, affects land use and complicates LIS implementation. Low-lying areas and haphazard urban development exacerbate these issues, as highlighted in studies from 2013 and 2020, which note the need for integrated land use planning to address environmental challenges.

Data Accessibility and Quality: The lack of consistent, high-quality, and accessible data hinders effective LIS implementation. A 2022 study on climate change impacts in Lagos noted that farmers rely on localized, informal data due to the absence of reliable, centralized data systems, a problem that extends to land administration.

Incomplete Digitization of Land Records: many land records, especially historical or pre-independence titles, remain in paper format, making integration into LIS difficult. Backlog of unprocessed and unverified land files slows down full digitization. Some parts of Lagos have no surveyed or georeferenced data, especially in informal settlements. Makoko is a prominent example of an informal settlement in Lagos lacking comprehensive surveyed or georeferenced data. Many other informal settlements across Lagos, such as those in areas like Ajegunle, Badia, and Amukoko, face similar challenges due to the city's overall shortage of open, detailed geospatial and cadastral survey data.

Limited Inter-Agency Integration: Key agencies such as the Land Bureau, office of the Surveyor General, Ministry of Physical Planning and Land Registry often operate separate databases. This lack of data interoperability results in duplicated processes, delays, and inconsistencies in land records. Fragmentation reduces the LIS's potential as a central, unified land management tool.

High Cost of Implementation and Maintenance: Modern LIS platforms require significant investments in hardware, software, cloud infrastructure, and GIS tools. Budgetary constraints often limit expansion, system upgrades, and staff training. Cost of acquiring up-to-date satellite imagery or high-resolution maps is also high.

Inadequate Human Capacity and Training: Limited number of skilled GIS professionals and digital land administrators. Many government staff are still more comfortable with manual systems. Insufficient ongoing training in using LIS tools for land management, decision-making, and dispute resolution.

Poor Public Access and Transparency: Access to LIS by the general public especially through online portals, is often restricted or non-functional. High reliance on intermediaries increases cost and reduces transparency. Lack of real-time access to information makes due diligence difficult for investors and developers.

Legal and Institutional Constraints: Outdated legal frameworks and weak regulatory enforcement impede the adoption of modern LIS technologies, such as blockchain for land management. Some laws governing land administration are outdated or not fully aligned with digital systems. The Land Use Act of 1978 still places control of land in the hands of state governors, creating bureaucratic bottlenecks. Legal frameworks for digital records and electronic Certificate of Occupancy (e-C of O) are not yet robustly enforced.

Resistance to Change and Corruption: Some officials benefit from the manual, opaque processes and resist full automation. Efforts to improve transparency through LIS can be undermined by internal resistance or tampering with data. Lack of accountability mechanisms within some agencies reduces the impact of LIS.

Infrastructure and Technical Limitations: Power outages, slow internet, and limited rural connectivity affect LIS operations. Some offices lack the infrastructure to host or regularly update the system. Inconsistent GIS mapping standards make integration across zones difficult.

Urban Complexity and Informality: Lagos is a megacity with rapid urbanization, complex land tenure systems, and thousands of informal settlements. Mapping and regularizing land under informal occupation, without surveys or documentation is extremely difficult. Many land transactions occur outside formal systems, bypassing LIS entirely. Despite efforts by the Lagos State Government to modernize land administration through LIS, these challenges hinder its full effectiveness.

User Adoption: One of the main challenges of implementing a new digital system is ensuring that users, including government officials and citizens, are comfortable with the new technology. Training programs and user-friendly interfaces can help address this challenge.

Data Security: Lagos lacks timely and accurate data on urban expansion and land use, which undermines the effectiveness of LIS for decision-making. The absence of a comprehensive, up-to-date land data repository complicates planning and monitoring. The lack of coordination between state and local government agencies results in fragmented data collection and management, reducing the effectiveness of LIS in supporting urban planning. Many surveyed plots are not accurately georeferenced, leading to boundary disputes. Errors in digitization or manual data entry can cause inconsistencies. Unvalidated or unverified land claims entered into the system can create legal complications. With the digitization of land records, ensuring the security and integrity of the data becomes paramount. The system must have robust security measures in place to protect against data breaches and cyber-attacks.

System Integration: Integrating the new digital system with existing systems and processes can be complex. It requires careful planning and coordination to ensure a smooth transition and avoid disruptions in service delivery. Providing adequate technical support to users is essential for the successful operation of the system. This includes troubleshooting issues, updating software, and addressing user queries. With advanced features such as online land registration, automated land valuation, and digital mapping capabilities, Lagos State is revolutionizing its land administration system to meet the demands of a rapidly urbanizing population and dynamic real estate market. However, the successful implementation of the new digital land administration system hinges on addressing key challenges such as unstable electricity, internet connectivity, training, bureaucracy, and complexity. By implementing backup power solutions, ensuring reliable internet access, conducting comprehensive training programs, simplifying procedures, and seeking expert assistance, Lagos State can overcome these challenges and realize the full potential of this innovative initiative. Engaging with experts in land administration and technology, can provide valuable insights and guidance throughout any land administration process. This can help address challenges and ensure the system meets the needs of stakeholders⁴⁵.

Challenges Facing the Real Estate Market

The real estate market in 2025, both commercial and residential, faces a complex landscape shaped by economic, regulatory, technological, and societal factors. Elevated interest rates continue to strain affordability and investment in real estate. The Federal Reserve's rate hikes, initiated in March 2022 to combat inflation, have increased borrowing costs, reducing demand for commercial and residential properties. Commercial real estate is particularly affected, with

higher financing costs impacting deal attractiveness and property valuations. Despite the growth, the real estate sector is hampered by inadequate infrastructure. Poor road networks, unreliable power supply, and insufficient water and sanitation services are significant challenges that affect the development and value of properties. Land tenure complexities, bureaucratic delays, and inconsistent enforcement of property laws slow project delivery and deter investment.

The real estate market in Nigeria faces complex regulatory and legal hurdles. Inconsistent property laws, land tenure issues, and bureaucratic red tape can delay project approvals and increase costs. These challenges often deter potential investors and developers. Low housing inventory fuels competition and price increases, while commercial real estate faces a mismatch between available space and demand locations. Affordability remains a significant barrier, particularly for first-time homebuyers and renters. Rising home prices, coupled with high mortgage rates, have made homeownership increasingly unattainable. The cost of construction materials and labor in Nigeria is relatively high, impacting the affordability of housing. The fluctuation of exchange rates and import duties on building materials further exacerbate this issue, making it difficult for developers to maintain reasonable profit margins while offering affordable housing solutions. Access to affordable financing is a major hurdle for both developers and buyers. High-interest rates and stringent lending criteria limit the availability of mortgages and construction loans. This financing gap restricts the growth of the real estate sector and makes homeownership unattainable for many Nigerians. For this reason and more, there is every need to secure the future of the real estate industry. Real estate is the only secured investment for an assured future. However, with the challenges facing the industry globally, there is a need for us to think outside the box on ways to tackle these crises.

A looming debt cliff threatens the commercial real estate sector. Refinancing at higher interest rates is challenging due to tightened lending standards and declining property values, particularly in office and retail segments. Shifts in work and consumer behavior, accelerated by the COVID-19 pandemic, have reduced demand for traditional office and retail spaces. Teleworking and e-commerce have reshaped commercial real estate dynamics, leaving office vacancy rates at 20% and retail spaces struggling in some areas²⁰.

2.1.17. Property Development in Nigeria

Property development in Nigeria, also referred to as real estate development, involves transforming land or buildings for specific purposes such as residential, commercial, industrial, or mixed-use projects. This process encompasses activities like land acquisition, planning, design, financing, construction, planning, design, financing, construction, and project management. The history of property development in Nigeria is characterized by various phases of growth, challenges, and transformations. Pre-colonial practices were communal, with land held collectively, and traditional housing structures prevailed. During the colonial era, British colonization introduced formal land ownership systems and urban planning concepts. Post-independence, urbanization accelerated, leading to ambitious government-led urban development projects and the emergence of private property developers in the 1970s. The oil boom era saw increased investment in luxury residential estates and commercial complexes. Economic challenges in the 1980s and 1990s impacted property development, but the privatization and liberalization policies of the late 1990s and early 2000s encouraged private sector participation, leading to growth in the sector. Despite challenges such as inadequate infrastructure and

regulatory bottlenecks, the property sector continues to attract investment, with ongoing developments in urban regeneration and affordable housing initiatives ⁴⁶.

Looking ahead, the future of property development in Nigeria holds promise amidst challenges. Urbanization, population growth, and changing consumer preferences are expected to drive demand for residential, commercial, retail, and hospitality developments. The government's focus on infrastructure development and policy reforms aimed at promoting private sector participation and addressing housing deficits will play a crucial role in shaping the future of the sector. Additionally, trends such as sustainable development, mixed-use projects, and technology integration are likely to gain momentum, contributing to the evolution of Nigeria's real estate landscape. Despite challenges such as land tenure issues and financing constraints, the real estate sector is expected to remain resilient, offering opportunities for investment, innovation, and growth in the years to come.

Property development is the process by which buildings are erected for occupation or for sale/investment. Owners may build premises for their own occupation, for example major retailers may erect supermarkets; alternatively, property developers may construct the same type of buildings for lease or sale. The process may be the same although some aspects of the financial appraisal may be different. A building offered for sale or investment is driven by a profit motive, a building for owner-occupation may be related to the profitability of the enterprise within the building and thus profit motivation may be redirected or constrained. Developers buy land, finance real estate deals, build or have builders build projects, develop projects in joint ventures, and create, imagine, control, and orchestrate the process of development from beginning to end. Developers usually take the greatest risk in the creation or renovation of real estate and receive the greatest rewards. Typically, developers purchase a tract

of land, determine the marketing of the property, develop the building program and design, obtain the necessary public approval and financing, build the structures, and rent out, manage, and ultimately sell it. Sometimes property developers will only undertake part of the process. For example, some developers source a property and get the plans and permits approved before selling the property with the plans and permits to a builder at a premium price. Alternatively, a developer who is also a builder may purchase a property with the plans and permits in place so that they do not have the risk of failing to obtain planning approval and can start construction on the development immediately. The financial risks of real estate development and real estate investing differ due to leverage effects⁴⁶.

2.1.18 Types of Property Development in Nigeria

Property development in Nigeria encompasses a range of activities aimed at transforming land or existing structures for specific purposes, driven by rapid urbanization, population growth, and economic development. Here is the overview of the main types of property development in Nigeria. Residential development involves the construction of housing units such as single-family homes, apartments, condominiums, and townhouses. These developments cater to individuals and families seeking residential properties for living purposes. Residential property development encompasses the creation of housing units and communities designed to meet the needs of homeowners and renters alike. It involves the creation of housing units and communities, including single-family homes, bungalows, duplexes, townhouses, apartments, condominiums, and gated estates. This sector is the largest and most active due to Nigeria's growing population and urbanization. Residential properties cater to diverse lifestyles, from affordable housing to luxury estates. Demand is high in urban centers like Lagos, Abuja, and

Port Harcourt due to population growth and a rising middle class. From single-family homes in suburban neighborhoods to high-rise condominiums in urban centers, residential developments cater to a wide spectrum of lifestyles and preferences. Single-family homes represent the quintessential form of residential property development, offering standalone dwellings for individual families or households. These homes range from modest cottages to luxurious estates, reflecting varying architectural styles and design preferences¹⁶.

Multi-family apartment complexes comprise multiple housing units within a single building or complex. These developments provide rental housing options for individuals and families, offering amenities such as shared common areas, fitness centers, and recreational facilities. Townhouses are a type of multilevel housing where multiple units are attached side-by-side in a row, with shared walls between adjacent units. These units are typically two or three floors high, with each townhouse having its own private entrance. While not as common as single-family homes or flats, townhouse communities can be found in some urban areas of major cities like Lagos, Abuja and Port Harcourt. Each townhouse unit has a small private outdoor space like a courtyard or balcony. Ownership of townhouses involves purchasing the unit itself, while the land may be owned jointly by residents or leased. Many townhouse estates have a residents' association that manages common areas and amenities. Commercial development focuses on constructing properties for commercial purposes, including office buildings, retail centers, hotels, and warehouses. These developments serve businesses and organizations looking for spaces to conduct their operations, offer goods and services, or accommodate guests. Commercial property development represents a cornerstone of urban and economic development, driving innovation, commerce, and connectivity in communities around the world. From towering office skyscrapers

to bustling retail centers, commercial developments serve as focal points for business activity, consumer engagement, and economic vitality.

Office buildings form the backbone of commercial property development, providing prime spaces for businesses, corporations, and organizations to conduct operations, collaborate, and innovate.

These developments range from sleek high-rise towers in central business districts to suburban office parks, offering a diverse array of workspace options tailored to the needs of tenants. Retail centers serve as vibrant hubs of commerce and consumer activity, offering a diverse mix of shops, boutiques, restaurants, and entertainment venues. From neighborhood strip malls to sprawling shopping complexes, retail developments cater to the diverse preferences and lifestyles of consumers while fostering economic growth and community engagement.

Industrial parks represent specialized zones dedicated to manufacturing, distribution, and logistics activities. These developments feature warehouses, distribution centers, and manufacturing facilities strategically located to optimize supply chain efficiency, transportation access, and logistical operations. Industrial parks play a crucial role in supporting regional economies, facilitating trade, and driving industrial innovation and productivity. Industrial development involves the creation of facilities for manufacturing, production, storage, and distribution purposes. These developments encompass industrial parks, factories, warehouses, logistics centers, and distribution hubs, supporting various industrial activities and supply chain operations. Industrial property development encompasses the creation of specialized facilities and zones designed to support manufacturing, distribution, and logistical operations¹⁶.

From warehouses and distribution centers to manufacturing facilities and industrial parks, these developments serve as critical infrastructure nodes in global supply chains, driving innovation,

efficiency, and economic growth. Warehouses and distribution centers form the backbone of modern logistics and supply chain management, providing essential storage, handling, and distribution capabilities for goods and products. These facilities range from small-scale storage warehouses to massive distribution centers equipped with advanced automation and technology. Warehouses and distribution centers play a crucial role in facilitating the movement of goods from production facilities to end consumers, supporting e-commerce, retail, and manufacturing industries. Manufacturing facilities represent specialized environments dedicated to the production of goods and products across various industries. These facilities encompass a wide range of operations, including assembly lines, processing plants, and fabrication facilities, where raw materials are transformed into finished goods. Manufacturing facilities are strategically located to optimize access to resources, transportation networks, and skilled labor, driving innovation, productivity, and competitiveness in global markets. Mixed-use development combines different types of properties, such as residential, commercial, and/or recreational, within a single project. These developments create vibrant and integrated communities where residents can live, work, shop, and socialize in close proximity, promoting convenience and sustainability. Mixed-use property development represents a dynamic approach to urban planning and design, integrating residential, commercial, and recreational spaces within cohesive and vibrant communities. These developments offer a diverse array of amenities, services, and activities, fostering connectivity, diversity, and quality of life for residents and visitors alike. Mixed-use developments blur the lines between living, working, and leisure environments, creating dynamic urban ecosystems where residents can live, work, shop, and play within walking distance of their homes. These developments often feature a blend of residential units, office spaces, retail establishments, restaurants, parks, and cultural amenities, fostering a sense of

community and vitality¹⁶. Examples of mixed-use developments abound in cities and urban centers worldwide, ranging from vibrant downtown districts to waterfront promenades and transit-oriented developments.

These developments offer numerous benefits, including enhanced walkability, reduced commuting times, increased social interaction, and a greater sense of place and belonging. By integrating diverse land uses and fostering compact, pedestrian-friendly environments, mixed-use developments promote sustainability, resilience, and quality of life for residents and visitors alike. Hospitality development focuses on creating accommodations and amenities for travelers and tourists. This includes hotels, resorts, vacation rentals, and other lodging facilities, as well as associated amenities such as restaurants, spas, and recreational areas, to cater to the needs and preferences of guests. Developers buy land, finance real estate deals, build or have builders build projects, develop projects in joint ventures, and create, imagine, control, and orchestrate the process of development from beginning to end. Hospitality property development revolves around the creation of accommodations, amenities, and experiences designed to cater to travelers, tourists, and visitors seeking comfort, convenience, and enjoyment during their journeys. From hotels and resorts to vacation rentals and timeshares, hospitality developments offer a diverse array of lodging options and recreational activities tailored to the needs and preferences of guests¹⁶.

Hotels and resorts represent the cornerstone of hospitality property development, offering accommodations, amenities, and services for travelers and tourists seeking temporary lodging and relaxation. These developments range from boutique hotels and luxury resorts to budget-friendly motels and extended-stay accommodations, catering to a wide spectrum of travelers and budgets.

Hotels and resorts play a crucial role in the tourism industry, providing memorable experiences, fostering cultural exchange, and driving economic activity in destinations around the world. Vacation rentals and timeshares offer alternative lodging options for travelers seeking flexibility, affordability, and authenticity during their journeys. Vacation rentals encompass a variety of accommodations, including private homes, condominiums, and apartments, rented out to guests on a short-term basis. Timeshares involve shared ownership of vacation properties, allowing multiple owners to use the property for designated periods throughout the year. Vacation rentals and timeshares provide travelers with unique opportunities to experience local culture, cuisine, and lifestyle while enjoying the comforts of home away from home¹⁶.

Trends in Property Development in Lagos

1. Urbanization and Population Growth: Lagos is one of the fastest-growing cities in Africa, with a population exceeding 24 million. The demand for housing and infrastructure is escalating due to rural-urban migration and natural population growth^{38,39}.

2. Expansion of Suburban Developments: There is increasing development in suburban areas like Epe, Ikorodu, Ibeju-Lekki, and Badagry due to land scarcity and high property prices in central Lagos. These regions are witnessing growth in gated communities, residential estates, and affordable housing projects^{40,41}.

3. Rise of Mixed-Use Developments: Developers are embracing mixed-use projects that combine residential, commercial, and leisure spaces within a single development to optimize land use and improve liveability⁴².

4. Luxury and Waterfront Property Growth: High-income earners and foreign investors are driving demand for luxury apartments, smart homes, and waterfront properties in areas like Victoria Island, Banana Island, and Ikoyi⁴³.

5. Infrastructure-Driven Property Value Appreciation: Major public infrastructure projects like the Lagos Blue Line rail, Fourth Mainland Bridge, Lekki Deep Sea Port, and the Lagos-Calabar Coaster Highway are catalyzing real estate investment⁴⁴.

6. Smart and Sustainable Developments: Developers are integrating green building techniques, solar energy, and smart home technologies in new projects. Sustainability is becoming a selling point for high-end and mid-tier developments⁴⁵.

7. Increased Use of Technology: The adoption of technology is revolutionizing property marketing, title verification, virtual tours, and digital transactions. Blockchain and GIS are also improving transparency in land management⁴⁶.

8. Affordability Crisis and Informal Housing Growth: Despite high-end growth, a housing affordability crisis persists, with rents often exceeding the average monthly income. This has spurred informal settlement and poorly regulated housing solutions^{47,48}.

9. Alternative Real Estate Financing: With limited access to traditional mortgage financing, developers and buyers are exploring alternatives such as rent-to-own, cooperative housing, and developer-financed properties.⁴⁹ The Lagos property market is shaped by a dynamic interplay of urbanization, infrastructure expansion, technology, socio-economic disparity, and evolving consumer preferences. These trends present both opportunities and risks for investors, policymakers, and developers⁴⁹.

2.2 Theoretical Framework

2.2.1 Institutional Economics Theory

Institutional Economics Theory as it applies to property development: The Institutional Economics Theory, emphasizes the role of institutions in shaping economic outcomes. Institutions include formal rules (laws, regulations), informal constraints (norms, customs), and organizational structures. It provides a framework for understanding how institutions formal rules and informal norms shape economic behavior and outcomes in property development. In the context of Lagos, Nigeria, where property development faces challenges like complex land titling, bureaucratic hurdles, and informal practices like Omo Onile, institutional economics highlights how these institutions influence transaction costs, property rights, and development efficiency. Some of the Key Components of Institutional Economics Theory are:

- I. Institutional Framework: The rules, laws, and regulations governing property development.
- ii. Property Rights: Secure and well-defined property rights encourage investment and development. In Lagos, weak enforcement of property rights due to fraudulent titles and Omo Onile interference discourages developers. A robust LIS strengthens property rights by providing transparent, verifiable records.
- iii. Transaction Costs: Institutions can reduce transaction costs, making property development more efficient. Institutional economics emphasizes transaction costs- costs associated with searching for information, negotiating agreements, and enforcing contracts. In property development, high transaction costs arise from verifying land titles, obtaining permits, and resolving disputes.
- iv. Regulatory Environment: The regulatory environment influences the ease of doing business and property development.

Institutional Economics Theory and Property Development in Lagos, Nigeria

1. Formal Institutions: Laws and regulations governing property development, such as the Lagos State Urban and Regional Planning Law.
2. Informal Institutions: Traditional and cultural norms influencing property development, such as community land ownership.
3. Organizational Structures: Government agencies, such as the Lagos State Ministry of Physical Planning, and private sector organizations.

Institutional Economics Theory provides a valuable framework for understanding the impact of institutions on property development in Lagos, Nigeria. By examining the institutional framework, property rights, transaction costs, and regulatory environment, policymakers and developers can identify areas for improvement to promote efficient and sustainable property development⁴⁷.

2.2.2. Diffusion of Innovations Theory

Diffusion of Innovation (DOI) Theory, developed by E.M. Rogers in 1962, is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something differently than what they had previously (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible. Adoption of a new idea, behavior, or product (i.e., "innovation") does not happen simultaneously in a social system; rather it is a process whereby some people are more apt to adopt the innovation than others. Researchers

have found that people who adopt an innovation early have different characteristics than people who adopt an innovation later. When promoting an innovation to a target population, it is important to understand the characteristics of the target population that will help or hinder adoption of the innovation. Diffusion of Innovations Theory provides valuable insights into the adoption and spread of innovative technologies in property development. Understanding the factors influencing adoption can inform strategies to promote the use of innovative technologies⁴⁸.

Key Components of Diffusion of Innovations Theory are:

I. Innovation: This is the idea, practice, or object that is perceived as new by an individual or group. Innovations vary in their rate of adoption based on five key attributes:

Relative advantage: The degree to which the innovation is perceived as better than existing alternatives such as cost, efficiency, or benefits.

Compatibility: How well it fits with existing values, needs, and experiences.

Complexity: How difficult it is to understand and use. The perceived difficulty of understanding or using the innovation.

Trialability: can it be tested or experimented with before full adoption? The ability to test the innovation on a limited basis.

Observability: Are the results visible to others?⁴⁸

2. Communication Channels: The means by which information about the innovation is transmitted. Includes mass media, interpersonal communication, social media, and demonstrations. Interpersonal networks are especially important in the persuasion stage of adoption. For instance, in land titling, community leaders might act as trusted channels of information. Awareness of the e-GIS portal is spread through government campaigns and media,

but interpersonal networks such as developers sharing experiences, are critical for convincing stakeholders to adopt it.

3. Time: Adoption occurs over time and includes several stages in the innovation-decision process:

Knowledge - Awareness of the innovation.

Persuasion - Forming an opinion.

Decision – Choosing to adopt or reject.

Implementation – Putting the innovation into use.

Confirmation – Reinforcement of the decision

Adoption can be early or late, and some innovations fail to diffuse.

4. The Social System: The network of individuals, groups, or organizations through which the innovation spreads. It includes norms, roles, leadership, and social structure that affect adoption. Different systems adopt at different rates depending on openness to change and internal communication patterns. In a community where land is governed by customary law, diffusion of formal land titling may be slower⁴⁷.

Stages of Adoption in Diffusion of Innovations Theory

I. Knowledge: The individual becomes aware of the innovation and gains some understanding of how it functions. For instance, a property developer in Lagos first hears about a digital Land Information System (LIS) but does not yet know how to use it. Awareness of an innovation. Developers and landowners learn about the e-GIS portal through government campaigns, media, or real estate associations.

II. Persuasion: The individuals to forms a favorable or unfavorable attitude toward the innovation. Influencing factors are personal beliefs, social influence, perceived benefits and risks. For instance, after seeing others benefit from LIS, the developers become interested and begins to view it positively. Formation of a favorable attitude toward the innovation. Developers may be persuaded by e-GIS's ability to reduce title fraud but skeptical due to its complexity or incompatibility with manual systems. Omo Onile may resist due to distrust in formal systems. Success stories from early adopters could enhance persuasion.

III. Decision: The individual makes a choice to adopt or reject the innovation. Trialability and observability often play a crucial role. For instance, the developer decides to begin using LIS for planning approvals or land verification. Choosing to adopt the innovation.

IV. Implementation: The innovation is put into use. The individual may still be learning and modifying the innovation during this phase. Challenges includes technical issues, institutional support, user adaptation. The developers use LIS for multiple projects and adjusts their workflow accordingly. Putting the innovation into practice.

V. Confirmation: The individual seeks reinforcement for the decision made and evaluates the outcomes. Possible outcomes are continued adoption, discontinue use, or adapt use. After successfully completing several developments faster and more securely, the developer fully integrates LIS into their business practices. Evaluating the innovation's effectiveness⁴⁷.

Factors Influencing Adoption in the Diffusion of Innovation Theory

Adoption of a new idea, practice, or technology depends on several interrelated factors. These factors influence how quickly and widely an innovation spread through a population or social system.

I Relative Advantage: The degree to which the innovation is seen as better than what it replaces. Greater advantage and faster adoption. The innovation's benefits compared to existing practices. This could include benefits like improved performance, cost savings, convenience, or social prestige. The greater the perceived advantage, the faster the adoption.

ii. Compatibility: How well the innovation fits with existing values, needs and experiences. Higher compatibility and easier adoption. The innovation's alignment with existing values and practices. Innovations that fit existing cultural norms, practices, or technologies are more likely to be adopted quickly.³⁵

iii. Complexity: How difficult the innovation is to understand and use. More complexity and slower adoption. The innovation's ease of use and understanding, simpler innovations are adopted more rapidly, while those perceived as complex or requiring significant learning may face slower adoption⁴⁸.

iv. Observability: How visible the results of the innovation are to others. The more observable the benefits, the faster others adopt. When the outcomes are easily seen or shared, adoption tends to increase as others are inspired to follow⁴⁸

v. Trialability; The extent to which an innovation can be tested or experimented with on a limited basis before full commitment. Innovations that allow trial runs reduce risk and uncertainty, encouraging adoption.⁴⁸

2.2.3 Limitations of Diffusion of Innovation Theory

There are several limitations of Diffusion of Innovation Theory, which include the following:

Much of the evidence for this theory, including the adopter categories, did not originate in public health and it was not developed to explicitly apply to adoption of new behaviors or health innovations. It does not foster a participatory approach to adoption of a public health program.

It works better with adoption of behaviors rather than cessation or prevention of behaviors. It doesn't take into account an individual's resources or social support to adopt the new behavior (or innovation). This theory has been used successfully in many fields including communication, agriculture, public health, criminal justice, social work, and marketing. In public health, Diffusion of Innovation Theory is used to accelerate the adoption of important public health programs that typically aim to change the behavior of a social system. For example, an intervention to address a public health problem is developed, and the intervention is promoted to people in a social system with the goal of adoption (based on Diffusion of Innovation Theory). The most successful adoption of a public health program results from understanding the target population and the factors influencing their rate of adoption⁴⁸.

2.2.4 Empirical Review

The need to improve on a system must begin with glare lapse(s) in the existing system yearning for redress. The desire for a much better way of going about the business evokes intensive search for possible available alternatives. The process ultimately leads the relevant stakeholders to discovery or fashioning of a pragmatic model that will not only serve the purpose more effectively and efficiently but will also have the approval of the majority of the stakeholders and stand the test of time. This study provided an overview of contributions made so far on land information management systems, with the sole purpose of ascertaining the progress recorded and inherent challenges to the existing system. Nigerians suffer unnecessary delays in obtaining land title and land title information. The scenario has caused failure and abandonment of many

developmental projects. A more robust and integrated land information management system that will provide timely land information for the stakeholders in Nigeria is imperative. The empirical review highlights the importance of LIS in property development and identifies gaps in existing literature. This study aims to contribute to the understanding of LIS effectiveness in Lagos, informing policy and practice. An empirical review for the project "Assessing the Effectiveness of Land Information System on Property Development in Lagos, Nigeria". Numerous studies have investigated the impact of Land Information Systems (LIS) on property development. An efficient and effective land information system is critical for national development. Land information systems drive decision making and policy creation in government, manage and appropriate property taxes and revenue which is integral to a country's economic viability and secure land tenure for the citizens of a country.

The base of a land information system is a uniform spatial referencing system, which also simplifies the linking of data within the system with other land-related data." The two key elements in this information system are the geographical/spatial element and linked enterprise data. Geography, both terrestrial and cosmic is an integral part of decision making in all sectors including business, industry and commerce, government and research which drive a country's growth and sustainability. Linked enterprises are the only way countries can connect and manipulate the information intelligently, meaningfully and effectively.

Locally, Land Information Systems are siloed, and this creates inherent inefficiencies in the system which hinder customer transactions and ultimately limit the potential gains the government can reap from these powerful, albeit isolated systems that they have invested millions of dollars in.

The real estate industry has been on the rise for many years. In recent years, despite the slowdown in the development of the real estate industry across the country, various provinces and cities have introduced various new housing policies in order to attract talent. It can be seen that, whether it is the direct impact of the real estate industry on economic growth in the past few decades or the indirect impact of the real estate industry on economic growth in recent years, it shows that the real estate industry is an important long-term effective factor for economic growth. It has been observed that a lot of conflicts associated with real estate are experienced in almost every part of the country, in which Lagos State is not excluded. The fear of purchasing and developing real estate is much on people, and this is why it is important and crucial for the purchaser to know where and who he/she is dealing with in the business of real estate so as not to fall victim. In the interest of the Lagos State Government to combat the problems relating to real estate brought about the implementation of the land Information system law in Lagos Nigeria, which has been of great help in the real estate industry. Property development or Real Estate Development refers to the process of transforming land or buildings for a specific purpose, such as residential, commercial, or industrial use. This involves various activities, including land acquisition, planning, design, financing, construction, and project management. Looking ahead, the future of property development in Nigeria holds promise amidst challenges. Urbanization, population growth, and changing consumer preferences are expected to drive demand for residential, commercial, retail, and hospitality developments. The government's focus on infrastructure development and policy reforms aimed at promoting private sector participation and addressing housing deficits will play a crucial role in shaping the future of the sector. Additionally, trends such as sustainable development, mixed-use projects, and technology integration are likely to gain momentum, contributing to the evolution of Nigeria's real estate

landscape. Despite challenges such as land tenure issues and financing constraints, the real estate sector is expected to remain resilient, offering opportunities for investment, innovation, and growth in the years to come⁴⁵.

2.2.5 Impact of LIS on Property Development

The Land Information System (LIS) in Lagos, Nigeria, such as the Electronic Document Management System (EDMS) and electronic Geographic Information System (e-GIS), has significantly influenced property development with both positive impacts and persistent challenges. The LIS in Lagos has positively impacted property development by improving access to land data, reducing transaction delays, and fostering transparency, which supports investment and urban planning. However, challenges like operational inefficiencies, corruption, and policy instability limit its effectiveness. Continued investment in technology (e.g., GIS, blockchain), staff training, and stable policies is crucial to maximizing its potential. In Ikeja, Lagos State's administrative and commercial hub, rapid urbanization, driven by population growth from 29.7% urban in 1990 to 51.2% in 2019 has intensified land pressures, leading to informal markets, disputes, and inefficient development¹⁶.

Positive Impacts:

LIS streamlines land administration processes, reducing bureaucracy and increasing the speed of property transactions. LIS provides a clear and accessible record of land ownership, boundaries, and transactions, reducing disputes and corruption. LIS reduces errors in land records, ensuring that property information is reliable and up-to-date. LIS digitizes land records, enabling faster verification of property titles. The e-GIS initiative, for instance, provides accurate data on land

ownership, zoning, and topography, reducing uncertainties for developers and speeding up project planning. LIS provides valuable data for urban planning, infrastructure development, and property investment, enabling informed decision-making. By providing a secure and transparent system for property ownership, LIS can increase property values and attract investment. LIS provides planners with data for efficient land use, enabling better allocation for housing, commercial zones, and infrastructure, which is vital for Lagos's urban expansion¹⁶.

Negative Impacts:

Establishing an LIS can be costly, requiring significant investment in technology, infrastructure, and training. LIS implementation can be complex, requiring technical expertise and infrastructure. LIS can be vulnerable to data breaches and cyber-attacks, compromising sensitive information.

The impact of LIS on property development is largely positive, as it improves efficiency, transparency, and accuracy in land administration. However, careful planning, implementation, and management are necessary to mitigate potential challenges and ensure the system's effectiveness. Despite digitization, delays in title registration persist due to bureaucratic processes, outdated technology, and inadequate staff training, slowing down property development timelines. Corrupt practices among registry officials undermine LIS effectiveness, discouraging developers and increasing project costs¹⁶.

2.3 Evolution of Land Tenure Systems in Lagos

The evolution of the land tenure system in Lagos reflects the broader historical, political, and legal transformations in Nigeria from pre-colonial times to the present.

Pre-Colonial Period (Before 1861): Land was largely communally owned and controlled by family heads, chiefs, or traditional rulers. Before colonial rule, Nigeria had a rich tapestry of pre-colonial land tenure systems characterized by indigenous customs, communal ownership, and traditional governance structures. Land was held collectively by communities and administered according to customary laws and traditions. The king was considered the custodian of land, especially in urban areas like Lagos Island. Land was often passed through patrilinear lines; disputes were settled by customary courts or elders.

Colonial Period (1861-1960): British colonial authorities introduced foreign concepts of land ownership, property rights, and administrative frameworks that diverged from indigenous practices. They imposed their land tenure system, disrupting traditional practices and altering the socio-economic landscape. The crown Lands Ordinance of 1902 and the Land Use Act of 1978 aimed to centralize control over land in the hands of colonial authorities and later the federal government, this allowed government to grant leases, usually 99 years of crown land. Lagos was ceded to the British crown, making it a colony; the British introduced formal legal frameworks and began to reshape land tenure. English property law began to coexist with customary law. Much land was declared as “crown land” allowing the colonial government to appropriate and allocate land.

Post-Independence (1960-1978): After Nigeria gained independence, the government embarked on land reform initiatives aimed at promoting land rights, enhancing land tenure security, and fostering sustainable land management practices. The Land Use Act of 1978 was a landmark legislation that vested land ownership in the government and guaranteed access to land for all Nigerians⁴⁹.

2.3.1 Types of Land Tenure Systems in Nigeria

Nigeria's land tenure systems encompass a diverse array of arrangements influenced by historical, cultural, and legal factors. Understanding the various types of land tenure systems is essential for navigating the complexities of land ownership, rights and access across the country's diverse landscape.

Freehold Land Tenure System: Freehold land in Nigeria refers to land that is owned outright, without time limitations or government control over the tenure. This means the owner has full ownership rights indefinitely and can transfer, lease, or develop the land without seeking government approval. Under the freehold land tenure system, individuals or entities hold absolute ownership rights over land, including the surface and subsurface rights. Freehold titles provide the highest level of tenure security and grant landowners the freedom to use, transfer, and develop land as they see fit. However, freehold land ownership is relatively rare in Nigeria and is primarily found in urban areas and former colonial settlements.

Leasehold Land Tenure system: This involves granting temporary rights to use and occupy land for a specified period, subject to lease agreements and conditions set forth by landowners or leaseholders. Leasehold arrangements are common in urban areas and commercial developments, where land is leased for residential, commercial, or industrial purposes. Leasehold tenures offer flexibility and investment opportunities but may entail periodic lease payments and lease renewal obligations. In a leasehold land tenure system, individuals or entities are granted the right to use land for a specific period, typically between 5 and 99 years, through a formal agreement with the landowner. During the lease period, the lessee has the right to use the land, but it reverts to the original owner after the lease expires. The leaseholder cannot use the land as collateral for loans, but they can typically cultivate it for agricultural purposes.

Customary Land Tenure System: The customary land tenure system is deeply rooted in indigenous customs, traditions, and communal practices across Nigeria's diverse ethnic groups and communities. Customary land tenure is characterized by communal ownership, collective rights, and customary laws governing land use and allocation. Land rights under customary tenure are often based on lineage, kinship ties, and community consensus, with land serving as a vital resource for sustenance, livelihoods, and cultural identity. Customary land tenure system refers to a system of land ownership and management based on traditional customs, norms, and practices of a particular community or culture.

Statutory Land Tenure System: The statutory land tenure system encompasses land ownership and administration governed by statutory laws, regulations, and government policies. Statutory tenures include lands vested in the government, public institutions, and statutory bodies for public purposes. It refers to a system of land ownership and management governed by laws and regulations created by a country's government. The land tenure system is based on legally established laws and regulations implemented by the government or state authority. It involves the formal recognition of individual or institutional land ownership, with defined property rights and legally enforceable land use agreements and land is treated as private property with clear ownership titles³⁰.

2.3.2 Challenges and Issues in Land Tenure

Despite the diversity of land tenure systems in Nigeria, the country faces numerous challenges and issues related to land ownership, rights, and administration. Addressing these challenges is essential for promoting social justice, economic development, and environmental sustainability

across the country's diverse landscape. Some of the challenges include; insecurity of tenure, land disputes, inequitable access, land grabbing and environmental degradation.

Insecurity of Tenure: Insecurity of land tenure rights remains a pervasive issue in Nigeria, particularly for marginalized communities and vulnerable groups. Weak land governance, lack of formal land titles, and land grabbing by powerful elites threaten tenure security and undermine the livelihoods and well-being of rural and urban dwellers. This involves lack of formal recognition or protection of land rights. Insecure land tenure restricts the ability of landowners to use their property as collateral for loans, hindering investment and development.

Land Disputes: Land disputes and conflicts are common across Nigeria, arising from overlapping claims, boundary disputes, and competing interests among individuals, communities, and government authorities. Conflicting land tenure systems, inadequate land documentation, and weak dispute resolution mechanisms exacerbate tensions and hinder peaceful coexistence. This involves conflicts over land ownership, boundaries, or use. Lack of clear documentation and poorly defined boundaries often result in conflicts over land ownership and usage.

Inequitable Access: Unequal distribution of land, often affecting marginalized groups. Inequitable access to land tenure presents significant challenges, particularly in developing countries, impacting livelihoods and economic development. These challenges often stem from unequal distribution of land rights, limited access for marginalized groups like women, and inadequate legal frameworks to protect land rights.

Land Grabbing: The phenomenon of land grabbing, characterized by the unlawful acquisition of land for commercial, industrial, or speculative purposes, poses a significant threat to land rights, social cohesion, and sustainable development in Nigeria. Land grabbing deprives communities of their ancestral lands, disrupts livelihoods, and exacerbates poverty and inequality.

Unlawful or unfair acquisition of land, often by powerful interests. Large-scale land acquisitions by private investors, companies, or governments can displace local communities and undermine their livelihoods.

Environmental Degradation: unsustainable land use practices harming the environment. Environmental degradation significantly exacerbates challenges related to land tenure, and vice versa. Weak land tenure systems can lead to unsustainable land use practices, contributing to environmental problems like deforestation and soil degradation⁵⁰.

2.3.3 Recommendations Towards Sustainable Land Tenure System

Creating a sustainable land tenure system is crucial for ensuring long-term environmental stewardship, equitable access to land, and economic development. In Lagos, Nigeria, it requires addressing the challenges of land titling, Land Information System LIS, and property development. A sustainable land tenure system ensures secure, equitable, and environmentally responsible land ownership and use, supporting long-term economic and social development⁵⁵.

2.3.3.1 Full Digitization with Advanced Technologies

Recommendation: Implement a fully computerized land tenure system using Geographic Information System (GIS) blockchain technology, and cloud-based platforms to ensure transparency, security, and accessibility of land records. Blockchain can prevent fraudulent alterations, while GIS supports accurate mapping and planning⁵⁵.

Rationale; Studies show that digital systems like Lagos's e-GIS reduce delays and fraud in title registration, but current technology is underutilized. Blockchain ensures immutable records, enhancing trust among developers⁵⁵.

Implementation; Upgrade the existing e-GIS platform with blockchain integration and ensure real-time updates of land data to support property development⁵⁵.

2.3.3.2 Capacity Building and Staff Training

Recommendation: Invest in regular training programs for land registry staff training programs for land registry staff to improve technical competence in managing digital systems and reduce bureaucratic delays.

Rationale; Research highlights staff incompetence as a major barrier to effective LIS in Lagos, leading to delays in property transaction. Trained personnel can enhance service delivery and user satisfaction

Implementation; Partner with institutions like the Nigerian Institution of Estate Surveyors and Valuers (NIESV) to develop training modules on GIS and digital record management⁵⁵.

2.3.3.3 Stable and Flexible Land Policies

Recommendation: Establish consistent land policies with clear guidelines on registration, titling, and dispute resolution to reduce uncertainty for developers and investors.

Rationale; Policy instability disrupts land tenure processes, discouraging investment in Lagos's property market. Stable policies encourage compliance and streamline development.

Implementation; Create a multi-stakeholder policy review committee, including government, developers, and community leaders, to draft and maintain long-term land tenure regulations⁵⁶.

2.3.3.4 Increased Funding and Infrastructure Investment

Recommendation: Allocate adequate funding to modernize land registry infrastructure, including high-speed internet, updated hardware, and backup systems to ensure reliability and scalability.

Rationale; Insufficient funding limits the effectiveness of LIS, as seen in Lagos, which struggles with outdated technology. Robust infrastructure supports sustainable land management.

Implementation; Leverage public-private partnership and international funding to finance infrastructure upgrades⁵⁵.

2.3.3.5 Stakeholders Engagement and Public Awareness

Recommendation: Engage land-allied professionals and communities through workshops and campaigns to increase awareness of LIS benefits and encourage compliance with registration processes.

Rationale; Low compliance and lack of user input hinder LIS effectiveness. Stakeholders' involvement ensures systems meet practical needs.

Implementation; Launch community outreach programs and online portals to educate landowners on registration benefits and processes, reducing informal land transactions⁵⁵.

2.3.3.6 Anti-Corruption Measures

Recommendation: Introduce strict anti-corruption measures, such as transparent audit trails, whistleblower protections, and penalties for fraudulent practices in land registries.

Rationale; Corruption undermines trust in land tenure systems, discouraging developers and inflating costs. Transparent systems reduce malpractices.

Implementation; Integrate anti-corruption tools into LIS, such as automated tracking of transactions, and establish an independent oversight body to monitor registry operations⁵⁵.

2.3.3.7 Integration with Urban Planning and Sustainable Development Goals

Recommendation: Align the land tenure system with urban planning frameworks and sustainable development goals, to support equitable access to land and sustainable urban growth.

Rationale; A sustainable land tenure system supports planned urban development, reducing slums and ensuring equitable land access in Lagos. LIS data aids in zoning and infrastructure planning.

Implementation; Use LIS data to inform Lagos's urban master plans, ensuring land allocation supports affordable housing and infrastructure development⁵⁵.

2.4 Gaps in Current Literature on LIS and Property Development in Lagos.

To assess the effectiveness of the Land Information System LIS on property development in Lagos, Nigeria, it's important to identify areas where current academic and policy literature may be lacking or underexplored. This will help to justify the research and give unique contribution. The literature on Land Information Systems (LIS) and property development in Lagos, Nigeria, provides valuable insights into urban planning and housing challenges but reveals several critical gaps that limit the understanding and implementation of effective land management strategies.

Limited Integration of Informal Land Markets into LIS Frameworks

Literature Gap: While informal land markets dominate property development in Lagos, particularly for low-income groups, the literature lacks comprehensive studies on integrating these markets into formal LIS frameworks. Informal transactions, often undocumented and prone to fraud, are critical to addressing the housing deficit of over 3.3 million units.

Implication: without integrating informal markets, LIS cannot fully address land tenure security or support equitable property development for the urban poor, a key focus of Urban Space Innovation's social housing initiatives⁵³.

Inadequate Data on LIS Implementation and Effectiveness

Literature Gaps: There is a scarcity of empirical studies evaluating the implementation, accuracy, and impact of LIS in Lagos. Existing studies focus on land use and land cover changes using remote sensing but do not address how LIS databases are built, maintained, or used for property development decisions.

Implication: The lack of data hinders policymakers' ability to assess whether LIS can reduce land disputes or support Urban Space Innovation's (USI) land allocation needs for projects⁵⁴.

Insufficient Focus on Socioeconomic and Environmental Impacts of LIS

Literature Gap: The literature often overlooks the socioeconomic and environmental consequences of LIS-driven property development. For instance, studies on Lagos' urban expansion quantify land use changes but rarely link these to social equity or environmental sustainability outcomes, such as flood mitigation or access to housing for low-income groups. The 2018 Lekki free trade zone study highlights gaps in land governance, including inadequate compensation and resettlement, but does not connect these to LIS capabilities.

Implication: This gap limits the ability to design LIS that supports Urban Space Innovation's goals of equitable housing and slum upgrading while addressing Lagos' flooding and environmental challenges⁵⁴.

Lack of Community-Centric LIS Models

Literature Gaps: Current research rarely explores community-driven or participatory LIS models that incorporate local knowledge, critical for addressing Lagos' informal settlements, which house 50-75% of the population. Urban Space Innovation (USI)'s community-based projects, like training Maroko residents for construction, require LIS that reflect community needs, but studies focus on top-down, technical approaches.

Implication: Without community input, LIS risks alienating residents, leading to resistance or displacement during formalization efforts, undermining Urban Space Innovation's inclusive housing strategies⁵⁴.

Limited Analysis of Technological and Financial Barriers

Literature Gap: The literature does not adequately address the technological and financial constraints of implementing LIS in Lagos, such as high costs, lack of expertise, or infrastructure limitations. Studies like the 2024 Land use and Land cover (LULC) review note issues with cloud cover and low-resolution satellite data but do not explore how these affect LIS development for property markets.

Implication: This gap hinders practical LIS deployment, limiting its support for Urban Space Innovation's land allocation and policy advocacy efforts⁵⁴.

Adoption and Implementation Challenges

Literature Gap: Limited exploration of the barriers to LIS implementation, such as funding, technical expertise, corruption, and resistance from traditional landowners.

Implication: In-depth studies on institutional, social, and technical constraints can help explain why LIS may be underperforming or unevenly implemented.

Perception and Satisfaction Among Stakeholders

Literature Gap: Few studies have examined perceptions of LIS among end-users, including developers, land agents, surveyors, and community members in Lagos.

Implication: Stakeholder's perception research can reveal gaps between system design and real-world effectiveness.

Addressing these gaps can significantly advance understanding of how LIS affects property development in Lagos⁵².

2.5 Contribution of this Study in the Ikeja Context

The project assessing the effectiveness of land information system on property development in Lagos, Nigeria would offer several important contributions, particularly in the context of Ikeja, which is characterized by rapid urban growth, land scarcity, and complex land administration challenges. It contributes significantly to understanding and improving property development, land administration, and urban planning. In a city marked by rapid urban expansion, overlapping land claims, and bureaucratic land processes.

Improved Land Administration Efficiency

Contribution: The project would reveal how well the LIS is helping to streamline land records, reduce bureaucratic delays, and eliminate redundant processes. The Lagos State government has introduced the Lagos e-GIS Integrated Land Administration Portal, which enhances efficiency, revenue generation, and customer service. This portal allows citizens to access services remotely, track application progress, and receive immediate feedback.

Ikeja Context: In Ikeja, land titling and documentation have historically been slow and inefficient. If the LIS is shown to reduce time and cost of land transactions, it supports scaling its use across the state.

Enhanced Transparency and Reduction of Land Disputes

Contribution: The assessment highlights how LIS streamlines land registration, verification, and title issuance processes. This encourages investors' confidence and reduces corruption and land disputes. The use of LIS and blockchain technology can streamline land transactions, reduce corruption, and increase security. Smart contract land transactions by transferring ownership and securing payment in real-time. The project could demonstrate whether the LIS reduces corruption, double allocation of land, and fraudulent land transaction.

Ikeja Context: Ikeja, Lagos has long struggled with opaque land allocation, title duplication, and bureaucratic delays. With frequent disputes over land ownership in Lagos, a functional LIS could serve as a key tool for improving transparency and accountability in land governance.

Local Impact: It aligns with the Lagos State Government's push for e-governance and digital transformation of public services.

Boost to Investment and Real Estate Development

Contribution: By evaluating how LIS improves access to reliable land data, the project shows its role in de-risking property investments. By analyzing LIS effectiveness, the project could show whether improved land information encourages more secure investment in property development.

Ikeja Context: Insecure land tenure and lack of accessible land records deter real estate development. Lagos is Nigeria's commercial hub, with high demand for residential, commercial, and industrial property. A more reliable land system can increase investor confidence and catalyze large-scale development.

Local Impact: Encourages formal property development and participation of private developers in Lagos’ rapidly growing urban landscape, especially in areas like Ibeju-Lekki, Epe, and Ikorodu.

Evidence-Based Policy Recommendations

Contribution: The project could offer actionable recommendations to policymakers on how to strengthen or reform LIS components.

Ikeja Context: These insights would be highly relevant for the Lagos State Government and agencies like the Lagos State Lands Bureau and Lagos State Geographic Information System in refining their digital strategies.

Data for Urban Planning and Infrastructure Development

Contribution: The study underscores LIS as a foundation for integrated planning-helping agencies like LASPPDA and the Ministry of Physical Planning to coordinate better. The project might show whether LIS data is being effectively used in planning infrastructure, zoning, and sustainable land use.

Ikeja Context: Ikeja, the administrative capital of Lagos State and a key Local Government Area, serves as a commercial and technological hub amid Lagos’ rapid urbanization. With ongoing urban sprawl and informal settlements, better land data can support smarter urban planning and development controls.

Local Impact; Helps manage rapid urbanization and reduce unplanned settlements by enabling data-driven zoning and infrastructure decisions,

Identification of Gaps in Implementation

Contribution: The study could identify shortcomings in LIS deployment---technical, human resource-related, legal, or institutional.

Ikeja Context: Ikeja, as Lagos State's administrative and commercial hub, grapples with implementation gaps in Land Information System, digital platforms for managing cadastral records, GIS mapping, and land administration, amid broader urban planning and infrastructure challenges.

Contribution to Academic and Professional Knowledge

Contribution: The project will fill a research gap on the intersection between digital land systems and development outcomes in sub-Saharan African megacities.

Ikeja Context: It could serve as a case study for other Nigerian states or cities across Africa facing similar land management challenges¹⁶.

2.6 Historical Development of Land Information System LIS Globally

The concept of Land Information System (LIS) evolved over time as societies recognized the need for organized, accessible, and accurate land data to support decision-making in land administration, taxation, planning, and development. Historically, land information was maintained manually through paper-based cadastral records, often stored in local government offices or land registries. These systems, dating back centuries in Europe, Asia, and the Middle East, were designed primarily for; recording land ownership, taxation, and resolving land disputes. For example, the Domesday Book in 11th-century England was an early attempt to record land holdings systematically for governance and taxation purposes.

Introduction of Cadastral and Mapping (18th-20th Century)

The modern cadastral system emerged in Europe during the 18th and 19th centuries, particularly in countries like France, Germany, and the Netherlands. These systems combined land ownership records with detailed maps showing parcel boundaries. The Napoleonic cadastral in France was particularly influential and became a model for many countries. As surveying techniques improved, topographic and cadastral mapping became more accurate. The land registration systems in countries like Sweden and Switzerland became pioneers in linking land maps with ownership data.

Digitization Era(1960s-1980s)

The 1960s marked the beginning of computer-based systems for land and geographic data. Governments and research institutions started experimenting with storing cadastral information digitally. Key developments include;

Use of mainframe computers to store and process land data, emergence of Geographic Information System (GIS) in the 1960s and 1970s, initial integration of mapping and attribute data such as land use, ownership, and zoning. This era laid the foundation for what would become LIS, as land data began to be stored, manipulated, and analyzed electronically.

Emergence of Modern LIS (1990s-2000s)

With advancement in GIS, remote sensing, and database management, LIS became more sophisticated and user-friendly. The 1990s and early 2000s saw: widespread adoption of GIS-based LIS by governments. Integration of legal, administrative, valuation, and geographic data, shift from land records as static documents to interactive land databases, the adoption of spatial data infrastructure (SDIs) to link various spatial datasets. Countries like Australia, Canada,

Sweden, and the Netherlands became global leaders in LIS development, creating comprehensive, accessible digital land systems.

Contemporary Developments(2010-Present)

Today, LIS is central to urban planning, property development, land governance, and environmental management. key recent trends include; use of cloud-based platforms for real-time data access, integration with mobile apps and online portals for land transactions, adoption of blockchain for secure land registration in countries like Georgia and Sweden, implementation of 3D and 4D cadastral to represent vertical and time-based land rights such as underground utilities, multi-level buildings. The global trend is towards open, interoperable, and citizen-accessible LIS platforms, which improve transparency, reduce corruption, and enhance planning efficiency. The evolution of land information systems globally reflects a transition from manual, fragmented systems to integrated, digital platforms that support sustainable land administration and development. As urbanization and land pressures increase, LIS continues to play a critical role in ensuring effective land governance worldwide⁵⁰.

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Chapter Three

3.1 Research Methodology

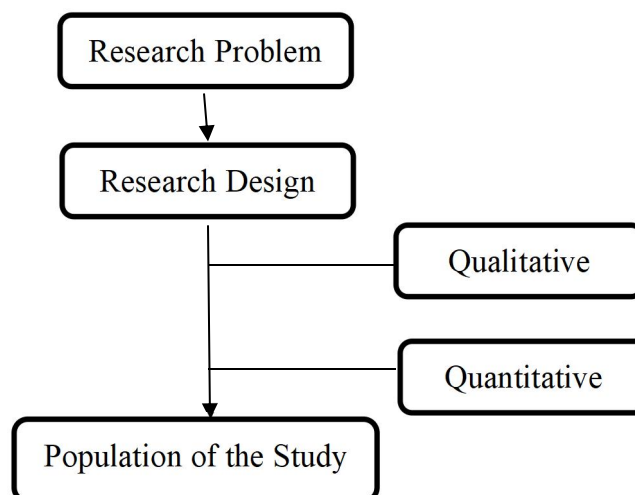
This chapter outlines the research design, population of the study, sample and sampling techniques, description of the research instrument, validity of the research instrument, reliability of the research instrument, method of data collection and method of data analysis. The aim is to

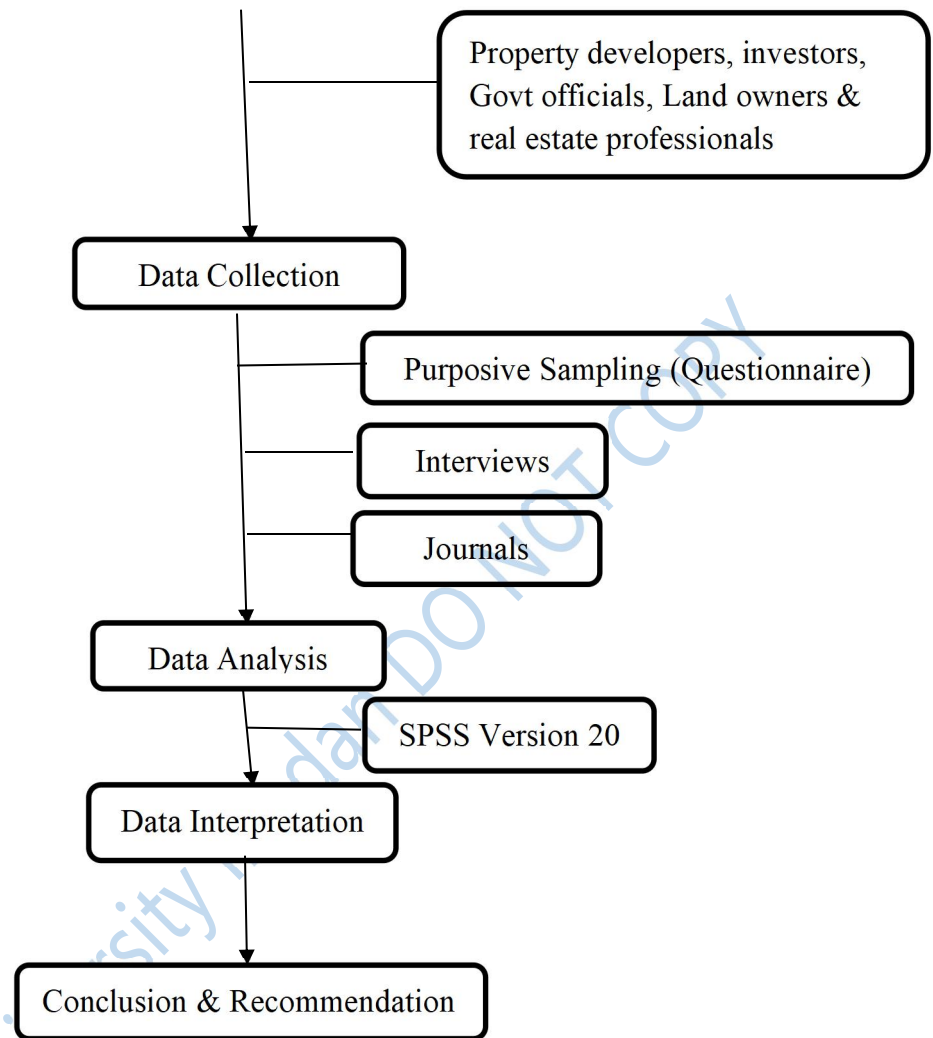
establish a systematic and rigorous approach to evaluate the effectiveness of land information system LIS on property development in Lagos, Nigeria.

3.2 Research Design

A research design is a plan that guides the researcher in the various stages of the research process. This study employs a mixed-methods research design, combining both quantitative and qualitative approaches to achieve a comprehensive understanding of the effectiveness of Land Information System on Property Development in Lagos Nigeria. The quantitative approach focuses on measurable outcomes, such as the time taken for land registration and the number of property developments facilitated by LIS. A quantitative approach is a research methodology that focuses on collecting and analyzing numerical data to understand a phenomenon or research problem. A qualitative approach is a research methodology that focuses on collecting and analyzing non numerical data to understand a phenomenon or research problem. The qualitative approach explores stakeholders' perceptions, including developers, government officials, and landowners, to capture nuanced insights into LIS implementation challenges and successes. Phenomenon, is an extraordinary or remarkable event, situation or experience that can be perceived, observed or experienced.

Fig 3.1 Methodology Flowchart





Source: Adesola et al, 2024.

3.3 Population of the Study

The population of the study was made up of the property developers, investors, government officials, land owners and real estate professionals in selected areas of Lagos.

3.4 Sample and Sampling Techniques

The sample size was determined using Taro Yamane (1967) formula for finite populations, which is widely accepted in social science research when the population is known⁷. However,

due to financial, time, and logistical constraints typical of undergraduate/ postgraduate research, the sample size was reduced to 100 respondents. This is considered acceptable and justifiable in similar studies on land administration and property development in Nigeria, where sample sizes between 80 and 150 were used with 95% confidence level.

Sampling Techniques: This study adopted a combination of purposive, stratified and simple random sampling techniques, Ikeja Local Government Area was purposively selected as the study area because it is the capital of Lagos State and hosts the highest concentration of property development activities, and area for the implementation of the Lagos State Electronic Land Information System(e-LIS), and has high presence of registered estate surveying firms and property developers. The target population was stratified into groups, Registered Estate Surveying and Valuation Firms, Property Development Companies, Staff of Lagos State Ministries of Lands and Housing, Ikeja. Respondents were selected from each stratum, using simple random sampling to ensure every member of the subpopulation had an equal chance of being selected. A total of 100 questionnaires were proportionately distributed as follows:

Table 3.1: Questionnaire Distribution

Stratum	Proportion	Questionnaires
Estate Surveying and Valuation Firms	40%	40
Property Development Companies	30%	30
Land Bureau Officials, Ikeja	15%	15

Individual Property Owners/Investors	15%	15
Total	100%	100

Source: Author's Questionnaire Survey, 2025.

3.5 Description of the Research Instrument

The research instrument that was used for this study was mixed-methods approach to capture both quantitative and qualitative data. Questionnaires was used to collect quantitative data on the usage, effectiveness, and challenges of LIS. The questionnaire was selected because it had the capacity of eliciting factual data from a given population. The questionnaire was titled "Assessing the Effectiveness of Land Information System on Property Development in Lagos Nigeria". The questionnaires were distributed to real estate developers and land officials to gather quantitative data on LIS usage, property transaction efficiency, land disputes resolved via LIS and development outcomes. Interviews was conducted for community leaders and selected officials to explore qualitative aspects, such as perceptions of LIS reliability and its impact on tenure security. The questionnaire was divided into two (2) sections covering the research questions raised in Chapter one of the study. The questionnaire was administered to property developers, land administration officials, and people in Opebi residential area.

Section A; Socioeconomic Characteristics of the respondents

Section B: Assessing the effectiveness of Land Information System on Property Development in Lagos Nigeria.

3.6 Validity of the Research Instrument

Validity refers to the extent to which a research instrument measures what it is intended to measure. The research instrument was validated by the project supervisor. The corrections made by the supervisor was carefully incorporated by the researcher in order for the instrument to be valid.

3.7 Reliability of the Research Instrument

To ensure a reliable research instrument for assessing the effectiveness of a land Information System on property development in Lagos, several steps were taken. A reliable instrument consistently measures what it intends to measure, and in this case, it needs to accurately reflect the LIS's impact on property development. The reliability of the instrument was done by the researcher through the test-retest method. This means to administer the instrument to the same group at two different time points and correlate the scores. A high correlation indicates good test-retest reliability. To calculate Cronbach's alpha for the instrument, a higher alpha value indicates good internal consistency reliability.

3.8 Method of Data Collection

This research relied solely on primary data with the use of questionnaire, which is purposive sampling as earlier stated, and interview. The questionnaire was administered to the respondents by the researcher personally. The questionnaire was collected back from the respondents immediately after completion in order to avoid mutilation and in order to record a high response rate from the respondents. Data collection was done using questionnaire and interview by the

researcher, which covers all the ten wards in Ikeja. Areas where data were collected include Olowu, Anifowose street, Unity Road, Balogun street, Majekodunmi street, Hilton drive, sowemimo street, and Alausa, all within Ikeja Lagos State.

3.9 Method of Data Analysis

The retrieved copies of questionnaire were analyzed using simple percentage and frequency count with the aid of the software SPSS version 20. This statistical tool was selected because of its simplicity and relevance to the research work. Qualitative data collection was a key component of this study, designed to complement quantitative findings by capturing in-depth insights from stakeholders directly involved in land administration and property development. The ultimate goal was to understand perceptions, experiences, and institutional challenges related to the implementation and effectiveness of land information system in Lagos.

3.1.9 Developing Indicators for Effectiveness in Property Development in Lagos

Developing indicators to measure the effectiveness of property development in Lagos, State Nigeria, requires a framework that captures the unique economic, social, environmental, and regulatory dynamics of the region. These indicators should measure the success of property development projects in terms of financial performance, quality, sustainability, stakeholder satisfaction, and alignment with urban development goals. Here is a proposed set of indicators for assessing effectiveness in property development in Lagos, tailored to the city's context as a rapidly urbanizing megacity with significant housing deficits, infrastructure challenges, and economic opportunities. Each indicator is accompanied by a rationale and supported by references to recent studies or relevant sources^{1,2,3}.

Stakeholders Satisfaction Indicators; Gauges the satisfaction of clients (buyers, tenants, or investors) with the property development process and outcomes, as well as their likelihood to recommend the developer. Client satisfaction drives repeat business and referrals, which are critical for real estate firms in Lagos competitive market.

Infrastructure and Accessibility Indicators; measures the availability and quality of infrastructure such as roads, electricity, water, sanitation, supporting the property development. Lagos' rapid urbanization has strained infrastructure and access to reliable services enhances property value and resident satisfaction. Assess proximity to and quality of infrastructure such as distance to major roads, reliability of power supply, using GIS mapping and resident feedback.

Public Transport Connectivity; evaluate the availability and efficiency of public transport options near the development site. Lagos suffers from severe traffic congestion, with peak-hour speeds below 10km/h, making public transport critical for accessibility. Map proximity to bus rapid (BRT) routes or rail systems and assess transport reliability via user surveys³.

Sustainability and Environment Indicators; Environmental Impact and Compliance, assesses the environmental footprint of the development, including compliance with environmental regulations and mitigation of issues like pollution or land degradation. Lagos faces environmental challenges such as air pollution and poor waste management, which affect project sustainability. Conduct environmental impact assessment and monitor compliance with Lagos State Environmental Protection Agency (LASEPA) standards⁴.

Provision of Green Spaces; Measures the inclusion of green spaces or public areas within or near the development to enhance livability. Sustainable urban planning in Lagos requires green spaces

to improve quality of life and address SDG 11 targets. Calculate the percentage of land allocated to green spaces and assess their accessibility and maintenance⁵.

Social and Economic Inclusion Indicators; Affordable Housing Provision, evaluates the extent to which developments include affordable housing units for low-income earners. Lagos has a housing deficit of 28 million units, with 58.8% of urban residents living in slums, necessitating affordable housing solutions. Measure the percentage of units priced for low-income earners and assess compliance with Lagos State Urban Development Policy goals⁵.

Reduction in Housing Deficit; Tracks the contribution of the development to reducing Lagos' housing deficit. With an estimated need for 80,000 housing units annually, effective developments must address this gap. Calculate the number of new housing units delivered relative to the annual demand⁵.

Regulatory and Policy Compliance Indicators; Adherence to Land Use and Planning Regulations, assesses compliance with Lagos State's Urban planning and land use regulations, including zoning and building permits. Unplanned urban expansion in Lagos has led to environmental and social issues, necessitating strict regulatory adherence. Audit projects for compliance with Lagos State Development Plan and zoning laws.

Timely Project Delivery; Measures the ability to complete projects within planned timelines and budgets. Delays in project delivery, common in Lagos due to bureaucratic hurdles and financing issues, reduce effectiveness. Track project milestones against planned schedules and budgets⁵.

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Chapter Four

Data Presentation, Analysis and Discussions of Findings

This chapter presents the analysis of data collected for the study on the effectiveness of land information system on property development in Lagos, Nigeria. It covers the analysis, presentation and the interpretation of the various data collected through the use of questionnaire. The study evaluates how LIS influences property development processes, focusing on efficiency, transparency, and accessibility in land administration. Data were gathered through mixed methods, including surveys of real estate developers, land bureau officers, and stakeholders. Questionnaires were administered to assess the effectiveness of Land Information System on Property Development in Lagos Nigeria. A total of 100 questionnaires were administered because of access to respondents, ease of data analysis, time and cost constraints, and all were retrieved back and considered valid for this study. This represents 100% response rate in this study.

Presentation of Results

4.1. Analysis of Respondent's Demography

The data in Table 4.1.1 shows the distribution of respondents by their gender. Out of 100 respondents to the questionnaires, 53 respondents which indicates 53% were male, while 47 respondents which indicates 47% were females. However, the population of male respondents are more than that of the female.

Table 4.1.1: Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Female	53	53
Male	47	47
Total	100	100

Source: Author's Questionnaire Survey, 2025.

Result in Table 4.1.2 shows the distribution of respondents by age range, and 13 respondents which represent 13% fall to the category of 18- 30 years, 25 respondents which represents 25% fall into the category of 31 - 40 years while 37 respondents which represents 37% fall into 41- 50 years category, while 25 respondents representing 25%, are 50 and above with respect to their age. It shows that respondents between the age 41 - 50 years has the highest number of frequency while the category aged 18 - 30 years has the lowest frequency.

Table 4.1.2: Distribution of Respondents by Age Range

Age-Range	Frequency	Percentage (%)
18-30	13	13
31-40	25	25
41-50	37	37
50 and above	25	25
Total	100	100

Source: Author's Questionnaire Survey, 2025.

Result in Table 4.1.3 shows the distribution of respondents by marital status. It revealed that 29 respondents representing 29% are single, 56 respondents representing 56% are married, 5 respondents representing 5% are Divorced, while 10 respondents representing 10% are widow. Hence, the respondents that are in married category have the highest frequency, while the respondents that are divorced have the lowest frequency.

Table 4.1.3: Distribution of Respondents by Marital Status.

Marital Status	Frequency	Percentage (%)
Single	29	29
Married	56	56
Divorced	5	5
Widow	10	10
Total	100	100

Source: Author's Questionnaire Survey, 2025.

Table 4.1.4: Distribution of Respondents by Level of Education

Result in Table 4.1.4 shows the distribution of Respondents by their academic qualifications, 51 Respondents represent 51% have obtained their Bachelor's degree, 37 respondents representing 37% of the total respondents have obtained Master's degree, 7 respondents representing 7% have PhD, while 5 respondents representing 5% have obtained Diploma. Hence, the respondents with Bachelor's degree have the highest frequency.

Table 4.1.4: Distribution of Respondents by Level of Education

Level of Education	Frequency	Percentage (%)
Primary School	—	—
B.Sc./B.Ed.	51	51
M. Sc	37	37
PhD	7	7
Secondary School	—	—
Diploma	5	5
Total	100	100

Source: Author's Questionnaire Survey, 2025.

Result in Table 4.1.5 shows the professional background of the respondents. It revealed that 21 respondents are investors, representing 21% of the total respondents, 15 respondents are quantity government officials representing 15% of the total respondents, 32 respondents are land owners representing 32% of the total respondents, 10 are property developers representing 10% of the total respondents, while 22 respondents are real estate professionals and developers, representing 22% of the total respondents. Hence, town planners have the highest frequency while the land surveyors have the lowest frequency.

Table 4.1.5 Professional Background

Profession	Frequency	Percentage (%)
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Investors	21	21
Government Officials	15	15
Land Owners	32	32
Property Developers	10	10
Real Estate Professionals and Developers	22	22
Total	100	100

Source: Author's Questionnaire Survey, 2025.

Result in Table 4.1.6 shows the familiarity of the respondents with LIS in Lagos, and it revealed that larger percentage of the respondents are familiar with the use of Land Information System in carrying out their works.

Table 4.1.6 Familiarity with LIS in Lagos State

Familiarity	Frequency	Percentage (%)
Yes	85	85
No	15	15
Total	100	100

Source: Author's Questionnaire Survey, 2025.

Result in Table 4.1.7 shows how effective LIS is, in facilitating property development in Lagos State. Out of 100 respondents to the questionnaires, 16 respondents agreed that LIS is effective

in improved land title verification, representing 16% of the total respondents, 9 respondents agreed that LIS is effective in faster land acquisition process, representing 9% of the total respondents, 27 respondents agreed that LIS is effective in reduced land disputes, representing 27% of the total respondents, 16 respondents agreed that LIS is effective in enhanced urban planning, representing 16% of the total respondents, 17 respondents agreed that LIS is effective in increased investment confidence, representing 17% of the total respondents, while 15 respondents agreed that LIS is effective in efficient land use management in Lagos State which indicate 15% of the total respondents. However larger percentage agreed that LIS effective in reduction in land disputes.

Table 4.1.7 Effectiveness of LIS in Facilitating Property Development in Lagos State.

LIS Effectiveness	Frequency	Percentage (%)
Improved Land Title Verification	16	16
Faster Land Acquisition Process	9	9
Reduced Land Disputes	27	27
Enhanced Urban Planning	16	16
Increased Investment Confidence	17	17
Efficient Land Use Management	15	15
Total	100	100

Source: Author's Questionnaire Survey, Interview Conducted by Author, 2025.

The data in Table 4.1.8 shows the distribution of the respondents on benefits of LIS to property developers in Lagos State. Out of 100 respondents to the questionnaires, 82 respondents agreed that LIS benefit them in the area of improved access to land information which indicate 82% of the total respondents, 2 respondents agreed that LIS is effective in reduced transaction cost, which indicate 2% of the total respondents, 11 respondents agreed that LIS benefit in increased efficiency in property development, which indicate 11% of the total respondents, 5 respondents agreed that LIS benefit them in the area of better decision making, which indicate 5% of the total respondents. Therefore, larger percentage of the respondents agreed that LIS benefit them in improved access to land information.

4.1.8 Benefits of LIS to Property Developers in Lagos State

Benefit	Frequency	Percentage
Improved Access to Land Information	82	82
Reduced Transaction Cost	2	2
Increased Efficiency Property Development	11	11
Better Decision-making	5	5
Others	-	-
Total	100	100

Source: Author's Questionnaire Survey, 2025.

The data in Table 4.1.9 shows the suggested improvement to enhance LIS effectiveness. Out of 100 respondents to the questionnaires, 8 respondents suggested upgrading technical infrastructure as a way of enhancing LIS effectiveness, which indicate 8% of the total respondents, 32 respondents suggested regular training and capacity building as a way of enhancing LIS effectiveness, which indicate 32% of the total respondents, 22 respondents suggested increased government funding and investment as a way of enhancing LIS effectiveness, which indicate 22% of the total respondents, 13 respondents suggested public awareness campaign as a way of enhancing LIS effectiveness, which indicate 13% of the total respondents, 10 respondents suggested simplification of LIS procedures as a way of enhancing LIS effectiveness, which indicate 10% of the total respondents. Also, 10 respondents suggested introduction of mobile LIS applications as a way of enhancing LIS effectiveness, which indicate

10% of the total respondents, while 5 respondents suggested establishing legal framework and policy support will enhance LIS effectiveness, which indicate 5% of the total respondents. However, larger percentage suggested regular training and capacity building as a way of enhancing LIS effectiveness.

4.1.9 Suggested Improvement to Enhance LIS Effectiveness

Improvement Area	Frequency	Percentage (%)
Upgrading Technical Infrastructure	8	8
Regular Training and Capacity Building	32	32
Increased Government Funding and Investment	22	22
Public Awareness Campaign	13	13
Simplification of LIS Procedures	10	10
Introduction of Mobile LIS Application	10	10
Establish Legal Framework and Support	5	5
Total	100	100

Source: Author's Questionnaire Survey, Interview Conducted by Author, 2025.

The data in Table 4.1.10 shows the level of experience of respondents. Out of 100 respondents to the questionnaires, 10 respondents have less than 2 years' experience, which indicate 10% of the total respondents, 18 respondents have 2-5 years' experience, which indicate 18% of the total respondents, 20 respondents have 6-10 year' experience, which indicate 20% of the total

respondents, also 52 respondents have more than 10 years' experience which indicate 52% of the total respondents.

4.1.10 Level of Experience

Level of Experience	Frequency	Percentage
Less than 2 years	10	10
2-5 years	18	18
6-10 years	20	20
More than 10 years	52	52
Total	100	100

Source: Author's Questionnaire Survey, 2025.

The data in Table 4.1.11 shows the challenges faced in using LIS as gathered by the respondents. 29 respondents noted that technical challenges affect the use of LIS, which indicate 29% of the total respondents, 17 respondents agreed that institutional challenges affect the use of LIS, which indicate 17% of the total respondents, 25 respondents agreed that financial challenges affect the use of LIS, which indicate 25% of the total respondents, and also 29 respondents agreed that human resources are a challenge that affect the use of LIS. However, both technical challenges and human resources have the highest percentage from the information gathered by the respondents.

4.1.11 Challenges Faced in Using LIS

Challenges	Frequency	Percentage (%)
Technical Challenges	29	29
Institutional Challenges	17	17
Financial Challenges	25	25
Human Resources	29	29
Others	—	—
Total	100	100

Source: Author's Questionnaire Survey, Interview Conducted by Author, 2025.

4.2 Analysis of Research Questions

Respondents' Questions

The research carefully selected some particular vital question in relation to the objectives of the research, response from respondent, have been represented by use of tables and single percentage.

The formula for it is:

$$A\% = a/n * 100/1$$

Where, n = total number of responses to a question.

a = number of Respondents ticking a particular answer option to the question.

A% = 'a' expressed as a percentage of N.

4.3 Discussion of Findings

The research work is based on assessing the effectiveness of Land Information System on Property Development in Ikeja, Lagos Nigeria, a rapidly urbanizing city with high demand for real estate and complex land tenure systems. The questionnaires were distributed to real estate developers and land officials. Findings revealed that larger percentage are familiar with the Land Information System and its importance on property development and real estate in general. Findings revealed that the importance of LIS and the effect lack of it could cause when handling property development in the state is known. The results of the study indicate that the Land Information System LIS has been effective in improving property development in Ikeja, Lagos. Most of the respondents agreed that the LIS has enhanced their ability to access Land Information, which has in turn facilitate property development. Further findings revealed that the LIS features found most useful are: Land Ownership Information facilitated, the LIS provided accurate and up-to-date information on Land ownership, which helped to prevent disputes and facilitate transactions⁸.

Also from the findings, it was gathered that LIS is very effective in Improved access to Land Information, LIS has made it easier for developers to access accurate and up-to-date land information, reducing the time and cost associated with land acquisition. On Enhanced Transparency and Accountability, LIS has increased transparency and Accountability in land transactions, reducing the risk of disputes and conflicts. Streamlined Land Administration Processes: LIS has automated Many lands administration processes, reducing the time and cost associated with land registration permitting and other transactions. Historically, land information was maintained manually through paper-based cadastral records, often stored in local

government offices or land registries. The influence of LIS on property development in Lagos State has been significant. Rapid urbanization, population growth and infrastructural limitations are some of the significant challenges of LIS on property development.

Enhanced Access to Land Records: Findings revealed that LIS has significantly improved access to land records in Lagos. Majority of respondents affirmed that land ownership and cadastral data are now more easily retrievable through digital platforms such as the Lagos State Geographic Information Systems. Faster access to accurate records is crucial for developers who require timely land title verification before proceeding with investments³.

Reduction in Land Dispute: Another key finding was a reduction in land related disputes and fraudulent transactions, particularly in urban districts like Ikeja, Victoria Island, and Lekki. Digitization of records and cadastral mapping has made it harder to duplicate land titles or sell land fraudulently, from findings it was indicated that manual records still exist, and inconsistencies between digital and paper systems occasionally result in conflict or litigation. The study also revealed that LIS contributes to the reduction of land disputes. By enabling stakeholders to verify land ownership and status, the LIS reduces the risk of double allocation and fraudulent transaction. However, the persistence of some disputes, as noted by some respondents, suggest that integration of historical land data remains incomplete or inconsistent¹.

Improved Efficiency in Property Development Approvals: Another significant outcome of the study is the increased efficiency in processing development permits and land titles, larger percentage of the respondents noted a noticeable improvement in turnaround time due to the LIS. This improvement correlates with the goal of sustainable urban planning. The availability of geospatial data for land suitability analysis also facilitates better decision-making in property

development. The findings affirm that the Land Information System has positively influenced property development in Lagos, particularly in promoting transparency, reducing disputes, and accelerating land related processes. However, for LIS to reach its full potential, issues related to infrastructure, human capacity, accessibility, and system integration must be addressed. Strategic investments and inclusive policy frameworks are essential for scaling the benefits of LIS across all segments of the property market in Lagos².

Implications of the findings on Policy and Practice

The implications of research findings on policy and practice depend on the field, but recent studies highlight common themes; bridging the gap between research and application, ensuring stakeholder engagement, and addressing context-specific needs. The findings from this study provide critical insights into how the Land Information System LIS influences property development in Lagos and what adjustments are necessary to optimize its impact. These implications affect both government policy and practical implementation by stakeholders such as urban planners, developers, surveyors, and property investors.

Policy Implications

Need for Comprehensive LIS Policy Framework: The study reveals that LIS significantly improves land administration and property development processes. This supports the need for a formal, comprehensive LIS policy that mandates its integration across all local governments and urban planning authorities in Lagos State. Lagos State policymakers should develop and enforce a standard operating framework for LIS use, including data collection protocols, system interoperability, and digital record mandates.

Public Access and Transparency Reforms: Findings show that public awareness and access to LIS remain limited. This reduces the full transparency potential of the system. Government should implement open-data policies that allow broader access to non-sensitive LIS data. This can foster trust, reduce land-related disputes, and support investment.

Capacity Building and Digital Literacy Programs: Technical challenges and low users' capacity were identified as barriers to LIS effectiveness. Policymakers should allocate funding for training programs aimed at both government officials and external stakeholders to build capacity for LIS usage.

Institutional Integration and Reform: Fragmentation between land-related agencies weakens the LIS effectiveness. Policy should enforce inter-agency data sharing and integration between LIS and other platforms like cadastral systems, planning departments, and tax authorities.

Practical Implications

Improved Planning and Decision-Making: The availability of accurate, real-time land data facilitates better decision-making for developers and investors. Real estate developers and investors should incorporate LIS data into their project feasibility studies to reduce risks and optimize site selection.

Reduction of Land Disputes and Transaction Delays: With clear land ownership records, disputes can be minimized, and transaction processes streamlined. Surveyors and legal practitioners should use LIS as a primary tool for verifying titles and boundaries before proceeding with land transactions.

Enhanced Urban Governance and Monitoring: LIS provides spatial data that can be used for tracking urban growth and enforcing planning regulations. Urban planners should leverage LIS for zoning enforcement, environmental impact assessment, and infrastructure planning, which will ensure orderly urban development.

Need for Private Sector Engagement: Findings highlight that the private sector sees value in LIS but is underutilizing it. Private technology and real estate firms should collaborate with the government to develop LIS-integrated applications that support smart city initiatives, property valuation, and investment analytics.

Long-Term Strategic Implications

Sustainable Urban Development: By embedding LIS in property development practices, Lagos can better manage land use, reduce slum development, and support sustainable growth.

Revenue Generation: More accurate land records can enhance property taxation, thereby increasing government revenue for infrastructure and public services.

Digital Governance Transformation: A fully functional LIS represents a step toward digital governance, improving Lagos State's image as a modern, investor-friendly city. The findings of this study highlight the transformative potential of LIS in the Lagos property sector. However, to fully realize its benefits, both policy reforms and practical adjustments must be made. Stakeholders at all levels, government, private sector, and civil society have roles to play in institutionalizing LIS as a central tool for efficient land and property management⁴.

Strategies for Successful Property Development in Nigeria

Successful property investment requires a strategic approach that balances risk, market knowledge, and financial planning.

I. Building a Strong Team

Building a strong team is a critical strategy for successful property development in Nigeria, given the complexity of the real estate market, regulatory challenges, and the need for diverse expertise. A well-coordinated team ensures efficient project execution, risk mitigation, and alignment with market demands. Property development is a collaborative endeavor that requires a strong team. Developers need to assemble a team of professionals, including architects, engineers, contractors, and legal advisors, who have the expertise and experience to contribute to the project's success. Building a strong team for property development in Nigeria involves assembling a multidisciplinary group with local expertise, fostering collaboration, and integrating sustainability and risk management skills. By addressing challenges like regulatory complexity and skilled labor shortages, developers can enhance project success in Nigeria's dynamic market. Key roles include architects, engineers, legal advisors, and project managers, with a focus on local knowledge and community engagement through corporate social responsibility⁵

ii. Conducting Thorough Market Research

Conducting thorough market research is a critical strategy for successful property development in Nigeria, given the country's dynamic real estate landscape, rapid urbanization, and unique challenge. Market research is a critical component of successful real estate development. Developers need to conduct thorough market research to understand the demand, supply, and trends in the target market. This includes analyzing demographic data, studying competitor

projects, and identifying growth opportunities. Market research helps developers make informed decisions, mitigate risks, and identify the unique selling points of their projects. Successful property development in Nigeria requires thorough market research to understand demand, mitigate risks, and capitalize on opportunities. By analyzing market trends, conducting due diligence, leveraging local networks, embracing sustainable practices, addressing challenges, and targeting high-demand segments, developers can achieve sustainable growth⁶.

iii. Implementing Effective Risk Management

Implementing effective risk management strategies in property development in Nigeria is critical due to the multifaceted and dynamic risks inherent in the sector, including political instability, economic volatility, regulatory challenges, and project-specific uncertainties. Risk management is crucial in property development. Developers need to identify potential risks and develop strategies to mitigate them. This includes conducting thorough feasibility studies, diversifying financing sources, and having contingency plans in place. Developers need to be adaptable and agile in responding to challenges to ensure the project's success. Effective risk management in Nigerian property development requires a structured approach involving risk identification, assessment, response planning, and monitoring, supported by stakeholder collaboration and technology. Addressing local challenges like knowledge gaps, regulatory volatility, and funding constraints is crucial for success⁷.

iv. Adopting Innovative Technologies

Adopting innovative technology as a strategy for successful property development in Nigeria is critical to overcoming challenges such as inefficiencies, cost overruns, regulatory complexities, and infrastructure deficits. By leveraging advanced tools and systems, developers can enhance project efficiency, reduce risks, and improve sustainability. Embracing innovative technologies

can enhance efficiency and productivity in real estate development. Developers can leverage tools such as Building Information Modeling (BIM), virtual reality, and project management software to streamline processes, improve decision-making, and reduce costs. Adopting innovative technologies can revolutionize property development in Nigeria by improving efficiency, reducing costs, and addressing local challenges like land disputes and funding shortages.

v. Sustainability Integration

Integrating sustainability into property development in Nigeria is increasingly recognized as a critical strategy for achieving long-term economic, environmental, and social benefits. Integrating sustainability principles into property development practices is increasingly important. Developers can implement sustainable design features, energy-efficient systems, and environmentally friendly materials to reduce environmental impact, enhance long-term value, and meet evolving market demands for green buildings. Sustainability integration in Nigeria's property development sector is a multifaceted strategy requiring policy reform, education, stakeholder collaboration, and innovative practices. Despite challenges such as regulatory gaps and financial constraints, adopting proven strategies from global models and investing in local capacity building can drive success^{8,9}.

4.4 Structural Digital Solutions to the Challenges and Limitations of Land Information System in Ikeja, Lagos State.

Lagos State has pioneered reforms like the Aumentum Land Administration Solutions (launched 2019) and Enterprise Geographic Information System (e-GIS/EGIS, advanced in 2025), providing blueprints for Ikeja-specific implementation. These emphasize integrated platforms, geospatial tech, and stakeholder capacity building. The Land Information System (LIS) in Lagos

State, Nigeria, is a critical framework for managing land records, titles, surveys, and transactions, overseen primarily by the Lagos State Ministry of Lands and Survey and agencies like the Lagos Geographic Information Service (LAGIS). As Africa's most populous city, Lagos faces immense pressure on its land resources, making an efficient LIS essential for economic growth, urban planning, and dispute resolution. However, the system grapples with persistent challenges rooted in legacy manual processes, legal ambiguities, and infrastructural deficits. This response outlines key challenges and proposes structured digital solutions, drawing on recent reforms like the Enterprise Geographic Information Service (e-GIS) and the "Identifier" project, to enhance transparency, efficiency, and accessibility. These structural digital solutions, building on Lagos' Aumentum and e-GIS successes, can transform Ikeja's LIS into a model for Nigeria—fostering secure tenure, economic investment, and sustainable urban growth. Success hinges on political will, funding (e.g., via World Bank partnerships), and inclusive engagement with Ikeja's communities¹⁰.

Key Challenges and Limitations

Lagos State's LIS suffers from systemic inefficiencies that hinder service delivery and foster disputes. Based on recent analyses, the primary issues include:

Outdated and Fragmented Records: Much of the land data remains manual or partially digitized, leading to inaccuracies, duplication, and difficulties in verification. This exacerbates land disputes, as over 97% of land in Nigeria lacks formal titles, limiting its use as collateral.

Legal and Regulatory Ambiguities: The Land Use Act of 1978 and fragmented state laws create gaps, such as lack of clear guidelines for registration, enabling step-skipping and loss of

title priority. Outdated frameworks also fail to address digital evidence admissibility and data privacy.

Infrastructural and Technological Barriers: Poor power supply, low internet connectivity, and inadequate digital infrastructure impede full digitization. High costs for implementation and maintenance further strain resources.

Human Capacity and Institutional Issues: Inadequate staff training, corruption risks from excessive gubernatorial powers, and lack of inter-agency integration result in bottlenecks, high processing fees, and unresolved disputes.

Limited Accessibility and Transparency: Citizens face delays in accessing services, with minimal GIS adoption for mapping and verification, leading to inefficiencies in urban planning and emergency responses. These challenges, if unaddressed, undermine investor confidence and sustainable development.

Structured Digital Solutions

To overcome these limitations, Lagos State can adopt a multi-layered digital architecture, leveraging emerging technologies for scalability and security. Structured solutions are categorized by focus area, with real-world implementations from ongoing reforms¹⁰.

1. Digitization and Automation of Records

Solution: Implement blockchain-enabled electronic document management systems (EDMS) to create immutable, tamper-proof digital ledgers for land titles and transactions. Integrate automated portals for end-to-end processing, reducing manual interventions.

Addressing Challenges: This counters fragmentation and inaccuracies by securing records against falsification, streamlining verification, and cutting processing times from months to days. Blockchain's immutability mitigates corruption risks.

Lagos Implementation: The Automated Land Administration Portal, launched under e-GIS in 2025, digitizes transactions for transparency and investor access. Similarly, EDMS reforms aim to reduce bottlenecks, though full efficacy requires legal backing for digital titles.

2. Geospatial Integration and Mapping

Solution: Deploy Geographic Information Systems (GIS) with LiDAR, drones (UAVs), and orthophoto mapping for real-time cadastral updates. Establish a centralized Spatial Data Infrastructure (SDI) to interconnect ministries.

Addressing Challenges: Enhances accuracy in fragmented records and supports urban planning by mapping every square kilometer digitally, resolving boundary disputes and improving emergency navigation.

Lagos Implementation: The state-wide Digital Mapping Project uses LiDAR and drones for precise surveys, coordinated via LAGIS since 2021. Over 150 GIS toolsets distributed to agencies like the Lands Bureau ensure inter-MDA integration, with regional e-GIS outlets (starting in Ikeja) for localized access.

3. Digital Identity and Addressing Systems

Solution: Roll out QR-code-based digital addressing platforms linked to property databases, allowing instant scans for title verification, approvals, and utility connections.

Addressing Challenges: Tackles accessibility issues and informal land holdings by enabling remote property checks, boosting collateral use, and aiding service delivery without physical visits.

Lagos Implementation: The "Identifier" project, piloted in August 2025, assigns unique digital IDs with color-coded QR codes to buildings, directly resolving title disputes and enhancing emergency responses.

4. Legal and Policy Reforms for Digital Enablement

Solution: Amend the Land Use Act to recognize electronic signatures, digital titles, and data privacy under frameworks like the Nigeria Data Protection Act. Harmonize state registration procedures via APIs for cross-agency data sharing.

Addressing Challenges: Closes regulatory gaps, ensuring digital records are legally binding and reducing ambiguities that lead to priority losses or disputes.

Lagos Implementation: As a case study in national reforms, Lagos's e-GIS portal (launched 2024) serves as a one-stop verification hub, with proposed amendments to integrate it fully. Capacity-building programs for civil servants further address institutional hurdles¹⁰.

5. Capacity Building and Infrastructure Upgrades

Solution: Invest in solar-powered data centers, subsidized broadband, and AI-driven training modules for staff. Use public-private partnerships (PPPs) for scalable tools like the Capture Lagos software.

Addressing Challenges: Overcomes infrastructural deficits and skill gaps, ensuring sustainable adoption and minimizing downtime.

Lagos Implementation: e-GIS includes GIS units in MDAs, drone services for data collection, and tools like the Merlin Billing Platform. Ongoing pilots, such as smart house numbering, demonstrate PPP viability. By prioritizing these structured digital solutions, Lagos State can transform its LIS into a robust, citizen-centric system that fosters economic inclusion and reduces conflicts. Initiatives like e-GIS and Identifier already position Lagos as a leader in African land governance, but success depends on sustained funding, stakeholder collaboration, and adaptive policies. Full implementation could unlock billions in untapped land value, aligning with Nigeria's digital economy goals¹⁰.

Endnotes

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Chapter Five

Conclusion

This chapter presents the summary of findings, conclusion and recommendations made from this research work. It summarizes key results, draws conclusions based on the research objectives, and provides actionable recommendations to enhance the role of LIS in promoting sustainable property development.

5.1. Summary of findings

The study examines the effectiveness of Land Information System LIS on property development in Lagos Nigeria, information gathered at Ministry of Physical Planning and Urban Development Ikeja Lagos State, and from Opebi residential areas around Ikeja. The research evaluated how the implementation of LIS impacts property development processes, including land acquisition, registration, ownership clarity, and dispute resolution. The study was divided into five chapters. Chapter one covers the background of the study, statement of the problem, research questions

and objectives, significance of the study, and scope of the study. Chapter two covers the conceptual framework, theoretical framework and empirical review was also included. Chapter three covers the research design, population of the study, sample size and sampling techniques, method of data analysis, source of data, instrument for data collection, test of validity and reliability, and method of data analysis. Chapter four covers data presentation, analysis and interpretation. The chapter also covers the discussion of the result. Chapter five covers summary, conclusion and recommendations

The summary of findings is presented below:

1. improved Data Accessibility: LIS has significantly enhanced the accessibility of land records for developers, surveyors, and government agencies. Digitalization has reduced manual errors and improved the speed of land information retrieval. The implementation of LIS has enhanced access to accurate and timely land data among property developers, government agencies, and the public. The Land Information System has significantly enhanced access to land-related information, enabling developers and stakeholders to retrieve accurate property data more quickly than traditional manual systems.

2. Reduction in Land Disputes: The system has improved transparency by providing reliable data, minimizing fraudulent land sales and duplication of titles. There has been noticeable decline in litigation and disputes over land ownership due to improved record accuracy. By providing reliable land records, the system has contributed to a reduction in land-related conflicts and disputes, which previously hampered property development. The digitization and systematic

documentation of land records have contributed to a notable decrease in land ownership conflicts, as the system provides verifiable and up-to-date information on property rights.

3. Efficiency in Land Registration and Transactions: The LIS has reduced the time required for land registration and property transactions by automating key processes and minimizing bureaucratic delays.

4. Positive Impact on Property Development: LIS has facilitated better decision-making for developers by providing spatial data for urban planning and land allocation. For instance, GIS-Based tools have supported urban renewal projects. Developers reported that the LIS has expedited the approval processes and facilitated smoother project execution.

5. Boost in Investor Confidence: The presence of a reliable and verifiable land data system has boosted investor confidence in the Lagos property market. This has led to increased real estate activities and investments in property development.

6. Impact on Urban Planning: The LIS has provided vital spatial data for urban planning authorities. This has improved decision-making in zoning, development control, and environmental impact assessments.

7. Legal and Institutional Support: The effectiveness of LIS is enhanced where there is strong legal backing and institutional collaboration. The study found that while the LIS has improved accessibility to land records and reduced processing times for property documentation, challenges such as inadequate infrastructure, poor data integration, and limited awareness hinder its full potential^{1,2,3,4,5}.

5.2 Conclusion

In conclusion, the Land Information System in Lagos has significantly contributed to enhancing property development by providing reliable land data, improving transparency, and reducing disputes. However, to maximize its effectiveness, addressing the infrastructural and operational challenges is imperative. The system's success in Lagos can serve as a model for other states in Nigeria and similar developing urban areas seeking to streamline land administration and boost property development. The Land Information System has proven to be a valuable tool in enhancing property development in Lagos. By improving the accessibility and accuracy of land data, the system addresses historical challenges associated with land administration, including disputes and delays. Although some operational and infrastructural challenges remain, the overall impact of LIS is positive, fostering transparency, efficiency, and security in property development activities. The study concluded that the implementation of the land information system in Lagos has had a moderately positive impact on property development. It has facilitated

improvements in land administration, enhanced transparency in land transactions, and supported better decision-making by property developers. However, the system is not yet fully optimized due to infrastructural, institutional, and technical challenges. If properly implemented and integrated across all relevant land and planning agencies, LIS has the potential to significantly boost investors' confidence, streamline land use planning, and encourage sustainable urban development. Based on the data collected, presented, analyzed and results of the statistical test, the following conclusions were gathered:

The study revealed that the LIS has improved land use planning, increased transparency and accountability, streamlined permitting and approval processes, enhanced conflict resolution, and generated additional revenue. It has been gathered that (LIS) Land Information System has great effects in supporting property development in Lagos State Nigeria., while the Land Information System has made commendable strides in transforming land governance and supporting property development in Lagos, a more integrated and inclusive approach is required to ensure its long-term effectiveness and sustainability in driving organized urban development. The influence of Land Information System LIS on property development in Lagos, Nigeria has been significant, though it varies in scope and effectiveness depending on the area, stakeholders, and technological adoption. The Lagos State Government's adoption of electronic Geographic Information Systems (e-GIS) has streamlined land title verification, reducing fraud and disputes. The e-GIS system allows developers to conduct due diligence efficiently, confirming ownership and detecting title defects, which is crucial for secure property development. For instance, the Lagos State Lands Bureau's digitization efforts have improved access to reliable land data, boosting investor confidence. One of the biggest challenges in Lagos has been land title disputes

and fraudulent land sales. LIS has helped digitize land records, reducing forgery and confusion. The extent of influence of LIS is moderate to high, in area where LIS has been fully implemented e.g., parts of Ikeja, Lekki, property developers now enjoy clearer ownership histories and faster title registration.

LIS enables electronic processing of land documents, including Certificate of Occupancy (C of O), surveys, and building approvals. The extent of influence of LIS on property development is moderate, while not fully automated everywhere, agencies like Lagos State Land Bureau and Lagos State Geographic Information System (LAGIS) have streamlined many parts of the process. Developers save time and cost with more predictable timelines. LIS supports spatial planning and zoning by providing accurate data on land use, topography, and infrastructure. This allows better planning for residential, commercial, and mixed-use developments. The extent of influence of LIS on property development is growing, adoption is more evident in new development areas like Lekki Free Trade Zone, and Ibeju-Lekki, where master plans rely on geospatial and LIS. Developers and investors use LIS to assess flood zones, road access, encumbrances, and legal boundaries before purchasing or developing land. The extent of influence of LIS on property development is moderately large, larger or institutional developers rely more on LIS than small-scale or informal sector builders, leading to more secure investments in high-value zones.

LIS helps Lagos State government track property ownership, improving land taxation and generating revenue for urban development. The extent of influence of LIS on property development is high, the state has used LIS to expand its tax net, particularly in high-density urban and peri-urban areas^{6,7}.

Are Government Policies and Technical Support Adequate on LIS?

The adequacy of government policies and technical support for land information systems in Lagos, Nigeria, can be assessed by examining their strengths, limitations, and gaps, drawing on recent studies and contextual evidence. The Lagos State Government has made significant strides in enhancing land information system through robust policies and technical support. These efforts aim to modernize land administration, improve transparency, and streamline processes for residents and investors. The Aumentum Land Administration System introduced in 2019, the Aumentum solution automates land record management, facilitating the registration of property transactions in a more chronological, controlled, and transparent manner. This system simplifies the way the state government manages land information and property tax revenue, enhancing productivity, revenue generation, document security, and customer-service delivery. The e-GIS and Urban Development Initiatives, the Lagos State Government has advanced digital innovations in land management and urban development through its Enterprise Geographic Information Service (e-GIS). This initiative aims to revolutionize land administration, urban planning, and geospatial data management across the state. It involves automating and integrating digitalization efforts across key agencies such as the Lands Bureau, Physical Planning, Land Use Charge, and the office of the State Surveyor-General. The project also includes establishing Spatial Data Infrastructure and deploying UAV drones, and cadastral software for precise land mapping and data collection. Lagos State Land Administration e-Portal, launched in January, 2024, marking a significant advancement in the digitization of land administration. This initiative strengthens the state's position as a model megacity and a pacesetter in bringing public service closer to the citizenry, advancing the ease of doing business. Policies supporting e-GIS aim to reduce fraud and disputes by providing accessible land records.

The Lagos State Geographic Information System (LAGIS) project, for instance, has digitized cadastral maps and land records, improving transparency for property development.

Challenges and Areas for Improvement

While significant progress has been made, there are challenges to address, such as :

User Adoption: Ensuring that users, including government officials and citizens, are comfortable with the new technology is crucial. Training programs and user-friendly interfaces can help address this challenge.

Data Security: With the digitization of land records, ensuring the security and integrity of the data becomes paramount, robust security measures must be in place to protect against data breaches and cyber-attacks.

System Integration: Integrating the new digital system with existing systems and processes can be complex. Careful planning and coordination are required to ensure a smooth transition and avoid disruptions in service delivery.

Technical Support: Providing adequate technical support to users is essential for the successful operation of the system. This includes troubleshooting issues, updating software, and addressing user queries. The Lagos State Government has demonstrated a strong commitment to enhancing land information systems through comprehensive policies and technical support. While challenges remain, the ongoing initiatives and investments in digital infrastructure are paving the way for a more efficient, transparent, and accessible land administration system. The study concludes that LIS has the potential to positively impact property development in Lagos, Nigeria,

but its effectiveness depends on addressing the existing challenges and implementing the recommended improvements.

5.3 Recommendation

Having summarized and concluded the work, the following recommendations among others would serve as ways of achieving effectiveness of Land Information System on Property Development in Lagos Nigeria.

Increase Public Awareness and Training: Launch public sensitization campaigns to educate property developers, surveyors, and the general public on the benefits and usage of LIS. Organize training workshops and seminars to improve user competence and engagement. The Lagos State government should organize regular training workshops for real estate professionals, surveyor, and landowners on using LIS effectively.

Improve Infrastructure and Technology Support: The Lagos State Government should invest in more robust and scalable digital infrastructure to support the functionality and accessibility of the Land Information System. Improvement should include cloud storage, GIS (Geographic Information System) integration, and real-time data updates to enhance transparency and speed

of land transactions. Government should invest in better internet infrastructure and data centers to ensure uninterrupted access to the LIS. Adopt cloud-based solutions for scalability, reliability, and real-time data access. Invest in modern servers, GIS software updates, and data backup systems to enhance reliability and speed of LIS.

Strengthen Institutional Collaboration: Foster stronger partnerships between government land agencies, town planning authorities, and property developers to improve data sharing and coordination. Create a centralized, integrated LIS platform accessible to all stakeholders.

Ensure Regular Data Updates and Accuracy: Encourage community participation or reporting in validating land data to ensure credibility. Implement a routine mechanism for updating land records to reflect current ownership, transactions, and zoning changes. Employ geospatial tools like GIS to enhance the precision and usability of LIS data.

Legal and Policy Reforms: Update existing land laws and policies to reflect technological changes and digital land management practices. Enact regulations that mandate the use of LIS for all official land transactions and property development assessments in Lagos. Review existing land use and LIS regulations to ensure they support digital transformation in land management. Introduce policy frameworks that mandate the use of LIS in all formal property development procedures.

Funding and Sustainability: Encourage public-private partnerships for funding and maintaining the LIS infrastructure. Set up a sustainable model for LIS maintenance through service fees or government subventions. The land information system has the potential to transform land administration and property development in Lagos. While it has delivered some improvements, its full benefits are hindered by infrastructure gaps, limited public awareness, and institutional

weaknesses. Addressing these issues will be key to unlocking sustainable, inclusive property development in the state.

Contribution to Knowledge

This study makes significant contributions to the growing body of knowledge on land management, urban planning, and property development in developing economies, particularly in the context of Nigeria. It contributes to understanding how digital land information systems affect property development in Lagos. It highlights both the strengths and limitations of LIS in the Nigerian context, providing insights that can inform policymakers and stakeholders aiming to leverage technology for improved land governance. This study makes several important contributions to the understanding of land administration and property development in Lagos State through the lens of the land information system. The research provides empirical data on how LIS implementation has influenced property development in Lagos, particularly highlighting improvements in land transaction efficiency, transparency, and record accuracy. It also provides empirical evidence on how the Land Information System LIS has been implemented in Lagos State and the extent to which it has impacted property development. It fills a gap in existing literature by presenting locally relevant data on the efficiency, accessibility, and user satisfaction associated with LIS in a highly urbanized Nigerian context. This adds to the limited body of localized studies on digital land administration systems in Nigeria.

The study identifies practical challenges facing the LIS in Lagos, including technical limitations, lack of skilled personnel, and bureaucratic inefficiencies. This practical diagnosis offers a foundation for further academic investigation and policy reforms targeted at improving LIS functionality in sub-Saharan Africa. By systematically analyzing user experiences and

institutional challenges, the study identifies critical bottlenecks such as technological limitations, accessibility issues, and legal-institutional conflicts. These insights help bridge the gap between theoretical benefits of LIS and practical realities on the ground. The study underscores the need for expanding LIS coverage beyond formal urban centers to include peri-urban and informal settlements, promoting inclusivity in land governance. This perspective contributes to the discourse on how digital land systems can support equitable property development in rapidly urbanizing regions.

The project offers actionable recommendations for policymakers, urban planners, and land management agencies, focusing on infrastructure upgrades, capacity building, institutional coordination, and public awareness. This serves as a practical guide to enhance LIS effectiveness and sustainability in Lagos and potentially other Nigerian states. The study lays groundwork for subsequent research by highlighting areas such as comparative assessments across states, socio-economic impacts on marginalized communities, and public-private partnerships in LIS deploying, thereby enriching academic and policy debates in land administration.

Suggestions for Further Research

Comparative Studies Across Nigerian States: Future research could assess the implementation and effectiveness of LIS in other Nigerian states such as Abuja and Kano, and compare results with Lagos. This would help evaluate regional disparities and best practices in land management across Nigeria.

Longitudinal Study on LIS Impact: A longitudinal study tracking the performance and outcomes of LIS over a 5–10-year period would provide deeper insights into how the system

influences property development trends, investment patterns, and urban planning efficiency over time.

Cost-Benefit Analysis of LIS Implementation: subsequent studies could explore the economic implications of implementing LIS, examining the return on investment for government, property developers, and landowners. This would provide evidence-based justification for scaling up LIS infrastructure.

Integration of LIS With Smart City Initiatives: With Lagos aiming to become a smart city, future research could explore how LIS can be integrated with broader digital governance tools such as Building Information Modeling, and e-permitting systems.

Public Awareness and User Experience Studies: Further studies could investigate the awareness, accessibility, and satisfaction levels of different user groups (developers, landowners, surveyors, investors) regarding the use of LIS. This can guide user-centered improvements and training strategies.

LIS and Land Dispute Resolution: Researchers could examine the extent to which LIS contributes to resolving land disputes, particularly in peri-urban or informal settlement areas. This would highlight LIS's role in promoting land tenure security and conflict reduction.

Legal and Institutional Framework Analysis: Future research may focus on analyzing the legal and institutional frameworks governing LIS in Nigeria. Are current land laws compatible with digital system? What reforms are needed to support sustainable digital land administration?

Gender and Social Inclusion in LIS Access: studies can explore how gender, socioeconomic status, or education level affects access to and benefits from LIS. This will uncover any digital divide issues and suggest inclusive policy approaches.

End Notes

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⁴. A. Alagbe, & O. Ojo, *Level of Use of GIS for Land Registration, Lagos State, Nigeria. African*

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Appendix A

Department of Urban and Regional Planning

Faculty of Environmental Design and Management

Lead City University, Ibadan.

**Assessing the effectiveness of Land Information System on Property Development in Ikeja
Lagos State.**

Dear Respondent,

I am a postgraduate student at Lead City University, Ibadan, conducting a research study on land
Information system and its effectiveness on property development in selected areas within the

city. This questionnaire is designed strictly for academic purposes, and all information provided will be treated with the highest level of confidentiality. To this end, your cooperation and sincerely in answering these questions will be appreciated.

Section A

Bio-Data of the Respondent

Personal Details

1. Name (Optional): _____.

Educational Background

1. Highest Educational Qualification:

(a) Primary School (b) Secondary School © Diploma (d) Bachelor's Degree

(e) Master's Degree (f) PhD

2. Field of Study: _____

Professional Background.

1 Occupation:

(a) Property Developers (b) Investors © Government Officials

(d) Land Owners (e) Real Estate Professionals and Developers

2. Membership in Professional Association:

(a) Yes (b) No

3. Relevant Certifications or Training:

(a) Yes (b) No

Section B

Assessing the Effectiveness of Land Information System on Property Development in Lagos State, Nigeria.

1. What is your level of experience in the property development sectors?

(a) Less than 2 years (b) 2-5 years © 6-10 years ss(d) More than 10 years

2. Are you familiar with the Land Information System LIS in Lagos State?

(a) Yes (b) No

3. How often do you use LIS in your work?

(a) Daily (b) Weekly © Monthly (d) Rarely (e) Never

4. What features of the LIS do you find most useful?

(a) Land Ownership Information (b) Land Use Information © Property Boundaries

(d) Zoning Regulations (e) Others

5. How effective do you think the LIS is in facilitating property development in Lagos State?

(a) Improved Land Title Verification (b) Faster Land Acquisition Process

© Reduced land disputes (d) Enhance urban planning (e) Increased investment confidence

(f) Efficient land use management

6. What benefits do you think LIS provides to property developers in Lagos State?

(a) improved access to land information (b) reduced transaction costs

© increased efficiency in property development (d) Better decision-making (e) others

7. What challenges do you think the LIS faces in facilitating property development in Lagos State?

(a) Technical Challenges (b) Institutional Challenges © Financial Challenges

(d) Human Resource Challenges (e) others

8. How would you rate the current availability of digital land records in Ikeja?

(a) Excellent (b) Good (c) Fair (d) Poor (e) Non-existent.

9. What are the most critical components needed for an effective Land Information System in Ikeja?

(a) Digital land records database (b) real-time data updates (c) public access portal

(d) legal and regulatory framework (e) Geographic Information System (GIS) Integration

(f) others.

10. What are the main limitations of the current LIS in Ikeja for property development?

(a) inaccurate or outdated land records (b) slow processing of land titles (c) lack of digital access

(d) corruption or mismanagement (e) limited stakeholder collaboration (f) other, please specify.

11. How do these limitations impact property development in Ikeja? (e.g., delays, costs, disputes.....)

12. Are you aware of the historical development of LIS in Ikeja? (a) yes (b) No

13. How has the evolution of LIS in Ikeja influenced property development over the past 20 years?

(a) improved land title processing (b) reduced land disputes (c) increased transparency (d) no significant impact (e) other, please specify.

14. Does the current LIS in Ikeja effectively support urban planning activities? (a)yes (b) no

15. Are there any additional features or functionalities that you think the LIS should have to better support property development in Lagos State?

16. What recommendations do you have for improving the effectiveness of the LIS in facilitating property development in Lagos, State? _____

Appendix B

Interview Questions

Assessing the effectiveness of Land Information System on Property Development in Ikeja Lagos State.

Dear Respondent,

I am a postgraduate student at Lead City University, Ibadan, conducting a research study on land Information system and its effectiveness on property development in selected areas within the city. This questionnaire is designed strictly for academic purposes, and all information provided will be treated with the highest level of confidentiality. To this end, your cooperation and sincerely in answering these questions will be appreciated.

1. Sex:
2. Age Bracket:.....
3. Marital Status:.....
4. Educational Qualification:.....
5. Professional Experience (in years):.....
6. How has the LIS influenced your ability to identify and acquire land for development projects in Ikeja over the past 2 - 3 years?.....
7. On a scale of 1 - 10, how effective is the LIS in supporting sustainable property development in Ikeja?.....
8. In your experience, how well does the LIS handle high volume demands from Ikeja' growing property market?.....
9. To what degree has the LIS reduced disputes or litigation related to land ownership in Ikeja development projects?.....

9. From a regulatory perspective, how has the LIS contributed to faster and more transparent property development approval in Ikeja?.....

10. How does the LIS supports economic growth through property development in Ikeja?.....

Bio-data

A. Personal Data

Matric No: LCU/PG/005201

Session: 2024-2025

Faculty: Environmental Design and
Management

Department:	Urban & Regional Planning
Course of Study:	MSc. Land Administration & Development.
Qualification in View:	MSc Land Administration & Development.
Name:	Oluwatunmise Esther JARRETT
Sex:	Female
Date of Birth:	2nd April, 1985.
Nationality:	Nigerian
Home Address:	No 8, AAA Estate Agoro Area Off Elenusonso Road, Ibadan.
State of Origin:	Oyo
Local Government Area:	Ona- Ara
Marital Status:	Married
Religion:	Christianity
Health Status:	Good
Next of Kin:	Dr. Owolabi Jarrett
Telephone No. & Address of Next of Kin:	08033326840. No 8, AAA Estate Agoro Area off Elenusonso Road, Ibadan.

B. Educational Background with Dates

B.Tech Urban & Regional Planning| 2008 |LAUTECH, Ogbomoso

WAEC| May/June 2001|Methodist Grammar School, Elekuro, Ibadan

NECO| May/ June 2001| Methodist Grammar School Elekuro, Ibadan.

C. Work Experience

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08034399739

Dr. Oluwatoyin Bolukale

Department of Urban and Regional Planning,

Lead City University, Ibadan, Oyo State.

08051037117

Signature

Date

The University Compliance Certification

This is to certify that this Thesis written by Oluwatunmise Esther JARRETT with Matric No LCU/PG/005201 in the Department of Urban and Regional Planning, Faculty of Environmental Design and Management, Lead City University, Ibadan is in full compliance with the approved University format and style.

Lead City University Ibadan DO NOT COPY

Signature

Date

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