

ANALYSIS OF LAND USE CHANGES IN BIDA TOWN, NIGERIA

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ABSTRACT

Land use changes are global phenomenon occurring over time. Commercial land uses in most Nigerian urban centres have sprawled and converted adjoining residential uses in a manner in which housing stock are significantly affected by such changes. The aim of this study is to analyses land use changes in Bida town; with a view to examining its effect on housing delivery. Primary data was sourced using a structured questionnaire administered across the population of the study interest in accessing the perceptions and experiences of experts and non-experts in land use dynamics regarding the drivers, trends and effect of land use changes in Bida town. In addition, archival data were gathered from the planning authorities in respect to the registration procedures and requirements for change of uses; thus, inventory of converted properties in the selected neighbourhoods were ascertained. A total of two hundred and thirty four retrieved questionnaires were analysed using descriptive and inferential statistical techniques like Simple Percentages and Statistical Mean Score; as well as Paired Sample t-Test and Coefficient of Variations respectively. The result indicate that common factors responsible for commercial land use encroachment on the residential areas include increasing demand for business premises, limited space in the central business districts, upgrade of older residential buildings and easy accessibility in the residential areas; thus, are considered as the topmost factors necessitating conversions of residential property to commercial uses having their mean scores above 3.50. The study also revealed that increasing traffic congestions/slum generation in residential areas, challenges in land use control measures, sprawling of economic activities in residential zoned areas, increasing crime rate in the residential areas reduction in residential vacant lots/housing stock closer to the central business districts, rising land/property values in the residential neighbourhoods were the common effects of residential to commercial land use changes on housing delivery. The result from the inferential analysis indicates that the opinions of experts and non-experts are in agreements on the effects of commercial land use changes on housing delivery with „P“ Value greater than 0.05. It was recommended that adequate space for commercial land uses along the access roads of residential areas should be reasonably allotted in the planning schemes in order to reduce business activities in the core residential areas and consequently ruining down the quality of the housing environment.

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CHAPTER ONE

1.0

INTRODUCTION

1.1 Background to the Study

Land use changes are global phenomenon occurring over time which could be noticed either in a mild or wholistic scale in a particular urban centre (Raharjo, 2005). The present great interest in analysing land use successions has stemmed a concern over the demographic, economic and environmental variables relating to the spatial structure of an urban area (Irwin & Bockstael, 2006). The trend in urban growth in developing countries has been on rapid increase with approximately 62 million inhabitants annually requiring about 16 million new accommodation units to be added to their existing housing stock (Pamuk, 2000).

The pace of physical development in Nigerian cities has brought about changes in land use of which commercial land uses continuously to sprawl and convert adjoining residential land uses. This has in most cases, stepped into the land use control measures lingering mixed land uses within residential areas in undesirable ways. The increasing commercial activities in Nigerian mega cities have taken an independent dimension outside the scope of the zoning regulations that guide intensity of land uses (Abdullahi, *et al.*, 2011). Abbas (2009), this trend in the recent situation analysis of land use changes in some selected Nigerian cities, perhaps due to relative small proportion of commercial land use allocation in relation to other land use like residential uses.

Since residential to commercial land use changes entail the conversions of existing residential vacant lot or building into commercial premises, or buildings, the number of

residential property which have been taken over by the commercial uses are not equally replaced within the same neighbourhood. This disproportionate replacement of converted residential property in urban centres has warranted for shortfall in the overall urban housing (UN Habitat, 2007). Enumeration Area Demarcation (2018), confirmed the scenario in the recent enumeration of housing stock in Bida town which elucidates greater concern over the high shortage of housing stock in medium density residential neighbourhoods of which, a few available stock are being steadily converted to commercial premises. Simwanza (2004), submitted that increasing rate of commercial activities attract land uses away from central districts to the adjoining residential areas and consequently escalate land values above those of the surrounding parcels. This has been a case for Bida urban where decent houses are being converted to commercial premises thereby, pushing the urban poor to live in poorly built houses with inadequate space to accommodate and secure the comfort and safety of family members.

Situation analysis of urban land use changes indicate number of factors responsible for residential to commercial land use changes ranging from profit maximisation motive of business operators, upward pressure on demand for commercial premises, upgrades of older buildings, as well as failure of the central business districts to contain the ever increasing economic activities; and these have consequential effect on housing delivery in numerous ways like escalating rental values of residential property, physical development challenges, land uses control challenges, housing deficits and mixed land uses (Lami & Umar, 2018; Gomna & Yusoff, 2016). It is on this background that the study seeks to analyse the drivers, trends and effects of land use changes; specifically

adjoining residential lots taken over by commercial uses; with a view to enhancing housing delivery in Bida town.

1.2 Statement of the Resaerch Problem

Since commercial land use sprawling into the adjoining residential neighbourhoods entails the conversions of existing residential vacant lots or buildings to commercial premises; the number of residential property been taken over by commercial/retail buildings are not equally replaced within the same neighbourhoods. This causes shortfall in the overall housing stock in a given urban area with such steady pattern of conversions (UN Habitat, 2007). The recent enumeration of housing stock expressed a serious concern over the high shortage of housing stock in medium density of residential neighbourhoods of Bida metropolis of which, a few available stock experiencing steady conversions for commercial uses (Enumeration Area Demarcation, 2018).

Sydney, (2012); opined that an urban centre experiencing rapid economic growth faces continuous changes in residential to commercial land uses and would consequently, results to decaying in the fabric of it housing neighbourhoods over time in diverse ways. So also, the spatial distribution of commercial activities in the adjoining residential areas could be traced to profit maximisation motives of the business operators as result of the easy accessibility in the residential neighbourhoods closer to the central districts. These scenarios demonstrate mixed land uses resulting to traffic congestion and slum formation in residential areas thereby, contributing to rapid decay in the residential infra structural systems.

Bida town in the last two decades has witnessed remarkable physical developments of which the Urban Development Boards saddled the with responsibilities of monitoring developments need to do so at regular intervals for sustainable urban environment (Lami & Umar, 2018). Though, the mandate of the Urban Development Boards in spreading wider awareness on the registration requirements and planning procedures for change of uses has being disregarded; thus, resulting to steady conversions of residential to commercial land uses without formalising the process for such changes. The illustration above represents the specific problem with land use change in Bida town that this study ought to address.

Therefore, it has been established that the general goal of analysing land use changes is centred majorly on "drivers, trends and effects". Several researches on land use changes in Nigerian cities mainly revealed its processes and causes of which none of the studies carried out, analyses the trends and effects of land use changes on housing delivery in Bida town; owing to the fact that the urban centre is witnessing continuous changes in land use over the years (Lami & Umar, 2018). Though, registration requirements for change of use have being less emphasised in the previous studies; as such no substantial efforts made at documenting the land use dynamics in Bida urban. Virtually also, the previous studies did not make any attempt at documenting the extent at which sprawling of commercial activities in the residential neighbourhoods contributes to housing deficit for the last two decades in the neighbourhoods of the study interest. Previous researches relating to this study made use of spatial analytical tool; geo-referencing the study areas in classifying land use types to ascertain the processes and causes of land use changes in urban centres. Whereas, none of these studies analysed

land use changes using statistical techniques like Statistical Mean Scores, Simple Percentages and Paired Sample t-Test to scientifically ascertain the factors, trends and effects that land uses outside the central business districts has on housing delivery; by a way of improving the quality of results and deductions made from data collected for this research work.

1.3 Aim and Objectives of the Study

The study is aim at analysing land use changes in Bida town (1998-2018); with a view to enhancing housing delivery.

In achieving this aim; the following objectives are set out to:

- (i) Examine factors responsible for commercial activities changing locations from the
- (ii) Central business districts to residential neighbourhoods of the study area.
- (iii) Assess the rate at which land use changes from residential to commercial uses in the study area between 1998-2018.
- (iv) Determine the effect of land use changes on housing delivery in Bida town.

1.4 Research Questions

This study intends to proffer answers to the following research questions:

- (i) Why are businesses changing locations from the central business districts to the residential neighbourhoods of Bida town?
- (ii) What is the rate at which commercial activities encroaches residential areas in Bida town (1998-2018)?
- (iii) How has the increasing land use changes in residential areas affect housing delivery in Bida town?

1.5 Justification for the Study

The increasing socio-economic activities are critical in changing the pattern of land uses in a given urban centre over time; and this is becoming a source of concern in the sense that, the progressive trends in urbanisation trigger land use changes (Enisan & Aluko, 2015; Yahaya & Ishiak, 2013). This study focused on the analysis of land use changes; with a view to enhancing housing delivery. There is therefore, the need to analyse the drivers of land use changes and informing the key players in urban land management on the effects of such changes. Undoubtedly, continuous changes in land use as against the planning regulations will results to rapid decaying in the infrastructural systems of the housing environment in ways that it allow for slum formation, congestion in traffic flows and physical development challenges due to undesired mix uses of land (Sydney, 2012).

Bida town has over the years experiencing population explosion with greater pressure on commercial land uses; thereby, attracting commercial activities away from the central business districts to residential areas in an unchecked manner. Therefore, reduces the available housing stock due disproportionate replacement of the residential property taken over by commercial uses within the same neighbourhoods (Ismaila & Husain, 2015).

Several studies however, were undertaken in order to analyse the rate at which land use changes in urban centres. For instance, Sydney (2012) carried out a study on the effects of residential to commercial land use changes on formal housing stock in Lusaka, Zambia and identified the principal factors responsible for residential lots being converted to commercial premises to include: failure of the central business district to

further contains the increasing business activities and raising demand for commercial land uses.

The study revealed that the main effect of this development is shortfall in the overall formal housing stock due to the influx of business activities into the residential areas of the city. Oluseyi (2006), in his study on an analysis of urban land use changes in Ibadan metropolis within the period of 1972 to 2003 revealed that the type of land use that is commonly prone to conversions is residential buildings changing to commercial premises which mostly occurs within the transition zone of the urban centre. Egbenta (2009), conducted a research on the factors responsible for residential land use changes in Enugu metropolitan areas from 1998 to 2008; and find out that profit maximization motive, increasing demand for commercial premises, demolition of older buildings and inefficiencies in the planning regulations were top most drivers of land use changes in the metropolis. Adebayo (2009), analyse the impact of land use change on property values in Victoria Island of Lagos metropolis with the aid of questionnaires administered randomly to the selected respondents in the study area.

The data obtained were presented and analysed with the use of simple descriptive statistics. The findings shows that there were enormous changes in land use from residential to commercial uses which led to corresponding variation in property rental values in the neighborhoods. Whereas, questionnaires were administered by the previous studies to analyse the effect of land use changes in urban centres; seeking the respondents' opinions by adopting spatial analytical techniques only; none of these studies analyse land use changes using descriptive and inferential techniques like Simple Percentages,

Coefficient of Variation, Statistical Mean Score, Paired Sampled t-Test to scientifically ascertain the drivers, trends and effects of land use changes; in measuring the degree of changes between residential and commercial land uses over time.

Virtually also, no attempt has been made at documenting the changes in residential land use for the last two decades in Bida town by the previous researchers. In order to complement the inputs of the past researchers in this area of study; more scientific and statistical approaches are employed to establish whether the sprawling of commercial activities in the residential neighbourhoods contributes to housing deficit. This study therefore hopes to serve as a basis that predicts future likelihood changes in land use for further research studies on the related topic.

The findings of this study will enlighten reader on the drivers, trends and effects of land use changes and how it affects housing delivery over the years. Property owners/users will adequately be informed on the indices responsible for commercial activities extending on the residential areas, thereby broaden their awareness on the rate at which business activities sprawling into residential neighbourhoods of the study area. It will also spread the needed awareness on the consequences of business cycles, as demand for new buildings is highly sensitive to short-term output changes. The result of this work will be useful to urban planners in tackling inefficiencies of land use regulations which in recent time has resulted grossly to land users not adhering to planning regulations. In this regard, the Urban Development Boards will be guided on the need for a well-articulated planning brief that specifies commercial land use requirements and registration procedures for change of land uses in Bida town; and forestalling the

negative effects of land use changes on housing delivery. Also, the urban land managers, particularly Estate Surveyors and Valuers will get a better understanding of the dynamics of land use changes as it affects housing stock (Sydney, 2012). Therefore, getting adequate information on the drivers, trends and effects of residential to commercial land use changes.

1.6 The Scope of the Study

This study focus on the analysis of land use changes; with a view to examining its effect on housing delivery in Bida urban. Specific considerations were given to the fringe of the central business districts where steady conversions in residential to commercial uses take place; like Cenema-Mokwala which is marked as the high density area, Esso-BCC Avenue as a medium density neighbourhood while having Gbangbara-Texaco district as the low density residential neighbourhood. A study of this nature require reasonable time frame to source for relevant data for analysis. The span of twenty years is an ample period in analysing land use changes as observed from the past studies. As such analysis for this study cover between years 1998 to 2018.

1.7 The Study Area

1.7.1 Geographical Location

Bida town is located in the South-West of Niger State, Nigeria which lies at the southwest of Minna, the State capital on the A124 highway (a regional road) linking Ilorin to Minna and Abuja. The urban centre has an area of 1.698km² and a population of 266,008 (National Population Census, 2006) with 9°05'N, 6°01'E, 9.083°N, 6.017°E, Coordinates.

Bida is a dry arid town being marked the second largest urban centre in the State; with Nupe being the predominant tribe. Bida is the headquarters of the Nupe Kingdom consisting the following districts, such as Katcha, Lapai, Mokwa, Pategi, Lemu, Enagi, Badeggi, Agaie, Kutigi and other towns. The people of Bida town are also known for its Durbar festival and in the production of glass and brassware. The town contains also Institutions like The Federal Polytechnic Bida, Federal Medical Centre Bida and National Palm Oil Research Institute (Max Lock, 1980).

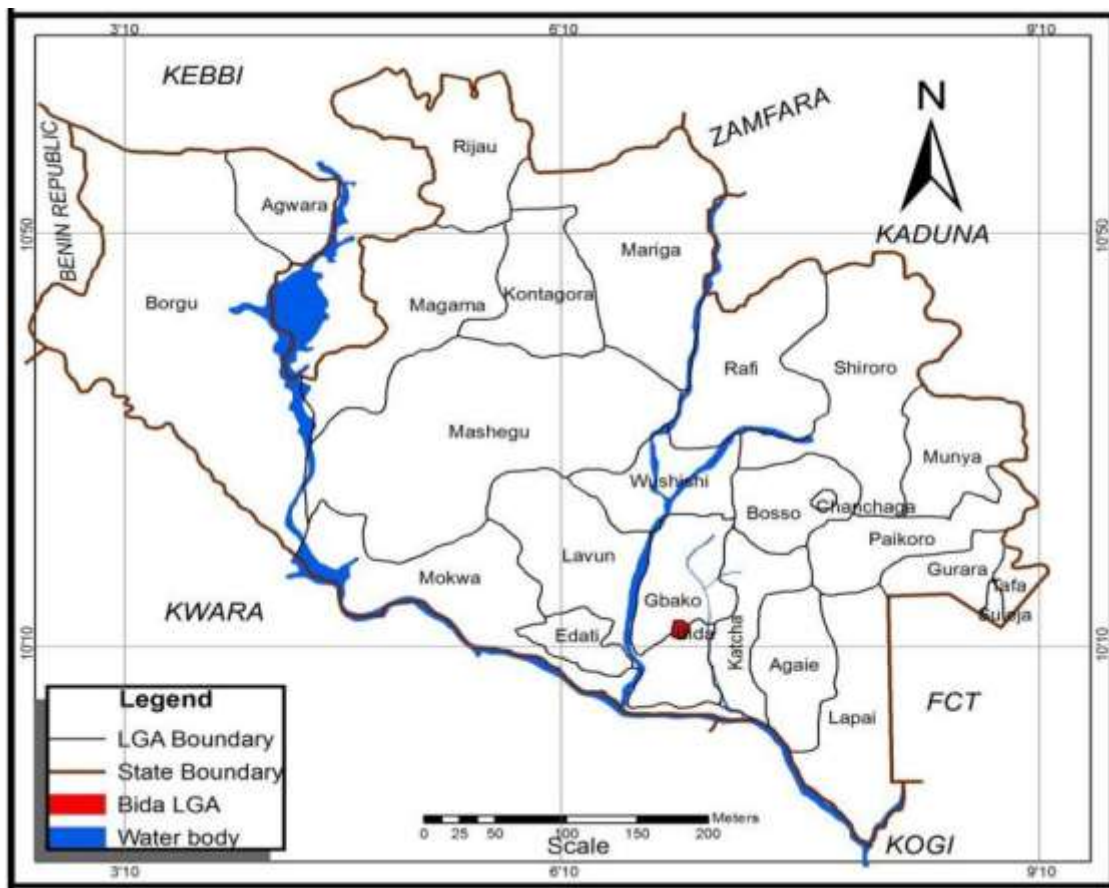


Figure 1.1: Niger State Showing the Study Area

Source: Niger State Ministry of Lands and Housing, 2018.

1.7.2 Climate

Bida town lies in the middle belt of Nigeria, Bida experiences a unique dry and wet seasons. The wet season last for 210days annually, beginning from April to October; with an average annual rainfall of 122.7mm having July and September recording highest rainfall between 226mm to 300mm and 240mm to 350mm respectively (Max Lock, 1980).

The cold harmattan wind ushers in the dry season, which becomes hottest between March and April, just before the set in of another season. The monthly temperature is highest in March and is about 37.1^oc. Bida though hot, is blessed with moderate climatic conditions almost throughout the year. As a result of the climate being the tropical in nature, the sunshine duration ranges between eight – ten hours a day and ranging from about 30^oc - 37.0^oc annually with the highest temperature recorded in the month of march. However, the marked increase in cloud cover during the months of July, august and September makes the hours of sunshine per day, drop sharply to an average of about four hours (Max Lock, 1980).

The normal onset of the rains is from about the middle of March. The end of the rainy season is around the middle of October to early November. Consequently, the duration of the rainy season varies from about 190 days to 240 days amounting to annual mean rainfall approximately 1,650mm per annum. About 60 percent of the annual rains fall during the months of July to September (Ishaya & Maisamari, 2008). The beginning and the end of the season is characterized by frequent occurrences of squall lines. This is a weather condition that is heralded by the occurrence of Cumulus-nimbus cloud. It is

accompanied by thunder and lightning, followed by strong winds and rainfall of very high intensity (Max Lock, 1980).

Another feature of the rainfall is its mean monthly distribution. There is a very high concentration of rainfall in the mid-year months during which about 57 percent of the annual rainfall is recorded. The feature also shows a sharp drop in the total amount received immediately following the three month period of very high concentration (Max Lock, 1980).

The humidity of the town rises everywhere during the rainy season and falls inseparably during the dry season within the town. In the afternoon relative humidity of the town cloud rise above 60 percent during the rainy season and fall to as 30 percent during the dry season (Max Lock, 1980).



Figure 1.2: Bida Showing Districts

Source: Niger State Ministry of Lands and Housing, (2019)

1.7.3 Relief and Drainage

Valleys and hills are common features of this settlement occurring some three to four kilometres west of the present developed areas. Occasional small steep hills rise 20m to 25m above sea level and the drained gutter slopping between the valleys. Most gradient are around 1:40 part of mesas and along the edge of the valleys north and south of the City. The southern valley does not adequately flows to the west as the river Gbako forms a barrier and the whole area between the valley and the hill measures some 100sqkms. The TowL;P9On is drained by landzu streams which flows across the heart of the Town with its other seasonal tributaries that are today guily routes (Max Lock, 1980).

1.7.4 Vegetation and Soil

The urban area lies in the basement complex and the Nupe sandstone formation. The basement complex is made of coarse sands or clays, surf stones and the soil with thick sandstone and the larger portions consisting of the undulating plains with very deep soils. Most soil were classified as ferisols that normally occupy the higher elevation of the terrain and a lower levels. Soils in dispositional areas are weakly developed ashruns or hydromorphic soil (Max Lock, 1980).

Bida is in the vegetarial region of Guinea savannah. The region is characterised majorly by grass land with trees and shrubs scattered all over the green space. The increase human activities have altered the natural vegetation in some parts of the City. Most grown trees in the area include parkia Filhu (Golden locus bean trees), Mangifera indica (mangoes, Azadirata indica (neem tree) and shear butter tree among others (Max Lock,

1980). The dominant soil types found in Bida include combisols and to some extent lithosol in the upper slopes of the interfluves of Bida and luvisols are the major soil type found on the foot slope plains (American Planning Association, 1916). The luvisols are product of down wash from the hills and they form on these foot plains, that is, the soil is merged with interfluves comprising the natural landscape that are continually been eroded by streams and sheet-wash from the hills. The character of this soil type varies as between upper, middle and lower slopes (Max Lock, 1980).

Riparian vegetation complex is the type of forest found in Bida and it consists of a complex of varying floristic composition and physiognomy. Consequently, there are units in the complex that can be characterized as high forest, while others are no more than woodland and thickets (Max Lock, 1980). Riparian complex that can be described as thickets and woodlands are relatively of lows stature. Furthermore, a few tall elements may be found as emergent, with vegetation crowns above the continuous „roof of the thickets or woodlands (Max Lock, 1980). Savanna woodlands are another type of vegetation found around Bida. They are the most luxuriant and are fire tolerant. They include ground vegetation dominated by grasses and also a continuous canopy, the trunk becomes more prominent and a large number of shrubs however exist between the trunks and also grasses are dominant on the floor in herb layer in which other important herbs are found within the housing areas of the city (Bruin *et al.*, 2000).

1.7.5 Land Use and Human Activities in Bida Urban

The built up area of Bida as at late 2017 was over 3.170 hectares (Town planning office, Bida) .Figure 1.3 show different land uses in the Metropolitan areas.

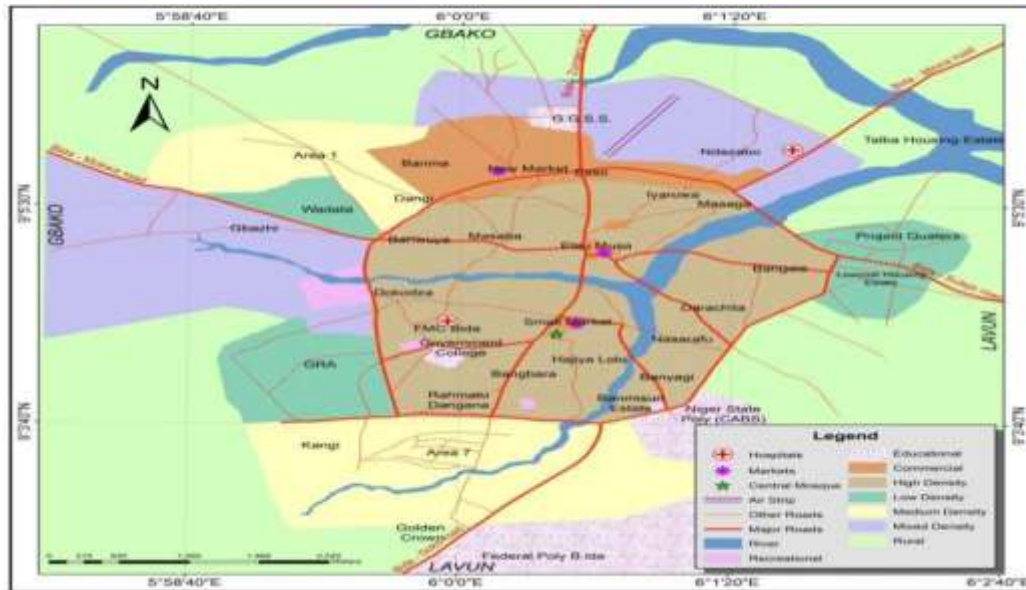


Figure 1.3: Bida Showing Land uses

Source: Niger State Ministry of Lands and Housing, (2015).

About 50 percent of the built areas can be found within the high density of the city which lies in the circumference of the traditional walls. In the recent time, the urban area expands outwardly due to population growth. However, there are two major patterns of informal sector activities in the settlement; these are agricultural activities (farming, hunting & livestock rearing). While commercial activities include trading and manufacturing. The survey conducted indicates that fuel-wood is the main stay of rural energy supply and this has been on the increase as a result of growth in population and the high cost of alternative sources of energy hence increasing emission through deforestation and thereby worsening the impact of climate changes.

CHAPTER TWO

2.0

LITERATURE REVIEW

2.1 Conceptual Review for the Study

Considering the laudable effect of land use changes particularly, residential to commercial land use change on Nigerian economy as a whole, which may be favorable or unfavorable. Favorable effect is when the changes of residential land use to commercial uses tend to raises suitably land/property values within the residential neighbourhoods in which such changes occur (Tomisi, *et al.*, 2016). While the unfavourable effect of residential to commercial land use changes will include traffic congestion in the residential areas and consequently reduces housing stock (Sydney, 2012).

The overall factors responsible for changes in urban land uses were obtained from selected relevant literatures on land use changes across the Nigerian cities and the globe. It is pertinent to express that, literature on urban land use changes especially residential land use change are not substantially available in Nigeria. This hence, prompts the researcher to analyse the several studies that have been carried out on land use changes on a global perspective. This section however, considers a logical way of conceptualizing the chain effect of man's actions on urban land use (Wang, *et al.*, (2012). Thereby adapts from the Drivers - Trends - effects of residential to commercial land use changes on the basis that residential property is a component of property market which play significant roles in a nation's economic development (European Environmental Agency, 2006).

The conceptual framework of this study is mainly based on land use changes; factors responsible for changes in land uses and its attendant effect on housing delivery within the fringe of Central Business Districts. The conceptual review is diagrammatically represented in Figure 2.1 below:

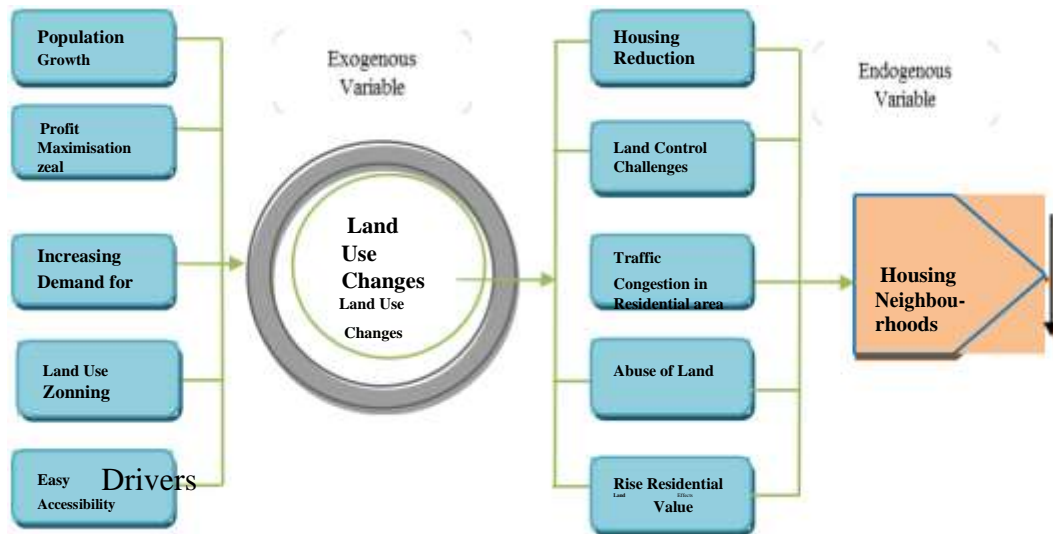


Figure 2.1: The Conceptual Review for the Study.

(Adapted from Raharjo, 2005; Egbenta, 2009; Asamoah, 2010; Sydney, 2012; Tomisi *et al.*, 2016; and Gomna *et al.*, 2016).

2.1.1 Negative Effect of Residential to Commercial Land Use Changes on Housing Stock

The study firstly, adopts the conceptual review by Raharjo, (2005); Egbenta, (2009); Asamoah, (2010); Sydney, (2012); and Tomisi *et al.*, (2016). In their studies, it was submitted that the drivers responsible for commercial land use taken over residential premises are mainly urban population growth; Failure of the Central Business Districts to contain further economic activities; The unplanned expansion of urban area; intra-17

urban migration effects; Profit maximization motive; Infrastructural amenities; Increase demand for commercial activities; Changes in taste and fashion; Accessibility; Safety and security; and Land use control measures. Their combined research findings indicate that land use succession, residential to commercial land use in particular has the propensity in resulting into mixed land uses which significantly contravenes land use control measures, the most noticeable effect are increase in residential properties rental values and reduction in formal housing stock (UN Habitat, 2007). Several other negative effects could be: traffic congestion, over stretching of infrastructural facilities and neighborhood pollution (Adebayo, 2009).

2.1.2 The Relationship between Land Use Changes and Housing Stock

Secondly, the philosophy of this study dwells on demand and supply forces; emphasising that drivers of land use changes are between those that have a long-run effect and those that affect short term dynamics. Nigel & Williams (2009), illustrate the important inter relationship that exists between land use change and housing shortage; explaining that when the total quantity of housing stock in an urban area remain constant, and that there is a boom in the overall economy, the demand for housing would increase; and consequently push upward the price/rental values of residential properties. Land users in the low and middle income class who cannot afford the rising prices move away from this transition zone and end up in squatter settlements. From this instance, it would be seen that commercial land use encroachments does not equally made available residential properties taken up within the same neighborhood; this results to shortfall in the overall housing stock in a given urban areas (UN Habitat, 2007).

2.2 Concept of Land

Land is meant as not just the surface of the earth but entirely of the materials and forces bestowed by nature freely as man's life requirements such as water, air including in heat and light (Gomna *et al.*, 2016). Land is a platform of all man's activities to include economic, social and spiritual. Wong (2006), submits that land is the focal point of human engagements upon which food, water, air and other resources are found for life continuity. Kuye, (2016), subsumed that concept of Land appears different things to different individuals depending upon their ideology, outlook, experience, interest and their endeavours. They further express the concept as thus: Layman; Views Land as the physical structure on which he stands moves and carries out his daily activities. Land from the perspectives of an Agrarian; is the soil on which trees, crops, grasses and vegetation's grows. The Legal view point, Land entails the quantum of rights and privileges which are excisable on the over the physical structure.

Geoinformative and mapping Surveyors, looks at Land as a geometrically measurable space of the earth cross. Accountants in the finance sector always view Land as the fixed and taxable assets on which revenue could be accrued and expended. Economist point of view; Land is the tradable commodity on which production and distribution of wealth are possible. Land is seen from the angle of Estate surveyors and Valuers; as the totality of man-made and natural resources on, above and beneath the earth surface in which bundle of rights and privileges are exercised. This opinion is confirmed with as the most professionally acceptable meaning of Land and even aligned with that of "Property and Conveyancy Law" that defines Land as the earth

surface and everything attached to the earth otherwise known as Fixtures and all chattels. Land is the source of all material wealth and is a resource without which life on earth cannot be sustained (Wyatt & Subedi, 2013).

Generally, land provides everything that man uses or values, whether it is food, clothing, fuel, shelter, metal, or precious stones. We live on the land and from the land, and to the land our bodies or our ashes are committed when we die. The availability of land is the key to human existence, and its distribution and use are of vital importance (Adeniyi, 2012). Land occupies a cardinal place in the existence and progression of humans (Birner & Okumo, (2012). Land and its resources have been used to provide for human physical, social, cultural and spiritual needs since human species first appeared on earth. They have utilised land for the growing of food, clothing, building of shelter, and heat; for making a vast assortment of goods and services; for traveling around and conveying goods; for recreational activities; for creative delights; for securing social status and reputation; for spiritual gratification; and for asserting territorial authority (Birner & Okumo, (2012).

Land differs from other resources in fundamental respects. It is fixed in place and cannot be relocated or exported. Secondly, it is extremely heterogeneous in that its price varies dramatically in location and quality. Thirdly, control over land is indispensable to almost all human activity and efforts to control it are woven together with almost everything that people do. Fourthly, land is commonly rented and is not consumed through use in the way that other resources are as its demand is a derived one. Lastly,

land differs from other resources as a result of the power and depth of the attachments people feel to it (Hilber & Robert-Nicoud, 2013).

2.3 Land Use

Land use is the basis of man's activities, from it food, shelter, space and room to relax are obtained (Birner & Okumo, (2012). Land use is any man's activity on space. Land use has being viewed as accommodation in terms of space of human activities on the earth surface and the manner in which it could be adopted to serve man's desires (Hegazy & Kaloop, 2015). The use of land encompasses all the numerous uses in which land enable man to with his needs which may be for purposes of Shelter; Trade, Commerce and Industry; Agriculture and Leisure; And road network development (Ningal, *et al.*, 2008)). The fixity in supply nature of land as a whole poses trouble in the flexibility of uses to respond rapidly to effective demand trend in the property market (Raharjo, 2005).

The concept involves modification of natural environment in to built environment by a way of integrating human activities aimed at harnessing services provided by terrestrial ecosystem (Lambin, *et al.*, 2007). The practical expression of economic, cultural, political and technological factors shaping the utilisation of land in urban centres connotes urban land use (Oluseyi, 2006). Usually, urban land is used for diverse purposes but the most common types of uses comprise residential, commercial, industrial, recreational, transportation and special land uses. The extent of the space strewn with different land uses is influenced by several factors such as socio-economic, physical, environmental, technical infrastructure, government policies and regulations (Adebayo, 2009). While land use pattern is the end product of the spatial arrangement

and distribution of individual land-uses within a given geographical area (Evert *et al.*, 2010).

2.3.1 Land Use Determinants

Chapin (2005), established that the determinants of land use can be viewed from two perspectives. They are the economic determinants of land use and the socially rooted determinants of land use. Economic determinants are characterised by the forces of demand and supply. Land is pressed into use by the existence of value as established by the alternatives of land development, and the use of a particular parcel is finally determined in the operations of market forces by the price paid and the decision as to what alternative will yield the highest return (highest and best use). While, the socially rooted determinants of land use can further be discussed as “ecological processes” together with their physical elements and “organisational processes” together also with their social structural elements. The primary and broadest basic process that describes the evolution and development of urban areas in time and space constitutes aggregation (Chapin, 2005).

Ericksen (2007) has identified the most important localised sub-processes of aggregation as:

- (i) Concentration and dispersion of services and populations.
- (ii) Centralisation and decentralisation.
- (iii) Segregation of populations into various distinctive areas.
- (iv) Dominance and the gradient of receding dominance in the successively more peripheral subareas of the city.

(v) and invasion of areas by groups, giving rise to succession of one group by another. Lichfield (1979), further describes factors determining urban land use to include: social, cultural and economic factors. The other factors are infrastructure, environment and institutions. Social factors that influence land use include population, migration, neighbourhood attribute, esteem, taste, and security and safety. Land accessibility and location, scarcity issues, supply and demand, agglomeration economies, nature and intensity of use, anticipated returns, and alternative competitive uses are in the economic category. Cultural factors comprise local traditions, religion and ethnic origins. Under the environmental factors affecting land use, nature of the environment, soil, topography and relief, climate, drainage and vegetation are listed. The quantum of infrastructural facilities available in a place is high-priority to urban land use structure (Lichfield, 1979). Access roads, electricity, water supply, functional drainage systems and telecommunications are instrumental to land use determination (Oduwaye, 2013).

Prominent among the institutional factors influencing the use of land is urban planning regulations with its instruments such as the comprehensive plans, master plans, zoning regulations, building codes, subdivision regulations, eminent domain, planned unit developments (PUDs), development control, land title and tenure (Ling & Archer, 2013). Other institutional factors are native customs and traditions, historical aspects, laws, and other conventions of human society (Oduwaye, 2013). The factors determining the pattern of land uses as submitted by Kuye (2009) are accessibility (distance and time coupled with the cost of transporting people, goods and services);

complementarity (firms and residences utilising comparative locational advantages leading to land use intensity); and the consideration of land's highest and best use.

2.3.2 Land Use Decisions

The location decisions of firms, households and local authorities principally determine the urban land use pattern. Firms occupying space for offices, retail shops and factories have on occasions to decide whether expand, or move, or to redevelop the existing site. More so, the emergence of new firms requiring a site within a particular urban zone, Similarly, households decide where to reside, and by implication if the city land users tend to concentrate in a particular zone of land use (say suburbs), the locational equilibrium will not be achieved hence everyone will have an incentive to move to a more desirable location, thereby affecting the pattern of urban land use. In the same direction, government authorities could also influence land use and control of development through taxation, police power and eminent domain in formulating overall land use and transport policy (Gomna, 2014).

2.3.3 Land Use Decision Parameters

The essentiality of rational land use decision is to aid firms achieving maximum profit, while households maximise utility. Johnbosco & Nnaji (2011) highlighted certain decision parameters that require to be adopted by both private and a given public authority in equitable distribution of resources; as thus:

The resources are allocated either on the basis of price mechanism or cost-benefit analysis for developmental projects.

- (i) The incentive of firms and households to settle in desirable locations should reflect their ability to pay the price/rent for the use of land;
- (ii) Land owners sell/let to the highest bidder;
- (iii) The buyers and sellers should have adequate knowledge of the market to provide for competition;
- (iv) There are no changes in the transport network system and cost;
- (v) Finally, there is little or no government interference in the market operations.

2.4 Commercial Land Use

Commercial real estate comprises the tangible assets affixed to land with the sole aim of investment for capital grows in form of profit or returns (Hamza, 2014). Abdusalam (2007), refers to commercial property/land as class of real estate basically designed for investment purpose. Commercial land use has being regarded as premises utilised for trading activities to includes hotels, shops, petrol stations, departmental stores, offices and warehouses designed, built and operated for profit realising purpose either through production of goods and/or provision of services in form of wholesale or retail outlets (Ogunsola, 2014). Poola (2007); expressed in the same vein as space put in for business activities to include petro filling station, shops, show rooms, hotels, offices and other buildings or premises built and operated for investment purpose. Commercial land use is a parcel lot which intend of use is either for retail or wholesale services (Online Business Dictionary, 2010).

2.4.1 Forms of Commercial Land Uses

2.4.1.1 Shops; Shops includes market shops, retail shops, workshops for the purpose of carrying out business activities (Ogunsola, 2012). He further classified shops into:

(i) Comparative Shop; these are business premises with products of long span which are made at random interims of materials for purchase, quality of products, price and marketing style for choice making.

(ii) Convenience Shop; these are residential outlets that whose product are readily available on regular intervals for the patrons.

2.4.1.2 Offices; Hamza (2014), refers to office as buildings specially constructed and designed for administrative functions, businesses and services delivery.

2.4.1.3 Shopping Malls; These are shopping centres with enclosed pedestrian hall.

2.4.1.4 Market Stalls; this is a structure or open business premises on which products or services are bought or sold.

2.4.2 Commercial Land Development

Commercial real estate development is viewed as a business activity seek to profitably supply new property to the space market at a value greater than the production costs (Brent *et al*, 2008). The concept was further expressed as an investment window that provides a feedback mechanism that entails cash flows in the space market, which influences property values in the determination of new property added to the space market. Commercial real estate development is a linear process that begins with an idea of creating a business asset and ends with stabilised business activity (McMahan, 2007).

Wilkinson & Reed (2014); affirmed activities that involves building materials, infrastructural services, man power, finance, legality and professional services for the purpose of intensifying or changing the use of land in producing new buildings for business use entails commercial property development.

2.5 Concept of Housing

Housing has being described as the process of supplying functional shelter in a well-serviced built neighbourhood environment supported by proactive maintenance culture for day to day living and circulation of the inhabitants (National Housing Policy, 1991). The document further describes housing as being more than mere shelter since it encompasses every other services and facilities that comfort it a habitable environment. Bartlett (1997); Bruin & Corrine (2000); viewed housing as a cogent determinant of quality living that can be measurable at individualist and societal level. Housing is the sum-total of the surrounding environment in which man and his family live, grow and decline (Agbola, 2005). Housing is seen as a social tool use to indicate a nation's political prestige and economic power (Agbola & Olatubara, 2003). Housing constitutes certain potential functional roles such as: social good that provide shelter together with neighbourhood required services; investment good that constitutes value accruable asset (Miller, 2001).

It can be deduced from these assertions that, housing is a process of providing accommodation on a permanent basis; together with infrastructural services in a decently habitable neighbourhood in order to facilitate the basic requirements of it immediately inhabitants.

2.5.1 Formal Housing

Formal housing stock is viewed in the form of an individual residence; comprising cluster of buildings on a designated site provided with adequate infrastructural services, in a mapped, decent, safe, secure and sanitary neighbourhood for habitation of the respective occupants (Kuye, 2016). Nicol, (2002), describes formal housing as a sub product of the residential propertiesmarket where by the prospective households interface in their quest for a well serviced neighborhood environment. Rakodi & Clement, (2009), refers to Formal housing as residential property units in a particular settlements designated for human habitation, whereby basic amenities such as water, roads, telephone lines , market stalls are adequately provided to the inhabitants by the local authority. They further ascribed the concept to include residential properties which are made of permanent building materials. On the other hand, any low-income self-help housing units, basically located on the city's peripheral which does not merit planning approval is regarded as informal housing stock (Rakodi eta al, 2009).

It is therefore, apparently noticed that formal housing stock is much desirable than informal residential units, in the sense that it provides an ideal neighbourhood attributes (Sydney, 2012). Chileshe (2003), asserts that adequacy of the infrastructural facilities in the formal settlement make it attractive for residential properties steadily being converted to commercial premises. On the fact that in a growing city like Bida experiencing a deficit in residential property units due to increasing demand for

commercial uses households in the fringe of central district tend to convert land use from residential to commercial (Ismaila *et al.*, 2014).

Different Policies and user solutions that are abound for the purpose of reducing quantitative housing deficiency. It could be possible to solve the problem if housing were used only for shelter needs. However, in addition to serving as a shelter, housing is also a produced commodity, consumer good, assurance for families, means used for reproducing social relations and an investment tool protecting the value of money against inflation. Moreover, it is important that house is a building block in its relations with its environment, mutual interaction and increasing the quality of its environment when it is considered as part of the city. In this context, it can be accepted that a large housing stock is available today as a result of new presentation forms and production processes with a high volume of housing production. However, the existence of this stock shows that the housing policies are planned depending mostly on production (Okupe 2002).

2.5.2 Formal Housing Market

Housing market as being viewed as an institution which facilitates the willingness in exchange of formal or informal residential properties related commodities (Nicol, 2002). Rakodi & Clement (2009), further clarifies the formal and informal housing concepts; regarding formal housing as those settlements which are provided with basic services such as water supply, road networks, telecommunications, residential markets made available to the inhabitants by the constituted authority. Formal residential properties

include housing units which are made of permanent materials (Sydney, 2012). Informal housing on the other hand are self-help residential settlements which does not passed the government authorisation processes (Rakodi *et al.* 2009). Informal settlements are characterised by low-income self-help residential property units, within the periurban. Chileshe (2003), further observed that in an urbanised city with a shortfall in housing stock, a rise in the level of demand for commercial land use will occurred as a result of households converting residential apartments or land areas.

Nicol (2002), expressed that the formal housing market is exists as a collection of various submarkets, disaggregated in terms of tenure, house type and geographical location. The housing stock types available on the formal housing market include; detached, semi-detached, terraced, flat or maisonette, and bungalow type of houses. Most of them have different tenure systems and all these categorizations may be further separated through the addition of the age of the dwelling and the size of the property (Nicol, 2002).

The amenities already mentioned and the distance from the Central Business Districts are also important determinants of the value a house attracts on the market. The types housing stock available in the formal housing market, could be noticed of similarity/homogeneity to those of the commercial stock type and could be easily converted into commercial premises. When demand for commercial use becomes too high, enterprises (businesses) would prefer to pounce on already existing residential structures and turn them into commercial centers, rather than building new ones (Chileshe, 2003).

2.5.3 Housing Delivery Approaches

Housing delivery system in Nigeria is provided through the public or Private sector (Olusola, 2014). However, several approaches are strategized in achieving affordable housing delivery in Nigerian urban centres as thus:

2.5.3.1 Affordable Housing Scheme

Jibril (2009), argued that most housing stocks in Nigerian cities are grossly devoid of qualitative and quantitative supply of which desires of the immediate inhabitants cannot be fully met. On this vein, Government at various levels put in several efforts in achieving decent accommodation for all through funding by the relevant public authorities or in partnership with the private bodies scheme. As such tremendous efforts were further supported with the private finance initiative.

2.5.3.2 Site and Services Scheme

Essentially, The World Bank (2000), pushed for the adoption of new approach to urban housing and basically incorporates two packages which received popular acceptance by the governments of the developing countries such were „site and services scheme, and upgrading scheme. The first catered for low-income as beneficiaries with serviced residential lands including tenure security that enable them to build and own homes; the second approach helped residential property owners living in squatter settlements to obtains tenure to their residential plots by improving their dwelling environments. In spite of the fact that governmental efforts to salvage the urban poor habitations, the programme is capital intensive in nature and the target population of the low income group are usually do not represent a reasonable percentage of the beneficiaries (Igbinoba & Aluko, 2002).

2.6 Land Use Changes

The results of complexity in the interplay between man and his immediate surroundings, connote land use changes. Land use changes generally, has been referred as any use or development that is dissimilar to the use initially approved by the planning authority (Ogungbemi, 2012). Change of land use as being viewed as when building/parcel land is converted into a new use type which requires modification to certain elements in order it compliment other proximate uses (The Great Britain Building Act, 2004).

Harvey (2004), argues that change in use from residential to commercial uses can be profitable and enhances the individual land owners' economic base. He stresses that physical conversion of residential building to commercial property as an event in which property owner(s) create a change in the real estate so that the rental values can possibly be enhanced. Harvey & Jowsey, (2004), added that urban land use pattern is bound to experience continuous modifications through changes in population, household income, infrastructural development, civil societies and public policy framework. He further explains that as the cumulative impacts of the aforementioned land use change drivers will lead to activities such as space adjustment, converting type of use, demolition and reconstruction, development on vacant lot, development, in the peri-urban, intensive development in the residential area.

Gomna *et al.*, (2016), refers to Land use changes as class of purposes which entails change in the function which a particular real estate is initially designed to perform to generates direct impact to neighborhood. The alteration of residential land use to

commercial uses is land use change (Tilumanywa, 2013). A particular land use can be changed into commercial use one just as land can be changed from a farmland to residential use and then later converted for commercial purposes (Ogungbemi, 2012). Specifically, residential to commercial land use changes occur when a particular land is changed from the use that was initially allocated for dwelling to a business premise, due to factors like increasing demand for commercial space, accessibility, highest and best use and other factors that incorporates urbanisation in its entirety (Ademola, 2012).

Sedney (2012), noted that when a material use change occurs, the parcel/building, or affected portion/part of it, requires to be refurbished to satisfy certain important parts of the building structure or neighborhood as the case may be. Change in use, is the use of land or buildings which is different from that for which the land or building was originally zoned and mapped for (Ogungbemi, 2012). Commercial land use change being a common phenomenon in urban morphology has being subsumed by the Ealing Council of Great Britain (2000), as a change in the purpose in which a property is utilised, so that after such conversion the building structure or part of it is:

- (i) Commercial use that is contrary to the previous uses;
- (ii) (ii) Contains a building structure, where previously it did not, or a building design is altered so that there are more or less of it kind than existed previously;
- (iii) Use as a shop or office for commercial purposes, where previously used as a room for a residential purpose.

2.7 Land Use Change Detection

Singh (1999), refers to change detections as the process of identifying variations in spatial distribution through interval observations. He

further expressed it as a 33

monitoring technique in managing the space of development in an urban area. Change detection is viewed as a process that entails identification of contrasts in the state of an object by observing it at different intervals (Mejabi 2008). This involves the ability to quantify temporal alteration and transformation using multi-temporal data sets. In general, change detection involves the application of multi-temporal data sets to quantitatively analyses the temporal effects of the object or phenomenon. Olaleye, Abiodun & Igbokwe (2009) assert that change dictation involves the application of time series satellite imageries and orthohoto maps of the study area, from land use maps can visually be generated through image processing.

Macleod (2008), outlined four important aspects of change detection as thus:

- (i) Detecting land use changes that have occurred over time.
- (ii) Identifying the pattern of land use changes.
- (iii) Measuring the extent at which land use changes has taken place over time.
- (iv) Assessing the pattern of spatial distribution. The rationales in employing remote sensing data for change detections are that land use changes resulting in variation in radiance values which can be accurately be monitored and remotely sensed from stations.

2.8 Factors Influencing Land Use Changes

Several studies have emphasised on discovering the factors determining urban development patterns considering the scale, rate and effect of land use changes (Song, 2015). Succession lands use models was adopted to investigate the determinants of land use dynamics in urban centres across the globe (Ke, Song & He, 2009). Conceptual reviews harmonised six basic factors that influences land use change like any other

factors such as: profit maximisation motive of commercial space users, easy accessibility in zones outside the central business districts, pollution growth, government policies on land uses, increasing demand for commercial space and change in location preference.

These drivers of land use changes are enormous, complex and intertwining (Rowcroft, 2005). More so, these driving forces differ and operate among specific measures ranging from rural resources management and uses to urban scheme and/or global perspectives (Antrop, 2006). Consideration of the wider literature on drivers of land use changes, economic improvement, cultural, natural scientific and technological factors as well as public policies and globalisation are the usually recognised responsible drivers of land use changes (Ramankutty *et al.*, 2002; Lambin *et al.*, 2003; Bürgi *et al.*, 2004; Ninal *et al.*, 2008).

Other factors responsible for land use changes that are peculiar to Nigerian cities of which the study area for this research work cannot be undermined. Factors like profit maximising motive of business operators as well as failure of the central districts to contain the increasing economic activities. Furthermore, empirical analyses of urban areas across the world confirm the theoretical derivations as thus: For the United States urban areas, the population and economic growth as significant effects on the size of urbanised areas; the operation of zoning regulations determines significantly the pattern of urban spatial scale (Song, 2015). Liu (2010) offered a summary of factors influencing land use changes from residential to commercial uses. The factors include demographic

density; accessibility; returns on land use; social norms; land use regulations and technological development.

2.8.1 The Influence of Population on Land Use Changes

It has been established by previous research works that there is a significantly favourable relationship between the level of population and land use changes (Tilumanywa, 2013). The current world population figure is around 7.2 billion and it has been projected to run at 9.6 billion by the year 2050 (United Nations, 2013). Most of this growth is projected to come from developing countries like Nigeria. The developing nations presently account for 95% of the growth in population with Africa as the globe's fastest growing continent.

The sheer population growth implies an extension of agricultural land and of agricultural land use intensification to meet rising food demand (Tilumanywa, 2013). The population growth also increases the demand for commercial premises and housing; this consequently has impact on the types and quantum of commercial property development in urban centres (Song, 2015). The magnitude of economic activities can exert a greater influence on the number and character of the local population which could result to changes in land uses (Wilson & Song, 2011).

2.8.2 Influence of Intra-Urban Migration on Land Use Changes

Land economists, sociologists and ecologists have in their several studies shown concerns in the intricacies of intra-urban migration and how it influences land use changes over the years. Economists have made assumptions that business operators at their own accords in deciding where to locate considering possibilities of attaining 36

maximum profit, easy accessibility, availability of infrastructural facilities and other business supporting goods (Li & Tu, 2011). Brown & Moore (2000), discovered certain factors influencing the choice of business location. These include transportation cost and proximity to consumers; rental values of business premises, spatial configuration, size of premises, design and state of repair and number and layout of shops among others.

The implications of intra-city migration are vital in the understanding of the nature of changes in the spatial distribution of the urban space. The cardinal actor responsible for variations in the composition of an area within a city is basically the intra-city mobility. Movement of population trigger changes in the magnitude of commercial properties development and demand (Li & Tu, 2011). Cho *et al.*, (2008) explored how population change affects spatial distribution of commercial land uses and they identified that accessibility, proximity to patrons neighbourhoods and infrastructural facilities, are xongent determinants of location decisions of commercial land uses and thus brings a higher level of profitability to business operators. It was submitted that, subject to factors such as affordability and availability of suitable rental values of commercial properties, classification of businesses and their operational modes played a significant role in influencing business location choice and subsequent investment relocation. Several factors are attributable to intra-city migration in one geographical region may differ in other regions. Additionally, business operators in developing countries have their own peculiar reasons for changing their investments from one location to the other within a given city (Ajibuah, 2010).

2.8.3 Influence of Security Facilities on Land Use Changes

Crime rates have been one of the causative factor responsible for urban unrest and suburbanisation (Ellen & O'Regan 2010). It is a common phenomenon in the habits of commercial land users to pay high price for land in a crime free neighbourhoods of an urban area (Ihlanfeldt & Mayock, 2010; Ceccato & Wilhelmsson, 2011). Urban centres that experience population decline are practically "shrinking urban centres" (Frazier, Bagchi-Sen & Knight, 2013). A number of contributing factors such as demographic movement seeking out for safer and secured neighbourhood may be responsible for land use changes (Hollander & Nemeth, 2011; Wiechman & Pallagst, 2012).

Migration of business operators from one central district to the other; it is indicated in conversion of residential properties to business premise (Schilling & Mallach, 2012). Crime can be regarded as a disamenity that discourages commercial land users from operating in a particular neighbourhood and encourages them to have the incentives to move to more secure areas; as such those abated commercial properties would be left out for other suitable land uses (Hipp, 2010). Similarly, Boggess & Hipp (2010) reveals that reoccurrence of violence in an urban area will results in larger transitions for owners and tenants of commercial properties. Several research has evident that cities with reduced crime rates experience less intra-city movement of investments compared to cities with records of higher crime rates (Ellen & O'Regan 2010).

Insecurity engenders community change which consequently have impacts on the pattern of land uses in a particular area. (Boggess *et al.*, 2013). When crime affects community composition, it likely propagates the instability of commercial property

market since security and safety are directly linked with investors' decisions and convenience. Specifically, prospective investors may be swayed by neighbourhood's level of safety and security composition in the decision making process on which location to rest their investments. Security and safety affects land values, commercial land location decisions and ultimately influences land use changes.

2.8.4 Influence of land use Control Measures on Land Use Changes

Land being it scarce and fixed in supply, it is necessary for land to have an administrative and management frame work which ensures prudent utilisation that goes line with the planning regulations requirements for optimum returns for those who may drive benefits, profit or some other goods (Lam & Man, 2013; Wyatt & Subedi, 2013). Nations rarely optimises the potentials of their land resources without organised utilisations of the developable land parcels (Kim, 2011). The population concentration in a city can be redistributed by a variety of zoning regulations with the land use laws having the strength to influence the general land area of the urban area. Certain land use policies have the influence of declining the inclusive density of land use in an urban centre (Jaeger, 2013; Hilber & Robert-Nicoud, 2013).

Challenges associated with land uses within an urban area majorly comprises slum generation, mixed land uses, environmental populations, congestion in the traffic flows and over population are addressed by efficient and purposeful planning regulations (Boamah, 2014). Land use control measures, specifically development control, enhance the realisation of sustainable city environment and support living standards of the urban populace. It equally helps to improve the wellbeing of urban inhabitants and thus,

preventing spatial disorderliness as a result of mixed land use pattern (Boamah *et al.*, 2012).

Land use control measures bear on the structure of the built-up residential areas and functions in revitalizing sick buildings which consequently will warrant for their conversions to commercial premises within the urban landscape. It weighs on the housing delivery, rezoning commercial land uses and the overall urban economy (Mohammed *et al.*, 2009). Nevertheless, planning regulations that failed to be effective could lead to urban land use disorderliness. Vermeulen & Ommeren (2009) and Kim (2011) have noted the possibility of inefficiencies land use control measures in triggering haphazard commercial land uses in an urban centre and consequently affecting the aesthetic looks of the city.

2.8.5 Other Factors Influencing Land Use Changes

Lean (2005) and Sedney (2012), deduced from previous literatures on land use changes that steady conversions of residential land to commercial land uses comes about as a result of the following drivers:

- (i) Urban population growth.
- (ii) increasing demand for commercial premise.
- (ii) Failure of the central district to contain the growing economic activities,
- (iv) Failure of land use control measures in it implementation.
- (v) Easy accessibility.
- (vi) Land use regulation. These drivers of land use changes can best be diagrammatically represented below:

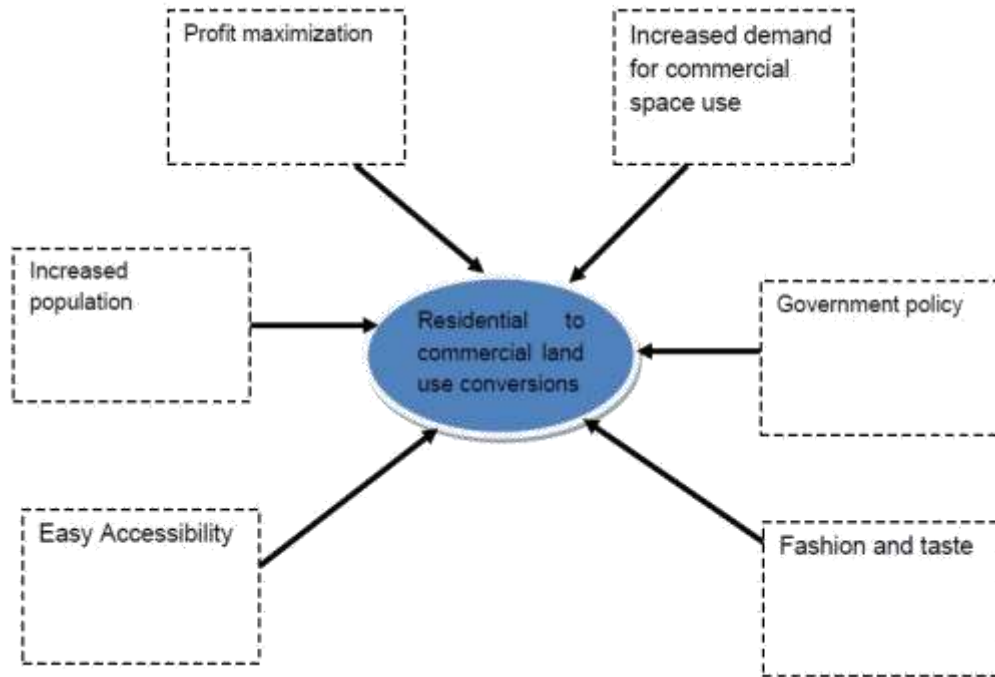


Figure 2.2: Drivers of Land Use Changes in Urban Centres

Sources: Adopted from (Lean, 2005; Asamoah & Blessing, 2010; Sedney, 2012).

Safariah (2006), considers other factors that could influence land use changes in an urban area as follows:

- (i) Site attraction; in terms of variables like building design, land size, accessibility, complementarity of uses and neighborhood attributes.
- (ii) Site functional capacity; the applicable variable include transportation system.
- (iii) Neighborhood attractions; in terms of commuting distance to the city core, infrastructural facilities, business activities, office type and operations.
- (iv) Socio-economic class; the application variable is land value within the neighborhood land use changes occur. He concludes under a study of residential to commercial land use changes in Bandung metropolis of Indonesia, that the commonest

influencing factor in land use changes in that city was merely socio-economic prestige. Maryam (2000), in another related study revealed that influencing factors of urban land use changes especially from residential to commercial include: prime of location, increasing economic activities, rising commercial properties rental values, easiness in get business premise planning permit, there is demand.

2.8.6 Opposite Styles influencing the formation of Land Use Changes

According to Bourne, as cited in Sedney (2012), there are two basic opposite styles that influences the formation of land use changes in urban centres:

- (i) Centrifuge style (Away from the CBD); this style of formation, forces an activity to move from the central core areas to the outskirts of a given city. This style comprises the following formative parametres:
 - (a) Space form; usually due to congestion in the traffic flows around the city centres.
 - (b) Site form; this occurs mostly as a result of reduction in land area for further agro-allied productivity due to intensive land uses in city centres vis-à-vis accessible fertile agricultural lands for agro-allied development in the outskirts.
 - (c) Situational form; this is experience in mixed use of land. ie distances between buildings and functional alignments in unsatisfactory ways.
 - (d) Social evolution form; due to increasing land values, property taxes, and other encumbrances that limit further developments around the city cores.
 - (e) Prestige and crystallise form; in most cases when land users define their socio-political or economic status/class, and most certainly when the functionality of the urban

fabrics got expires and unsatisfied transportation systems; this will tend the land users to focus the direction of land uses to the outskirts.

(ii) Centripetal style (Towards the CBD); under this style, certain activities are hold back or attracted to the central areas of the city. Some of these formative factors are:

- (a) Physical attraction; i.e landscape quality and appearance).
- (b) Functional comfortable; i.e easy accessibility and effective transportation system.
- (c) Functional attraction; i.e road reputation or location for certain activity.

The diagram below is an illustration of the noticeable drivers of land use changes from residential to commercial in an urban centre:

2.9 Influence of Land Use Changes on Slum Formation in Urban Centres

Malpezzi & Maclellan (2001), expressed that elasticity of land supply varies in different cities due to restrictions in land use control measures that regulate changes in use of land. Recent empirical studies are based on data obtained from developed nations, where housing and commercial property's quantities/prices adjust to externalities and residential property market may have the tendency to display equilibrium (Glaeser & Saks, 2005).

However this market scenarios is unlikely to display in most of the developing countries' economy where the strength of residential property market is so limited that the middle and low income group resort to informal housing on a poorly neighbourhoods environment. Somik, (2006), conducted an analysis on the influence of land use regulations on land use changes indicates that an increasing in socio-economic activities of an urban centre, houses within the fringe of the central districts would be

taken over by commercial uses and would consequently result to reduction in housing stock and further give rise to high rental value of residential properties. Due to this effect, residents on middle or low in category will find it difficult to afford the high price/rents; thereby resort to informal houses. In this regard, inelastic housing supply restricts the available housing stock to adjust to population explosion and therefore, stimulates generation of slum as shown in the diagram below:

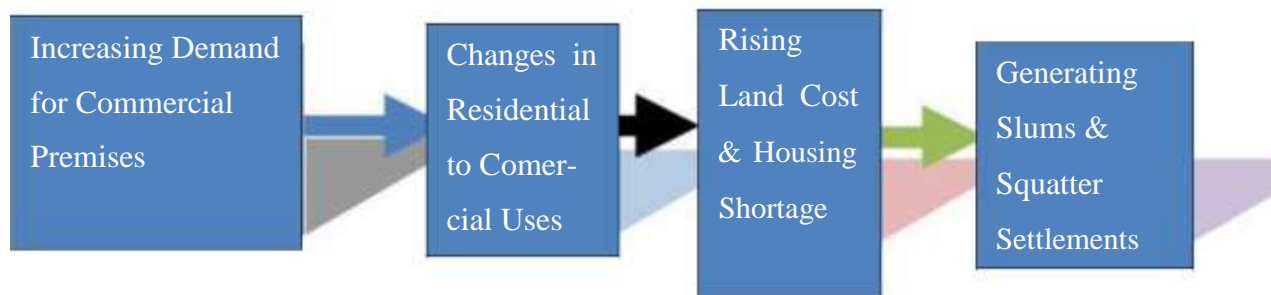


Figure 2.3: Influence of Land Use Change on Slum Formation in Urban Centres

Sources: Adopted from (Asamoah, 2010; Sedney. 2012).

2.10 Effects of Residential to Commercial Land Use Changes in Urban Centres

Mathews William (2006), observed from an empirical studies of sylvan urban centre of North Carina that the effects of residential land use conversion to commercial uses are usually felt by residence of the affected neighbourhood. He found out that most residential properties owners objected to proposed new commercial developments within the residential areas due to it anticipated negative effects on the neighbourhood characteristics. The existence of commercial property within the residential areas foster rapid deterioration of the neighbourhood facilities, thereby affecting residences' desirability and comfort. It has been argued that residential land use conversion to commercial uses within a residential area escalates residential property values and tends

to reduce transportation cost (Gomna, 2014). Miller (2005), asserts that influence of negative externalities usually warrant for building setbacks to protect residential properties from noise pollution generated by the adjoining non-residential land uses which could reduce the desirability of nearby residential properties.

Blessing (2010), ascribed certain implications in residential to commercial land use changes as follows:

(i) Decreases formal housing stock; since residential land use conversion to commercial uses involve the change of a residential plot or existing structure into a commercial use, or existing commercial building, the number of residential houses which have been taken up over by the new commercial blocks, are not equally replaced within the same location, this causes a shortage in the overall housing stock that a city has (UN Habitat, 2007). Generally, commercial and industrial uses have attracted land away from residential use. Competition by firms to be in the desired locations will force the land values above those of the surrounding land used for residential purposes due to this effect (Ivor, 2003).

(ii) Challenges in Land Use Control Measures; the process of land use changes from residential to commercial uses requires to be monitored by local planning authorities; especially where the succession occurs at an increasing rate (Tomisi, Oluwatosin & Samson (2016). Sedney (2012),

asserted that the efficiencies in enforcing development control measure is normally a difficult task to regulate developments in an urban centre due certain factors associated to inadequate funding, to include other issues such as non-enforcement of development control laws as well as inadequate public awareness regarding compliance to the terms

and conditions of the appropriate land use measures. Adding also, the cumbersome process to grant approval for change of land use purpose, this most situations trigger some developers to embark on redevelopment scheme without planning permission. The effect of this scenario would take the custodian of the urban planning organs unaware of such changes and consequently, such developments will contravenes the master plan for the metropolis (Michael, 2001).

(iii) Increases economic activities in residential zoned areas; Asamoah (2010), observed that a continuous conversion of residential vacant lots into commercial plots, economic activities would tend to increase in residential neighbourhood and as such declines in the central district. As noted by Raharjo, (2005), the common problems being associated by this land use change scenario include lack of adequate parking space and traffic congestion.

(v) Challenges in physical development; due to rapid urban growth trend and the subsequent increasing prevalence of economic activities in residential areas, as a result of converting land use from residential to commercial uses, city residential neighbourhoods are changing to meet the emergent needs of the urban commercial centres. Certainly standards and specifications of physical developments outlined as planning in the long run are altered by urban land users since the areas are neither a residential nor commercial (Asamoah, 2010).

(vi) Increasing land and property values; the study emphases that land use changes occurs within Residential neighbourhood commonly, Residential land is hence affected leading to limited spaces available for accommodation. The conversion of residential properties in to commercial uses, subsequently, raises land values due to the shortage

created in the residential areas (Enisan & Aluko, 2015). As a result of this effect, rental values of residential properties are considerable high in the study area when compared to other residential areas in the metropolis which are not significantly affected by the land use change. This scenario affects other areas since individuals who move from the central district will have to compete for land and accommodation at the city outskirts. Consequently, land values at these periphery areas will tend to increase as well (Asamoah, 2010).

(vi) Misuse of land; since residential zoned areas are smaller than commercial strip, changing land use from residential to commercial uses implies that the land shall be misused in terms of its carrying capacity. It would be seen that residential properties whose initial intent purpose as housing, is converted into say offices and stores, thus abusing the land on which the commercial activities are operating. It would also be found that a parking lot that is designed for say four cars would now be forced to accommodate eight cars. A critical analysis of this situation would imply an abuse of urban land (Asamoah, 2010).

2.11 Theoretical Framework for the Study

Sedney (2012), have expressed that the basic urban theories focuses on the intensity of land uses, pattern of city growth and trade-off between transportation costs and land cost in choice for residential and commercial land use, as developed by Von Thunen (1826); Burgess (1925); Hoyt Ulman (1935); and Ullman and Harris 1945 (1945). In developing the land use zones of a city, Burgess (1925) events the earliest form of the ancient city model which was an extension of von Thünen's theory detailing the urban dynamics in

relation to variant land uses. In Burgess's form of the model, households receive utility from land while firms drive profit, for their desires to locate in a particular area.

The use capacity of Land vary where given sites closer to the Central Districts offer land users lower commuting costs and pay high price for land use proximate to the Central Business Districts. Hoyt (1935) and Ulman (1945), in there discussions added housing to the model with a view that residential land users fails to maximize utility directly from land rather maximizes the utility from housing stock and housing is achieved by the combination of land and capital which are cardinal factors of production. Although Hoyt (1935) and Ulman (1945) operate within a time interval of approximately ten years. In this form of the model, housing, land prices and height of building and building density declines with distance from the Central Business District.

The model assumes that all employment opportunities lies in the city core otherwise known as the Central Business Districts and the workers requiring to locate closer to Central Districts with a minimum transportat cost. The city structure is then shaped by the balance between affordable land and housing further away from the Central Business District and the respective commuting costs.

The flow chart shows the proponents of the genetic urban models adopted for the research.

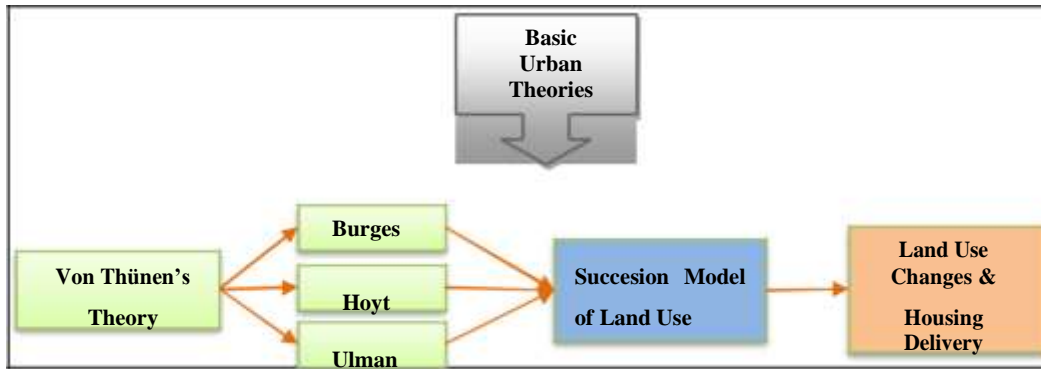


Figure 2.4: Theoretical Frame work

Sources: Adapted from (Arnott & McMillen, 2006; Adebayo & Egbenta, 2009; and Sedney, 2012).

2.12 Theoretical Review of Urban Land Uses

Empirical studies carried out by Lichfield (1969) as adopted by (Asamoah, 010), reveals that the pattern of distribution of land uses, location of use type, manner of urban morphology and growth are being influence by several factors ranging from sociological, economic, environmental and institutional frameworks.

The study of urban land use and growth pattern is widely drawn from different descriptive theories which were devised to generalise the patterns of city growth applicable in pre-industrial urban centres of the world top economies. It is therefore, pertinent to state that these are general models developed to comprehend the overall pattern of urban land use. Hence, none of the models is accurate in describing patterns of land uses in all urban centres. Described below are the Concentric Zone theory, Sector theory and Multiple Nuclei theory of urban land use applicable in the Preindustrial era (Asamoah, 2010). The other land use models applicable to the current urban settings including the Succession Theory, Residential Theory and Shopping

Theory of land use were revealed in order to seek certain explanations on urban land use pattern in an attempt to relate the cumulative assumptions of the models to the current situation in the study area. From this land use doctrines, analysis will be made regarding the trend in residential to commercial land use change as it negatively affects housing stocks in a formal settlement of the selected residential neighbourhoods in the study area.

Therefore, lots of descriptive and analytical urban land uses models have been developed over time, with steady improvement and complexity upon one another. Rodringue (2009) citing Carter (1995), emphasized that several of these theories land uses developed in the pre-industrial era are essentially rigid in describing specific pattern of urban land use and adamantly explains the morphological processes in the urban growth. Among which are:

2.12.1 The Von Thunen's Theory of 1826

This rural land use model is the oldest, which was created by an amateur economist in 1826 in the pre-industrialisation to analyses the competing agricultural land uses in the peripherals of Germany. Krumme (2002), reveals certain limiting assumptions of Thunen;s land use pattern which serve as foundation for several opinions in land use theorem where land rent and distance are incorporated:

- (i) That the city is centrally located in an “isolated state” which is self-sufficient and has no external influences to support it economic life.
- (ii) The “isolated state” is surrounded by an unoccupied wilderness completely flat and has neither river nor mountain to interrupt the terrain.
- (iii) The climate and soil structure is consistent throughout the isolated state.

(iv) Farmers transport goods to market via oxcart, meaning there were no clear road networks.

In an isolated state with the forgoing assumptions being true, Von Thunen hypothesized that a pattern of rings around the city would develop where farmers balance the commuting cost with land cost and therefore, produces the most cost effective products for the market in city center:

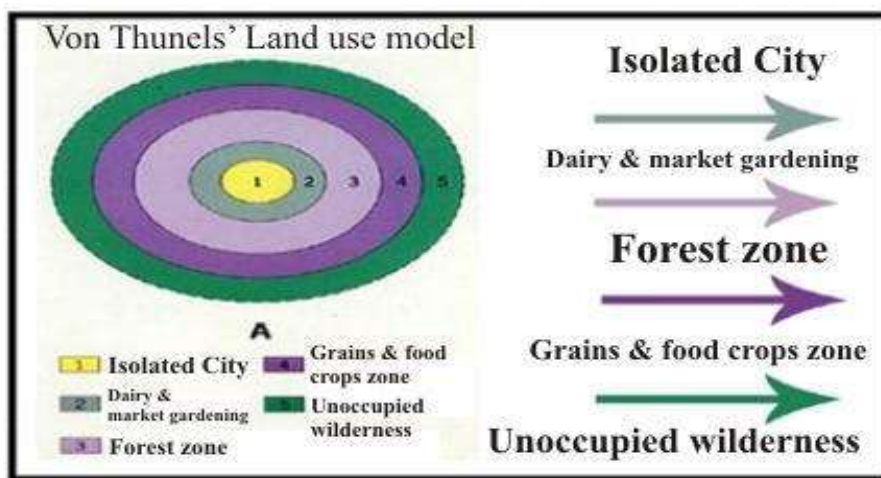


Figure 2.5: Von Thunel's Land Use Model of 1826
Source: Von Thunel (1826) as modified by Krumme (2002)

Zone 1 represents a city, Zone 2 is occupied by Dairy and Market Gardening, Zone 3 is the Forest Zone, Zone 4 is the Zone for Grains and Field Crops while Zone 5 is the Raching Zone. Rodrigue (2009), further explains the rings of agricultural land uses as developed by Von Thunen J.H (1826) that assert of the city core represented as zone 1, zone 2 is the closest zone to the central district which is occupied by dairy and intensive farming activities. Since vegetables, fruits and milk and other dairy products must get to the market in a timely distance due to perishability nature of the produce hence there were no refrigerated oxcarts. Zone 3 comprises timbers for fuel wood and construction

materials; due to heaviness of wood, is difficulties for easy carriage, so it is located as close to the city core as possible. Field for extensive cropping Such as grains for bread occupies the 4th zone; since grains last longer than dairy products and much lighter than timber, it is located further away from the city core. The 5th zone represents the final ring surrounding the central city; live stocks can be raised far from the city due there ability to be self-transporting for sale or butchering. Beyond the final ring lies the unoccupied wilderness, which is a great distance from the city centre for any agricultural activities. Von Thunen's model is a typical illustration of tradeoff between transportation cost and land cost. As land users move further away from the city centre land price/rent tend to fall at increase commuting costs via-a-vis.

2.12.2 The Concentric Theory of 1925

This is an early theory developed by Ernest W Burgess in 1925 to explain the land use patterns in most American urban centres (Igwe-kalu, 1998). The model suggest that the city's growth pattern could best be described in a concentric ring approach expanding its original centre point further away to the city's outskirts. It sought to established that land the intensity of landuses decline in the city outskirts and increases with equal magnitude in all directions as one move closer to the core centre otherwise known as central business district. The contention is that the CBD would be used for intensive high rent uses such as shops, offices, hotels, theatres, departmental stores, banking and insurance businesses; And other retail outlets. This mark the focal point of the civic and commercial life of the city (Ogbuefi, 2012). As the city expands over time, the central district would exert pressure on the zone next to it. The process is thought to continue with each successive neighborhood moving further away from the center point resulting

to land use changes (Michael, 2001). The ring immediately surrounding the central district would be made up of a variety of low rent worker's residences otherwise known as the „The fringe of the central business district“ consisting those whose earnings lies in the central district as well as light industries, wholesale, trucks, motor parks, rail way terminus as well as activities related to those carried out in the central district.

The Transition zone further out would consist of low wage earners in substandard quality residential buildings resulting from neglect by light manufacturing and business activities (Igwe-kalu, 2012). This zone is blighted by the process of change in use where the older homes are converted to flats and other high density housing upon which factories, warehouses and other Business establishments are encroaching; there by predominantly occupied by immigrants as a result of the rural push (Ratcliff, 2005).

Medium Value Residential Zone is devoted to the second generation immigrants and families who could afford homes. The motivating force of those who decides to live here has the incentive to remain being proximate to place of work, taking the advantage of the available transport services. Housing design and quality are better of than those in the Transition zone of the city.

Further out is the concentric ring of progressively high-valued housing other word known as the „High Class Residential Zone“ which comprises better residential neighborhood where families of high income earnings live. Although, high commercial and industrial activities from the inner core area does not concentrate nor encroaches in this ring but instead leapfrogs out to peripherals/commuter's zone. In the Commuter's Zone; here, development is patchy and comprises of both middle and high class residential neighborhood (Oyebanji, 2003). This zone is apparently characterized by the green fields sites usually alongside better transport routes

Surrounded by farm lands and recreational arenas for the comfort of those who could afford regular transport to the city centre. (Ogbuefi, 2012). It has been observed that land uses within the greenfield „Rural-Urban fringe“ reduces the vulnerability of harmful substances on the neighbourhood environment due to low intensity of commercial and industrial operations (Kemiki, 2017).

The cardinal development attributing to this theory is the „Liquid wave effect“ that maintains urban land uses spread out from a business district of high intensity of use to progressively low intensity in a similar manner to ripple from a stone drop in a pond. The concentric model asserts that those activities of related elements will cluster within the same location at a certain distance from the city centre; this implies a positive correlation between socio-economic status of households and distance from the central district which incites the affluent households to live at greater distances from the city core. The theory however, failed to recognise the effect of road networks on land use; others like commuting time; competing satellite city centres; geographical elements such as topography of the landscape in most cases mountains and navigating rivers tend to obstruct the ideal urban growth pattern and land distribution. Again, the fact that residential areas may further be segregated by race, income and educational level can affect the structure of the model (Oyebanji, 2013).

Below is the diagrammatic presentation of the concentric model:

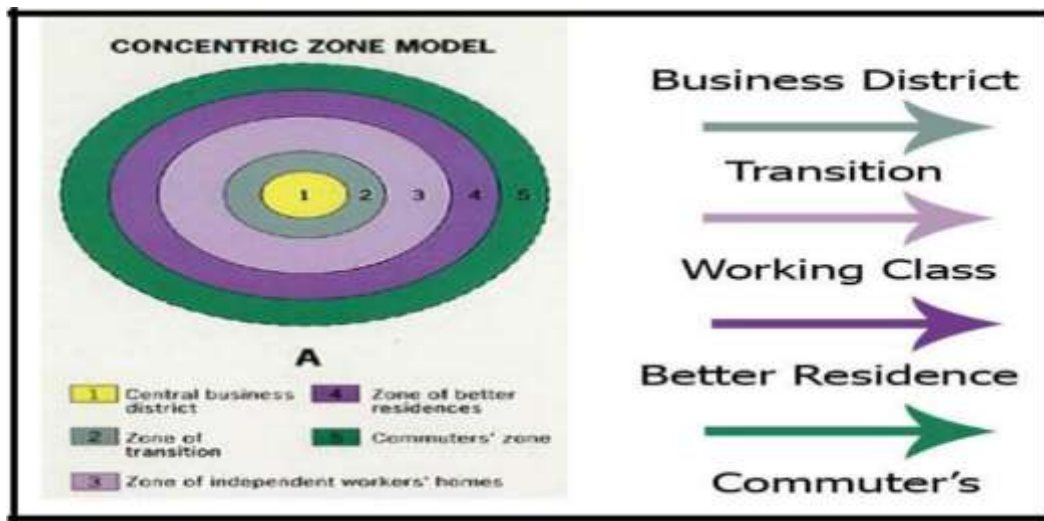


Figure 2.6: Concentric Theory of 1925

Source: Park & Burgess (1925), as modified by Michael (2001).

From the above description, Zone 1 is occupied by Central District, Zone 2 is occupied by Zone of Transition, Zone 3 is occupied by Zone of Medium-Value Residential, Zone 4 is the Zone for High-Class Residences while Zone 5 is Commuters Zone.

2.12.3 The Sector Theory Of 1934

The Wedge or Sector theory of urban land use is a clear alternative to the concentric theory of 1925 outlines (Oyebanji, 2011). This theory was propounded by Hoyt in 1934 as a model of urban structure which was the result of an analysis of more than 200,000 neighborhood blocks in approximately 75 American cities. This theory however, assume that in an urban area with uninterrupted geographical elements, a sliced pie saped of land uses will result to numerous „slices“ of several land pushing out from the city core

to the greenfield (John, 1997). Within each slice there similar use and people of like socio-economic strata will tend to relate and growth will be accommodated by extending further outward from the central district rather than by encroaching on an adjacent slice/sector. Road networks greatly influences individual wedges which radiate outwardly from the central district. Hoyt further expressed that urban centres would tend to grow in wedge-shaped patterns emanating from the central district along major transportation routes (Sedney, 2012) as adopted from Ullman & Harris (1945). Below is the diagrammatic presentation of the concentric model:

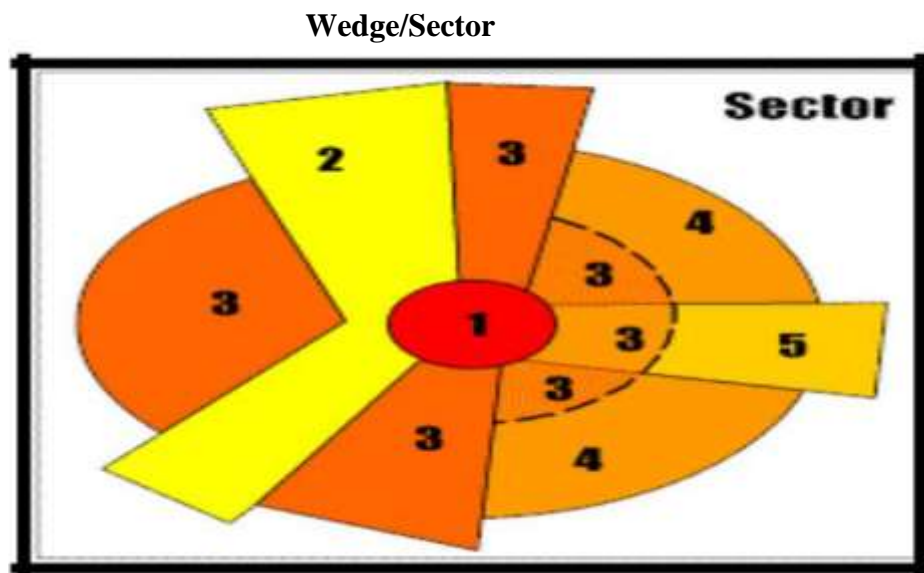


Figure 2.7: **Sector Theory of 1934**

Source: Hoyt (1934) as modified by John (2013).

The sector theory comprise of five land use zones: Zone 1 is made up of the City Core, Zone 2 is a Zone of Light Industries and Zone 3 is a Low Income Residential Zone. Zone 4 represents a Medium Income Residences while Zone 5 is a High Income Residential Zone. John (2013), in his review of Hoyt's studies observed that land values

are a function of neighbourhood accessibility. This means that several commercial strips locate within the central district while industrial activities tend to develop in a sector surrounding the route of road networks; then building land use would grow in sliced-shaped patterns with a sector of low income residences bordering the industrial sector as shown in the above diagram. This is because traffic congestion and noise-pollution warrant these neighbourhoods less desirable locations to habitation (Sydney, 2012).

However, a sector of middle and higher income residences would further away from the industrial land use zone. In many respects, Hoyt's sector theory is apparently a concentric zone theory modified to account for the effect of road networks on and land values in an urban area (Asamoah, 2010).

2.12.4 The Multiple Nuclei Theory of 1945

This land use theory, which is closer to reality assumes that an urban area often grow with more than one central district and takes place around several nuclei which lies along major road network. The nuclei could form a market stall, a proximate periurban neighbourhoods, an industrial sites or a railway terminal (Sydney, 2012). Ultimately, all the nuclei would be integrated as an urban area predominantly occupied by residential land use and intra-city road networks. The centre of the model signifies the Central Business District with light industries and wholesale activities located along road network (Harris & Ullman, 1945) as modified by (Asamoah, 2010). The model argues that large metropolitan cities develop into substantial suburban centres with certain suburbs tend to reach significantly minor business districts and act as satellite nodes or nuclei of distinct activity around which pattern of urban land use develops. In this

model, the Central Business District remain the focal point of civic and commerce (Sydney, 2012); this implies that specialised cells of the urban activity would develop according to specific requirements of certain activities and ability-to-pay for particular land use.

The model therefore, suggests that there is a greater tendency for certain economic activity to cluster together as a result of the complementarity effect in land use in order that time and costs involve in commuting to the central district will bring about the opportunity of the suburbs nuclei to provides services and products offer by the central business district (John, 2013) ; with heavy industries tend to locate near the outer edge of the city, perhaps surrounded by low-income housing estates and suburbs of commuters occupy the city outskirts.

The model is diagrammatically represented below:

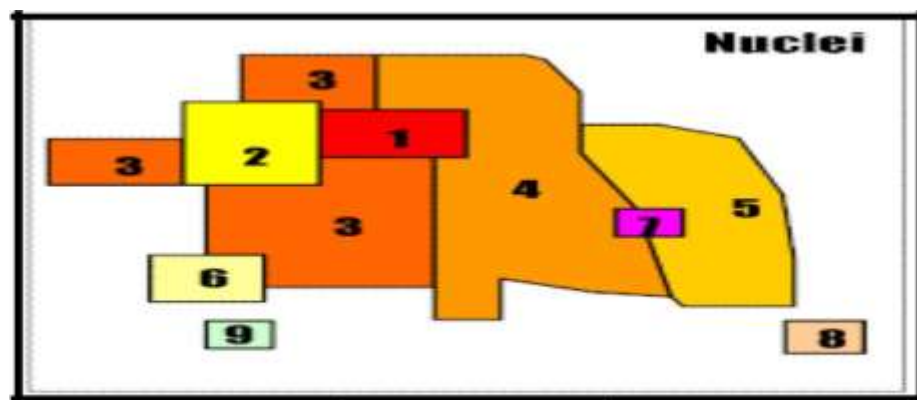


Figure 2.8: Multiple Nuclei model of ofof1945

Source: (Sydney, 2012) as adopted from (Ullman & Harris 1945).

The theory comprise of nine zones: with Zone 1 represents by Central Business District, Zone 2 is a Zone of Wholesale and Light Industries and Zone 3 is occupied by Low Class Residential Zone. Zone 4 is a Medium Class Residential Zone while Zone 5

is occupied by High Class Residential Zone. Others are Zone 6 represented by Heavy Industries, Zone 7 occupied by Outlying Business District, Zone 8 is the Residential suburb, and Zone 9 made up of Industrial Suburb Zone in the periphery.

2.12.5 The Succession Theory of Urban Land Uses

This is a contemporary model on urban land use change which assumes that over time, the growth pattern of an urban area will result to succession in use of different land uses as the best and highest use changes (John, 2013). The theory emphasised that the central district that is already congested to further accommodates economic activities will eventually expand by the redevelopment of proximate land use zone otherwise known as the CBD Fringe or Transition Zone and slightly into the Medium Value Residential Zone, hence changing the character of the neighbourhoods to that of the commercial premises.

The succession model of urban land use is an element of the formal housing market which occurs in advance of acquisition pressure of commercial land use (Sydney, 2012). Its effect on residential property market often takes this related scenario where by owners of high cost residential properties closer to an expanding commercial strips offer it for sale; a filtering down in housing prices will occur, in which rental values/prices of formal housing stock gradually declines due to succession of lower income tenants being the present occupants seeking location proximate to source of their livelihoods which lies in the CBD and until the residential properties are demolished and replaced by commercial properties. The succession theory of urban land use is a significant overlay to the broader urban land use theories in developing a model detailing the

transitional areas that mostly take form between different land uses, but are explicitly detailed by other theories mentioned earlier on (John, 2013).

2.13 Empirical Review of Global Experience on Residential to Commercial Land Use Changes

Empirical studies on the analysis of residential to commercial land use changes in urban centres globally would be reviewed in order to ascertain its possible effects on formal residential properties. However, as a result of rapid urban growth trend, most cities in developing countries have experienced ample changes in terms of commercial land use replaces residential uses, which urban planners considers to as threats (Bhagawat, 2011). Various causes of the urbanization bring about the used impact of uncontrolled land use change due which has become a concern issue mega cities of the developing world; among the major factors are over population, inter-city migration, political and economic instability, government policies and programmes, accessibility of urban infrastructures and globalization (Feiet, 2005). Residential to commercial Land use change is one of the most noticeable impact of urban growth (Yichun et. al (2007). Additionally, empirical studies done on each of the influencing factors were reviewed to discuss the issues and findings from the studies in the context of urban land use change and its effect on housing delivery.

2.13.1 Residential Land Use to Commercial Use Change Experience in United State of America

John & Richard (2001), in an empirical study of the America residential property market, titled: „The evolution of Commercial Strip“ reviewed the influence of an arterial

commercial strip in an residential neighbourhood which was initially zoned as a residential street in the city of Chicago. This study firstly, hypothesed that automobile businesses were steadily trooping in to the district.

Secondly, that there was significant relationship existed between residential land converting to commercial land use and formal housing stock. Additionally, the study also analysed the relationships between the street's changing its social outlook and commercial orientation with some selected automobile-oriented businesses such as gasoline filling stations, automobile repair and sales centres, motels and restaurants and tourist centres. In the early 1920s about eight businesses had already situated in the three major districts of nearest to the Champaign business district. Champaign Urban Directorate of the United State of America (2006), publicised that most of these newly located businesses occupied small-sized front stores, built in front of residential properties in the neighbourhood.

Through the 1930s, a number of automobile-related businesses had come up, including additional two gasoline stations on the three blocks closest to Champaign's business district in the city of Chicago. A decade later, another gasoline stations had appeared at the street's midpoint at the intersection of Lincoln Avenue and Urbana central business district at the eastern end point of the street. Around 1950s seven residential blocks had been intruded by the activities of commerce of which six of these residential blocks had been taken up by automobile-oriented enterprises and five it colonised by gasoline stations located centrally on the urban vacant lands.

Between 1955 and 1965 entrepreneurial activities explored out into six additional residential blocks, five of which were first intruded by gasoline stations. Gasoline stations were clustered at the street's eastern end point one other gasoline station with a food canteen appeared around the Lincoln Avenue. By 1969 commercial property development dominated most vacant lots proximate downtown of Urbana; turning out the residential area becoming more of automobile oriented district as auto repair shops and restaurants jointly existed together with gasoline stations within the the metropolis. Similar scenario occurs at the eastern luck of the street proximate to Champaign downtown, where the demands of the motorist began to fill in the Blocks in which store fronts housed many grocery stores and tailor shops among other businesses. Also here, several small scaled restaurants and auto repair shops appeared. By the late 1970s the neighbourhood attribute had expanded predominantly on automobile convenient, Parking space, together with motels and bars had also appeared. Commerce now dominated University Avenue, a fact which would be made increasingly clear in the next two decades.

Therefore, a greater variety of business types housed in larger facilities now characterized the street, a trend which continued through 1979. Between 1919 and 1979 commerce tended to spread from the two ends of University Avenue toward the middle.

John *eta al* (2001), hypothesises that gasoline stations and other automobile-oriented commerce served to colonize residential blocks was supported. Perhaps of greater significance, however, another relationship involving automobile-oriented commerce was disclosed. A second spatial sequence developed after 1959 as a variety of

businesses replaced gasoline stations and other automobile-oriented enterprises. This sequence also spread from each end of the street toward the middle. By 1979 a wide range of business types, including gasoline stations, was evenly distributed along the street. John *eta al* (2001), concludes by presenting the distribution of residential land use along University Avenue between 1919 and 1970. Owner-occupied rented, single-family and multiple-family dwellings were differentiated. Around 1920s the University Avenue was a residential street dominated by owner-occupied, single-family housing and changes the character of the district in the late 1970s in to commercial sub-hub.

The findings of this study indicated several gradual but different land use succession that had occurred between 1920 and 1979. And that quite a number of residential units declined by 25% approximately 12 units in 10 years of the urban growth; and the changes accelerated in 1959. Between 1959 and 1979 the proportion of single-family residential units dropped from 51% to 10%. This was due to steady changes of residential units into commercial premises.

2.13.2 Urban Land Use Change Scenario in Jakarta, Indonesia

Residential to commercial land use changes does affects the pattern of urban land use as well as the physical views of residential neighbourhood (Raharjo 2005). He further presented certain research findings in empirical studies of a residential neighbourhood within the Southern Jakarta, Indonesia affirmed that land use conversions are integral part of urban development process, which can occur within and or outside an urban centre. The city was chosen as the study area due to noticeable land use changes undergone particularly residential changing into commercial over the years. The

occurrence of land use changes which brought out questions in the mind of Raharjo (2005), investigates certain factors necessitated for rapid changes and the rate at which

These changes took place in Jakarta metropolis; the investigation further analyses the pattern of the land use succession. Similarly, Sumbangan, *et al* (2011), reviewed the land use dynamics that influence the pattern of land use changes between 1997 and 2009 in South Sulawesi, Indonesia in order to map land use/land cover on a time series basis. This experience compared to other urban centres has some significant relative influential factors which featured out unique characteristic of land use changes where the main actors are the indigenous land owners which brought the form of the area into commercial area (Raharjo, 2005).

The study outcomes revealed that land use changes in Mampang Prapatan goes beyond building function changes from the residential into commercial function, but also in intensity changes of the buildings. These changes have indicated commercial premises in form of residential and multi-function buildings mixed to alter the initial purpose designed and used. Conclusively, the main activity in the study area is commercial activities with domination of commercial buildings that reach approximately 25% and mixed building about 75% which occurred after year 2000, after a new plan has been set up in Mampang Prapatan Avenue as a commercial area. Accessibility advantage from the road function and high level of profit return is one of the strongest factors that have influenced the land use changes to occur. Other influencing factors include the flexibility and inability of government policy to control these changes. A remarkable

decline in the formal housing stock also resulted due to this development (Raharjo, 2005).

2.13.3 Demand and Supply for Formal Housing Stock in China Republic

The government efforts in analysing noticeable consequences of changing the face of residential areas in to commercial districts of mega cities of China in the late 1980s became a concerned of the Chinese land economists (Chow &Niu, 2009). In there findings, enhancement of land prices

in the affected areas was identified as one of the positive effects of conversion of land from residential to commercial uses. Hence, further efforts were putted to investigate factors responsible for the residential property prices enhancement from 508.19 Yuan per square meter in 1987 to 4119.35 Yuan per square meter in 2007, representing an annual growth rate of 11.9%. Such price increase has been a major concern to the Chinese government and the general populace which had prompts the government to regulate the residential property market due to the speculative rise in housing prices (Chow *eta al*, 2009). Their study was based on the assumption that the theory of demand for and supply of consumer durable products will be applicable to housing market in China around the late 1980s; and provided estimates of income and price elasticity of demand for residential properties. Although, Hu, Su, Jin &Jiang (2006)

and Zhang, Weng & Zhou (2007), in their past empirical studies failed to review the determinant of housing prices change in China.

The study reveal some of the greater factors determining the demand for the housing stock are user's income level and relative price (price of housing divided by a general price index); with the income effect been positive and the price effect was negative. The same income and price factors were assumed to have significant effect on the demand for housing by public authorities and commercial enterprises that provide relative cheaper accommodation to their employees. They measure the housing stock in per capita terms to prevent the scale effect of the population growth. Chow *et al*, (2009), concludes that an increase in population would not automatically warrant for an increase in the quantity of housing in the same proportion, instead Demand law applies to the behavior of a particular consumer. mean demand of consumers by mean income and relative price. Thus, the below equations was developed for demand and supply to interrelates mean demand of consumers by mean income and relative price.

2.13.4 Impact of Urban Land Use Control Measures on Residential to Commercial Land Use Changes in Lexington, Kentucky

Brent & Gonas (2003), conducted an investigation on economic implications of planning regulations on the Lexington housing market in order to ascertain the future possible scenario in the land use changes as well as availability of formal residential properties in the study area.

Brent *et al*, (2003), discovered from their study how urban land policies has impact on land and property values, through analysing the effect of urban land use and development control ordinances on the existing housing stock, housing price, and

displacement of owner-occupied and tenement residential properties. Therefore, developed a model based on Brueckner (1990)'s research which revealed that an unanticipated land use laws will have a positive effect on slowing population increase for all urban centres, thus improving a city's public facilities and services by removing the tendencies of being overstretched as a result of higher population levels. The model also measures the pattern of land value changes prior and post imposition of "marginal" and "continuous" controls. The model is however, drawn up some assumptions below:

- (i) Population growth and consumer satisfaction are exogenous indices that cannot be link to the form or timing of an urban development control;
- (ii) The primary objective of development control is to maximize values of existing land parcels;
- (iii) The urban centre is open to the relocation of potential or existing households that allows for a lower quality of life style due to population growth;
- (iv) The city is radially symmetric with varieties of job opportunities at the central business district;
- (v) The level of residents' satisfaction in an urban area depends on their income status, the rent per square acre, distance from the district centre;
- (vi) Land consumption level, and the level of the demographic characteristics surrounding the urban neighbourhood.

However, the decision to succeed residential land into commercial land use is wholly based on the certain land use decision parametres as thus: The net present value of commercial rental value

from residential land captured up until conversion and the net present value of future rents after conversion which is reduced by the net present value of development costs incurred during the conversion (Brent & Gonas, 2003).

2.13.5 Analysis of Land Use Changes in Selected Cities in Nigeria

Egbenta (2009), carried out an investigation on the influence of urban land use changes, particularly residential land use changes in Enugu metropolitan areas from 1998 to 2008. The study identified the sudden change in residential to commercial land use in Enugu Urban. The study revealed that cardinal factor responsible to this change was as a result of the property investors' actions striving to maximise the highest and best uses of land resources for optimum returns. He further emphasized that a proactive legal framework on land use conversion be adequately put in place and that profit oriented property developers be well informed of the consequences of business cycles, as demand for new buildings are highly sensitive to short-term output changes (Egbenta, 2009). In addition, other factors contributing to the sudden changes in Enugu urban to include profit maximization motive leading to increasing demand for commercial premises, physical obsolesces of housing structures and inefficiencies of the constituted legal frame work to benchmark the rate at which land use changes in the metroplis (Egbenta, 2009).

This trend in land uses in the city of Enugu is an indication of a boom in commercial property market in the area which as adverse effects on the housing market, thereby brings about deficit in the housing stock and rises rent on the available residential properties in other locations.

Negative effect of these changes are traffic congestion and excessive uses of the existing urban infrastructures along the major road network (Raharjo,2005 & Egbenta, 2009). The study, therefore, recommend that, property developers should be adequately informed of the business cycles, in that demand for new buildings are highly sensitive to short term output changes; also, building cycles and expansion of cities should be explored by further study for comprehensiveness of the dynamics in property market in Nigeria.

Adebayo (2009) and Ismaila & Huseini (2015), carried out a similar study on the effect of residential to commercial land use changes was carried out in Lagos and Jimeta metropolitan areas of the cities. In their course to conduct the research their consensus views on urban land use centred on the role of master plan on commercial land use proposal changes and physical manifestation of social, economic, cultural, political and environmental variables shaping the utilization of land in a given urban centre. Akinmoladun & Oduwaye, (2004), further elaborated that the „Concept of Land“ appears different things to different individuals depending upon their ideology, outlook, experience, Interest and their endeavours. Land is therefore as explained earlier from the onset, a platform of all human activities-economic, social, spiritual or recreation. The study discovered that within the metropolitan areas, a pattern of land uses evolves which consists of a wide range of variety of interdependent activities and in the considerations of relative advantages of various locations, rationale choices is required for the performance of a given activity; and activities tend to locate in areas that give the greatest relative advantage in the long run. Thus, by a process of competition, activities seek out and disperse themselves in that zone in which the relative advantage are greater

and by virtue of which they are normally able to exclude other uses. The spatial variation of urban land use pattern becomes more complex as the city experiences population growth and degree of specialisation increases (Adebayo, 2009). He argues that economic indicators of demand and supply forces interact in determining the urban land market.

Lean & Goodall (2000) attest to Adebayo's argument by saying that the urban land use pattern is a product of competition for sites among different land uses operating via interactions of demand and supply forces. Similar, land use pattern spring up in different Nigerian mega cities as a result of competition among different potential users for given sites. By this mechanism, land parcels in a city will tend to be engaged for the purposes in which land users make the optimum gains from the alternative uses of land in the attainment of the highest and best use for that land parcel. This development appears to be a continuous process in Victoria Island of Lagos metropolis where individual land users gave up a particular use to those of higher valued uses where the optimum realisable returns would be possible (Adebayo, 2009). The researcher therefore, analyse the impact of land use change on property values in Victoria Island of Lagos metropolis with the aid of questionnaires administered randomly to selected estate surveyors, land agents and practicing property managers on the island. The data obtained were presented and analysed with the use of simple descriptive statistics, particularly frequencies, percentages and ratios.

The research findings shows that there were enormous changes in land use from residential to commercial uses and this had led to corresponding variation in property

rental values in the neighbourhood. More also, the succession in use have also generated urban issues such as traffic congestion, over stretching of infrastructures and urban pollution. Hence, recommends that, there is the need for adequate and effective land use planning framework to tackle the changes that brought about by boom in commercial activities. Adebayo (2009), concludes emphasising that there is a need for the planning authorities to check the process of changes to prevent negative effect on the urban environment through enforcement of planning laws that allow for balance in allocation of land for various uses. Adding that land use control measures should be adequately operational for maximum effectiveness in the study area.

2.13.5.1 Analysing Land Use Changes Using Remote Sensing and Geographic Information Systems in Selected Nigerian Cities.

Arvind & Nathawat (2006) conducted a study on land use mapping of Panchkula, Ambala and Yamunanger districts of Haryana City in India. In their study, it was revealed that the variation in climatic factors and physiographic conditions in these neighbourhoods have resulted in the development of different land uses. Digital analysis of satellite data shows that most areas in these neighbourhoods are engaged in to agricultural purposes. The high rocky sites exhibit moderate growth of reserved timber forests. It was concludes that land use pattern in the area are generally controlled by agro-climatic factors.

Chigbu,N., Igbokwe,J.I., & Orisakwe,K.U. (2011), analyses Land use changes in Aba metropolis within the study period using Landsat ETM+, of 2000 and Nigeria Sat-1, of 2005. The research findings shows that between 1991 to 2005, the water increased from

15.2% to 22.2% due to increasing human activities around the waterways during the study period, While,

built-up areas increases from 21.8% to 26.9% in the city. Also, a significant disparity in vegetation land use surfaced due to rapid growth in socio-economic activities in the region. Thus, green area declined from 63.3% in 1991 to 41.2% in 2005.

Oluseyi (2006), carried out an analysis of urban land use changes in Ibadan metropolis within the period of 1972 to 2003. The study revealed that the land use categories commonly prone to conversions are building structures out of planning regulations and vegetal surfaces, mostly found around the city core and the transition zones of the urban area. Similarly, Dami, Adesina, & Garba (2011), adopted remote sensing and Geographical Information System techniques to analyses the trends in urban land use changes in Maiduguri metropolitan areas between 1961 and 2002. The result shows a noticeable trend in land use changes to be rapid urbanization growth trend and its consequences on urban sprawl and management. Zubairu, (2006) analysed Land use change in Ilorin town between 1972 and 2001; the study indicate a rapid growth in high residential density areas between 1972 and 1986 while the periods between 1986 and 2001 witnessed a decline in housing stocks of the class zone. It was also examined that land use changes by 2015 may likely witness a similar trend in 1986 to 2001. Several developmental projects were undertaken after creation of the state and falls in between the oil boom era of early 1970s. In the same vein, Vander, Nielsen & Omitogun (2002), employed Landsat ETM+ images combined with field survey to estimate the Acreage Infested with *Imperata Cylindrica* and *Stiga* in the moist savanna of Nigeria. The spectral signatures of *Imperata* and other LC types assisted in the classification of

the Land Use forms in the neighbourhood. Similarly, Okhimamhe, (2002), used ERS SAR and Landsat ETM images which integrate maximum likelihood classification (MLC), Normalised differences vegetation indices (NDVI) and Interferometry Land Use (ILU) techniques to measure the accuracy of the maximum likelihood classification MLC for timber vegetal areas. Ekpenyong (2008), an empirical research carried out on analysis of land use change in Uyo metropolis; adopted Geographical Information System database to model the rate at which land use changes between 1984 and 2003. The result of the study indicates that some urban centres had expanded into agricultural land areas and the surrounded secondary forest. Also, an examination of the process of land use change in South-Eastern region of Nigeria between 1972 and 2001, the result identified factors responsible for high deforestation in publicly controlled lands as well as indicators attributed to moderate vegetal cover change in communal lands (Bisong, 2007).

Abbas (2009) conducted a research work on issues and realities on Land changes in Nigeria, the study used Landsat data of 1975 and SPOT XS data of 2005. This study was further modified by Ujoh, Kwabe, & Ifatimehin (2011), in the analyses of urban growth pattern and vegetal cover loss in Abuja using Landsat imageries between 1987 to 2006. The study shows that vegetation area decreases at an increasing rate of built-up area. Population of the study area for 1987, 2001 and 2006 was considered, the rate at which Land was consumed and absorbed were determined. The result shows that population growth and physical development in Abuja has brought about land degradation in diverse ways.

2.14 The Legal Framework of Land Use in Nigeria

2.14.1 Land Use Act cap 202 Laws of Federal Republic of Nigeria

The current legislation that guides land use in Nigeria is the Land Use Decree of March 1978, otherwise known as Land Use Act cap 202 laws of the Federation of Nigeria, 1990 Nigeria's land policy instrument and enacted to harmonise land policy across the Nigerian geo-political zone of the Federation (Nuhu, 2008). This law has been the viable land law in Nigeria till present. In all ramifications of the national lives, the Act prudently oversees the ownership, alienation, acquisition, development, management and administration of land within the Federal Republic of Nigeria (Udoekanem, Adoga & Onwumere, 2014).

12.14.2 Noticeable Provisions of the Land Use Decree of 1978

Adeniyi (2012), highlighted the major provisions of the Land Use Decree 1978 as follows:

- (i) It differentiated, rather arbitrarily, the Nigerian land into rural and urban with different policies.
- (ii) All land within the territory of each state in the country is vested in the Governor of the state in trust for the common benefits all.
- (iii) The control and management of urban lands is vested un to the hands of the state Governor while the Local Government Chairman take charge of the control and management of rural lands.
- (iv) All lands already developed remained the possession of the person in whom it was vested before the Decree came to being in 29th March 1978.

(v) The state governor is empowered to grant statutory certificate of occupancy (C of O) for a definite term to any person for all purposes and rights of access to land under his/her control.

(vi) The maximum area of undeveloped land that any person could hold within an urban area in a given state is 1.5 of a hectare; in the rural areas not exceeding 500 hectares except with the permission of the state governor.

(vii) The consent of the Governor must be sought for the transfer or alienation of a statutory right of occupancy through either mortgage or assignment. The consent of the Local Government Chairman or that of the Governor in appropriate cases must also be obtained for the transfer of customary right of occupancy.

Birner & Okumo (2012) affirmed that notwithstanding the cogent objectives of the Land Use Act, it failed to address the land governance issues in the country due to:

- (i) Non transactive and participatory principles of the Act;
- (ii) The major provisions of the Act were adamant in implementation of wider coverage of core activities and functions of land administration;
- (iii) Uncoordinated regulations required for effective and efficient implementation of the Act;
- (iv) Absent of land information regarding ownership and titling as less than 5% of the vacant lots in the country have been demarcated and registered;
- (v) Activities of land speculators triggering land prices exorbitantly;
- (vi) Cumbersome land registration process, time consuming and expensive;
- (vii) Unchecked sprawling of informal development in major Nigerian cities;
- (viii) Raising socio-economic pressures.

As submitted by Deininger, Selod & Burns (2012) in their report revealing that the frame work for land governance in Nigeria is weaken as regime changes. The areas of weaknesses are identified below:

- (i) Enforcement of terms and conditions of the Act;
- (ii) Mechanisms for recognising the numerous rights to land;
- (iii) Unfair basis of assets valuation for compensation for the expropriation;
- (iv) Justful and equitable access for appeal against expropriation;
- (v) Institutional overlap;
- (vi) Transparency in public land transactions;
- (vii) Equitable access to land resources;
- (viii) Public awareness of land use policy and planning;
- (ix) Land registration, mapping and administration;
- (x) Effectiveness of land use planning and regulations;
- (xi) Credibility, fairness and transparency of valuation;
- (xii) Property tax collection;
- (xiii) Speedy and transparent land expropriation procedures.

2.14.3 The Effect of Noticeable Provisions of the Land Use Decree 1978

It is obvious that the goals of the Land Use Act CAP 202 LFN were not expressly stated in the body of the Act but in the official pronouncement of the then head of state - Major General Olusegun Aremu Obasanjo at its inception (Omirin, 2012). He articulated the set out goals of the Decree as follows:

- (i) Making land readily available for all Nigerians;

- (ii) Unifying the multiple systems of land tenure practicing in the country;
- (iii) Minimising costs of land acquisition in all parts of the county;
- (iv) Monitoring the appropriation of rising land values by speculators.

Omotola (1981) as amplified by Adeniyi (2012), interpreted these goals further to include:

- (i) Removing bitter controversies leading to loss of lives caused by land ownership tussles;
- (ii) Simplifying management and ownership of land in the country;
- (iii) Promotion of home ownership among the citizenry;
- (iv) Facilitating government control of land uses through effective planning and zoning.

Olayiwola & Adeleye (2006) expanded the goals to include:

- (i) Promotion of investment in agricultural development by removing the uncertainty over control of land;
- (ii) Facilitation of land access to all Nigerians irrespective of ethnicity, tribe, religion or state of origin;
- (iii) Reallocation of land to large scale agricultural productions.

As an instrument of land reform, the Land Use Act 1978 introduced drastic changes in several dimensions which are discussed as follows:

2.14.4 Nationalisation of Land

The Act enabled the unification of land tenure system throughout the country. This is achieved by vesting all lands within the territory of each state in the Governor for the common benefit of citizenry and set the modalities for state and local government tiers in their dealings with issues of land allocation, fixing of grand rents and issuance of 77

consent for transactions on land. By empowering Local Governments to issue customary rights of occupancy, taking away authority over land holding from the community leaders where such practices were peculiar, thus presenting a radical departure from the status *quo ante* (Umezulike, 2011).

2.14.5 Individualisation of Land

The Act changed the land ownership structure by superimposing individualisation of land ownership over the preceding priority on family and communal land ownership in southern Nigeria. Umezulike (2011) confirmed this development as a removal of the major obstacle to industrial and agricultural development in Nigeria.

2.15 An Overview of Residential to Commercial Land Use Change in Bida town

Adebayo & Egbenta (2009), put forward the basic doctrine of land use models which state that: “within an area of a given urban centre, a rationale pattern of land uses evolves as the city consists of a great variety of independent activities and location decision of any activity is normally decided on the relative advantages of various locations for the performance of such activity. Therefore, the activities would tend to

locate in areas that provide optimum conditions in the long run. Thus, by a process of competition among different uses, such activities seek out and segregate themselves in that area in which their relative advantages are to be met and by the virtue of which they are normally able to exclude other activities/uses”.

This is a related case for Bida town where the raising level of demand for commercial land use has warranted stiff competition between commercial and residential uses with

the residential areas. Household consumption patterns are changing dimension with a greater appreciation of a one-stop shop concept in the residential areas of the town. Hence, the central business districts failed to contain the increasing business activities, consumers tend to move to attractive residential areas with ease of accessibility in carrying out their retail and/or corporate businesses. This has however, triggered socio-economic and environmental issues like increasing rate of crime, poverty, shortfalls in residential properties associating with high rental values; traffic congestions as well as slum formations in the residential neighbourhoods.

A survey of Records of Commercial property inventory (2018) in few selected estate firms in Bida town, revealed that the current demand for retail space in Bida metropolis within 10 kilometre radius is 145, 789 square metres, from which the supply of commercial space to include the recently built retail shops and those to be completed in the next 24 months is at 104, 991.

2.15.1 A Compressive Outline of the Proposed Land Use Plan for Bida town 1980-2000

Bida town over four decades ago, had a predetermined land use pattern as against the rapid pace of urbanisation in the country. The overall land use coverage for Bida town plan is over 192 hectares which comprises the commercial core (New market) and its servicing and expanding neighbourhoods in the western region covering about 18% of the land uses; public institutions in the western part with over 40% of the entire land coverage in the city; a considerable proportion of high density housing on the northern edge occupying about 23% of the urban space; and the remainder 16% of the city's land

area lies open spaces within and around the town. Similarly, the plan identifies two areas of further commercial activity adjacent to the new central district plan; to the east the district connects with the existing Esso-high way commercial spots which will expand westwards to meet the Mokwala business district. Also to the north-west, an emerging supplementary commercial hub is envisaged in the master plan which will require its own detail local plan in due course.

Table 2.1: The Proposed Land Use Plan in hectares for Bida town 1980 – 2000

Proposed land uses	Area (hectares)	(%) of land uses	(%) of
total Area Commercial Activities (C3 & C5)	27.26	17.9	14.1
Open Space (A10)	24.44	16.0	12.7
Residential Uses (B)	35.60	23.3	18.5
Public Institutions (D1)	65.21	42.8	33.9
Total Land Uses	152.51	100.0	79.2

Source: Department of Land Registry, Ministry of Lands, Bida Area Office (2019).

The plan also stipulates the proposed land use streets blocks (road network areas) as thus:

Primary Distributors	(90m)	6.50	16.3	-
District Distributors	(60m)	6.06	15.2	-
Local Distributors	(45m)	16.47	41.2	-
Primary Access Roads	(30m)	10.92	27.3	-
Total Road Areas		39.95	100.0	20.8

Source: Niger State Urban Development Board, Bida Area Office (2019).

The overall land use consumption as stipulated on the 1980-2000 proposed land use plan runs at a total One thousand, nine hundred and two point fourty six (192.46) hectares of land for Bida metropolitan areas (Niger state ministry of lands, survey and town planning, 2000).

2.16 Conceptual Framework for the Study

Drawing from all the literatures and discussions in the previous studies relating to this work, the researcher maintained a position to come up with a conceptualised set of principles that provides basis for this research study which encapsulate Why are businesses shifting from the central business districts to the residential areas? Why has there been an increase in the change of land uses in recent years? What effects does land use changes from residential to commercial have on housing delivery? How can reduction in housing stock be analysed? And how can housing delivery be enhanced? The framework has been adapted from the “Drivers - Trends – Effects – Response” model that was developed by the European Environmental Agency (2006). It is a framework that provides a “logical way of conceptualising the chain effect of human activities on urban land uses (Wong, 2006). The conceptual framework is therefore, diagrammatically represented in the figure 2.4 below:

DRIVERS OF LAND USE CHANGES

2.17 The Research Gap

It has been established that increasing economic activities is a critical phenomenon in changing the pattern of land uses in a given urban centre over time (Aluko & Enisan, 2015). This is becoming a source of concern in the sense that, the progressive trends in urbanisation has triggers residential to commercial land use changes (Lami & Umar (2018). Therefore, in line with the literatures reviewed relating to this study, certain identifiable research gaps are presented as thus:

Generally, the goal of analysing land use changes is centred majorly on three separate but interrelating parameters which are the "drivers, trends and effects". Several researches on land use changes in Nigerian cities mainly revealed its processes, causes and effects of which none of the studies carried out, analyses the trends and effects of land use changes on housing delivery in Bida town; owing to the fact that the urban centre is witnessing continuous changes in land use as against the planning regulations which as resulted to mixed/misuses of land over the years (Lami *eta''al*, 2018).

Bida town in the last two decades has witnessed remarkable population growth of which the development had attracted commercial land uses away from the central business districts to residential areas in an unchecked manner; certainly due to disregard of the zoning regulations (Lami *eta''al*, 2018). Though, registration requirements for change of use have being less emphasised in the previous studies; as such no substantial efforts made at documenting the land use dynamics in Bida urban. Virtually also, the previous studies did not make any attempt at documenting the extent at which sprawling of commercial activities in the residential neighbourhoods has contributed to housing deficit for the last two decades in the neighbourhoods of the study interest.

Previous researches relating to this study made use descriptive statistics and spatial analytical tools; seeking the respondents' opinions and classifying classes of land uses respectively in ascertaining the processes, causes and effects of land use change in urban centres. Whereas, none of these studies analyses land use changes using statistical techniques like Statistical Mean Score, Simple Percentages and Paired Sampled t-Test to scientifically ascertain the factors, trends and effects that land uses outside the central business districts has on housing delivery; hence, improving the quality of results and deductions made from data collected for this research work.

CHAPTER THREE

3.0 REASERCH METHOLOGY

The methodology of this study is developed base on the need of analysing land use changes as it affect housing delivery within the fringe of central business districts. It covers the study Population, sources of data required, methods of data collection, sampling technique and size, data analytical techniques and presentation.

3.1 Sources of Data for the Study

This study required the use of both primary and secondary data which were gathered in various forms as thus:

3.1.1 The Primary Source; information is designed to collect direct data from the field. Under this section, the researcher made use of Questionnaire in an inquiry form and administered to Landlords and Tenants of converted residential property who are of 112 and 113 respondents respectively. This was established in order to gather data on effects and reasons for residential to commercial properties conversions in the selected neighbourhoods of the study area. The Planning Officials and Estate Surveyors were interviewed on information like procedures involved in change of purpose clouse; as well as variations in rental values of the affected housing stocks.

3.1.2 Secondary Source; these are archival data; that is, data obtained from other sources. These data were deduced from the records obtained from the relevant planning offices regarding the extent at which commercial activities encroaches the adjoining residential neighbourhoods and its effect on housing stock.. The researcher hence, made use of extracts from official files of various type of land uses in the metropolis over the years. Other published materials adopted for the research

study include the official documents like old and adjusted neighbourhood layout plans, approved building plans for change of use as well as government agencies' reports and publications specified in this study.

The table below shows data sources and collection procedure for the study:

Table 3.1: Sources of Data and Collection procedure

Population	Data for Study	Data Sources
Relevant Planning Authorities (NUDB, Bida Area Office & NMLH, Bida Area Office)	Data on application for change of use received & executed; extract of old & new land use maps showing the residential to commercial changes that have occurred over the years.	Secondary Source
Landlords & Tenants of converted housing units in the selected residential areas of Bida town.	Data on effects & reasons for residential to commercial use conversions in the selected neighbourhoods.	Primary source
Estate Surveyors & Valuers practicing in Bida town.	Data on the prevailing housing market indices, rental values variations of residential properties before and after conversions in the selected neighbourhoods.	Primary sources

Researcher's Field Survey (2019).

3.2 Study Population and Data Requirement

Population of the study is refers to as a survey of relevant matters that characterises the studying situation (Asika, (2009). The targeted population of the study comprises the officials of planning authorities who are 05 staff in (Niger State Ministry of land & housing, Bida Area office; and Niger State Urban Development Board, Bida Area office), and are chosen to provide relevant documents regarding the procedures of change of land uses that will demonstrate the extent at which commercial land uses has taken over residential housing stock in the study area during the study period. Also documents stating clearly the registration requirements and procedures for change of land uses were readily made available.

Also, the total population of 112 numbers of landlords and 113 numbers of tenants of converted residential property were considered in order to inform the reader(s) on the factors responsible for commercial activities extending outward from the central business districts to the adjoining residential areas; and the effect of such changes in the selected neighborhoods on housing delivery. Other required information were obtained from the practicing Estate Surveyors who are of 04 number, in order to obtain from their experience on land use dynamics; the possible variations that must have occurred in the rental values of residential property before and after conversions in the selected neighborhoods of Bida urban.

3.3 Sampling Frame

Sampling unit/frame is a geographical area within a given locality where the targeted population can be found (Morenkeji, 2006). The populations for this study comprise three different central districts and there proximate residential neighbourhoods of Bida urban; the

commercial spots are “New market/Esso high way business district, Old market/Estu Musa central business district and Small market/Estu Umaru commercial centre” with proximate residential areas like Esso-BCC Avenue, Cinema-Mokwala down town and Gbangbara-Texaco district respectively.

3.3.1 Sample Size

The sample size is the number of individuals to include in a sample.

The sample size is arrived at based on the following considerations:

(i) Questionnaires administered to 112 respondents“ Landlords whose residential property has being taken over for commercial uses within the neighbourhoods of the study interest.

(ii) Questionnaires administered to 113 respondents“ Tenants whose occupational status changes from residential to commercial premises in the selected residential neighbourhoods.

(iii) The total numbers of 332 converted housing stock in the selected neighbourhoods.

(iv) Census sampling of population of experts (Estate Surveyors and Planning Officials) with familiar experience on urban land use changes.

(v) The formula developed by Kothari (2004) us adopted in determining the sample size for the selected neighbourhood units like “Esso-BCC Avenue, Cinema-Mokwala down town and Gbangbara-Texaco district.”

Sample size = $\frac{Npq}{e^2}$ equation (1)

Where:

α = level of significance (1.96)²

P = sample size frequency estimate (0.09)

q = 1-P

e = margin of error (0.03)

N = population size

Below are computations of the sample size for the selected neighbourhoods of the study area:

Sample size for Esso-BCC Avenue

Recall the Kothari formula (2004) = $\frac{Nn}{(n + N)}$, where N is 67

$$= \frac{67n}{(n + 67)}$$

$$= \frac{67n}{(n + 67)}$$

$$= \frac{67n}{(n + 67)} = 56$$

Sample size for Cinema-Mokwala down town

Recall the Kothari formula (2004) = $\frac{Nn}{(n + N)}$, where N is 175

$$= \frac{175n}{(n + 175)}$$

$$= \frac{175n}{(n + 175)}$$

$$= \frac{175n}{(n + 175)} = 117$$

Sample size for Gbangbara-Texaco district

Recall the Kothari formula (2004) = $\frac{Nn}{(n + N)}$

$$= \frac{90n}{(n + 90)}$$

$$= \frac{90n}{(n + 90)}$$

$$= \frac{90n}{(n + 90)} = 72$$

, where N is 90

Table 3.2: **Sample Size of the Selected Neighbourhoods of the Study Area**

Neighbourhood Units	Converted Houses	Sample Size
Esso-BCC Avenue	67	56
Cinema-Mokwala down town	175	117
Gbangbara-Texaco district	90	72
Practicing Estate Surveyors in Bida town	04	04
Planning Officials	05	05
Total	341	254

Source: Researcher's Computations (2019).

The city master plan shows that Esso-BCC Avenue is a trunk „A“ road network basically zoned as commercial strip comprising 67 residential properties affected by commercial land use conversion. Cinema-Mokwala down town situates along a trunk „B“ transport route of the city and comprises 175 commercial properties that were originally residential units. And Gbangbara-Texaco district with 90 commercial premises taken over from accommodation units on trunk „B“ during the study period.

3.3.2 Sampling Techniques

This study employed cluster random sampling technique for the landlords/tenants of both converted and unconverted residential properties in the selected neighbourhood. Firstly, due to heterogeneity of commercial land uses in the selected neighbourhoods as identified in table 3.2 above. Secondly, due to differing factors that responsible for business activities relocating to the fringe of the selected central business districts in the study area.

The researcher therefore due to the limited number of Estate Surveyors, sampled and considered the set of the population relevant for this study; purposive sampling technique was hence adopted. While in order to compliment the set out questionnaires, officials of the relevant authorities (Niger State Ministry of Lands and Housing, Bida Area Office; & Niger State Urban Development Board, Bida Area Office) were interviewed due to their expertise knowledge on land use dynamics.

3.5 Method of Data Collection

Administration of questionnaires and interviews of the officials in the Area Lands and housing office; as well as officials in the Urban Development Board, Bida Area Office); Owners of the affected residential property and Occupants of the converted residential property from which valuable information were obtained in analysing factors, trends and effects of land use changes in the study area. A desktop study of the secondary data was carried out through review of existing literature from which conceptual and theoretical frameworks were formulated.

3.5.1 Questionnaire

A closed-ended questionnaire was designed to collect relevant information on effects of land use changes on housing environment of the selected neighbourhoods closer to the Central Business Districts. Questionnaires was designed in an inquiry form and administered to Landlords and Tenants of converted residential properties; and officials of Niger State Ministry of Lands and Housing, Bida Area Office; as well as the staff of Niger State Urban Development Board, Bida Area Office; based on the objectives of the research for reasons of consistence in the layout of the study.

The structured questionnaires with close-ended questions were designed on a 5-point Likert scale basis. The responses of this research questions are categorised as “STRONGLY AGREE, AGREE, MODERATE, DISAGREE, and STRONGLY DISAGREE”; and also “VERY HIGH, HIGH, MODERATE, LOW and VERY LOW” for the set out objectives of the study. Allen & Seaman (2007) and Mathers *et al* (2009), have submitted that the Likert scale is universally utilised in survey research in order to ensure the objectivity and proportionality of questions.

3.5.2 Interview

This section is simply a personal interview conducted with the respondents (Officials of Planning Authorities and Estate Surveyors) on certain information that could not be gathered via Questionnaires under the average time of thirty-minute intensive discussions; such information like procedures involve in change of purpose clause as well as variations in rental values of the affected housing stocks. Thus complementing the research questionnaires designed in achieving the predetermined objectives for the study.

3.6 Questionnaire Design

Closed-ended questionnaires were distributed to respondents in analysing the drivers and effects of land use changes in Bida Town. This study therefore, adopted Raharjo, 2005; Arnott & McMillen, 2006; Adebayo & Egbenta, (2009); Asamoah, 2010 and Sedney, (2012); Tomisi *et al.*, (2016) s’ conceptual and theoretical frameworks in administering the research questionnaire designed in achieving the set out objectives for this study. Thus, a total of 254 questionnaires were designed and distributed on the basis of being a figure obtained as the sample size for the study, out of which 234 questionnaires were retrieved; representing 68%

and 92% for the total study population of the affected housing stocks and total questionnaires administered respectively. While a success response rate of 94.8% was achieved. This achievement was largely due to the earlier contacts made with most of the targeted respondents in the study area.

The selected residential areas were hence clustered in accordance with the density of housing stocks and rate of business activities as thus: Mokwala-Cinema down town as high density with 110 retrieved questionnaires from both landlords and tenants of converted residential properties; Gbangbara-Texaco District being the medium density residential neighbourhood with 65 retrieved questionnaires equally from landlords and tenants of the affected housing stocks; while Esso-BCC Avenue as the low density having 50 retrieved questionnaires from landlords and tenants of converted properties. Meanwhile, 05 and 04 questionnaires administered for the practicing Estate Surveyors and planning officials were 100% retrieved without any lost. Hence, field survey for the data collection was undertaken between the months of September and November, 2019. Table 3.2 below provide details of response rate to questionnaire administered for the respondents:

Table 3.3: **Distribution and Administration of Questionnaire for the**

Respondents

S/No	Selected Neighbourhoods	Total Population	Sampled Population	Retrieved Questionnaires	(%) Success
1	Esso-BCC Avenue	67	56	50	89
2	Mokwala-Cinema Down Town	175	117	110	94
3	Gbangbara- Texaco District	90	72	65	90
4	Estate Surveyors	04	04	04	100
5	Planning Officials	05	05	05	100
Total		341	254	234	-

Sources: Revenue Department of Niger State Ministry of Lands Housing & Author's (2019).

3.7 Method of Data Analysis and interpretation for the Study

Data analysis refers to the practical application of mathematical and scientific procedures to the analysis of social science data (Kothari, 2004). It provides sensitisation for social researchers to the use, interpretation and evaluation of data related to a particular study (Morenikeji, 2006). Hence, the study adopts descriptive and inferential statistical techniques; and the relevant data were collected and presented in Tables and Charts for interpretation.

3.7.1 Statistical Mean Score

This is a descriptive statistical tool commonly used in social science researches which refers to the average value of a set of variables especially when the data is ratio or interval scaled (Dent, 2016). Jose & Montserrat (2009), computed mean score using the formula:

$$\text{Mean Score} = \text{Summation of } FX/N$$

Where X = score apportioned to each variable by the respondents on 1-5 point scale,

F = frequency of respondent to each variable

N = total number of respondents surveyed. This was employed for „objective one“ of the study in order to rank the respondents“ opinions on the possible factors attracting businesses to residential areas.

3.7.2 Simple Percentages

A statistical simple percentages is viewed as a proportion of a set of data expressed in terms of one-hundredth, usually computed by multiplying a fraction by 100 (Morenikeji, 2006). In tackling „objective two“ of the study, simple percentages was deployed in order to classify the progressive changes in spatial distribution of land uses in the study area between 1998-2018. Hence, percentage changes in the various land uses that have occurred over the years have been critically analysed. The rate at which commercial land uses has taken over the residential areas was also ascertained; and thus deducing the percentage increase in commercial land uses attributing to percentage decrease in residential land uses in study area.

3.7.2.1 Coefficient of Variation

Hayes (2017), described Coefficient of Variation as a statistical tool commonly used in measuring the degree of variance or deference from one data series to another; which represent the ratio of Standard Deviation to the Mean. This descriptive statistical tool of measurement was also engaged in computing the percentage increase in the number of commercial properties as against percentage decrease in the number of housing stock over the years; thus, compliments the Simple Percentages Technique in tackling the second objective of the study.

The formula is expressed as: $CV = (SD/X) \times 100$; where

CV is the coefficient of variation;

SD is the standard deviation; while

X is the mean value.

3.7.3 Paired Sample t-Test

This is an inferential statistical technique usually employed in situations where two measurements are considered for each respondent (Dent, 2016). It is therefore engaged in order to determine either or not there is a reliable variation between the mean scores of experts“ and non-experts“ opinions on effects of residential to commercial land use changes in Bida town as it affects housing delivery between 1998-2018; so as to reveals p-values of all the paired respondents in determining the level of statistical significance in the variant opinions of the target respondents surveyed in achieving the „objective three“ set out for the study. The table below describes appropriate analytical techniques for the study:

Table 3.4: Study Objectives, Data Collection Methods and Analytical techniques

Objectives of Study	Type of Data Collected and Sources	Analytical Techniques
To identify common factors responsible for commercial activities changing locations from the central districts to residential areas in the study area.	Data on factors necessitating residential to commercial land use conversions in the selected neighbourhoods (Landlords & Tenants of converted properties; & Real Estate Surveyors in Bida).	Descriptive Statistic (Statistical Mean Score)
To assess the rate at which land use changes from residential to commercial uses in the study area within the study period.	Extract of application for conversions & official files of land use maps showing the changes that have occurred in the residential neighbourhoods (NUDB, Bida Area Office & NMLH, Bida Area Office)	Simple Percentages (Coefficient of Variation)
To examine the effect of commercial land use encroachment on the residential neighbourhoods in Bida town (2008-2018).	Data on inventories of commercial and housing stocks and the rental variations of residential properties before and after conversions in the selected neighbourhoods (Estate Surveyors in Bida & Landlords/Tenants of both converted & unconverted housing units in Bida).	Paired Sample t-Test

Source: Author's (2018)

.3.8 Guide to Degree of Significance

Baji & Wachiko (2008), expressed that degree of significance table is essential in summarising a large set of variables into definite class or category so that the mean score of the given variable can be determined and ranked. Therefore, the table is adopted in order to rank the prevalence as very low, low, moderately high and very high as the case may be in order to arrive at certain level of measurement for analysis:

Table 3.5: Ranking Scale for Degree of Significance

S/No.	Mean Score	Decision
1	4.50-5.0	Very High
2	3.50-4.49	High
3	2.50-3.49	Moderate
4	1.50-2.49	Low
5	0.00-1.49	Very Low

Source: Morenikeji (2006)

CHAPTER FOUR

4.0 DATA PRESENTATION, RESULTS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter analyses data collected for the study. The research analysis was based on the objectives set out for the study. The chapter therefore, presents the findings on the factors responsible for business activities changing locations from central districts to the residential areas; the rate at which land use changes from residential to commercial uses; and effect of land use changes on housing delivery. The views of landlords and tenants of converted properties, Estate surveyors and Planning Official were sought in analysing the drivers, trends and effects of land use changes in Bida town. The results are presented in form of frequency distribution table for the respondents' responses; percentage changes in land uses; coefficient of variance; line graphs of changes in land uses; pie charts of trends in land distribution; Statistical Mean Scores of the respondents' opinions and Paired Sample t-Test revealing the p-values of all the paired respondents to determine the level of statistical significance.

4.2 Category of Respondents for the Study

This section basically present information of respondents in relation to the total number of questionnaires administered, number of questionnaires retrieved, percentage retrieved were analysed to guide readers on the nature of respondents and their participation in providing information required for this study; and were represented in the table below:

Table 4.1: Category of Respondents

S/No	Respondents ^{**} Category	Administered Questionnaires	Retrieved Questionnaires	(%) of Retrieved Questionnaires
1	Landlords of Converted Property	121	112	.93
2	Tenants of Converted Property	124	113	91
3	Estate Surveyors	04	04	100
4	Planning Officials	05	05	100
Total		254	234	

Source: Author's (2019)

4.3 Factors Responsible for Commercial Activities Changing Locations from Central

Business Districts to Residential Areas

4.3.1 Factors Responsible for Residential to Commercial Land Use Changes

In table 4.2, the consensus opinions of all the respondents on Factors responsible for commercial activities changing location from the central districts to the residential areas is critically analysed. The statistical result of the analysis via Mean Score substantiated the ranking

to which these factors have contributed to business activities sprawling in the residential areas of Bida town. It has indicated clearly from the table that increasing demand for business premises due to population explosion has a mean value of 4.74 and ranked 1st; this is preceded by failure of the central business districts to contain the increasing economic activities which has a mean value of 4.12 and thus ranked 2nd; proprietary interest or aged building necessitating change of use has a mean value of 4.11 thus ranked 3rd; similarly, easy accessibility in the residential areas as well as fire disaster in central business districts with mean scores 3.98 and 3.86 respectively which were ranked as 4th; and profit maximization motive of the commercial land users ranked 5th indicating the slightest factor responsible for commercial land use extending out to the residential areas of Bida town. Based on ranking the factors that mostly responsible for commercial land use changing location from the central districts to the residential neighbourhoods are: increasing demand for business premises due to population growth, failure of the central business districts to contain the increasing economic activities as a result of congestions in the central districts, proprietary interest or physical obsolescence of residential property, easy accessibility in the residential areas. The factors outlined have their mean scores above 3.50, except profit maximization motive of the commercial land users with 3.35 mean score. The findings are related with Sydney (2012) and Asamoah (2010)'s studies. Therefore, the criteria used in the rating scale has being established in table 3.4 earlier in order to summarises the set of variables into definite class; thus the mean value index of each variable is determined and ranked accordingly below:

Table 4.2 Causes of Residential-Commercial Land Use Changes in Bida Town (2008-2018)

Variables	Mean Score	Std Deviation	Ranking	Rating
Increasing Demand for Business Premises due to Population Growth	4.74	0.73	1	Very High
Failure of the Central Business Districts to Contain the increasing Economic Activities	4.12	0.90	2	High
Proprietary Interest/Upgrade of Physically Obsolete houses	4.11	1.17	3	High
Easy Accessibility in the Residential Areas	3.98	1.47	4	High
Occurrences of Fire Disaster in Market Stalls/Places	3.86	1.00	4	High
Commercial Land Users' incentive for Profit Maximization	3.35	1.03	5	Moderate

Source: Author's (2019).

4.4 Rate at which Land Use Changes from Residential to Commercial Uses (1998-2018)

4.4.1 Procedure for Change of Land use in Bida town

Land use changes in Bida town is guided by the series of administrative processes set out by Niger state ministry of lands and housing which allows conversions of residential land use for commercial uses. In order to collect data on number of applications received and executed for change of purpose clause in ascertaining the rate at which commercial land uses taken over residential uses over the years, the researcher make a review of official documents on land use change procedures at the Area land office, Bida during the study period; and having it as following:

(i) Submission of Application for Change of Purpose Clause; the application form obtained to be filled in by the property owner accompanied with other documents like: a copy of certificate of occupancy, a copy of certificate of tax clearance of non-indebtedness for three years, a copy of bank draft of three thousand naira (#3000) cost of form payable to the Niger state government, a building/floor plan of the proposed development, a court affidavit of such property not under any mortgage transaction, an Environmental Impact Assessment report on the proposed development.

(ii) Scrutiny of the Submitted Application for Change of Purpose Clause; upon the submission of the application form alongside with other requirements, the applicant will be invited for a site visitation in order to authenticate all the items claimed in the application form. An advert is then prepared for publication, at least three timely intervals which run at the client's costs; and a certificate of publication will be submitted to the Area land officer for onward processes

(iii) Reporting and Determination by Land Use Change Committee; This committee comprises of the Director Lands, Director Town planning and Surveyor General in the Niger state ministry of lands and housing, Minna; who holds a full council meeting regarding the findings and report of the scrutiny session. Then the committee prepare and endorse relevant technical documents for

onward transmission to the commissioner for lands and housing who will then approves or disapproves; upon which the client will finally be communicated in writing on the decision passed.

4.4.2 Land Use Distribution in Bida Town Between 1998-2018

Archival records on the pattern of land use distribution in Bida town were obtained for two time periods, that is, 1998 and 2018. For these periods, residential land use reflects a larger proportion of land coverage with 62.8% in 1998 and 66.9% in 2018 portraying percentage increase of 4.1% within the 20 years period. Commercial land use covered 23.5% of the metropolitan areas in 1998 and 13.8% in 2018 depicting percentage decrease of 9.7%. Industrial land use had 2.9% coverage in 1998 which increased to 4.3% in 2018 representing an increase with 1.4%. Institutional land use had 4.6% coverage of the metropolitan areas in 1998 but was increased to 6.3% in 2018 signifying an increase in this land use with 1.7%. While recreational areas had 7.2% coverage in 1998 which had also increased to 4.8% in 2018 indicating a percentage rise of 2.4%. The percentage changes in the various land uses that have occurred over the years in the metropolitan areas of Bida town; even though there was a boundary outward adjustment in the recent time. The changes are thus, shown in the table and figures below:

Table 4.3: Land use coverage and percentage changes in Bida town for 1998 & 2018

Year	1998	2018	(%) Changes
Land Uses	(%)	(%)	(%) Changes
Residential	62.8	66.9	+4.1
Commercial	23.5	17.8	-5.7
Industrial	2.9	4.3	+1.4
Institutional	4.6	6.3	+1.7
Recreational/open spaces	7.2	4.8	+2.4
TOTAL	100	100	

Sources: Max Lock Consultancy, (2011) & Niger State Ministry of Lands & Housing, Bida Area Lands Office (2019).

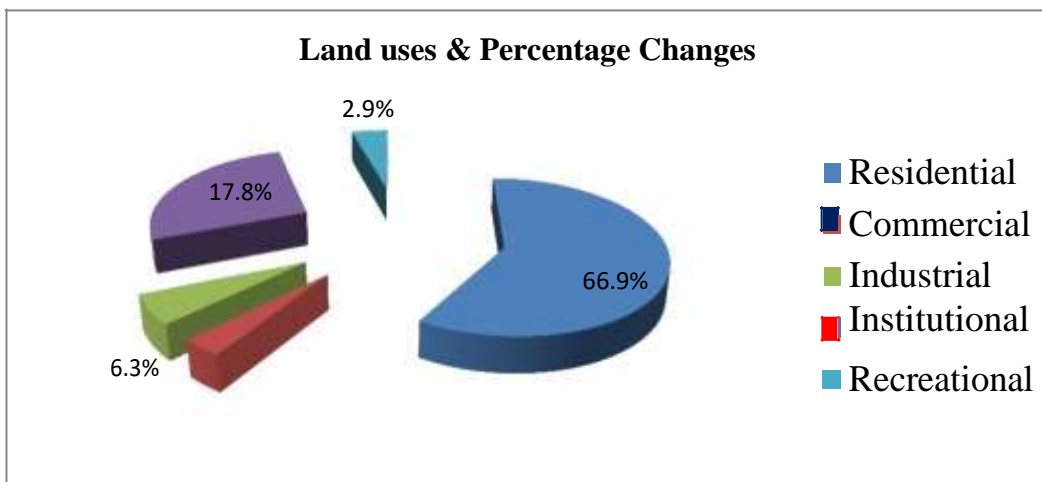


Figure 4.1: Land Use Distribution in Bida in 2018

Source: Author's Work (2019)

Bida town in the last two decades experienced upward pressures in residential, commercial and institutional land uses at 4.1% and 9.7% 1.7% respectively; while industrial and open space declined by 1.4 and 14.1 respectively. These variations in the overall land use coverage over the years was due to rapid pace in urbanisation whereby, the number of residential properties taken over by commercial uses in the residential neighbourhoods were further replaced in the city outskirts; there by, absorbing the open spaces as well as industrial sites that have suffered survival during these periods.

4.4.3: Establishing the Rate at which Commercial Land Use Encroaches Residential Property within the residential neighbourhoods over the Years

Owing to the increasing demand for commercial space, businesses tend to shift from the central districts to residential areas in search for optimum conditions in terms of profit maximisation and easy accessibility. In order to establish whether the increasing commercial activities in the selected residential areas have attributed reduction in housing stocks; the researcher sought for the opinions of the planning officials and prudently find to know the exact number of applications received and implemented for change of land uses in an average year, as evidenced from the related literature. It was gathered that there is a steady conversions of residential property to commercial uses in residential neighbourhoods closer to the central districts of the town due to raising economic pressures that trigger such development.

It can therefore be deduced that residential to commercial land use change contributes to housing deficit in the residential neighbourhoods closer to the central districts.

The table and charts below shows the degree of responsiveness of residential uses to change to demand for commercial land uses; whereas four yearly interval scale was designed due to time

consuming nature property development process; so that reasonable number of converted residential to commercial property could be recorded over the study period.

Table 4.4: Percentage Increase in Commercial Land Uses Attributing to Percentage Decrease in Residential Land Uses in Bida Town Between 1998 to 2018

Selected Neighbourhoods	Nature of Property	Land Use Changes at Four Yearly Interval										TOTAL STOCK
		1998-2002 No. of Property	(%) Changes	2003-2007 No. of Property	(%) Changes	2008-2011 No. of Propert y	(%) Changes	2012-2016 No. of Propert y	(%) Changes	2017-date No. of Propert y	(%) Changes	
ESSO-BCC AVENUE	Residential	1315	-	1299	1.2	1274	2.0	1259	1.2	1250	0.75	1250
	Res.to Com.	-	-	16	-	25	-	15	-	09	-	67
	Commercial	570	-	586	3.0	611	4.0	626	2.4	635	1.4	635
MOKWALA-CENIMA DOWN TOWN	Residential	2740	-	2709	1.1	2682	1.0	2636	1.7	2565	2.8	2565
	Res.to Com.	-	-	31	-	27	-	46	-	71	-	175
	Commercial	1225	-	1256	2.5	1283	2.1	1329	3.5	1400	5.1	1400
GBANGBARA-TEXACO DISERICT	Residential	1575	-	1565	0.6	1530	2.3	1528	0.1	1485	2.9	1485
	Res.to Com.	-	-	10	-	35	-	02	-	43	-	90
	Commercial	390	-	400	2.5	435	8.0	437	0.6	678	6.3	678

Sources: Enumeration Area Demarcation (2018), Bida Area Lands Office (2019), Bida Zonal Office of AEDC (2019) & Author's (2019)

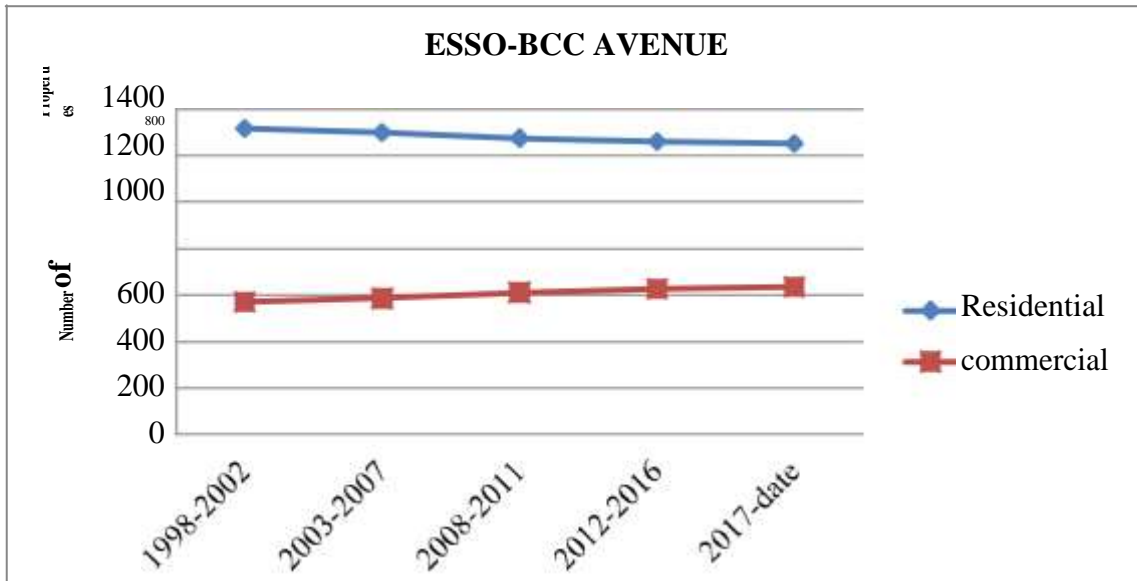


Figure 4.2: Residential to Commercial Land Use Changes in Esso-BBC Avenue of Bida Town Between 1998-2018

Source: Author's (2019)

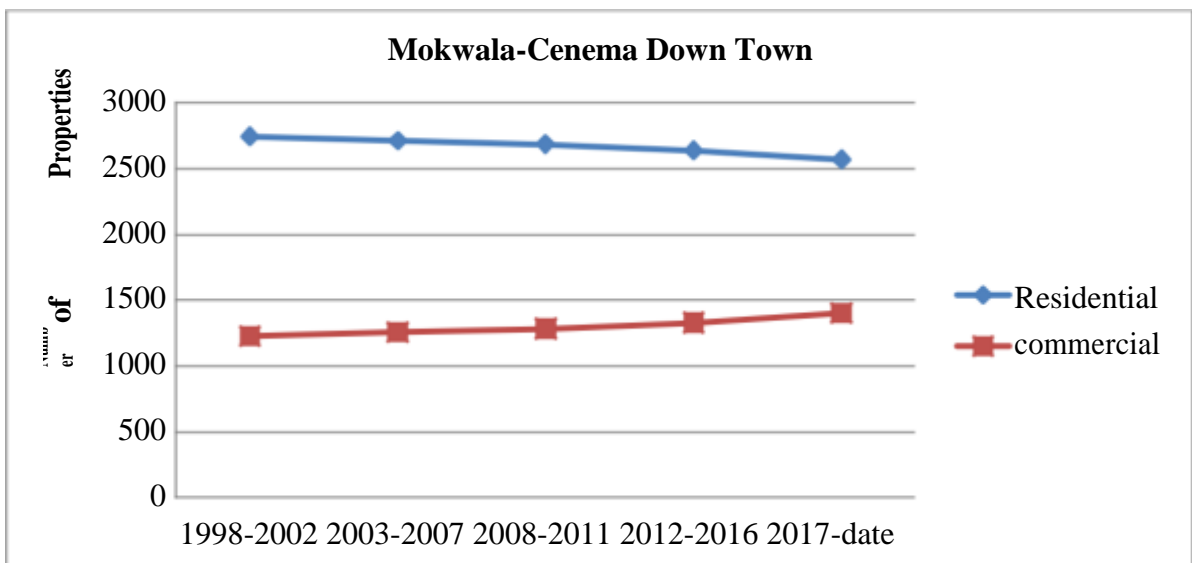


Figure 4.3: Residential to Commercial Land Use Changes in Mokwala-Cinema Down Town of Bida Urban Between 1998-2018.

Source: Author's (2019).

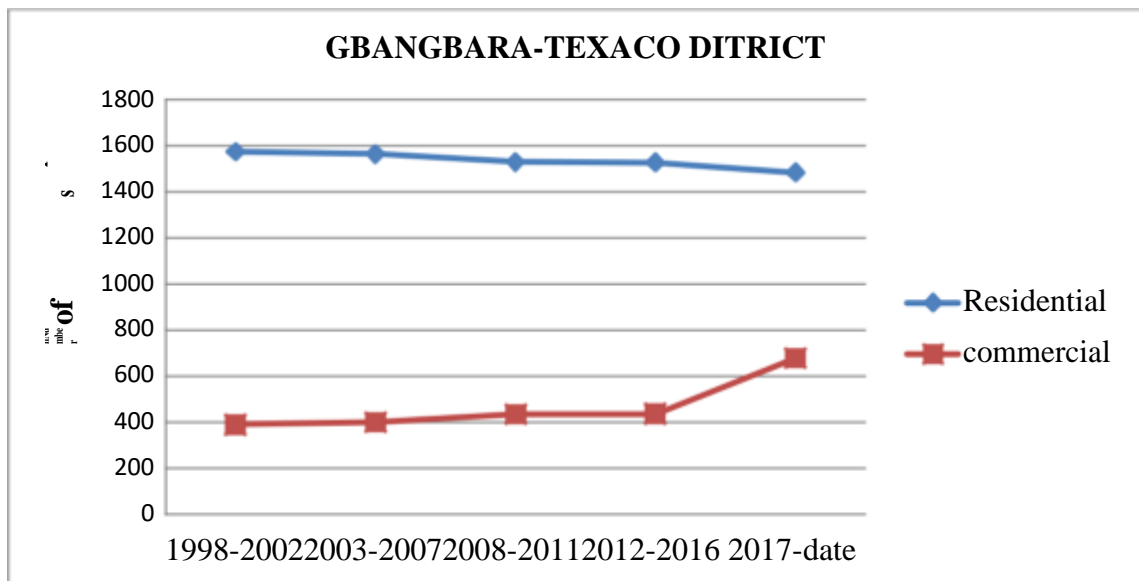


Figure 4.4: Residential to Commercial Land Use Changes in Gbangbara-Texaco District of Bida Town Between 1998- 2018.

Source: Author's (2019).

4.4.4 Coefficient of Variations in Residential Property and Commercial Property in the Selected Neighbourhoods

The table 4.5 below shows the degree of variance between residential land uses and commercial uses. Indicating the percentage increase in the number of commercial property as against the percentage decrease in the number of housing stock over the years. This implies that, commercial land uses has more upward pressure relative to its Mean value with Coefficient of Variation at 47.53 as against residential uses with 39.70 Coefficient of Variation.

Table 4.5: Coefficient of Variations in Residential and Commercial Properties in the Selected Neighbourhoods of Bida Town (1998 & 2018)

Nature of Property	Mean Scores	Variance	Standard Deviation	Coef. of Variance	Remarks/ Comments
Residential	1766.67	491808.33	701.129	39.70	Less variation
Commercial	904.33	184726.33	429.798	47.53	More variation

Source: Author's (2019)

4.5 Effect of Land Use Changes on Housing Delivery in Bida town (1998-2018)

4.5.1 Respondents' Consensus Views on Effects of Land Use Changes on Housing Delivery

The table 4.4 below shows the respondents' overall opinions on effect of commercial land use encroachment on housing delivery in the selected residential neighbourhood of the study area. The statistical result of the analysis via mean score presented the ranking to which these effects have affected the character and composition of housing environment proximate to the central districts.

It has indicated clearly from the consensus opinions of Estate surveyors and Planning officials that increasing traffic congestion and slum formation in residential areas with a mean value of 4.74 is ranked 1st; this is preceded by challenges in land use control measures which has a mean value of 3.86 and thus ranked 2nd; sprawling of economic activities in residential zoned areas being one of the effects of change of use has a mean value of 3.82 and ranked 3rd; similarly, increasing crime rate in the residential areas with mean score 3.55 which was ranked as 4th; reduction in residential vacant lots/housing stocks closer to the central 112

districts ranked 5th; and increasing land/property values in the residential neighbourhoods was ranked 6th indicating the least opinion of experts regarding effect of commercial land use change on housing delivery in Bida city. Similarly, the overall opinions of landlords and tenants of converted properties also shows that increasing traffic congestion and slum formation in residential areas with a mean value of 4.59 takes the 1st in the ranking; increasing economic activities in residential zoned areas ranked 2nd effect with 4.53 mean value; this is preceded by increasing land/property values in the selected residential neighbourhoods which has a mean value 3.73 and thus ranked 3rd; also, challenges in land use control measures with mean score 3.53 which is ranked as 4th; reduction in residential vacant lots/housing stocks closer to the central districts; and increasing crime rate in residential areas with mean values of 3.30 each and thus, rated equally as 5th and 6th respectively.

Table 4.6: Experts and Non-Experts Opinions on Effect of Residential-Commercial Land Use Changes on Housing Delivery

S/No	Variables	Experts (Estate Surveyors & Planning Officials)			Non-Experts (Landlords & Tenants of Converted Properties)			Overall		
		Mean Score	S,dev,	Rank	Mean Score	S,dev	Rank	Mean Score	S,dev	Rank
1	Increasing Crime Rate in the Residential Areas	3.55	0.77	2	3.30	1.42	3	4.74	0.87	1
2	Increases Economic Activities in Residential Zoned Areas	3.82	1.05	2	4.53	1.03	1	4.67	0.82	1
3	Increasing Traffic Congestion & Slum Formation in Residential Areas	4.74	1.00	1	4.59	1.23	1	4.64	0.87	1
4	Challenges in Land Use Control Measures	3.86	1.00	2	3.53	0.77	2	4.59	.089	1
5	Increasing Land/Property Values in the Residential Neighbourhoods	3.40	1.28	3	3.73	1.19	2	4.53	0.97	1
6	Reduction in Residential Vacant Lots/Housing Stocks Closer to the Central Districts	3.53	1.20	2	3.30	1.42	3	3.86	1.00	2

Source; Author's (2019)

4.5.2 Paired Sampled Statistic between Experts (Estate Surveyors & Planning Official) and Non-Experts (Landlords & Tenants of Converted Properties) on the Effect of Land Use Changes on Housing Delivery

A paired t-test was used to determine whether there is a statistically significant difference between the mean value from the opinions of experts and non-experts in the land use dynamics. The paired t-test revealed the p-values of all the paired respondents to be greater than 0.05 and has been concluded that there is no statistically significant difference between the mean scores in the responses of Estate surveyors and planning officials as well those landlords and tenants of the affected residential properties taken over for commercial uses. This implies that the estate surveyors, planning officials as well as landlords and tenants of converted properties are in agreement on the common effects of land use changes in the selected housing neighbourhoods.

Table 4.7: Summary of Paired Sampled Statistic of Experts & Non-Experts

Respondents

Paired variables	Mean	Std.Dev	Std. error	95% confidence interval of the difference		T	R	df	Sig(2-tailed)
				Lower	upper				
Experts & Non-Experts.	0.180	.68197	.278	- .0895668	.53568	0.674	0.507	5	0.546

Source: Author's (2019)

4.6 Summary of Findings

Based on the analysis of data collected for this research work, the survey reveals the following major findings using the research objectives format for consistency in the layout for the study:

- (i) All the respondents surveyed are regarded as the key players in the urban land use dynamics and thus, have ample familiarities on the drivers of land use changes in the selected neighbourhoods of the study area and were categorised as experts and nonexperts. Experts were Estate surveyors 04 (1.7%) and Planning official05 (2.1%) while nonexperts were Landlords and Tenants of converted properties with 112 (47.9) and 113 (48.3%) respectively.
- (ii) The study revealed that land use changes is greatly influenced by numerous factors which were ranked accordingly to their mean values index as thus: increasing demand for business premises, limited retail space in the central business districts, upgrading of physically obsolete houses and easy accessibility in the selected residential areas. This imply that landlords reserve the right to convert the present use of their property (residential) to another type of uses (commercial) for the purposes of upgrading the obsolete housing stock without necessarily sought the consent of other land users.
- (iii) The study has clearly indicates that frequent occurrences of fire disaster in market places is one of the strong factor responsible for dispersal of commercial activities in the residential neighbourhoods; thereby, impending serious challenges on land use and development control. The planning authorities have therefore sought expansion of the central business districts in tackling noticeable negative effects of retail activities in the residential areas.

(iv) The study identified that land use changes occurred mostly in residential neighbourhoods closer to the central business districts of the study area.

(v) The research shows that there is a raising expectation on further commercial land use extending on the residential areas among the households in the population of interest (Esso-BCC Avenue, Mokwala-Cinema Down town and Gbangbara-Texaco District). The simple percentages computed in ascertaining the extent at which commercial activities encroaches the residential areas indicates about 3% of housing stock lost on four yearly basis; thereby, housing deficit is recorded.

(vii) The study revealed that despite high rate of residential property conversions for commercial uses in the selected residential areas of Bida town, majority of the residential property owners do not seek planning permit/approval prior to such changes. Thus, the role of planning authorities in issuance of change of purpose clause for conversions and its procedure has been widely elaborated.

(vii) The results from this study also revealed in order of magnitude the effects of land use changes on housing neighbourhood to comprise: increasing traffic congestion and slum formation, challenges in land use control measures, sprawling of economic activities, increasing crime rate, reduction in residential vacant lots/housing stocks, rising land/ property values; were common effects of land use changes in the study area.

(viii) The inferential analysis further revealed that there is no statistically significant difference between the mean scores of the responses of experts (Estate surveyors and planning officials) and those of nonexperts (landlords and tenants) of converted properties with p-values of all the paired respondents to be greater than 0.05. This implies that the opinions of experts and non experts are in agreement on the effects of commercial land use change on housing delivery.

(ix) The study reviews the „Bida 1980-2000 Proposed Land Use Plan“ which indicates that retail/commercial space are inadequately allotted in the land use plan. The consequential effect of this has been observed from the existing urban facilities that would have been provided for commercial activities which are grossly lacking in the residential areas taken over as commercial strips.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The implication of this study is that there are raising expectations on further commercial land use sprawling on the residential areas, due to upward pressure that commercial properties has on rental values than residential properties in Bida property market. This is a signal for real estate developers in channeling their investment windows towards the prevailing sector of the market. As the central business districts failed to contain the increasing business activities, space consumers tend to move to residential areas where relative advantages are greater with ease accessibility and possibility of realizing and maximising profits in carrying out their retail and/or corporate businesses. Occurrences of fire outbreak in market places which consequently raises the level of demand for commercial space were also considered as key factors responsible for competition between commercial and residential uses within the residential areas. Hence, households' consumption pattern changes dimension with a greater appreciation of a one stop shop concept in the residential areas of the town.

The study therefore, concludes that the current demand for retail space in the residential areas of Bida town is within 10 kilometre radius within which the supply of retail space is on a progressive trend. This rising pressure on commercial land uses has contributed to the rapid decaying of the urban fabrics in the selected housing neighbourhoods; such effects to include traffic congestions, slum formations, high crime rate in the residential areas, challenges in land use control

measures, and deficits in housing stock as well as raising rental values of residential property.

5.2 Recommendations

The following recommendations are made on the basis of the study findings to mitigate the effect of land use changes on housing delivery:

(i) The knowledge and experience of the key players on land uses should be broadening, especially on the possible factors responsible for change of land use in an urban centre like Bida town. This will wholistically go a long way in addressing the realities in land use dynamics.

(ii) The stakeholders in urban land management should introduce database of landed property transactions in order to ascertain the actual situations surrounding residential to commercial land use changes in Bida town. So that the trends in land use changes can adequately be monitored or remotely acquired from stations.

(iii) There should be deliberate efforts by the government to collaborate with high profiled fire safety organisations that would provide a guiding framework in strengthening the operational mode of the fire service men in the prevention and control of further outbreaks of fire, especially in commercial districts; and seek expansion of central business districts to the emerging residential areas, in order to decongest high rate of commercial activities in the neighbourhoods of the study interest.

(iv) Real estate developers should be aware of the business cycle effects, in that continuous conversions of residential to commercial property within the residential areas closer to the central districts are highly sensitive to short term output changes.

(v) In order to curtail the raising competition between commercial and residential properties

in Bida town, the local planning authority should design and introduce policies that would increase the supply of both commercial and residential properties to cater for the growing population in the metropolis.

(vi) The local planning authorities should enforce compliance to the set out registration requirements and procedures for change of use, especially on landlords of residential properties closer to central districts where steady conversions takes place. This will foster documentation of housing deficits resulting from commercial activities encroachment on the residential neighbourhoods of the study area.

(vii) The land use control measures must be revised so as to give stringent controls of land use change processes. This will go a long way in addressing effects of commercial land use encroachment on the residential areas of Bida town.

(viii) Commercial land uses along the access roads of residential areas like eateries, retail stores, filling stations, supermarkets and banks among others generates traffic congestions, slum, poor sanitary environment and thus, degrades the quality of the existing residential facilities. As such, adequate space for commercial land uses in the planning schemes should be reasonably allotted in order to reduce these effects.

(ix) The study further suggests that preparation of a Master plan for Bida urban should be accompanied by a well-articulated planning brief that specifies retail space requirements for every sector and subsector; such that all sectors have their shopping centres with adequate facilities and services for their performance.

5.3 Areas for Further Study

More rigorous and detailed study should be carried out in the following research related areas:

- (i) Effect of Land Use Changes on Residential Property Investment Returns in North-Central Nigeria.
- (ii) A Framework for Effective Urban Land Use Decision in North-Central Nigeria.

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APPENDIX I: QUESTIONNAIRE
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA,
SCHOOL OF ENVIRONMENTAL TECHNOLOGY,
DEPARTMENT OF ESTATE MANAGEMENT AND VALUATION,
PRIVATE MAIL BOX 65, MINNA, NIGER STATE,
21 OCTOBER, 2019.

Dear Sir/Madam,

RE: ANALYSIS OF LAND USE CHANGES IN BIDA TOWN, NIGERIA.

Dear Sir/Madam,

The drive behind this questionnaire is to analyse land use changes, with a view to consider its effect on housing delivery in Bida town between (1998 to 2018). This survey is a part of the research thesis undertaken at Master's Degree level at Federal University of Technology, Minna, Nigeria. Please kindly complete the accompanying questionnaire to reflect your true opinion. Your co-operation will contribute to the greater success of this phase of research process, while your responses will be kept with Absolute confidentiality.

Thank you for your anticipated response.

STUDENT'S NAME:

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FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, SCHOOL OF ENVIRONMENTAL TECHNOLOGY, DEPARTMENT OF ESTATE MANAGEMENT AND VALUATION.

QUESTIONNAIRE DESIGNED AND ADMINISTERED FOR THE RESPONDENTS

This Questionnaire is strictly for academic purposes, developed to aid the researcher on the Analysis of Land Use Changes in Bida Metropolitan Areas. Be assured of utmost confidentiality of your responses.

SECTION A: BACKGROUND OF RESPONDENTS

Name of Respondent's Organization/Location.....

..... Category of Respondents:

- Landlord(s) of converted properties
- Tenant(s) of converted properties
- Estate Surveyors
- Planning Officials

Please tick only one box as specify (where applicable) in this section.

1. Academic qualification	OND/HND	<input type="checkbox"/>	B.Tech	<input type="checkbox"/>	M.Tech	<input type="checkbox"/>	PHD	<input type="checkbox"/>
2. Employment status	Civil Servant	<input type="checkbox"/>	Corporate Staff	<input type="checkbox"/>	Self-Employed	<input type="checkbox"/>		
3. Organisation's Years of Service	5-15years	<input type="checkbox"/>	15-25years	<input type="checkbox"/>	25-35years	<input type="checkbox"/>	Above 35years	<input type="checkbox"/>
							(please specify)	
4. Respondent's Residential Location	Esso-BBC	<input type="checkbox"/>	Mokwala Cenema	<input type="checkbox"/>	Gbangbara-Texaco Area	<input type="checkbox"/>		
5. Respondent's familiarity with Land Use Change Dynamics	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>				
6. Respondent's Professional Registration Status	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>				

SECTION B: RESEARCH QUESTIONS

Please tick only one ranking option box per question in this section as applicable.

Key: SD- Strongly Disagree; D- Disagree; M- Moderate; A- Agreed; SA- Strongly Agreed.

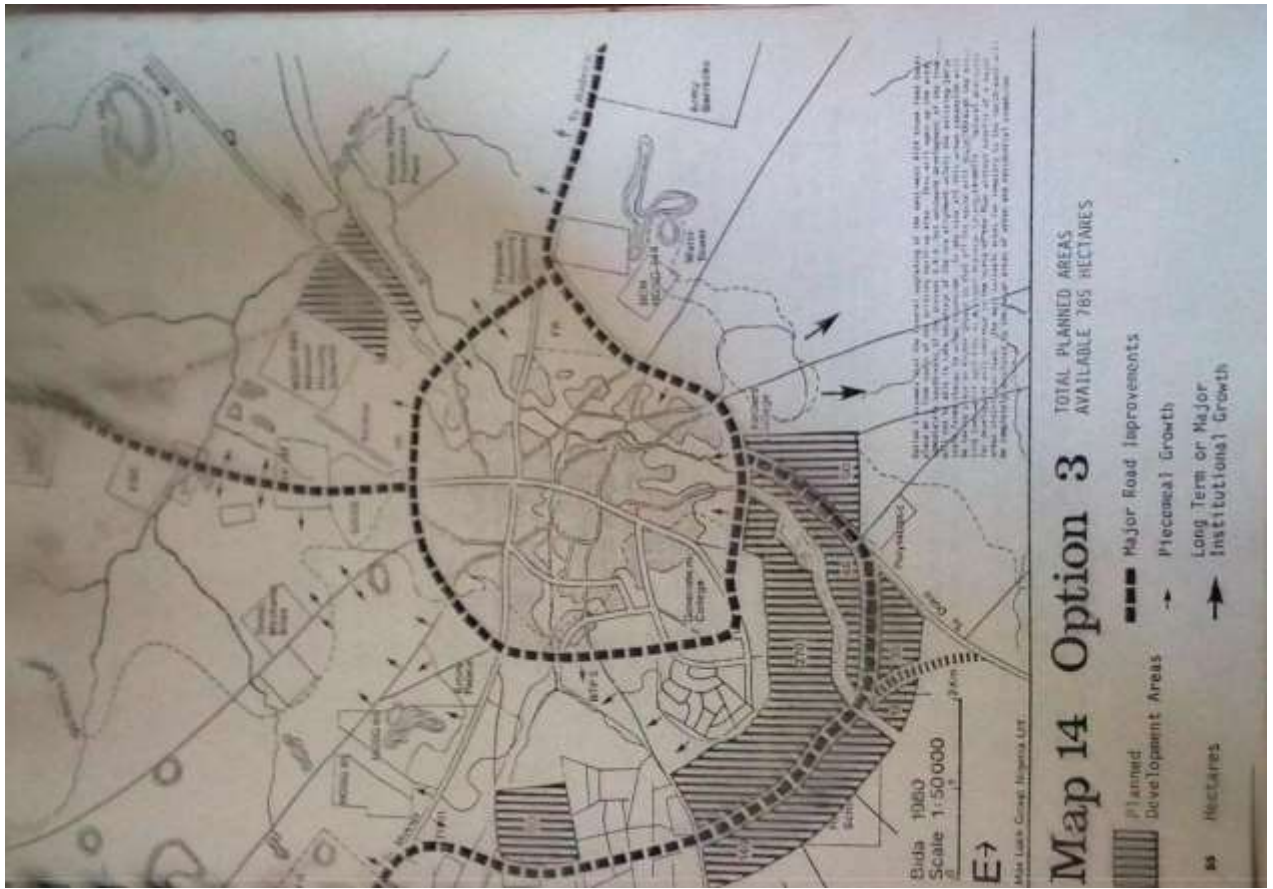
S/N	Common Factors Responsible for Commercial Activities Changing Locations from the Central Districts to Residential Areas in the Study Area.	SD	D	M	A	SA
1	Increasing Demand for Business Premises due to Population Growth	1	2	3	4	5
2	Failure of the Central Business Districts to Contain the Increasing Economic Activities	1	2	3	4	5
3	Profit Maximization Motive of the Commercial Land Users	1	2	3	4	5
4	Easy Accessibility in the Residential Areas	1	2	3	4	5
5	Ageing Building /Physical Obsolescence of Housing Stock	1	2	3	4	5

Key: VLE- Very Low Effect; LE- Low Effect; M- Moderate; HE- High Effect; VHE- Very High Effect.

S/N	Effect of Land Use Changes on Housing Delivery in Bida Town (1998-2018)	VL E	L E	M	H E	VH E
1	Decrease in housing stock closer to the Central Districts	1	2	3	4	5
2	Challenges in Land Use Control Measures	1	2	3	4	5
3	Increases Economic Activities in Residential Zoned Areas	1	2	3	4	5
4	Increasing in Traffic Congestions & Formation of Slums in the Residential Areas	1	2	3	4	5
5	Increasing Land/Property Values in the Residential Neighbourhoods	1	2	3	4	5

Thank you for participating

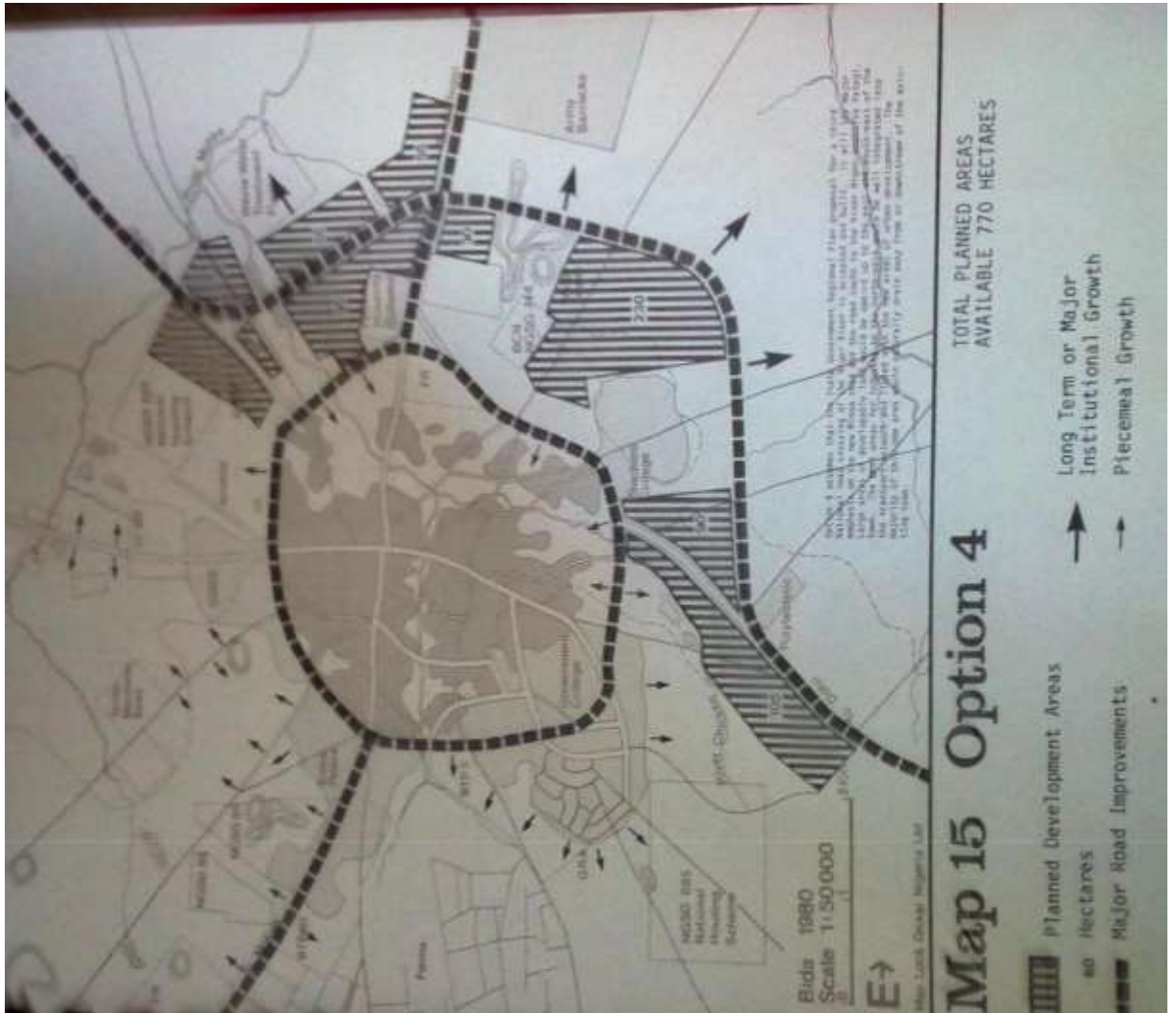
APPENDIX III



Bida Proposed Land Use Plan 1980-2000; Map14, Option 3

Source: Niger State Ministry of Lands and Housing, Bida Area Office (2019)

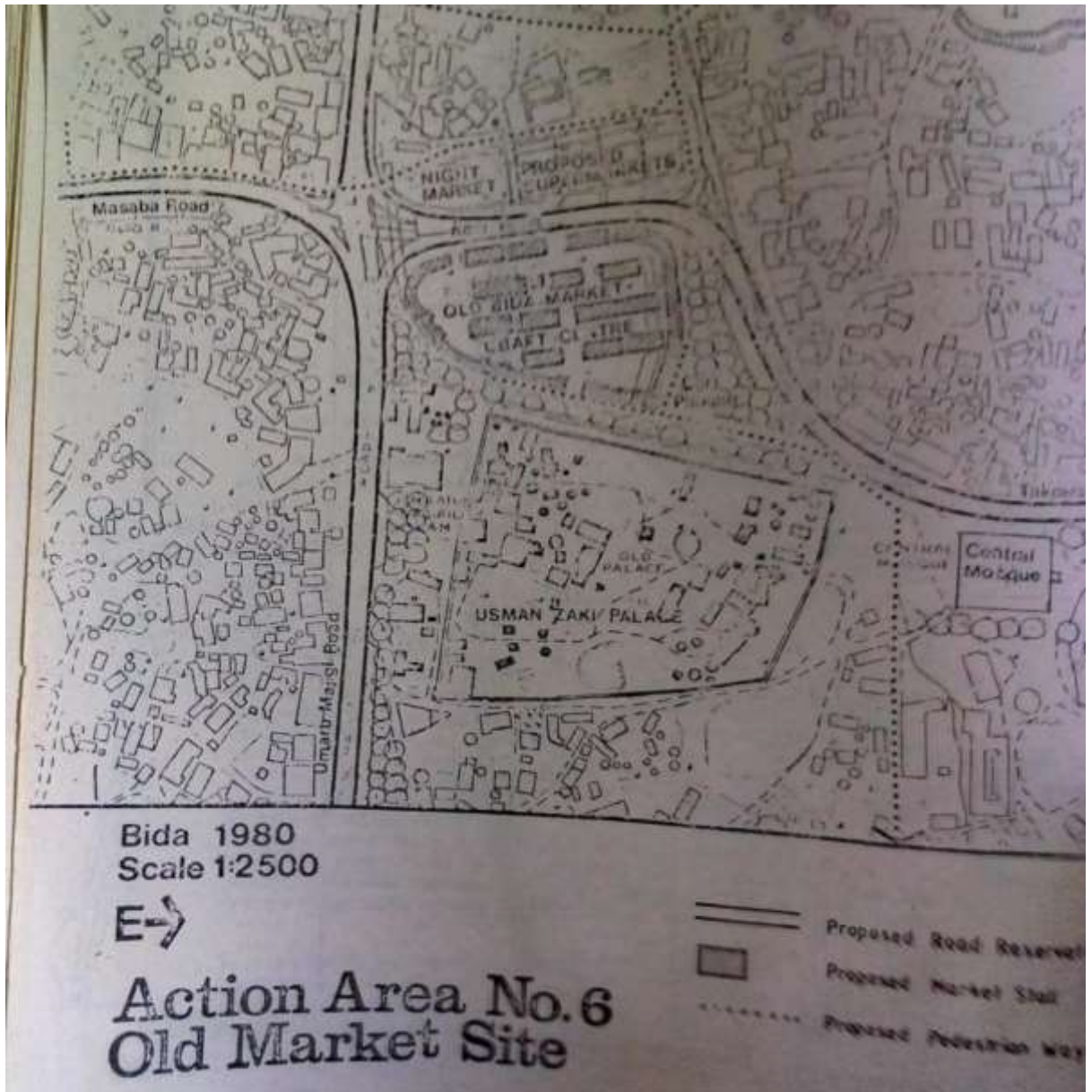
APPENDIX IV



Bida Proposed Land Use Plan 1980-2000; Map15, Option 4

Source: Niger State Ministry of Lands and Housing, Bida Area Office (2019)

APPENDIX V



Bida Old Market Site of the Proposed Land Use Plan 1980-2000; Action Area No.

6 Source: Niger State Ministry of Lands and Housing, Bida Area Office (2019).

APPENDIX VI

Descriptive Statistics

	N	Mean	Std. Deviation	Variance
Residential	3	1766.67	701.290	491808.333
Commercial	3	904.33	429.798	184726.333
Valid N (listwise)	3			

Source: SPSS (201)