**DEVELOPMENT CADASTRAL/LAND INFORMATION SYSTEM USING PYTHON SCRIPT**

**BSC. FINAL YEAR PROJECT**

PRESENTED TO

**DEPARTMENT OF SURVEYING & GEOINFORMATICS FACULTY OF ENGINEERING UNIVERSITY OF LAGOS**

BY

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# CERTIFICATION

# ACKNOWLEDGEMENT

# DEDICATION

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**ABSTRACT**

Land Information Systems (LIS) provide a foundation for supporting decision-making across a broad spectrum of natural resource applications: agronomic, environmental, engineering and public good. Typically, LIS constitute a computerized database repository holding geospatial components, ‘mapping unit’ geometry and related geo-referenced materials such as satellite imagery, meteorological observations and predictions and scanned legacy mapping. Coupled with the geospatial data are associated property, semantic and metadata, representing a range of thematic properties and characteristics of the land and environment. (S.H Hallet)

This project reviews recent developments of national and regional LIS, presenting applications for land resource capabilities and management while implementing a simple but powerful LIS in a bid to fill the gap in technical knowledge on the technologies involved. These focus on the ‘Federal Land Information System’ (FELIS) for Nigeria which was implemented by Sivan design for managing land administration in Nigeria. Land Information Systems support purposeful environmental interpretations, drawing on soil and related thematic data, offering insight into land properties, capabilities and characteristics. The examples highlight the practical transferability and extensibility of technical and methodological approaches across geographical contexts. This assessment identifies the value of legacy-based natural resource inventories that can be interoperated with other contemporary sources of information, such as satellite imagery.

# TABLE OF CONTENT

Contents

[CERTIFICATION 2](#_Toc64595458)

[ACKNOWLEDGEMENT 3](#_Toc64595459)

[DEDICATION 4](#_Toc64595460)

[TABLE OF CONTENT 6](#_Toc64595461)

[TABLE OF FIGURES 7](#_Toc64595462)

[CHAPTER ONE 8](#_Toc64595463)

[INTRODUCTION 8](#_Toc64595464)

[1.1 BACKGROUND TO STUDY 8](#_Toc64595465)

[1.2 PROBLEM STATEMENT 10](#_Toc64595466)

[1.2 LAND INFORMATION SYSTEM 11](#_Toc64595467)

[1.3 BENEFITS OF LAND INFORMATION SYSTEM 11](#_Toc64595468)

[1.4 AIM AND OBJECTIVES 14](#_Toc64595469)

[1.4.1 AIM 14](#_Toc64595470)

[**1.4.2 OBJECTIVES** 14](#_Toc64595471)

[**1.5** **SCOPE OF THE PROJECT** 15](#_Toc64595472)

[**1.6** **SIGNIFICANCE OF THE PROJECT** 15](#_Toc64595473)

[CHAPTER TWO 16](#_Toc64595474)

[LITERATURE REVIEW 16](#_Toc64595475)

[2.1 CADASTRE 18](#_Toc64595476)

[**2.2 LAND TENURE** 19](#_Toc64595477)

[2.3 HISTORICAL BACKGROUND OF LAND ACQUISITION AND LAND USE IN NIGERIA 20](#_Toc64595478)

[2.4 LAND USE ACT OF 1978 22](#_Toc64595479)

[2.5 OBJECTIVES OF THE LAND USE ACT 1978 24](#_Toc64595480)

[2.6 IMPACT OF THE ACT ON ECONOMIC DEVELOPMENT IN NIGERIA 27](#_Toc64595481)

[2.8 LAND ADMINISTRATION 31](#_Toc64595482)

[CHAPTER THREE 33](#_Toc64595483)

[METHODOLOGY 33](#_Toc64595484)

[INTRODUCTION TO THE PYTHON PROGRAMMING LANGUAGE 35](#_Toc64595485)

# TABLE OF FIGURES

[Figure 3‑1 36](#_Toc64595493)

# CHAPTER ONE

## INTRODUCTION

## 1.1 BACKGROUND TO STUDY

In recent decades, land-use information has been migrated from their papery home in the offices of land regulation ministries to virtual databases mounted either in datacenters or in the cloud. This evolution of how we store our land use information has majorly bolstered socio-economic development in areas such as software startups, housing, crime prevention, and many more sectors of the socio-economic spectrum. Barriers to the effective adoption of this revolutionary technology in many developing and underdeveloped countries however, are the prior mismanagement of land use information and many land transactions being either untracked or not properly documented, the complexity of existing systems, and the amount of unsynchronized data collection bodies.

Rapid urbanization has placed urban land in African countries under pressure. In many of these countries, access to urban residential land by households is limited and thus an issue of public concern. Africa and Asia are the fastest urbanizing continents and Nigeria together with India and China are expected to account for 37% of the projected growth of the world’s urban population between 2014 and 2050 (United Nations Department of Economic and Social Affairs, 2014). In most African countries, houses are in short supply and the land market appears to be moribund (Tibaijuka, 2004).

In Nigeria, access to urban land is such a sensitive matter that the security of land rights can be precarious. This is reflected in the difficulty in searching for information for land transactions and the inefficient production of formal land title documents by the government. (Federal Ministry of Housing and Urban Development, 2006). The result is that in many cases, urban land purchasers find it difficult to confirm the validity of land titles they want to acquire. Indeed, households’ access to urban land with secure tenure, especially for the low and middle-income groups, has become an important factor in governance. One way to achieve security of land rights is through implementing a distributed Land Information System (LIS).

Land Information Systems (LIS) provides a ‘framework to combine land surface models, relevant data and computing tools and resources. (Kumar et al, 2006). Typically, LIS constitute a computerized database repository for holding geospatial components, comprising ‘mapping unit’ geometry, and related geo-referenced materials such as satellite imagery, meteorological observations and predictions and scanned legacy mapping. Associated property, semantic and metadata, representing a range of thematic properties and characteristics of the land, and related subjects are also held. Geographical Information Systems (GIS) provide a natural technological basis for the development of LIS, being able to combine disparate sources and types of geospatial data, and providing the basis for integration of other types of information, such as remote sensing imagery. GIS further adds geo-processing capabilities that can be undertaken on its data; however, it cannot alone provide the full range and scale of data management functionality required of LIS. Thus, an additional database management system can be employed to hold, manipulate and serve data as required, depending on scale and application. The aim of this project was to develop a lightweight software which enables land use information and transactions to be uploaded to a robustly designed and optimized database either in the form of boundary coordinates or cadastral maps

## PROBLEM STATEMENT

Land disputes in many rural and urban communities in Nigeria are increasing drastically. Among other major land disputes experienced and continued to be predominant are land boundary disputes between individuals, double allocation by Traditional Authorities, illegal fencing by wealthy individuals, self-extension by said wealthy individuals, and widow eviction by the headman or relatives of the deceased. These land disputes pose serious implications on the regional resource base if solutions are not found, and may leave many unsustainable uses of natural resources unattended (Ministry of Lands, Resettlement and Rehabilitation, 2005). Various forms of land disputes resolution have been used in the past to find possible solutions to different cases. There has been no proper system of recording and keeping of events, as such, manual based systems with incomplete coverage are still being employed and supply most of the available land information.

The absence of well-designed Land Information Systems (LIS) has forced decision makers often to make critical decisions based on little or no information. The current manual based system used is not designed to help resolve land use conflicts or facilitate decision-making processes, however it is for recording purposes only. Misplacement of records and land disputes has been blamed on the manually based system in many developing countries. According to Mothibi (2003), this has not only an impediment on the effective functions of the Communal Land Boards but also negatively affects the Land Information Management which often results in numerous other land related problems. Therefore, this project is a design study in nature that will develop a Land Information System (LIS) to help in resolving land disputes by storing information on land and their respective owners, uses and properties. The study relies primarily on Lagos state as a case study.

## 1.3 LAND INFORMATION SYSTEM

The International Federation of Surveyors (FIG) has defined Land Information Systems (LIS) as follows:

"… A tool for legal, administrative and economic decision-making and an aid for planning and development. A Land Information System (LIS) 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 Systems is a uniform spatial referencing system, which also simplifies the linking of data within the system with other land-related data" (UNECE, 1996).

## 1.4 BENEFITS OF LAND INFORMATION SYSTEM

There are inumerable and varied benefits of a Land Information System implementation in developed and developing countries alike. In analyzing the benefits, it is prudent to look at both rural and urban areas separately, both of which have economic, social and environmental benefits.

As stated by one of the urban research divisions of the World Bank (Williamson, 1990): A well-functioning land management system -- with all its component parts -- is essential for orderly urban growth, a dynamic private sector and an efficient housing finance sector. Again as pointed out by the World Bank in (Williamson, 1990), in order to address some of the problems of poor urban land management in developing countries, it is necessary from both an economic and environmental point of view to put in place the following systems in urban areas:

* a legal framework that ensures land can be easily bought and sold
* a system of procedures and regulations to ensure the development of land at affordable cost
* land taxation measures to promote efficiency and equity in land use
* a land registration system which ensures that land ownership can easily be identified and transferred and that property taxes can be assessed and collected

Further justification for improvements in urban land management (and land information management) are seen in the World Bank's Urban Sector Strategy (World Bank, 1988):

*Usually, the lack of secure tenure is not a result of illegal invasion and squatting on public and private land but is due to outdated land tenure laws and inoperative cadastral and land information systems. The lack of land records not only prevents the poor -- and many middle-income families -- from having secure tenure, it also precludes the use of land and houses as collateral for mortgage loans and hinders the assessment and collection of property taxes (which is usually the largest revenue source for local governments).*

The World Bank has also done a lot of work to confirm the benefits of urban property taxation in developing countries. (Dillinger, 1988). Work done by the World Bank over countless number of years show that property tax can be an efficient and equitable means of financing municipal services in developing countries, but in most countries, it needs reform.

Simply, appropriate land information management systems contribute to cities running more efficiently, ensure adequate taxes are raised, contribute to improved services and generally lead to cities being able to better play their usual role of being the "engines" of economic growth in the country. Also as stated above, efficient land information management systems in cities,

primarily through assisting in better planning and more revenue through taxes, lead to an improved urban environment as a consequence of improved transportation, sewerage, water, drainage, electricity and telephone services. (Ian P. Williamson,)

The benefits of cadastral and land information systems in rural areas have been documented extensively (Williamson, 1986), however they can best be summarized by the following two quotes from the World Bank's 'World Development Report 1989' (World Bank, 1989):

*The legal recognition of property rights -- that is, rights of exclusive use and control over particular resources -- gives owners incentives to use resources efficiently. Without the right to exclude others from their land, farmers do not have an incentive to plough, sow, weed and harvest. Without land tenure, they have no incentive to invest in irrigation or other improvements that would repay the investment over time. Efficiency can be further served by making property rights transferable. (p86ff) In most countries’ real estate accounts for between half and three quarters of national wealth. If ownership is widely dispersed, tenure is secure, and title transfer is easy, real estate can be good collateral for nearly any type of lending. Unfortunately, these conditions are not always met in developing countries. Land distribution is often skewed, tenure (if any) insecure, and title transfer cumbersome. One key to a smoothly functioning system of land tenure is land registers supported by cadastral surveys. In many developing countries these are still woefully inadequate or missing altogether. (p87)*

As stated in Williamson [1990], considerable World Bank research has supported investment in land titling in rural areas, with consequent economic and social benefits (Feder et al, 1988). Other examples of the benefits of land information management in the Bank is the work by Francois Falloux [1989] with regard to renewable resource management in Sub-Sahara Africa. This report describes the application of mapping, land and geographic information systems and remote sensing in an institutional and economic framework in rural areas. In addition to the economic and social benefits highlighted above, improved cadastral and land information systems can lead to significant improvement in the rural environment through improved agricultural practices which contribute to better stewardship of the land, protection of forests and particularly a reduction in destructive "slash and burn" practices of rural squatters.

## 1.5 AIM AND OBJECTIVES

### 1.5.1 AIM

This Aim of this project is to examine, analyze and develop a Land Information System (LIS) for creating, reading, updating, and deleting information about land belonging to the users.

**1.5.2 OBJECTIVES**

The Aim was achieved by the objectives listed below:

* To analyze the existing Land Information Systems (LIS) and attempt to build on their progress while eliminating most of their shortcomings.
* To close the gap in knowledge as regards to the adoption of foreign technologies in augmenting the processes of administering and tracking landed properties.
* To restructure Land use information such that both authorized personnel and regular citizens alike can access information about the state of landed properties of interest.
* To reduce or eliminate delay in obtaining relevant documents as regards land ownership i.e. Certificate Of Occupancy (C of O).

**1.6 SCOPE OF THE PROJECT**

**1.7 SIGNIFICANCE OF THE PROJECT**

# CHAPTER TWO

## LITERATURE REVIEW

This chapter presents a review of essential literature on concepts and theories of land administration, land disputes resolution and Land Information Systems (LIS). The literature review includes Land Tenure System in Nigeria and in particular Lagos state with more emphasis placed on major sources and causes of land disputes, and its effect on land management and administration in rural and urban areas. The role of the government in land allocation, administration and dispute resolution was reviewed to give a better understanding as well as the available methods and tools currently used to store Land use Information.

The lack of reliable information on land, in particular, remains one of the most significant problems in land management throughout the world. In effect, the land administration process manifests various uncoordinated record keeping systems and duplication of efforts by myriad of agencies responsible for different aspects of land administration. Land disputes and misplacement of information in many developing countries like Nigeria has been blamed on the manually managed system of paper files. This has not only been an impediment on the effective functions of the land institutions but also negatively affected the land information management, often resulting in other numerous land related conflict (Mothibi, 2003).

Land Information Systems (LIS) have proven to be invaluable tools for land administration, enabling among other things better land use planning, property tax management, utility service management, emergency service planning and environmental management (Mothibi, 2003). However, many countries that have large proportion of Communal Lands held under customary land tenures where land rights are common, are also wishing to establish LIS. These countries LIS is a tool to facilitate the management and administration of their land resources, preserve their customs and traditions as well as promote the development of a market economy. For the system to be effective, LIS introduced into these countries will need to incorporate customary land tenure data (Rakai and Williamson, 1995).

The necessity for a digital system for the management of land information cannot be overemphasized, this is partially due to our ever-changing society and due to the sheer amount of data involved as (Ghilani and Wolf, 2012) posits that Land Information Systems require enormous quantities of position-related land data.

The issue of inefficiencies posed by manual method of keeping land records has become a topical issue in the world, especially developing countries like Nigeria. (Arnot, 2006).

Magaji Galadima – AGIS: The Journey so Far (2006): In his words stated categorically that the former Department of Land Administration and Resettlement was operating a manual system of land record management. These were plagued by numerous bottlenecks and cumbersome, widespread forgeries, document laundering, and racketeering of land. According to him, other problems of land administration include cases of multiple allocation, unattended applications, allocations from “Parallel Ministry” mismatches in land use, and encroachments. Other worrisome problems include inefficient revenue generation and collection, as well as delays in issuing/perfecting transactions in land.

In the same vein, Adeoye (2006): During 5th FIG Regional Conference, Accra, Ghana; posits that Manual record-keeping has been in use by Land related Departments of the Ministry of the Federal Capital Territory (MFCT) and the Federal Capital Development Authority (FCDA) since the inception of the Federal Capital Territory almost 30 years ago. The city and its surrounding have been expanding rapidly beyond projections. With this rapid expansion, manual record-keeping became inefficient, time-consuming and prone to abuses. Several unsuccessful attempts were made in the past to solve the problems. The attempt failed because of the gross under estimation of the gravity of the problems and the ill-defined scope of the project. The primary reason that has hindered the computerization of the Cadastral and Land Registry records in the past is lack of a strong political will on the part of the authority hence the need to eliminate paper based system. (Arnot, 2006).

A land administration system provides a mechanism that supports the management of real property. The processes of land administration include the regulating of land and property development, the use and conservation of the land, the gathering of revenues from the land through sales, leasing, and taxation; and the resolving of conflicts concerning the ownership and use of the land (Dale and McLaughlin 1988).

## 2.1 CADASTRE

The International Federation of Surveyors (FIG, 1995) defines a cadastre as a “parcel based and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, ownership or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (valuation and taxation), legal purposes (conveyancing), to assist in the management of land and land-use control (planning and administration), and enables sustainable development and environmental improvement”.(Larsson, 1991) further defines and distinguishes between a cadaster and land registry as follows:

A cadastre is a systematic description of the land units within an area. The description is made by maps that identify the location and boundaries of every unit, and by records. In the records, the most essential information is the identification number and the area of the unit, usually differentiated by land-use class. Furthermore, the classical cadastre provides information concerning owners, land classes and values or land taxes’.

He describes the Land registry as follows: ‘The land register is a public register of deeds and rights concerning real property. Depending on the legal system, there may be a register of deeds or a register of titles. Under the system based on the registration of deeds, it is the deed itself that is registered. A deed is a record of a particular transaction and serves as evidence of this specific agreement, but it is not itself a proof of the legal right of the transacting parties to enter into and consummate the agreement. Under the alternative system based on the registration of title, this process of tracing the chain of deeds is unnecessary. Title registration is itself a proof of ownership and its correctness is usually guaranteed and insured by the State’.

**2.2 LAND TENURE**

In common law systems, land tenure is the legal regime in which land is owned by an individual, who is said to “hold” the land. It determines who can use land, for how long and under what conditions. Tenure may be based both on official laws and policies, and on informal customs. In other words, land tenure system implies a system according to which land is held by an individual or the actual tiller of the land. It determines the owners’ rights and responsibilities in connection with their holding. The French verb “tenir” means “to hold” and “tenant” is the present participle of “tenir”. The sovereign monarch, known as The Crown, held land in its own right. All private owners are either its tenants or sub-tenants. Tenure signifies the relationship between tenant and lord, not the relationship between tenant and land. Over history, many different forms of land ownership, i.e., ways of owning land, have been established. A landholder/landowner is a holder of the estate in land with considerable rights of ownership or, simply put, an owner of land. (Wikipedia, 2020).

## 2.3 HISTORICAL BACKGROUND OF LAND ACQUISITION AND LAND USE IN NIGERIA

Land is a veritable ingredient of development especially in the agricultural and tourism sector of any economy. Nigeria has a total land mass of 924,768 sq.km with a population of 198 million and annual population growth rate of 2.8%. Nigeria comprises over 250 ethnic groups located within the 36 states and the Federal Capital Territory. Land is an asset and factor of production for households in Nigeria however, the level of access and title ownership is determined by the state. Therefore, the land system is characterized by several actors including government, community leaders, families, lawyers, middle men and estate agents among others.

All activities of the different actors are regulated by the government through policies and programmes. Generally, land systems thrive on clearly stated property rights. Two types of proprietary rights have been defined in literature-absolute or non-derivative interests and derivative interests. The absolute or non-derivative interest is a nonrestrictive access and use of land conferred on the holder. The absolute interest on land has also been explained as inclusive of highest scope of proprietary decisions on the use and management of land. Derivative interest derives from a larger estates or superior estates. The derivative rights cover leaseholds, life interests, mortgage, rents and pledges among others. The two types of property rights (absolute or non-derivative interest and derivative interest) exist in Nigeria.

The Nigerian land system has evolved over the years as classified into precolonial, colonial and postcolonial periods in literature. The three periods are explained below:

1. **Precolonial land ownership structure**: Prior to the colonial era, lands were solely owned by families and communities. The land was owned by the community and family heads who then allocate based on the needs of their subordinates. The legal estate or authority existed at the community or family level. Thus, the leadership of communities and families had absolute interests, while constituents had derivative interests.
2. **Ownership structure during colonial rule**: The ownership of land was regulated by the colonial authorities before independence. The legislations included Treaty of Cession (1861), Land Proclamation Ordinance (1900), Land and Native Rights Act (1916), Public Lands Acquisition (1917), State Land Acts (1918) and Town and Country Planning Act (1947). The colonial legislations were meant to take property rights out of the reach community leaders. For instance, in 1900, the Land Proclamation Ordinance created by Lord Lugard regarded the principles of native law and custom and stipulated that the title of land can only be acquired through the high commissioner.
3. **Postcolonial ownership structure**: As depicted earlier, the land ownership structure in Nigeria has evolved over the years. Two key legislations have been enacted since independence: Land Tenure Law of Northern Nigeria of 1962 and Land Use Act of 1978. The land tenure law of Northern Nigeria of 1962 stipulated that the minister responsible for land matter controls, holds and allocates land (unoccupied or occupied native lands) to natives of Northern Nigeria. This implies that non-natives except for the approval of the minister could not land titles. The law granted the natives of Northern Nigeria the right to own land for a limited number of years. The individual/native may sell, mortgage or transfer the land subject to the minister’s approval. The Land Tenure Law of 1962 was repealed, and land use decree of 1978 was implemented.

Land tenure issues are important components of developmental discourse. This is because unplanned or weak regulatory undermines development as informal settlements grow thereby stressing already inadequate urban infrastructure. Therefore, poor land management affects security and growth as it induces, slums and suboptimal living conditions. The Nigerian land use decree of 1978 stipulates that all land belong to the government holding same in trust for the public. This implies that the government allocates land to individuals and corporate entities based on the objectives of interested parties.

## 2.4 LAND USE ACT OF 1978

The Nigerian Land Use Act 1978 is the principal legislation that regulates contemporary land tenure in Nigeria. Upon its enactment, the law brought about radical, if not revolutionary, changes in the erstwhile land tenure systems in the country. The law was aimed, among other things, at reducing unequal access to land and land resources, a situation that had caused a great deal of hardship to the citizenry. Massive and unfettered access to land and land resources by the citizens could stimulate the needed economic growth in an economy that depends heavily on agriculture and mineral resources.

The Land Use Act was equally targeted at reducing the high cost of land required for industrial estates and mechanized agriculture. For these reasons, the law appeared to nationalize land when it placed it in the hands of the government as a custodian, to hold in trust and administer for the use and common benefit of all Nigerians.

However, after more than three decades of the operation of the law, it is apparent that most of the problems it sought to cure have resurfaced and certain provisions of the law have themselves worked hardship on the citizens and tended to impede economic development, which the Act initially sought to stimulate.

 When the British Government Colonized the northern part of Nigeria, it promulgated the Proclamation of 1900 by which all the land in the territory was annexed by the British Government. Subsequently, the Colonial Government of Northern Nigeria set up the Northern Nigeria Lands Committee in 1908 to recommend an appropriate land tenure system for the region. Based on the committee’s report which was adopted by the Colonial Government, the Land and Native Rights Proclamation of 1910 was enacted. The statute was replaced later by the Lands and Native Rights Ordinance of 1916. After Nigeria’s independence, the Northern Nigerian Legislature enacted the Land Tenure Law, 1962, which was the operative legislation at the time the Land Use Act was enacted in 1978. The tenure systems formulated by these two statutes are in many respects similar. The major similarity is the vesting of all land in the territory in the government, which then made it available to the citizens through the grant of rights of occupancy. The system maintained by the Land Tenure Law 1962, ensured that the radical title in all the land in the territory was vested in the government of the Region. The government then held the land as trustee and ensured that the land, under its control and management, was used for the benefit of the subjects. Concurrently, the citizens were entitled to rights of occupancy, and certificates of occupancy were usually issued as evidence of these rights. Alienation of a right of occupancy was only permitted upon the consent of the regional governor.

In the South of Nigeria, there was no uniform tenure system applicable to the various communities.

The various communities, tribes and nations comprised in the territory operated diverse land tenure systems, which largely endured and survived colonialism. The basic thrust of these various land tenure systems in the South was private ownership of land. Land was owned absolutely by private individuals, families or communities and was not subject to superior control save where the occupier held an inferior title as tenant or customary tenant. The government only exercised direct proprietary control over comparatively small areas which it had acquired for its own use. In effect, land could only be acquired through negotiation with various land owing families, communities or individuals. The radically title, therefore, was not vested in a government, but in the various landowners.[3](http://journals.univ-danubius.ro/index.php/administratio/article/view/3976/3876" \l "sdfootnote3sym) The government of the various States of southern Nigeria may however, compulsorily acquire land through the Public Lands Acquisition Laws applicable in the various States. Where this was the case, compensation was paid to the previous owners and the land was used for some public purposes. Outside the lands acquired by government, most of the lands in the South were the subject of private ownership and were as such articles of commerce. For that matter, individuals, families or communities had absolute liberty and discretion to sell, mortgage, lease or retain their land without reference to a superior authority.

## 2.5 OBJECTIVES OF THE LAND USE ACT 1978

The Land Use Act aims principally at the effective and sustainable management and control of land in Nigeria particularly in a manner that gives government sufficient powers over the acquisition, transfer or otherwise assignment of land and land resources. In *Savannah Bank Ltd v. Ajilo*, the Nigerian Court of Appeal stated that what the mischief aimed at resolving by the Land Used Act was the abrogation of absolute ownership or freehold interest by the community, the family and the individual. When *Ajilo’s case* went to the Supreme Court, the Court described it as a revolutionary law intended to change land management in Nigeria. (NWLR, 1987).

There are a number of objectives, which the Act sought to accomplish, and these may be encapsulated for the sake of clarity. First, the Act was intended to curb land speculation, which accounted for the astronomical rise in land values especially in urban areas. It was believed then that once ownership of land was vested in the government, speculators would be forced out of business and government would then be able to stabilize the value of land. Second, the Act was intended to assist the citizenry irrespective of their social status to realize their ambitions or aspirations of owing the place where they and their families would live a secure and peaceful life. Third, investing ownership of land in government sought to remove the difficulty which government encountered in acquiring land for public purposes. Fourth, the Act intended to harmonize the tenure systems throughout the country especially in the southern part of the country which lacked a coordinated and formalized tenure arrangement as was the case in the North under the Land Tenure Law 1962. In most parts of the South, the situation gave rise to multiple and endless litigations, which hampered economic development especially as it concerned the location of industries, the siting of infrastructural projects such as hospitals, schools, and the operation of mechanized agriculture. These problems, among others, were expected to be eliminated or at least drastically reduced by the enactment of the Land Use Act. (Daily times, 1976).

The stated primary objective of the Act is to facilitate rapid economic and social change in the country through efficient land use. The immediate aims include prevention of land concentration in both the rural and urban sectors of our economy, control of land transactions, land prices and land speculation, and the facilitation of access to land for the state as well as private individuals and thereby remove a cause of socio-economic inequality. (L. Alegwu Ega, 1985).

According to Anyanwu *et. Al* the Land Use Act was enacted to satisfy the need for larger areas of land for agriculture and non-agricultural purposes; end racketeering and the unending litigations in land transactions due to rising demand for land; checkmate traditional land ownership that had constituted barrier to national development programmes; prevent a situation where on the death of a land occupier, inheritance problems arose in the form of excessive subdivision of holdings; carter for the need for sustained security of rights to land in matters of duration, compensation and alienation of rights in land and sharpen governments sensitivity to a system in which only the rich, powerful and influential owned. (Anyanwu, Oyefusi, & H. Oaikhenan, 1997).

The objectives of the land use act 1978 are as follows:

* Make land accessible to all Nigerians
* Prevent speculative purchases of communal land
* Streamline and simplify the management and ownership of land
* Land available to governments at all levels for development
* Provide a system of government administration of rights towards improving tenure security

The aftermath was political considerations in the allocation of land, corruption and rise in lobbyist tendencies. The land use act avails the opportunities to own lands without recourse to families and communal land holdings. The process of obtaining certificates of occupancy is characterized by bureaucratic bottlenecks, high registration fees and perpetual payment of levies and taxes. (Chikaire JU, 2014).

Nigeria trails other African countries in the ease of registering land indices. Nigeria ranks 179th in the ease of registering land compared to Botswana (81st position), Morocco (86th position), South Africa (107th position) and Ghana (119th position). In terms of the number of procedures required to complete land title registration, there are 11 procedures in Nigeria compared to Botswana, Morocco, South Africa and Ghana with four procedures, six procedures, seven procedures and six procedures, respectively. This depicts low level of innovation and inefficiency in the land registration process in Nigeria. As expected from a country with one of the highest number of procedures for land title registration, it takes more days to register land title in Nigeria than elsewhere. (World Bank, 2017).

## 2.6 IMPACT OF THE ACT ON ECONOMIC DEVELOPMENT IN NIGERIA

In terms of attaining its set objectives, the Land Use Act has not been a success and two principal reasons account for this. The first is the Act’s inherent contradictions and defects, the second is institutional weakness, and lack of political will in the country to secure a just, fair and effective implementation of the Act to bring about economic. On the first leg, the divesting of citizens’ freehold title to their land is antithetical to their economic prosperity as land ceased from being an article of commerce upon the commencement of the Act. Against the backdrop that overwhelming majority of Nigerians have no other source of income and livelihood save the one derivable from land by way of subsistence farming or disposal to earn income for business or family needs, this dispossession has plunged the majority of Nigerians into poverty rather than prosperity.

Isong, argues that any development strategy must ultimately be interwoven with the aspirations of the people and society rather than seek to pursue the ambitions of few people in government. (Isong, 1985). This dispossession therefore places less income in the hands of the vast majority of Nigerians and, for that matter, impacts adversely on the *per* *capita* income and the Gross Domestic Product (GDP). This leads to a vicious circle of low savings, low investment and slower economic progress.

Section 22 of the Act is particularly devastating as it prohibits any person to whom the Governor has granted a statutory right of occupancy from assigning, mortgaging, transferring, subleasing or howsoever adversely dealing with the land against the terms of grant without having first had and obtained the consent of the Governor. (*Abidoye vs. Alawode,* 1994). Obtaining the consent of the Governor is fraught with administrative bottlenecks, financial burden, delays and even in some cases politicization. The severest consequence of the requirement for Governor’s consent before alienation manifests in the area of mortgages. A mortgage is a security for the payment of a debt or the discharge of some other obligation for which it is given. Worldwide mortgages are an effective way of raising capital from financial institutions needed for investment that induces growth in the various sectors of the economy. To obfuscate this significant tool by preconditioning it to the Governor’s consent in the light of the foregoing analysis is to weaken it. Worst of all, the Governor may withhold or refuse his consent and if it happens, the landowner would have been shut out from credit facilities that would otherwise regenerate his investment portfolio. The Supreme Court of Nigeria held that:

It has been argued and rightly too that it is the holder of a statutory right of occupancy granted by the Governor that should apply for consent to mortgage the property. This does not detract from the fact that the power to grant or refuse consent to the mortgage rests with the Governor. ( NSCQR, 2013).

The predicament of the landowner is further compounded by section 28 of the Land Use Act that empowers the Governor to revoke for overriding public interest any right of occupancy he had earlier granted. Overriding public interest includes when the Government requires the land for public purposes, projects or infrastructure. Sadly, the circumstances under which the Governor can exercise his power of revocation include where the occupier or holder of a right of occupancy assigns, mortgages, transfers possession, subleases or otherwise deals adversely with his right of occupancy or part thereof contrary to the provisions of the Act. This provision drains off any choices or freedom that a landowner may possibly have over his property except the one dictated by the mountains of bureaucracy, which he unavoidably has to deal with. Although, section 29(1) of the Act provides for the payment of compensation on the event of revocation by the Governor of a right of occupancy, such payment is to be made only *for the value at the date of revocation of their unexhausted improvements*. There are many problems with this requirement of the law. Those who validly obtained a certificate or right of occupancy over land that was subsequently revoked are not entitled to compensation if they did not make any improvements on their land or if they have exhausted such improvements, whatever they are. The question is what happens to the substance of the land itself as a store of value? A rural subsistence farmer or urban poor who depends on his land for sustenance losses out completely because there are no *unexhausted improvements* on the land. Moreover, compensation is not payable in the event of a revocation by the Governor where the holder of a right of occupancy has assigned, mortgaged, transferred possession, subleased or otherwise adversely dealt with a right of occupancy or any part thereof without the prior consent or approval of the Governor. In the same category are those who have breached any of the terms contained in the certificate of occupancy granted by the Governor. (*Sani Abacha vs. Eke-Spiff* 2009). Apart from the fact that compensation where applicable is largely and grossly inadequate, this atmosphere generated by the Act has done more to impoverish Nigerians than otherwise.

Although section 15 of the Act provides that during the term of a statutory right of occupancy, the holder shall have the sole right to and absolute possession of all the improvements on the land, such right and possession only relates to improvements that the holder still cannot transfer, assign or mortgage without the prior consent of the Governor or would lose if in breach of terms and conditions in the certificate of occupancy. This clearly creates a problem of security of title because though it is conventional in Nigeria to grant a certificate of occupancy for a period of ninety-nine years, there is nothing in the Act that prevents the Governor from granting a certificate of a lesser period. Section 8 of the Act only enjoins the Governor to grant a right of occupancy for a definite or fixed term. Where the right covers a short term then it amounts to economic risk to embark on massive improvements because of the atmosphere of uncertainty induced by the Act. (*Nzelu vs. African Continental Bank Ltd* 1974). More so, unless the certificate of occupancy contains a renewal clause, the Land Use Act does not contain a renewal provision so that if a Governor chooses not to renew a right of occupancy, the rights holder is bereft of remedy. (Chianu, 1992)

On the second leg, national institutional frameworks are weak and the requisite political will that could have guaranteed a firm, equitable and just implementation of the Act is lacking. The result is that the cost of land continues to rise astronomically and land speculation has become even more rife than previously. Land has continued to be accumulated in the hands of the private rich few who have the wherewithal to acquire them. Concurrently, the harsh economic climate in the country with rising cost of living has put Nigerians in dire straits such that some who have access to land whether by inheritance, previous purchase, or by family or communal allotments are more readily predisposed to selling them to meet immediate survival needs. Thus, the rich continue to accumulate more and more lands to the detriment of the dominant poor. The situation has been complicated by the politicization of almost all public affairs and institutions in the country. This has resulted in a situation where sitting Governors revoke the certificates of occupancy of political adversaries or refuse to grant it to those who do not share their political vision. At the same time, in some cases, grants of rights of occupancy have been made to political cronies and associates of the Governors even against the tenets of the Act. It is no wonder then that, after more than three decades of operating the Land Use Act, few of its set objectives could be said to be accomplished and the Act has neither generated the anticipated economic prosperity and equality of access to land for Nigerian nor the desired economic development that it was hoped to usher in.

## 2.8 LAND ADMINISTRATION

Land administration is defined as the procedure of recording and disseminating information about the ownership, value and use of land and its associated resources. Such processes include the adjudication of rights and other attributes of the land, the survey and description of the land, its comprehensive documentation and the purveying of associated information in support of landed markets.

Land administration is the way in which the rules of land tenure are applied and made operational. Land administration, whether formal or informal, comprises an extensive range of systems and processes to administer. The processes of land administration include the transfer of rights in land from one party to another through sale, lease, loan, gift and inheritance; the regulating of land and property development; the use and conservation of the land; the gathering of revenues from the land through sales, leasing, and taxation; and the resolving of conflicts concerning the ownership and the use of land. Land administration functions may be divided into four components: Juridical, regulatory, fiscal, and information management. These functions of land administration may be organized in terms of agencies responsible for surveying and mapping, land registration, land valuation and land revenue generation. (Wikipedia, 2020).

# CHAPTER THREE

## METHODOLOGY

This section goes into detail about the specific methods, tools, practices and extra steps that were utilized and/or taken from inception of the research topic right down to the bundling and deployment of the Land Information System. As the research topic has alluded to, the production of this Land information System was augmented almost entirely by the computer science ecosystem.

We began the project by enumerating the different components required to implement a Land Information System, the components we concluded on follows the common Model, View and Controller (MVC) paradigm of software application design.

The Model-View-Controller (MVC) is an architectural pattern that separates an application into three main logical components: the model, the view, and the controller. Each of these components are built to handle specific development aspects of an application. MVC is one of the most frequently used industry-standard web development frameworks to create scalable and extensible projects.

**MODEL**

The Model component corresponds to all the data-related logic that the user works with. This can represent either the data that is being transferred between the View and Controller components or any other business logic-related data. For example, a Customer object will retrieve the customer information from the database, manipulate it and update the data, then send it back to the database or use it to render data.

**CONTROLLER**

Controllers act as an interface between Model and View components to process all the business logic and incoming requests, manipulate data using the Model component, and interact with the Views to render the final output. For example, the Customer controller will handle all the interactions and inputs from the Customer View and update the database using the Customer Model. The same controller will be used to view the Customer data.

**VIEW**

The View component is used for all the UI logic of the application. For example, the Customer view will include all the UI components such as text boxes, dropdowns, etc. that the final user interacts with.



Figure 3‑1

The diagram above illustrates the ecosystem of an MVC architectured application and how input from the user is filtered through the controller which represents the engine of the application, responsible for translating user inputs into commands to the database or external server and returning an appropriate response back to the user.

The methods and tools empolyed will be classified and explained within the scope of the Model-View-Controller archictecture, but befor that we need to explore the python programming language and what makes it a candidate for developing native desktop applications.

## INTRODUCTION TO THE PYTHON PROGRAMMING LANGUAGE

# NOTES

* Tkinter operates on the principle of an event loop. An event loop represents the current state of an application.
* We have to create the loop.
* A program ends when the loop ends

# CHAPTER FOUR

## RESULT AND ANALYSIS

# CHAPTER FIVE

## SUMMARY, CONCLUSION AND RECOMMENDATIONS