

Reimagining a Suitable Locational Paradigm for the Urban Structure of Calabar Metropolis, Nigeria

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Abstract— Reimagining a suitable locational paradigm for the urban structure of Calabar Metropolis is essential for the explanation of processes that are put together for philosophical assumptions of some frameworks to which a city is developed. These frameworks are the various theoretical perspectives in which the urban structure of Calabar Metropolis is empirically verified in its application. The grounded theory method was adopted in this study in order to determine a suitable paradigm or perspective that underpins the urban structure of the study area. Based on the GTM, the ecological theory was construed as the most suitable perspective for the Calabar urban structure.

Keywords— Agglomeration; Competition; Central Business District; Master Plan; Polarization; Urban Land Use Theories; Zoning Ordinance.

I. INTRODUCTION

A paradigm is a set of assumptions and perspectives that creates a viewpoint of the world. It is the explanation of processes through which certain philosophical assumptions and frameworks are made. These processes are seen through a convincing perspective simply referred to as a theory in Social and Environmental Sciences. A theory in generic term is, therefore, a generally acceptable assumption or perspective put forward to explain phenomena. However, the various perspectives put forward in the explanation of the urban morphology of Calabar Metropolis are demonstrated in the urban land use theories. Urban land use studies are special aspects of studies on location. Specifically, location embraces several theoretical perspectives. The earliest theoretical speculation on the location of activities in space was that of Johann Heinrich von Thunen in 1825 which was supported by an empirical study of agricultural land use in Southern Germany. Another forerunner of theories of ecological process is the Star Theory propounded by Hurd in 1903. Hurd's Star Theory studied cities in the United States and suggested that a city grows from its centre along major transportation arteries, resulting in star-shaped configuration. Studies on urban land use, however, have been conceptualized in the following classical theories;

- i. The Concentric Zone Theory of Burgess (1925)
- ii. The Sector/Axial Theory of Hoyt (1939)
- iii. The Multiple Nuclei Theory of Harris and Ullman (1945), and
- iv. The Ecological Theory of Park (1950).

II. THE CONCENTRIC ZONE THEORY

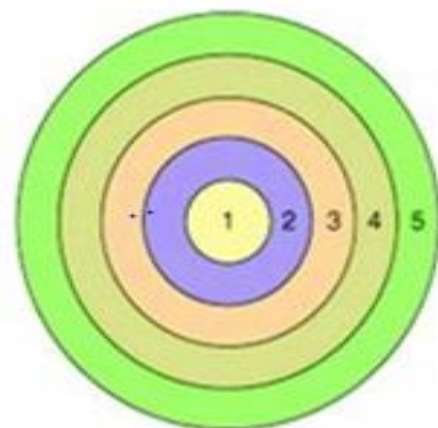
Burgess (1925) pioneered interest in urban land use theory with an empirical study of the city of Chicago in North

America. According to his generalization, land use in cities is differentiated into five major concentric zones (Baba, 2014). These zones are as follows (Figure 2.1A):

ZONE 1: The Central Business District (CBD) – which occupies the city centre and is characterized by commercial activities, including businesses, departmental stores and financial institutions such as banks and insurance companies.

ZONE 2: The zone in transition, made up of areas of residential deterioration which occur as a result of continuous encroachment by businesses and industries from the CBD. Because of the outward growth and expansion of land uses from the CBD, the zone in transition experiences the process of invasion from the CBD and a gradual conversion of old residential buildings to commercial and industrial uses. Eni (1998) noted that the zone in transition is a temporal residential location of poorly paid migrants who work very hard to move upward through the socio-economic strata and when they finally become rich, they relocate to better quality residential zones. Their relocation creates housing vacancies which trigger off the filtering process.

ZONE 3: Zone of independent workers' homes. This zone comprises residences of second-generation immigrants into the city. The homes are poorly maintained and are deteriorated because the occupants are poor workers.



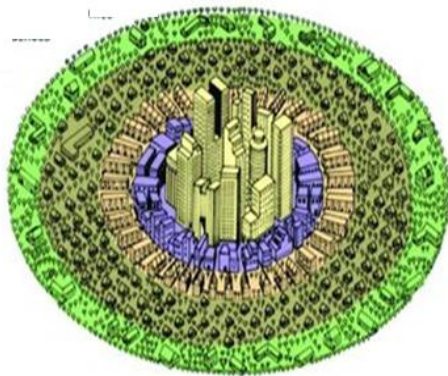
1. Central business district (CBD)
2. Zone in transition
3. Zone of independent workers' homes
4. Zone of better residences
5. The Commuter's zone

Figure 2.1A Concentric Zone Model of Burgess (1925)
Adapted from Obongha, (2024:68).

ZONE 4: Zone of better residences. This zone is made up of high-class neighbourhoods. It consists of the upper-class group. It is exclusive for rich people. This zone is inhabited by owners of small-scale retail businesses, the professionals and career people.

ZONE 5: The commuter’s zone which comprises encircling small cities, towns and hamlets, satellite towns which serve as dormitory suburbs for the affluent and well to do (wealthy) citizens. The inhabitants are mostly those who have retired from service and prefer the quiet life of the country-side. They have automobiles which enable them to commute between the CBD and the country-side. The Figure 2.1A is an illustration of Ernest Burgess’s two dimensions Concentric Model of 1925 showing five major concentric rings or zones of the model.

Burgess’ theory has some fundamental weaknesses. It assumes a mono-centric city. Notable among the weaknesses of the concentric theory is the assumption of a concentric spatial form and its explicit explanation of successive growth taking place along broad margins (Nwanekezie, Iroegbu and Alozie, 2010). This arrangement of land uses totally disregards the distorting influence of some physical features such as mountains, valleys, rivers, and lakes. The presence of rivers in the eastern and western flanks of Calabar Metropolis has faulted the conceptualization of the concentric zone theory in Calabar Metropolis (Obongha, 2024).



1. Central business district (CBD)
2. Zone in transition
3. Zone of independent workers’ homes
4. Zone of better residences
5. The Commuter’s zone

Figures 2.1B: Concentric Zone Model of Burgess (1925)
Adapted from Obongha, (2024:68).

It assumes uniform and invariant land use within each zone. Its assumption of a circular ring of land use is unrealistic and does not represent the reality of most cities, particularly cities in the developing world. Concentric land use rings of cities are not realistic in the developing countries, such as the Yoruba cities in Nigeria. Yoruba cities, for example, are multi-centric. These cities develop around many nuclei, some of which are ancient shrines, the Oba’s Palace, the market (Nwanekezie, et al., 2010). Eni, (1998) confirmed that Yoruba cities developed from peculiar cultural settings, which make the assumption of mono-centric arrangement unrealistic. The

implication of this weakness is that the theory is founded in a particular historical and cultural context and as such, it reduces its universal application. However, conceptualizing the concentric zone theory in Calabar Metropolis would ever remain futile. The Figure 2.1B shows three dimensions of the concentric zone model.

III. THE SECTOR THEORY

Hoyt (1939) carried out an empirical study of a number of American cities. Hoyt concluded that cities display axial land use pattern (Figure). Hoyt in Animashaun (2002) based his theory on two factors: (i) the effects of land pricing or rent (housing market), and (ii) the influence of major transport routes. According to Hoyt in Leke (2013), as a city grows, population and businesses continue to grow with it, resulting in competition for land. The most accessible locations particularly, those of the CBD are used for businesses. The CBD is attractive because it represents the point of minimum aggregate travel in relation to every other point within the city. Competition within the centre makes land values to rise in the CBD, making it possible for only businesses that can afford to pay the rent to occupy the CBD. Considering transport routes, Hoyt postulated that land values rise gradually and continuously outward from the CBD. However, according to him, land values rise axially along major transportation routes forming a functional radial pattern of urban land uses. Hoyt concluded that growth along any transport route would influence similar types of land use (Animashaun, 2002).

However, Mabogunje (1968) pointed out that the sector theory is an assumption of a laissez-fair economic system in which people and businesses compete for land in most accessible location, the CBD may not hold. Such competition would make the highest bidder to consequently, locate in the choicest location. Another criticism of Hoyt’s theory is its axial arrangement of land uses along transport routes. Where transport is poorly developed, people would be comfortable with the existing poor means of communication as it is in certain locations in Calabar Metropolis such as NEPA line in Ikot Omin, Nyahassang, Spat Avenue/Ekeya in Calabar South. In this circumstance, the traditional elites which do not pay for land are found located close to the CBD, the costliest land. Eni (1998) pointed out that Hoyt narrowly focused on rent and housing market. He however, explained that the theory failed to consider the various social and economic characteristics of the residents which are very vital in studies of urban ecology. The theory is also not instructive about the economic characteristics of urban households which are very important factors in urban demographic analysis. The urban structure of Calabar Metropolis is highly sophisticated and totally dependent on its household systems because of the socio-economic characteristics of the people. The failure of the sector theory to emphasize on the socio-economic systems of the households has made its relevance doubtful in Calabar Metropolis.

Even though the application of the sector theory in Calabar Metropolis has been practically doubtful, there are traces of its resemblance in some residential zones of Calabar Metropolis. For example, in Calabar South, there is a residential sector

bordering Mayne Avenue, Goldie, Mount Zion and Ekpo Abasi Streets. This sector comprises only residential land uses without a mixture of industrial land use which conforms to Hoyt's Sector Theory (Figure 3.1) (Obongha, 2024). In Calabar Municipal Zone, a residential sector is also identified by the interconnectivity of two major transport routes such as Murtala Hohammed Highway and Old Odukpani Road radiating from the Flour Mill Junction up to Federal Housing Estate. This axial arrangement of residential zone in the study area also agrees with the Sector Theory of Hoyt (Figure 3.1) (Obongha, 2024). Figure 3.2A shows an illustration of Hoyt's two dimensions Sector Model. In Hoyt's model, each land use, having taken off from outside the CBD continues to grow and expand outward in that direction. Figure 3.2B shows three dimensions of the sector model.

IV. THE MULTIPLE NUCLEI THEORY.

In their Multiple Nuclei Theory, Harris and Ullman (1945) are able to improve on Burgess' assumption of a mono-centric city (Ogbazi, 2003). Harris and Ullman, in Leke (2013), observed that a city is built not around a single nucleus called the CBD, but it is functionally segregated around several nuclei. Some of these nuclei may include residential, industrial, educational (University), commercial (market), community hall, shrine, palace, water front, and higher ground. However, land use and growth of a city in different parts of the developed and the developing world is not a simple phenomenon which can be explained by geometric designs – either concentric zones/circles or sectors radiating from the centre. Urban land use structure is not also simple and singular, it represents intermingling of various functions such as commercial, industrial, cultural, administrative and social that work together to increase functional antagonism of land uses (Figure).

Consequently, a city is not mono-centered. Its evolution is not the product of a zone or sector. Various types of land use and their patterns develop often around several separate nuclei. Harris and Ullman postulated multiple nuclei theory for accommodating a complementary growth of residential, commercial, industrial or other elements taking place in cities from inception, through developmental stages (Ocran, 2015). The growth of separate land use nuclei is due to factors which influence the discrimination of activities within a city. These factors are as follows:

- (i). Certain activities require specialized facilities. For example, the CBD can function at a nodal point, where maximum accessibility is available. This development happens because the CBD still exists as the primary nucleus. But multiple small business districts are developed and functionally segregated around the metropolitan area. Some of these newer areas compete with the CBD for businesses such as banks, real estate and insurance. These separate nuclei become specialized and differentiated, reducing the pull of the CBD (Animashaun, 2002).
- (ii). There are also a group of activities which benefit from agglomeration economies that bring about interrelationship and harmony. For example, industrial uses are clustered around agricultural land use of outer districts of large cities. They profit from vertical integration, cohesion and perform complementary functions as they interdepend on each other in exchange of raw materials for finished products (Obongha, 2024).
- (iii). Certain activities are detrimental to one another, and generally seek separate sites. For example, heavy industry and high-class residential areas do not prefer to be neighbours. This happens because of the high noise level, high toxic substance, smoke and mechanical operations prevalent in the industrial land use which is not compatible especially with the high-class residential areas.

The multiple nuclei of a city develop from two sources: one develops at the time of a city's origin, and others develop with the growth of a city (Hurd, 2011). The nuclei existing at the time of origin of the city have a long history behind them. Areas around such nuclei would have been occupied by

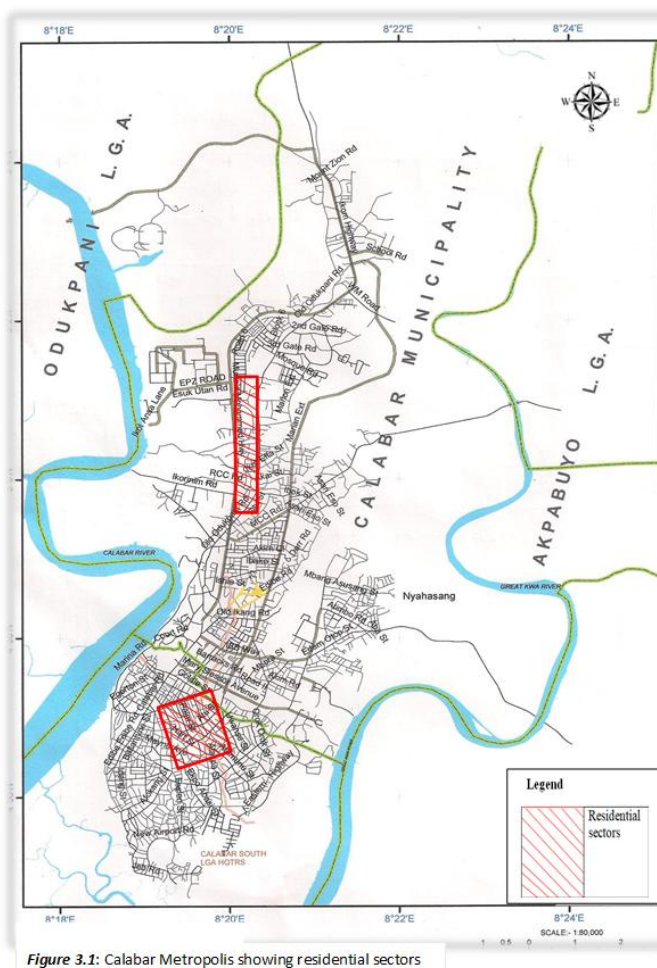
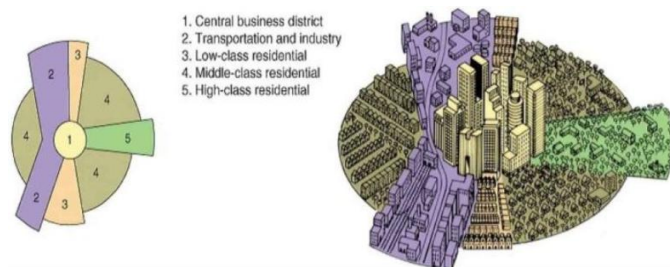


Figure 3.1: Calabar Metropolis showing residential sectors



Figures 3.2A & 3.2B: Sector Models of Hoyt (1939)

Adapted from Obongha, (2024:70).

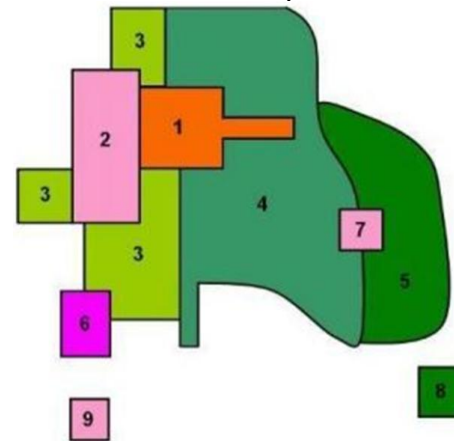
different land uses during the course of growth of the city. London at the time of its origin had the City and Westminster as separate nuclei, the former being a commercial-financial node, while the latter served as a political centre (Lansing and Muella, 2004). Lansing and Muella (2004) also cited the example of the city of Detroit as a nucleus developed with the growth of the city. It evolved concurrently with the expansion of heavy industries in the center of the city and subsequently moved to the Calumet area where it created a new core. In India, many cities such as Delhi, Mathura, Varanasi, Patna and Mumbai have numerous nuclei of antiquity and their interstices are filled in by different land uses during their historical development (Kim, 2011). Thus, history operating jointly with some economic and social factors is an important factor shaping the form of urban development.

Several nuclei are seen to have developed with the growth of Calabar Metropolis. This development includes certain nuclei such as the University of Calabar, Calabar; University of Cross River State, Calabar; Flour Mills Industries; U. J. Esuene Sports Stadium; Margaret Ekpo International Airport; Federal Government Girl's College; State and Federal Government Residential Housing Estates. There are some other traditional nuclei such as Duke Town, Henshaw Town, Big Qua Town, etc. Some of the nodal points also grow as nuclei and transformed into either larger commercial centres such as the Watt and Marian Markets. Then, smaller commercial centres also grow, such as Ishie Town Market, Mbukpa Market, and Akim Qua Town Market with the growth of commercial institutions such as banks and insurance. Figure 4.4 shows these nuclei in the study area.

The multiple nuclei theory explains two significant observations based on historical records and the elements of the morphology of a city (Obongha, 2024). Firstly, the multiple nuclei theory produces a model involving the complexities of the urban structure which may not be easily and immediately discernible because of the stratification of different land uses during the process of urban growth. Although most cities have only one CBD and a series of other sub-centres around the nuclei, these smaller centres are less specialized but large enough to provide for the needs of the neighbourhoods of the city. Secondly, there is the probability of elements of the concentric and sector theories to intermix in the multiple nuclei theory. Actually, land uses around nuclei and in-between in-fill areas display intermixing of concentric and sector theory principles. The multiple nuclei approach is therefore, looked upon as a guide to the structure of a city, rather than as a rigid generalization of the urban form (Obongha, 2014).

The multiple nuclei theory shows a uniformity of use. But in practice, there is no uniformity of uses as activities are multiplied and intensified in multiple districts. In modern cities, there is need for walk-able distance to facilities and the multiple nuclei city structure provides for convenient shopping. The multiple nuclei theory was criticized in Imimole (2014) that a particular parcel of land (nucleus) is determined by the operations of market forces or price paid. The decisions as to what alternative would yield maximum return and not necessarily allocating activities around nuclei as

modeled by Harris and Ullman (1945). Figure 4.1 depicts Harris and Ullman's Multiple Nuclei Model. The spatial arrangement of the Multiple Nuclei Model in Calabar Metropolis has also been illustrated in Figures 4.2 and 4.3 that is the emerging land uses of the years 2000 and 2023 Calabar Metropolis urban spatial structure. The various models show spatial arrangement of land uses according to the theory. The CBD in Figure 4.2 occupies relatively larger space including the airport area than the CBD in Figure 4.3. Figure 4.4 shows the various nuclei of Calabar Metropolis.



1. Central business district
2. Wholesale, light manufacturing
3. Low-class residences
4. Medium-class residences
5. High-class residences
6. Heavy manufacturing
7. Outlining business district
8. Residential suburb
9. Industrial suburb

Figure 4.1: Multiple Nuclei Model of Harris and Ullman (1945)
Adapted from Obongha, (2024:72).

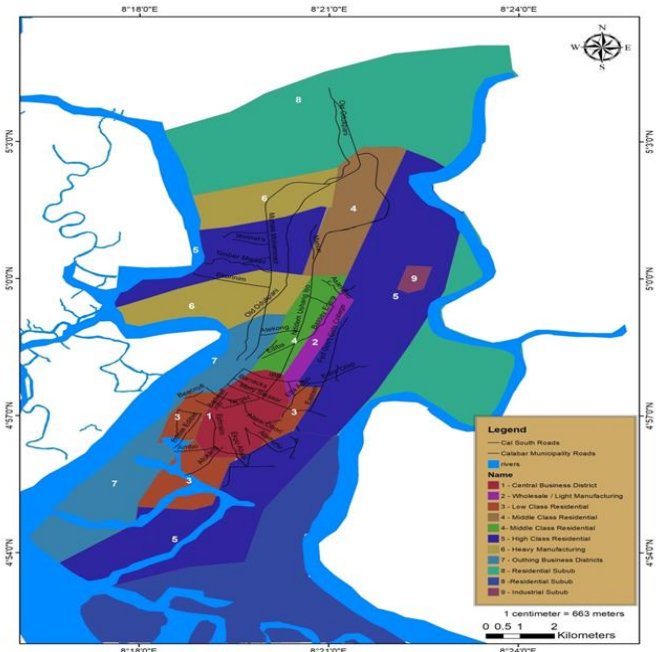


Figure 4.2: Calabar Metropolis in the year 2000 showing the emerging Multiple Nuclei Model
Source: Researcher's design, 2024.

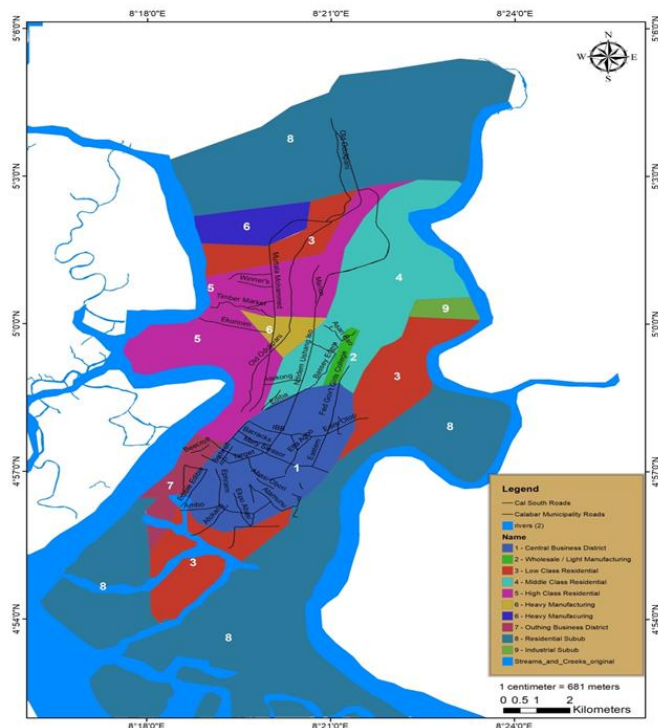


Figure 4.3: Calabar Metropolis in the year 2023 showing the emerging Multiple Nuclei Model

Source: Researcher's design, 2023.

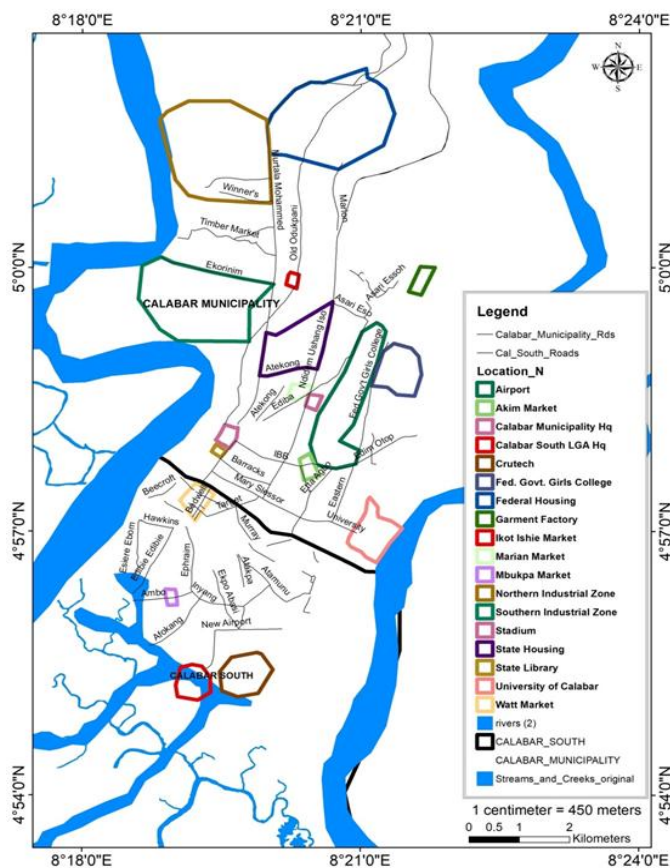


Figure 4.4: Nuclei of Calabar Metropolis in 2023.

Source: Researcher's design, 2023.

The multiple nuclei theory is best suited for explaining the urban morphology of Calabar Metropolis. This is because, there are several nuclei with formation of growth centres arranged according to their hierarchies and providing services at different scales and levels in different locations. However, in (Obongha, 2024), the multiple nuclei theory was criticized based on the fact that most of the growth centres (adjacent nuclei) are non-conforming and as such results in conflicts. For example, the locations of Margaret Ekpo International Airport and Akim Qua Town, Edim Otop, Ediba Qua Town residential neighbourhoods as adjacent nuclei have made the multiple nuclei theory not realistic or unsuitable for the study area because it encourages non-conformity of land uses.

V. THE ECOLOGICAL THEORY

The ecological theory, developed by Park (1950) at the Chicago University was based on two fundamental premises. First, how human population collectively adapts to the environment and second, how the human population succeeds and dominates the environment. Human space follows some specific principles such as competition for the best location, overall efficiency of the use of the location, mutual compatibility of the neighbouring use, evolving change in the population size and composition, patterns of economic expansion and contraction. These activities make the city a social organism in which individual behaviour and social organisation are governed by struggle for existence (survival of the fittest) that produces a given urban pattern (Eni, 1998).

Park considered the dominant activities of the human community as commerce and industry which often outbid other competitions for specific central locations in the city. Drawing from Darwin's theory, Park explained that the dominant factor in the spatial and economic differentiation of land uses in the city is competition. Pressure for space at the centre, therefore, is the result of high land values throughout the city and the cause of land uses by different functional groups. Park concludes that the principle of dominance which tends to determine the general ecological pattern of the city and the functional relation of each of the different land uses of the city is a product of the struggle of industries and commercial activities for strategic locations. However, different activities have need for different ecological conditions. For example, commercial activities require high population concentration and high purchasing power in order to maximize profit from exchange of goods and services. Physical factors of the environment also contribute to preference of some land use activities to a particular ecological setting. For example, location of industries does not require hills/highland areas to enabled pollution control. There are other notable components of the ecological theory; they include (i) invasion, succession and dominance (ii) concentration and centralization, and (iii) segregation.

5.1 Invasion, Succession and Dominance

Invasion, succession and dominance are components of the ecological theory of Park (1950) that explained the processes of land encroachment and change in the growth of the city. It is a process whereby one land use class becomes so

established to push out the others in the choicest physical space, while establishing itself. Invasion and succession describe the dynamic nature of urban space. The terms are related with the Burgess concentric rings. According to Burgess, the growing demand for land for the immigrant population's housing and other uses, such as commercial and manufacturing, forces the immigrants occupying the residential land use to move outwards.

Invasion refers to the gradual encroachment and consequent dominance of one type of land use on another for various purposes such as education, insurance, manufacturing, commerce, and banking. The low economic status of the immigrant groups is mostly reflected in this movement. The movements, often times, have a negative impact on the quality of life of the current occupants. The process eventually, leads to the high-class residential land use moving out of the city core and shifting to a more comfortable and convenient part of the city which is the periphery. Invasion has a negative implication which reflects negative sentiment of the residents' population for the fresh immigrants.

Succession is a process that shows successive movement of urban activities usually outward to the peripheral districts (Mabogunje, 2006). The movement does not follow a particular order and is often seen as an attack on the natural habitat of the outer zones. Succession is a complementary process of invasion and only takes place after invasion. The processes of invasion, succession and dominance are frequently the result of some spatial patterns of concomitant land uses in which two or more land uses such as commercial, manufacturing and residential could be seen coexisting at a particular location (Obongha, 2024). For example, in Calabar Metropolis, such concomitant land uses are common in certain locations such as Bedwell, Target, Nelson Mandela Streets and Esuk Utan area.

5.2 Concentration and Centralization

Concentration is simply the movement and expansion of activities in urban communities and often referred to as migration. Urban-urban migration is also a form of concentration. This movement of activities leads to high concentration of variable demographic composition and, thereafter, put pressure on land uses (Mabogunje, 1968). Therefore, a higher spatial interaction sets in, as a result of higher concentration of activities characterized by superficial relationships with pressure on the available infrastructure. The fast-growing urban land use activities of major cities is a significant indicator of functional concentration. However, urban land uses in Calabar Metropolis, for example, began to experience a significant change in 1987 when Akwa Ibom State was carved out of the then Cross River State and some individuals preferred to remain in Calabar with their continued impact on the land uses (Obongha, 2024).

The concentration of economic activities in and around the city centre is referred to as "polarization or agglomeration". It is the result of the spatial concentration of the market, information sources, decision making centres, interactivity linkages and other external economies (land uses). However, concentration and centralization increase the disadvantage of

peripheral locations and contribute to the economic and social deprivation commonly found with greater distance from the city core (Eni, 1998). There is also the process of land use concentration which exhibits another important aspect of urban composition. Concentration and centralization are processes of residential differentiation among urban activities as an aggregate effect of socio-economic and cultural differences (Park, 1950). On the other hand, spatial concentration and centralization are associated with the tendencies for economic activities to be organized in unit of increasing size and within a hierarchical organizational structure as could be seen within the Central Business District of Calabar Metropolis.

5.3 Segregation

Segregation is the process in which urban activities become more divided into different spatial locations in terms of functional land uses and others. The division is based on the spatial arrangement and isolation of the land use patterns. Residential segregation, for example, is a noticeable phenomenon, which further increases social distancing among various localities. The greater the degree of differences between the spatial distribution of residential groups (high, medium and low densities) within an urban area, the greater their social distance from each other (Park, 1950).

Segregation becomes more prominent in recent times because of increasing acceptance of market-based land and basic services for different land uses. For example, commercial land use would prefer busy areas such as the Central Business Districts (CBD). The intention is basically to price out the residential land use occupied by the marginalized, from better locations such as the CBD for more competition of commercial activities. The disparity may be primarily tenural, with differentiation in occupation of the accommodation types that reflects the spatial manifestations. The traditional motive of segregation was interactions with different categories of urban activities with exchange of ideas which have a direct influence on their functional relationships.

Park's theory of segregation has significant relevance to the study of urban land use in view of the fact that segregation directly explains the concept of the urban master plan as a tool for functional separation of urban land uses. The master plan is a designed comprehensive plan/document which shows and directs the spatial, physical, structural and environmental development of an urban area by explicitly identifying various land uses with the instrumentality of zoning ordinance. The master plan also shows functional and harmonious arrangement of activities (land uses) in such a way that one land use type does not impact negatively on the other. Rather, they coexist harmoniously. Therefore, segregation component of Park's Ecological Theory represents a set of processes in which different activities in the urban environment have been functionally zoned to locations in space where such activities are best performed without negative influence on the residents and other activities. However, segregation also emphasizes the functional arrangements of urban land uses and how they are zoned congruously in the master plan of a city. Segregation

component of Park’s Theory best explains the perspective through which this study is conducted.

The ecological theory has been criticized in Mabogunje (1968) on the assumption that the growth of a city is determined by forces involving competition and selection. He argued that the patterns of residential location were largely a function of patterns of industrial location and that industries are located along the road networks, which exhibited no uniform pattern. Mabogunje (1968) differentiated between ecological correlations (aggregate phenomena) and individual correlations (individual units) and pointed to the misconception of using an ecological correlation as evidence for an individual unit. Mabogunje’s argument was also supported by Eni (1998) who observed that the ecological correlation overemphasized individual ones. Ratcliffe (1981) also criticized the ecological theory on the premise that human ecology explained locational activity purely in terms of economic maximization. He argued that space may be symbolic and have economic value, however, locational activity may reflect sentiments as well as economic reality.

Figure 5.1 shows a symbolic representation of the ecological model showing the components of natural and built environments with activities that compete for the best locations. The activities performed by the individuals are all shown in Figure 5.1. The land uses and their interrelationships and interdependence are the various ecological factors of natural and built ecosystems that determine the wellbeing of the inhabitants and other elements of the urban milieu.

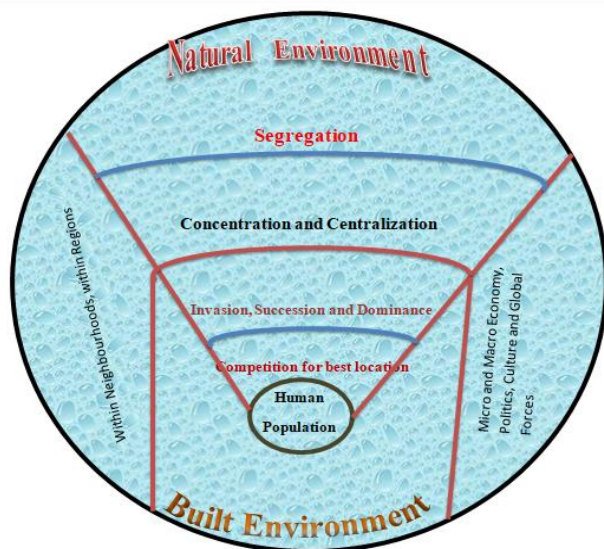


Figure 5.1: Ecological Model deduced from Park (1950)

Source: Modelled by the Researcher (2024)

A summary of the defects of the theoretical perspectives discussed in this study verifies that the Burgess’ Concentric Zone Theory, with the presence of the Calabar and the Great Kwa Rivers in the western and eastern flanks of Calabar Metropolis have faulted its application to the urban structure of Calabar Metropolis. Hoyt’s Sector Theory is also not applicable to the study area because of its failure to particularly address the socio-economic characteristics of the households, since the households play a functional role in the

land use structure of Calabar Metropolis. The Multiple Nuclei Theory of Harris and Ullman would have been best suited for the urban structure of Calabar Metropolis because of the presence of multiple growth centres spread around Calabar Metropolis. Even though the urban structure of Calabar Metropolis has a significant reflection on the multiple nuclei theory, its perspective is not spatially applicable to the study area. This is so because, most of the growth centres are incongruously located and result to spatially non-conforming land uses. Figure 5.2 shows the various growth centres in Calabar Metropolis that are non-conforming to each other.

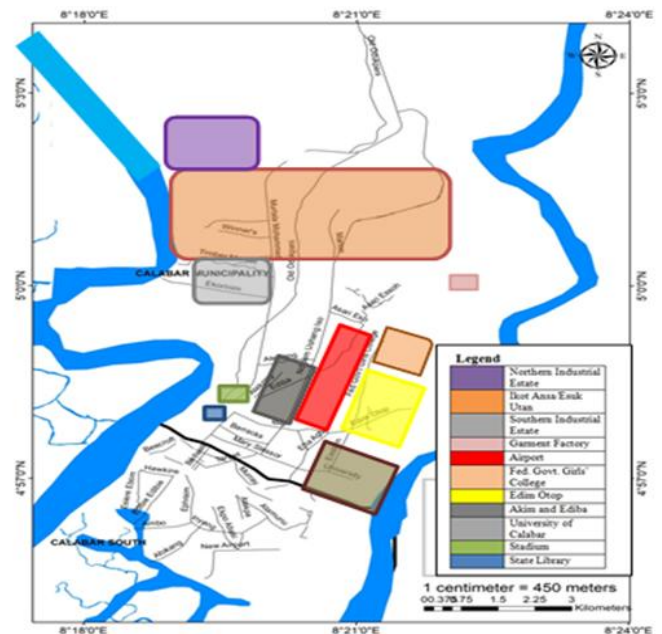


Figure 5.2: Non-conforming adjacent land uses

Source: Researcher’s design, 2024.

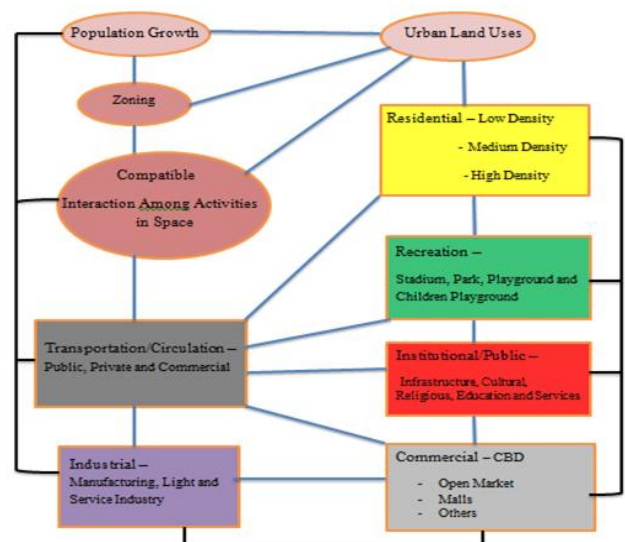


Figure 5.3: Segregation Model built from Park’s (1950)

Source: Modelled by the Researcher (2024).

Park's ecological theory is the perspective that fulfilled all the requirements through which the study area is based and, therefore, has been adopted for some obvious reasons. The reasons for its adoption are its elements of comprehensiveness, zoning regulation, and separation of adjacent non-conforming land uses. It shows how land uses are zoned in conformity with the master plan and interaction among activities through circulation and distribution of land uses. Circulation is functionally linked to other conforming land uses while other activities are performed by functional segregation (Figure 5.3).

VI. METHODOLOGY

The methodology adopted in this study is the Grounded Theory Method (GTM). This Methodology was developed by Glaser and Strauss in 1967. Their aim was to generate theory from data without testing any hypothesis. GTM is a qualitative design method in which the theory emerges from data. In applying GTM into this research, exploratory and descriptive design was introduced with non-numerical data by using text, images, maps, and observations for in-depth and contextualized insights. Content analysis and narrative analysis were also used in this study for in-depth explanation and description of the theories.

of the Calabar River; its growth is limited by mangrove swamps in the South. There are two local government areas in Calabar Metropolis, these are Calabar Municipality and Calabar South L. G. A. There are 18 residential zones in Calabar Metropolis.

Calabar has a subequatorial type of climate. The annual temperature is moderately high about 31-35°C and does not fluctuate greatly. The rainfall distribution shows that it is characterized by double rainfall maxima, which starts from the months of May to November, reaching its climax in the months of July and September. The yearly average precipitation is approximately 2000-3000mm with a brief dry spell in August. The significant rainfall usually increases runoff volume and speed, thus leading to flooding and environmental deterioration in the city. Figure 6 shows Calabar Metropolis in Nigeria and Cross River State.

VII. THE CONCLUSIONS

Having discussed the theoretical perspectives of Burgess, Hoyt, Harris and Ullman as well as that of Park and their respective weaknesses in relation to their applicability to the urban morphology of Calabar Metropolis, therefore, the Park's Ecological Theory was found to possess some spatial features and components that are relevant to the spatial pattern of the study area. Park's Ecological Theory is made up of notable components such as invasion, succession and dominance; concentration and centralization; and segregation. These components individually explain how land uses are manipulated and controlled by the various activities of man. Invasion, succession and dominance for example, discussed the gradual encroachment of certain activities on districts and locations originally not zoned for them. Very often, commercial land uses invade residential areas of old settlements within the CBD. The old settlement is made up of some group of poor people who may not be able to afford to live elsewhere. When this happens, the two land uses (residential and commercial) coexist as non-conforming land uses until succession takes place. Succession is a process that allows the commercial land use to take over from residential land and later become the dominant land use within the district. This process has taken place within the CBD of Calabar Metropolis where the poorly paid inhabitants worked so hard and moved through the socio-economic strata to become rich and, thereafter, relocated to better residential zones in a filtering process.

Concentration and centralization are also components of Park's ecological theory (1950). The ecological theory emphasizes on the concentration of urban activities at certain locations particularly, the city centre often referred to as "polarization or agglomeration". Centralization works closely with concentration of urban land uses. The result is an increase in the peripheral locations which contributes to economic and social deprivation occurring between the city centre and the sub-urban districts (Obongha, 2024). For example, the concentration of institutional, commercial and cultural land uses such as the Federal and State Secretariats, National and State Library Complexes, the Stadium, Cultural Centre Complex, Watt and Marian Markets, Calabar Municipal

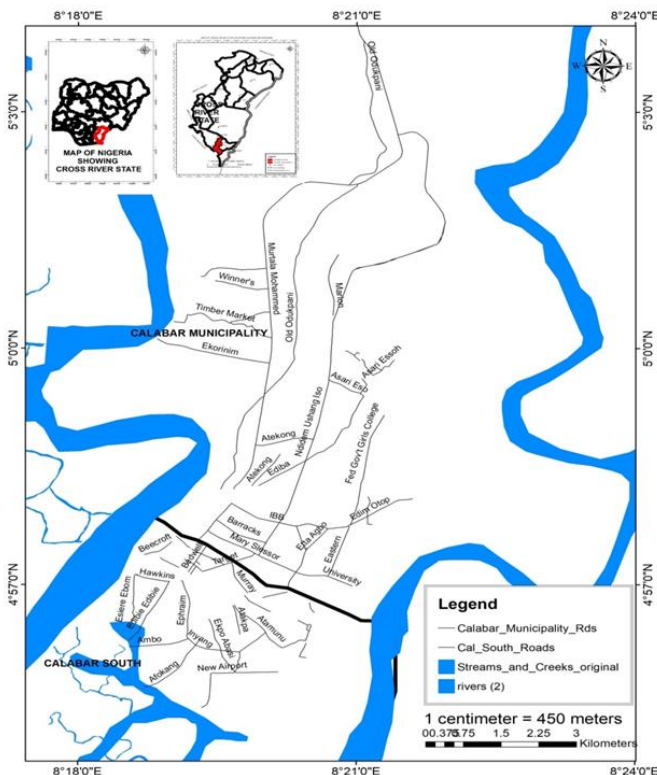


Figure 6: Calabar showing Nigeria and Cross River State.

6.1 Study Area

Calabar is the Capital City of Cross River State of Nigeria and has a population of over 500,000. It is located between latitudes 040 5611⁰ N and 050 411⁰ N and longitudes 080 1811⁰ E and 080 2411⁰ E. It is bounded at both sides by Great Kwa River and Calabar River (Figure 1). It can be accessed by sea, land and air. Its present settlement is on the Eastern flank

Council, University of Calabar, Calabar and even the Airport at the central area of Calabar Metropolis boosted the application of this component of ecological theory in the study area. Concentration and centralization of activities leads to spatial clustering of urban land uses and become a problem for the residents to have access to facilities and infrastructure especially in zones farther away from the city centre. This phenomenon is highly observable in Calabar Metropolis where the travel behaviour of commuters and residents radiates and converges at the city centre.

Finally, segregation component clearly identified as a process of functional separation of urban land uses, activities and infrastructure following the zoning application in the master plan. Segregation emphasizes the strength of the master plan where zoning is observed by associating compatible land uses and separating incompatible land uses. Segregation further explains in details, the design codes of zoning regulation by categorizing different land use types into subdivisions and micro-units. For example, residential land use is sub-divided into three densities such as low density, medium density and high density. The master plan spells out the intensity of use in each density and prescribes how other activities and land uses are allowed to intermix within each density for functional coexistence and harmony. It is on the basis of all these peculiarities of the ecological theory, that the ecological theory becomes the appropriate theoretical perspective through which the urban morphology of Calabar Metropolis is construed.

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