

The Impact of Population Growth on Residential Landuse in Calabar, Cross River State

Eni, D. D., Ukpong, Blessing Johnson
Department of Geography and Environmental Science, University of Calabar, Calabar

Abstract

This study examined the impact of population growth on residential landuse in Calabar, Cross River State. The major research problems which elicited interest on this study include the increasing densification of houses in the study area, increase in the cost of a plot of land, astronomical increase in house rents and increase in overcrowding index. The main objectives of the study include to examine the consequences of population growth on urban residential landuse in Calabar, and to examine the rate of increase in the value of land in the study area. One hypothesis, namely, there is no significant relationship between population growth and the cost of urban residential land. Data for the study were collected from the National Population Commission, the Cross River State Ministry of Lands and Housing, and the Town Planning Department. The results confirm a strong correlation between population growth and cost of land at the city centre and at the periphery. Furthermore, the study has shown that between 1999 and 2009, the proportion of land used for residential purposes increased by about 61.3 percent. The work concludes by recommending that Government, through the Town Planning Department, should be meticulous in land allocation, registration of building plans, and be involved in strict supervision when houses are being built.

Keywords: Population Growth, Land rent, urban residential landuse, Overcrowding

Introduction

Few aspects of human societies are as fundamental as the size, composition and the rate of change of population (Robinson, 2001). The growth of human population in the last fifty years has been staggering. According to the United States Census Bureau, the global population was 2.5 billion in 1960, it increased to 3.5 billion in 1975, 5 billion in 1999 and 6.5 billion in 2006. The rate of increase of world population is alarming and so causes increased demand for food, shelter, clothing and other life-supporting needs. These needs are derived directly or indirectly from the natural environment, (Animashaun, 2002). This astronomical growth in human population has a number of environmental, social, economic, political, and physical consequences.

One of the implications of uncontrolled population growth is its impact on residential landuse particularly, in the urban areas. Urbanization and high population density have caused landuse degradation especially in most parts of the developing countries. Nigeria is one of the developing countries that has experienced rapid population growth since 1960. The population is still increasing although the growth rate reduced from 3.3 per cent in the 1980's to about 2.8 per cent in 1991 and rose slightly to 3.0 per cent in 2006 (National Population Commission, 2009). The increase in the rate of population growth occurring in most Nigerian cities has been resulting in rapid rise in the demand for urban land particularly for housing, roads, and other economic activities (Salau 1981). This rising demand for urban land tends to be reflected primarily in the congestion of the central areas of cities, rise in land values and in the conversion of rural land at the peripheries of cities to urban use.

In Calabar, as it is in other cities, rapid population growth means more people to feed, more infrastructural development, increased provision of facilities and amenities such as hospitals, schools, water, electricity, telecommunication, among others. The provision of these amenities means putting intense pressure on urban land, resulting in the stiff competition for scarce land.

Calabar has experienced tremendous changes in land uses between 1999 and 2011 especially for residential purposes. The reason for this is not far-fetched. The city became an Export Processing Zone (EPZ) in addition to the establishment of the TINAPA Business Resort. Apart from these two major factors, the expansion of the University of Calabar Teaching Hospital, the establishment of the Cross River State University of Technology (CRUTECH), the addition of new consultancy programmes in the University of Calabar, the increase in the number of nursery, primary, and secondary schools, increase in the number of financial institutions, and, of course the international Christmas Carnival in December of every year implies that there would be increase in the number of hotels and the demand for more land for residential housing and the hospitality industry. This increase in population has also resulted in the establishment of new residential estates and layouts owned by both government and private individuals.

Calabar originally was an agglomeration of ethnic settlements each being referred to as "town" and separated from one another by vast patches of undeveloped land. Recently, there has been reasonable increase in the growth of residential districts from the traditional nuclei of Big Qua, Old Town, Henshaw, Ediba, Duke Town to the development of the Cross River State Housing Estate, Federal Housing Estate, Unical Staff Quarters, Cross River University of Technology (CRUTECH) staff quarters, the Parliamentary Village, Akai Effa, Esuk Utan,

Ekot Ekpo, Ikot Effanga, Ekorinim I & II, Sacramento, Abeena Estate, Mekenge Layout, Asari Iso, etc. The implication is that the residential districts in Calabar have expanded greatly in the last ten years. Hence, the purpose of this research is to critically examine the effect of population growth on residential land use in Calabar from 1991 to 2010.

Statement of the Research Problem

It is obvious that any area with increasing population density has serious implications on the pattern of land use especially for residential purposes. The population of Calabar has increased from 285,065 in 1991 to 375,196 in 2006 at an annual growth of 3.0 percent (National Population Commission). The paradox is that, in spite of the small land mass of Calabar which is about 299.10sqkm, compared to other cities like Lagos, Kano, New York, Chicago, its population continues to grow thus, bringing enormous pressure on land particularly, for residential purpose.

Land meant for residential growth even in other cities of the world is expected to be available and affordable. It is expected that at least every taxable adult can own a plot of land. In Calabar only very few adults can afford land, the available land is not enough for the increasing population and this shortage in available land has adverse effects on the use of land.

One of the major problems observed is the densification of houses. Housing density has increased significantly especially from the year 2000 till date. In the high density areas of Akim Qua, Big Qua, Efut, Duke Town and Henshaw Town, there is an estimated number 300-400 houses per square kilometer instead of an average of 120 houses and the distance in between the houses is estimated at about 0.5 – 1m, 1m – 2m, or 2m – 3m instead of about 5m apart. In the low density areas of the Federal Housing, Ekorinim I & II, Ikot Ekpo, Ikot Effanga, Ikot Effa, Akai Efa, State Housing, the building density is estimated at 2m – 3m or 3m – 5m instead of 10m apart (Researchers' Field Survey, 2013).

Another problem of the population pressure on land is the scarcity of land optimized by an increase in land rent. Land in Calabar is very expensive. In the late 1980's a plot of land of about 100m by 100m cost between N100,000 – N150,000 along major streets and about N40,000 – N80,000 at the periphery, depending on the site. From the late 1990's the price of land has sky-rocketed. In 2010 a plot of land measuring 100m by 100m in the city centre cost between N300,000 and N700,000 and at the periphery between N1,000,000 to N3,000,000.

The astronomical increase in house rent in Calabar has become very glaring. As the price of land increases so does house rent. For example, the rent for a one-room apartment (rooming house: 'face-me-I-face-you') in parts of Goldie, Ekpo Abasi, Edibe-Edibe, Essien Town, Uwanse, Orok Orok, Akim Qua is about N24,000 per annum, a self-contained room is about N90,000 – N100,000 per annum, a one bedroom flat is about N100,000 – N150,000, a two bedroom flat depending on the quality of the building is between N150,000 – N250,000 per annum, a three bedroom flat is between N300,000 – N400,000 per annum. In parts of Ekorinim II, Parliamentary Village, State Housing Estate, Federal Estate a self contained room is between N100,000 – N150,000, a one bedroom flat is between N150,000 – N200,000, a two bedroom flat is between N200,000 – N300,000, a three bedroom flat is between N400,000 – N450,000 per annum. However, the price of these houses depends on the quality of the house, the housing facilities, the site of the building and sometimes the owner of the house. The increase in the cost of rent makes these houses unaffordable to an average urban resident. The implication is that squatter settlements can be seen in parts of Esuk Utan, Henshaw Town, Duke Town, Goldie, Uwanse, Orok Orok, Ekpo Abasi, Inyang, Akim Qua, etc. These buildings, no doubt, reduce the beauty of the city. Most of the occupants of these houses are the urban poor. The inhabitants of these settlements also dump refuse at ugly spots as well as exhibit bad toilet habits.

Overcrowding of persons per room is another dimension of the problem. The occupancy ratio increases with increase in the number of houses and people. In the high density areas of Goldie, Uwanse, Akim, Mount Zion, the occupancy ratio is between 5-7 persons per room. This is very common among students and low income families. In the low density areas of State and Federal Housing, the occupancy ratio is 1 – 3 persons per room.

Objectives of the Study

- i. To examine the consequences of population growth on urban residential land use in Calabar.
- ii. To examine the rate of increase in the value of land in the study area.
- iii. To examine the effect of population growth on housing rent in Calabar.

Hypothesis: One research hypothesis was tested namely: There is a significant relationship between population growth and the cost of urban residential land.

Conceptual Framework/Literature Review

Several concepts have been used to study the subject matter of population and residential land use in urban centres. For this study attention is basically focused on the Malthusian Theory of Population and Ecological Urban Land Use Theories of City Structure.

- a) **Malthusian Theory:** Thomas Malthus in 1714, postulated that population increase depends on the rate of increase in the means of subsistence. According to him, population will grow at a geometric proportion unless checked by moral restraint, vice and misery. Paradoxically and, owing to the diminishing returns to land, the fixed factor (land) grows at an arithmetical rate. It follows logically that, unless checked, population will tend to increase faster than subsistence.

The Malthusian population theory was supported by David Ricardo in 1817. Malthus and Ricardo argue that population growth will result in a steady decline of per capita income which will eventually lead to a stationary state in which economic growth will cease. Malthus based his population on land as a fixed factor of production and did not anticipate improvement in land, seedlings and advancement in farm technology which are all parts of the agrarian revolution that ultimately enhanced productivity substantially. Many writers like Ehrlich and Ehrlich (1977) have criticized Malthus' postulation insisting that the problem is not that of too many people as claimed, but that of inequality. According to them, if inequality in resource allocation is controlled and family planning methods are conscientiously used to check population growth, then the consequences of continuous population growth can be checked. This theory is applicable to this work because population pressure on land which is a fixed factor will certainly reduce the quality and quantity of land for use. This will inevitably lead to further parcelization and depletion of land and hence increase the severe scramble for it.

- b) **Urban Landuse Theories:** There are several theories in the literature which have been used to explain the structure of urban landuse. These include the ecological, econometric and behavioural theories. Traditional ecological models have been popular in studying the spatial structure of cities in both the developed and developing countries. These classical models are: the Ernest Burgess Concentric Model of 1925, the Homer Hoyt's Sector Model of 1939, and the Harris and Ullman's Multiple Nuclei Model of 1945. Each of these have their relevance or applicability to this study. However, preference is given to the microeconomic postulate because of the parameters of location (distance) and price of land (rent) which this study is interested in.

Classical microeconomic models of urban land use derive principally from the works of Richards and Von Thunen. Von Thunen, for instance, was essentially concerned with the location of agricultural activities, but his ideas were applied to the location of urban activities, first by Hurd in 1903 and later by Haig in 1926. The two concepts which featured prominently in their formulations are those of urban rent and transport accessibility. However, modern versions and application of this theory emanate from Alonso (1964).

From figure 1, as land stretches from the Central Business (CBD) to the periphery, the price of land reduces but the size or quantity of land sold increases. This model is applicable to the urban landuse market in Calabar. For instance, as one moves from the city centre such as the Watt Market, Calabar Road, Edgerton Street, Atu Street, Marian Road, Akim Qua, to mention but few, the size of land given out as one plot increases but the price decreases. This is an inverse proportional relationship. That is, at the city centre, the size of land is smaller but the price is high. However, Alonso's model has been criticized. Its assumption that the urban landscape is featureless with equal transportation in all directions as well as the existence of a singular employment centre in the city is unrealistic. For example, in Calabar, the multiple employment nodes are scattered all over the metropolis. Thus, intra-city residential location is more complex than the notion that households or firms maximize some utility function subject to budgetary constraints.

Literature Review

Camphell (2000), in his study of Charlotte submits that landuse intensity increases as one moves closer to the city centre, and that land prices are positively correlated with accessibility that is, the more accessible parcels of land are more expensive. Both producers and consumers make trade-offs between the price of land, its characteristics in terms of location, accessibility, quantity, quality and attributes. The outcome of numerous location decisions by business, households and governments produce a complex urban mosaic of business districts, shopping centres, government centres and residential neighbourhoods characterized by different landuses. Reilly (1996) in his study at New Orleans noted that most urban land is devoted to residential landuse and declines with distance from the Central Business District (CBD). For example, one result from the analysis of rent gradients is that the intensity of landuse should generally increase as one moves close to the CBD. When this notion is applied to residential patterns, one would expect population densities to be higher as one moves closer to the CBD and lower in sub-urban locations.

Hanson (1979), in his study of urban housing in the United States noted that accessibility shapes landuse. He conducted an empirical examination of the residential development patterns and noted that accessibility and the availability of vacant developable land can be used as the basis of a residential landuse model. He posited a process of distributing forecasted metropolitan population to small units within the

metropolitan region.

According to these studies it is obvious that accessibility shapes landuse. The more accessible parts of the city are more developed. As posited by Alonso in the theory of urban land values, the more accessible land is more expensive and highly competed for.

Ikhuoria (1995) studied urban landuse characteristics of two major urban centres (Benin City and Warri) and two medium-sized urban centres (Ekpoma and Uromi in Nigeria). He examined the general pattern of landuse characteristics and the results showed that the major urban centres have distinct landuse specializations while that of medium urban centres are just emerging. The data generated were useful for urban planning and landuse modeling.

Onorkerhoraye (1995) observed that one major feature of rapid growth of urban centres in most parts of the developing world in recent years in the evolution of residential districts whose socio-economic characteristics are distinct from one another. He studied the social characteristics of contemporary residential districts in Benin and identified the major factors responsible for the present spatial structure of residential districts in the town. The study suggests that social, cultural and institutional factors have greatly influenced the development of the present residential pattern, which cannot be explained solely by the theories which have been advanced for western industrial cities.

Idoko and Bisong (2010) conducted a study in the Federal Capital Territory, Abuja, where they applied geo-information for the evaluation of landuse changes of Abuja in 1987 and 2004 respectively. A spatio-temporal change in landuse type was obtained in quantitative terms. Vegetation cover in 1987 reduced by 875.22% in 2004, while built-up areas increased by 21.99% in 2004. Farmland cover increased by 0.14% during the period. This study revealed the impact of landuse change caused by massive human movement into Abuja and the attendant high demand for land and high price for land.

To Sule (1981), the physical structure of the city, the pattern of economic activities and to some extent, the social structure are created by individual land owners and entrepreneurs and are site-specific. The decision to change landuse is based on the judgments of individuals as to what development programmes will yield the highest returns for each location. Sule, (1981) also noted that zoning is the sole instrument of operationalizing urban landuse compatibility. It is also predicated on the assumption that residential landuse planning cannot take place without making use of the framework of zoning. Sule (1981) has, therefore, urged Nigeria to borrow a leaf from the zoning experiences of other developed nations especially the United States of America.

Furthermore, the land rent theory was developed to explain landuse as a market where different urban activities were competing for land usage at a location (Sule, 1994). It is strongly based on the market principle of spatial competition. The more desirable the location the higher its rent value. Transportation, thorough accessibility, and distance-decay is a strong explanatory factor on land rent and its impact on landuse. However, conventional representations of land rent are being challenged by structural modifications of contemporary cities. Rent control has generally been rationalized on urban housing shortage since 1994. The sky-rocketing housing rents in Nigerian cities especially in State capitals, including Calabar, are precipitated by rapid rates in crowding and high housing demand therefore culminating into high rents. The combined effort of private and public sectors have fallen short of the urban housing needs and demands in Nigeria. As much as 50% to 70% of urban households in Nigeria live in one room unit and average occupancy ratio in Nigeria which was 3 – 4 persons per room has risen up to 5-6 persons by the year 2000.

Emodi (2002) in his study on social policy and housing needs in Nigeria asserted that the desire to own a house, irrespective of one's economic status, has contributed to the development of low quality houses in developing countries. This view is similar to that of Sule (2004) who observed that in the urge to satisfy the desire to own a house by low income earners, low quality houses and potential slums feature prominently in sprawl areas in Nigeria.

Data Presentation and Analysis

Data collected from this study are presented and analysed in this section. This is closely followed by testing the research hypotheses using the aforesaid data.

a. Population And The Cost Of Urban Residential Land

There is a direct proportional relationship between increase in population and the cost of residential land in the city. This information is shown in Table 1. It consists of the proportion, cost of land at the city centre (CBD) and the cost of land at the periphery.

Table 1: Cost of Urban Residential Land (1991 – 2009)

Year	Population*	Cost of land at city centre (₦)**	% Incr	cost of land at periphery (₦) ^{xy}	% Incr
1991	283,065	300,000		100,000	
1992	294,647	310,000	3.22	100,000	0.0
1993	302,486	320,000	3.12	110,000	9.0
1994	312,590	330,000	3.03	115,000	4.39
1995	321,967	340,000	2.94	120,000	4.16
1996	331,626	350,000	2.85	150,000	20.0
1997	341,674	360,000	2.77	160,000	6.25
1998	351,821	370,000	2.63	170,000	5.88
1999	362,375	380,000	2.52	180,000	5.55
2000	372,276	500,000	24.0	200,000	5.0
2001	384,442	500,000	0	200,000	0.0
2002	395,976	530,000	5.65	300,000	3.33
2003	407,855	540,000	1.80	470,000	3.61
2004	420,090	580,000	6.6	480,000	2.1
2005	435,069	1,000,000	42.9	500,000	4.0
2006	375,196	3,000,000	25.0	1,000,000	50.0
2007	379,272	4,000,000	20.0	1,200,000	16.6
2008	397,273	5,000,000	28.5	2,500,000	52.0
2009	408,194	7,000,000		3,000,000	15.3
2010					

Source: *National Population Commission, 2009

**Ministry of Lands and Housing, Town Planning Department

Whilst the cost of land in 1992 at the city centre increased by 3.22 percent, there was a quantum leap of the cost of land from 1999 to 2000 by 24.0 percent. This steady increase continued until the year 2009 where a plot of land measuring 100m by 100m cost about 7 million naira. Similarly, the cost of urban residential land at the periphery witnessed a steady rise from 9.0 percent in 1993 to 50 percent by 2006. Also, by 2009 the cost of land at the fringe of the city has increased to N3,000,000.00 from an initial sum of N100,000.00 in 1991.

The data on Table 1 were used to test the only hypothesis for this study as follows:

H₀: There is no significant relationship between population growth and the cost of urban residential land.

H₁: There is a significant relationship between population growth and the cost of urban residential land.

The Pearson Product Moment Correlation technique was used to test the hypothesis. First, population growth was correlated with the cost of land at the city centre while the second correlated population growth at the periphery. The results of these correlation analysis are presented in Tables 2 and 3. From Table 2,

Table 2: Result of Correlation Between Population Growth and the cost of Land at the City Centre.

R	Degree of Freedom (df)	T-cal	T-tab	Sign. Level
0.42	19 - 2 = 17	2.16	2.11	0.05

Source: Author's Fieldwork, August, 2012

the coefficient of correlation is 0.42 which shows a positive relationship between population growth and the cost of urban land at the centre. The t-test showed that t-cal of 2.16 is greater than t-tab of 2.11 at 0.05 significance level. The null hypothesis is rejected while the alternative hypothesis is accepted, that is, there is a significant relationship between population growth and the cost of urban residential land.

Table 3: Result of correlation between Population Growth and the cost of land at the Periphery.

R	Degree of Freedom (df)	T-cal	T-tab	Sign. Level
0.48	19 - 2 = 17	2.16	2.11	0.05

Source: Author's Fieldwork, August, 2012

The result of the second analysis shown in Table 3 shows population growth and the cost of land at the periphery are positively correlated with a coefficient of 0.48. The t-test result also shows the null hypothesis is rejected at the 0.05 confidence level. The result of these two analyses confirms the assertion that population growth positively affects the cost of land for residential purposes. That is, the higher the population, the higher the cost of land both at the inner city and at the city fringe.

b. Population Growth And The Spatial Expansion Of Calabar

The population of Calabar has recorded a modest increase from 283,065 in 1991 to 375,196 in 2006 which was the census year for the country. Today, the projected population of Calabar as at 2010 is about 450,000 people. The implication of this phenomenal population growth is a concomitant areal expansion of the city which stretches deep into its hinterlands. The data on Table 4 show how the growth of population of Calabar has affected the amount of land used for residential purposes between 1991 and 1999. It has increased by more than 1912 percent between the two periods. Whereas, between 1999 and 2009, the proportion of land used for residential purposes increased by about 61.3 percent.

However, population growth may not be the singular factor that affects residential landuse in Calabar.

Table 4: Population Growth and Land Used for Residential Purposes

Year	Population (A)	Cumulative size of land (Hect.) (B)	Increase %
1991	283,065	16.74	
1992	294,647	28.61	58.5
1993	302,486	32.94	41.5
1994	312,590	38.16	
1995	321,967	48.36	
1996	331,626	106.43	
1997	341,674	110.66	
1998	351,821	115.07	
1999	362,375	306.54	1912
2000	372,276	316.36	
2001	384,442	319.15	
2002	395,976	534.99	
2003	407,855	556.50	
2004	420,090	568.38	
2005	435,069	710.94	43.1
2006	375,196	752.52	
2007	379,272	772.85	
2008	397,273	782.15	
2009	408,194	791.24	61.3

Source: A - National Population Commission, 2009
 B - Town Planning Department, Ministry of Lands and Housing

There are other factors particularly since 1999 which may help to explain the quantum leap in the areal expansion of residential land in the city. First, the year 1999 marked the re-introduction of democratic administration in Nigeria and this may have resulted in the socio-economic empowerment of residents. This, no doubt, has raised their financial status and has motivated these residents to buy new plots of land which they use to build new homes for themselves. The second factor is attributable to the activities of land speculators. These are very wealthy urban residents who specialize in buying several plots on a massive scale and later develop them indiscriminately without consulting appropriate city planning authorities. Incidentally, and thirdly, most of these speculators live outside Calabar, and because of the assumed peaceful nature of the city, they always scramble for plots of land in choice areas in the city. Furthermore, Calabar suffers from a locational disadvantage being sandwiched between the Calabar River and the Great Kwa River. This has restricted the areal expansion of the city in a north-south longitudinal direction. This explains why the residential growth of the city is gravitating towards Odukpani LGA in the north, eastwards towards Oban in Akamkpa along the MCC Road, and southwards across the Atimbo Bridge into Akpabuyo Local Government Area. Infact, the sectoral wedge of land between the MCC Road and the New Parliamentary dual-carriage way has witnessed very phenomenal residential expansion in the last seven years. However, much of the residential layout here are haphazard and uncontrolled by the Town Planning Department, and therefore, distorts the scenic beauty of the city.

Recommendations

Based on the findings of this study, the following suggestions are germane in improving the situation of residential landuse in Calabar.

1. The Federal, State and Local Governments should stop paying leap service to population control. There is a compelling need to intensify effort in inculcating family planning tenets on the citizenry.
2. It is absolutely necessary for Government, through the Town Planning Department, to be meticulous in land allocation, registration of building plans, and on-the-spot supervision when building is actually taking place as this will help to sanitize the rather chaotic residential environment.

3. The Cross River State Government should emulate what the Lagos State Government has recently legislated on, by re-introducing rent control both on the cost of land and the annual/monthly rents paid on buildings.
4. Furthermore, concerted effort should be made to regulate the prices of building materials especially that of cement and timber products to help reduce house rents.
5. The Calabar Master Plan is already distorted. But government should endeavour to regulate city expansion of ensuring the introduction of discipline and compliance to the basic Town Planning regulations.

Conclusion

This research is based on the impact by population growth on residential landuse in Calabar. It is indubitable that almost every facet of development is affected by population growth, and this has impacted overly on urban residential landuse. It is important that urban landuse and residential problems in Nigeria's metropolitan centres must revolve around the stabilization and understanding of the land systems.

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