

Uncontrolled Urban Expansion, Population Growth and Urban Development in Ado-Ekiti, Nigeria

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ABSTRACT: This paper examines the inter-relationship of three major phenomena- population growth, uncontrolled urban expansion and urban development in Ado Ekiti, Nigeria. Uncontrolled urban expansion has a resultant effect on the urban development of a city whereas uncontrolled urban development is caused by uncontrolled population increase is caused by Migration. This work encapsulates how population growth has affected the urban expansion and resultant land use and urban development in the city. The methodology adopted the use of both primary and secondary data: the population data from the Demography Division of the Governor's Office and the urban growth Maps (1956 and 2006). Data were analysed and the resulting graphs extrapolated to show the relationship of population growth on urban expansion and urban land use/urban development. Results show a direct correlation between population growth and both urban expansion and land use/urban development: between 1966 and 1976 the population dropped; as reflected in the drop in urban growth in terms spatial expansion of the city and urban development as there was a decrease in urban land use for education, industrial, and other land uses. Between 1996 and 2006, the population increased; also reflected on the increase in urban growth and urban land uses. Result is useful for Physical, Economic and Strategic Planners in formulating policies for urban renewal schemes and Development Control. The result is also applicable to medium-sized and small cities, in the Developing Countries.

Keywords: Population Growth, Urban Expansion, Urban Development, Land Use

INTRODUCTION

The character of urban environments throughout the world is the outcome of interactions among a host of environmental, economic, technological, social, demographic, cultural and political forces operating at a variety of geographic scales ranging from the global to the local (Amarsaikhan & Tsolmongerel, 1997). Growth of any city can be a good sign of development, but the way the expansion taken place in recent times calls for concern due to the loss of prime agricultural land and plant and animal biodiversity, land use/land cover change and incursion into the edge of the city due to the physical expansion of cities. This growth is seen absorbing smaller villages on the periphery gulping fertile agricultural lands uncontrolled and unauthorized urban developments have also taken place without having basic civil amenities on the city (Shimou, 1994).

The influx of people into Ado-Ekiti was exacerbated by the changes that took place in the socio-economic and political life of the city not only because of infrastructure such as electricity and potable water, but mainly with the presence of employment opportunities that led to the influx of more and more people of whom a greater majority were erstwhile rural dwellers. This insurgence of people and firms into the city has warranted the expansion of the city both demographically and spatially and has expansion of the city. With the absence of effective planning mechanism, the city tends to mimic the painful experience of the developed countries of the world during the nineteenth century when development proceeded without Physical Planning.

Urbanization

Urbanization is defined as a demographic process characterized by the movement of people from rural to urban settlements

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from small towns to large cities, and from large cities to their suburbs (Wikipedia, 2015.). Urbanization in newly developed countries was associated with industrialization with varying degrees of association, (Breese, 1966). However mainly in some cases, large urban areas have developed without any association with industrialization mainly in administrative or marketing centres where the urbanization is generated from external impetus. Breese (1966) made a clarification of the differences between the terms urbanization, detribalization and stabilization. He quotes Mitchell, (1962) as defining urbanization, as being

“a process of becoming urban, moving to cities, changing from agriculture to other pursuits common to cities and corresponding changing of behavior using the development of modes and standards behavior peculiar to urban areas...”

Tali & Murthy (2012) observed that Urbanization in its most general sense refers to the complex set of processes by which the proportion of the country's population concentrated in urban areas increase over time. Urbanization on the one hand acts as a centripetal force, attracting people to towns and cities; on the other hand it also acts as centrifugal force, radiating its influence outwards, which reinforces its centripetal role.

They further assert that

“Urban sprawl has become the catch phrase for everything that is bad about urban growth today-congestion, blight, monotony, endless development and ecological destruction. Rapid urbanization has resulted due to the several factors. However, the natural growth of the population, the rural to urban migration are important in it. Rapid urbanization causes disorganized and unplanned growth of the towns and cities.”

The pressure of rapidly increasing population puts the city infrastructure under intense pressure resulting in water variability, ever-collapsing roads, unstable electricity, and non-functioning telecommunications services.

Statement of Problem- Urbanization and Ado-Ekiti

Since the creations of Ekiti State in 1996 with Ado-Ekiti as the state capital had continued to significantly grow in size with expanding infrastructure and population consequently, there is the urgent need to assess the environmental impact of these developments. Urban growth has resulted in the conversion of land for urban uses because, according to Oriye (2008), there has been urban haphazard development control without effective development planning mechanism to put in place organized commensurate investment in infrastructural installations and plants. At various times, the city has had street lights in some sections of it powered by generators to create cosmetic effects. The land management system is such that de jure the administration of land is in the hands of government but de facto the land owner families control the land administration mechanisms only using the official systems and professional services as cover or 'stamp'. The land administration is still largely in informal hands.

Ortiz (2012), in a study of Ado-Ekiti which he called Document for Debate, opines as follows:

“Africa is experiencing rapid urban growth in a framework of weak institutional settings. The level of informality in urban and economics is large: sometimes beyond 70%. But as relevant to the overall process are the informal social and governance sectors. Informality plays a role; in its absence the existing levels of equilibrium might not be reached. And the system is not able to transform it into formal. Integrating both formal and informal becomes part of the requirements to overcome the difficulties of the transition process. ... (Ado-Ekiti) : a city in Nigeria, the most populated country in Africa with 25% of the Sub-Saharan population. The city is Ado Ekiti, experiencing an annual growth of 6%, which can be quite representative of what is happening in the African continent. The results and suggestions of this paper focus in the specific place of Ado but they are made with the African continent in view in the hope that the outcome could be of use for the general problem of rapid urbanization growth in Africa: harnessing and integrating the informal urban sector.”

Ortiz (2012), in analyzing Oriye (2013), said about Ado's urban growth figures as follows:

“Ado is growing fast. The very relevant paper “Urban expansion and depletion of agricultural lands in Ado---Ekiti” ... O. Oriye reflects a staggering growth pattern during the years 1956–2006. The expansion of the urban area between the years 1996 and 2006 has been of 17.1 Sq. Km. That is an 87.2 % increase from the previous extension in ten years. That is an average urban growth beyond 6% per year: 2.2 Sq. Km for 2006. Ado Ekiti is currently experiencing that rate of growth.” Referring to a statement by Cobbett (2011), Ortiz (op cit) stated as follows:

“So for the next 30 years, I would summarize the planning challenge –because it is the same as the policy challenge systematically, consistently, and coherently formalizing the informal; bringing people in metaphorically and literally into those cities and not pushing them out, which is the dominant force.”

In the consequence of several failed attempts to curb urban expansion or to continue to see it as a monster despite its possible attendant problems, it is expected that a new paradigm be explored to harness the potentials rather than to continuously attempt to prevent urban sprawl. This paradigm attempts to unleash the potentials of urban sprawl and population growth for proper and sustainable development. To achieve this, an effort was made to monitor the expansion of city in relation to the population growth and attendant urban development. The challenge for the next few decades is learning how to exploit the possibilities urbanization offers.

Explaining the importance of the city and how the future of humanity depends on it, the UNFPA (2007) posits as follows:

“The world is undergoing the largest wave of urban growth in history. In 2008, for the first time in history, more than half of the world's population will be living in towns and cities.

By 2030 this number will swell to almost 5 billion, with urban growth concentrated in Africa and Asia. While mega-cities have captured much public attention, most of the new growth will occur in smaller towns and cities, which have fewer resources to respond to the magnitude of the change.

In principle, cities offer a more favourable setting for the resolution of social and environmental problems than rural areas. Cities generate jobs and income.

With good governance, they can deliver education, health care and other services more efficiently than less densely settled areas simply because of their advantages of scale and proximity. Cities also present opportunities for social mobilization and women's empowerment. And the density of urban life can relieve pressure on natural habitats and areas of biodiversity."

Maps are the best known conventional models of the real world used for many years to represent information about the real world. However, with the advent highly optimized computer system, the roles of the maps as data storage have been overtaken by database. What remain are the visualization functions of maps. Akinyede & Boroffice (2004) assert that databases are computerized digital (including computerized cartographic product) data that can be expressed in both 2-dimensional and 3-dimensional forms and are dynamic. Spatial databases store representation of spatial phenomena in the real world to be used in the geographic information system (GIS) called GIS databases. Such spatial feature representations, unlike maps, are stored in a scale less and seamless manner with their world or geographic coordinates stored as location variables. As against the use of maps, calculations can be easily performed and any desirable scales can be chosen. The databases are easy to query and to combine data from different layers.

Remote sensing remains a vast means of acquiring geo-spatial data and GIS can utilize (satellite) images to extract useful information and map large areas (Awoseyila, 2004). The applications of remote sensing and GIS in Urban studies at present in China give more weight on the urban sprawl spanning most recent several decades giving an image that remote sensing and GIS applications are located in the dynamic monitoring of urban growth only. Therefore only in a few cases, we see GIS technologies are applied in empirical analysis on the urban spatial structure.

The Remote Sensing (RS) and Geographic Information System (GIS) are appropriate tools for creating such type of information system. There is a demand to constantly monitor such changes and understand the processes for effective and corrective measures towards a planned and healthy development of Ado-Ekiti. Recently, GPS and Remote Sensing data are being widely used for mapping and monitoring at urban spread especially in some major cities in Nigeria. Hence, the same technology and data can be systematically mapped, monitored and accurately assessed from satellite data along with conventional ground data.

GIS is a computerized system that facilitates the phases of data entry, data analysis and data presentation especially in case

when dealing with geo-reverenced data. GIS has capabilities for database management, mapping, image processing and statistical analysis (Amarsaikhan & Tsolmongerel, 1997). A GIS defines entities (or features) on a map using spatial and descriptive (or attribute) data. Spatial data indicates the location and dimension of a feature. Geographical objects also have non-spatial attributes, such as material, ownership, age and area, which describe characteristics of an object it is the ability of a GIS to reference and describe objects by a location that distinguishes it from traditional database and spreadsheets. (Liu, 1999).

The application of remote sensing and GIS in urban studies at present in China gives more weight on the acquisition of urban land-use information and the comparison on the urban sprawl spanning most recent several decades (Changda, 1995), giving and image that remote sensing and GIS application are located in the dynamic monitoring of urban growth only therefore in few cases, we see GIS technology are applied in empirical analysis on the urban spatial structure (Shan, 1999).

Visualizing places and the way they evolve is a fundamental part of what planners, urban designers, landscape architects, and geographers do. Without being able to visualize a region as a whole, it is often difficult for citizens to plan for the future. (Parmenter, 2003)

Study Area

In the defunct Western State, Ado-Ekiti was one of the Provincial Headquarters. The town retained this status under a different name (Local Government Headquarter) when Ondo State in 1976. When Ekiti State was carved out of the "old" Ondo State in 1996, Ado-Ekiti became the State Capital. With the sudden change of the status of the town, many civil servants of servants of Ekiti State origin, (many of whom were hitherto resident in the former Ondo State), were transferred to Ekiti State. Most of them reported in Ado-Ekiti. Also, the irreversible flow of people from the rural to urban areas swelled the population of the town in a very short period of time. Consequently, the existing infrastructural facilities became grossly inadequate to meet the yearning needs of the dense population. This then set the stage for the eventual unprecedented expansion of the town. Unfortunately, as the town continued to grow, visual representation of the pattern of its growth (inform of maps) was not given the desired priority attention by policy makers. Consequently, ten years after the creation of Ekiti State, there was no large – scale township maps of its capital city, Ado-Ekiti.

Ado-Ekiti township extends between latitude 7o 31' N and 7o 44' N of the equator and 5o 11'E to 5o 19'E of the Greenwich Meridian. Geologically, the town is located within the Pre-Cambrian Basement complex rock group which underlies much of South Western, Nigeria. As for the climate, it is characterized by distinct wet and seasons. Ado-Ekiti located within the seasonally wet tropical savanna climatic belt with a uniformly high mean temperature of about 25oC and a mean

annual rainfall of about 1400mm, which falls in the lowland rainforest zone. (Fig.1 to Fig.3)



Fig.1: Ekiti State in its National Setting. (Source: Oriye, 2013)



Fig. 2: Map of South-Western Nigeria. (Source: Oriye, 2013)

MATERIALS AND METHODS

The Population Data for the project was collected from the Demography Division of the Planning Commission, Deputy Governor's Office, Ado-Ekiti, Nigeria while the geo-spatial data on the expansion of Ado-Ekiti (for every ten years) before and after the creation of Ekiti State, from 1966 to 2006 was collected from Oriye (2008). These data sets that were used for this work was gathered from Topographical Maps, Land-use Maps, and LANDSAT Satellite Imageries. These data was then integrated into Integrated Land & Water Information System (ILWIS), a Raster- based GIS Software to see the town structure

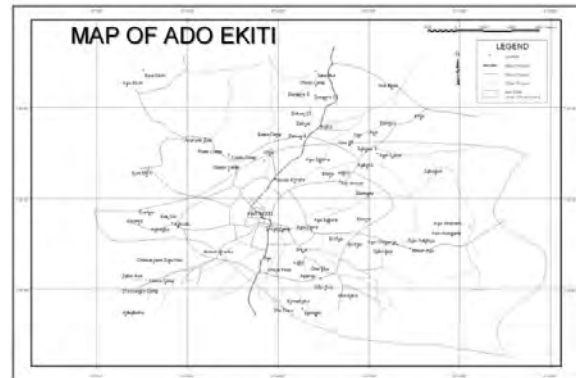


Fig. 3: Map of Ekiti State, showing Ado-Ekiti.

and development from 1996 to 2206, for every ten years. The imageries were integrated into a composite Map showing the overlay of successive years from the decadal areas below.

For Ado-Ekiti 1966, the township Map was extracted by digitizing Ado-Ekiti Sheet 244 SW&SE topographic map at scale 1:50,000 published in 1966 by the Federal Surveys, Lagos, Nigeria.

Ado-Ekiti 1976 was extracted by digitizing Ado-Ekiti boundary on the Nigeria Vegetation and Land-Use Map Akure Sheet based on LANDSAT Imagery acquired in 1976 published in 1977 by the Federal Department of Forestry, Abuja, Nigeria.

Ado-Ekiti 1986 Map was extracted by digitizing Ado-Ekiti boundary from the Nigeria Vegetation and Land-Use Map, Akure Sheet based on LANDSAT 1987 published in 1989 by the Federal Department of Forestry, Abuja, Nigeria.

Ado-Ekiti 1996 Map was extracted by digitization Ado-Ekiti boundary from the Nigeria Vegetation and Land-use Map, Akure Sheet acquired in 1994 and published in 1996.

Ado-Ekiti 2006 Map was extracted from a LANDSAT TM acquired 2007. The image was processed in Regional Centre for Training in Aerospace Surveys (RECTAS), geo-referenced and the boundary of Ado-Ekiti was extracted by on-screen digitizing.

RESULTS AND DISCUSSION

The results show that there is a direct relationship between urban population growth, urban expansion and land use/urban development. (Table 1 to 4) (Fig. 4 to Fig.10)

Rapid urban development and increasing land use changes due to changing population and economic growth in Ado-Ekiti landscape is being witnessed of late. Agricultural land is being converted into urban purposes in all around the town, and since Ado-Ekiti has shown a typical traits of urbanization there is an urgent need for the improvement in information technology system to help reduce increasing pressure on land, water. Environment planners need the whole data and information of

Table 1: Population, Population Increase, and Percentage Growth for Every Decadal Intervals from 1956-2006

| YEAR | POPULATION | POPULATION INCREASE | % INCREASE |
|------|------------|---------------------|------------|
| 1956 | 97,964 | - | - |
| 1966 | 200,855 | 102,891 | 105 |
| 1976 | 155,181 | -45,674 | -22 |
| 1986 | 204,300 | 49,119 | 31 |
| 1996 | 274,205 | 69,905 | 34 |
| 2006 | 409,090 | 134,885 | 49 |

Table 2: Spatial Growth of the City from 1956- 2006

| Year | Area(km2) | Decadal Variation(km2) | % Growth |
|------|-----------|------------------------|----------|
| 1956 | 2.5 | - | - |
| 1966 | 6.5 | 4 | 3.8 |
| 1976 | 9.7 | 3.2 | 8.2 |
| 1986 | 13.3 | 3.6 | 10.5 |
| 1996 | 19.6 | 6.3 | 18.4 |
| 2006 | 36.7 | 17.1 | 50.0 |

Table 3: Spatial Growth of the City from 1956- 2006

| Year | Area (km2) | Decadal Variation | Population | Density (Population/Area) | Decadal Growth (Population) |
|------|------------|-------------------|------------|---------------------------|-----------------------------|
| 1956 | 2.5 | - | 97,964 | 39,185 | - |
| 1966 | 6.5 | 4 | 200,855 | 30,900 | 102,891 |
| 1976 | 9.7 | 3.2 | 155,181 | 15,998 | -45,674 |
| 1986 | 13.3 | 3.6 | 204,300 | 15,360 | 49,119 |
| 1996 | 19.6 | 6.3 | 274,205 | 13,990 | 69,905 |
| 2006 | 36.7 | 17.1 | 409,090 | 11,146 | 134,885 |

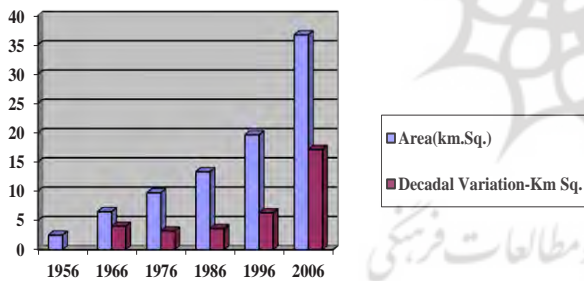


Fig. 4: Increase in Area of Ado- Ekiti for each Decade in Ado-Ekiti- 1956 to 2006.

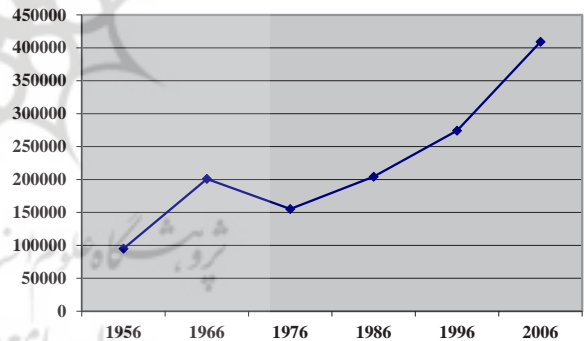


Fig. 5: Population Increase in Ado-Ekiti- 1956 to 2006.

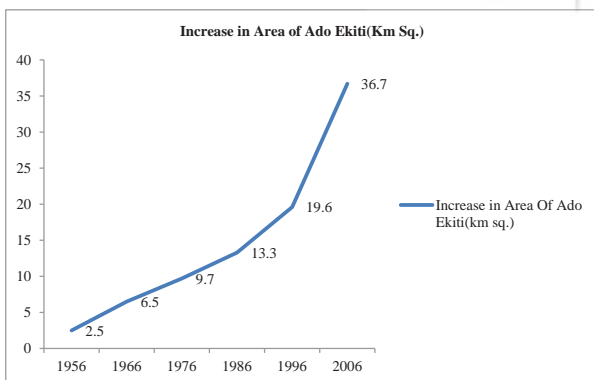


Fig. 6: Increase in Area of Ado Ekiti from 1956 to 2006.

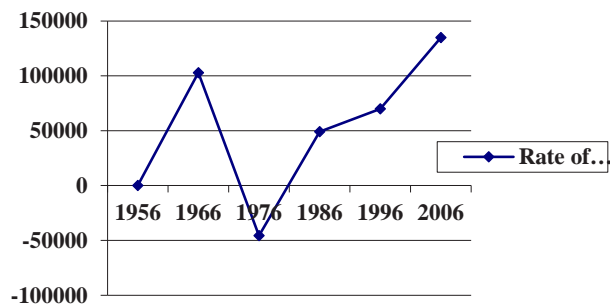


Fig. 7: Rate of Urban Growth in Ado-Ekiti- 1956 to 2006.

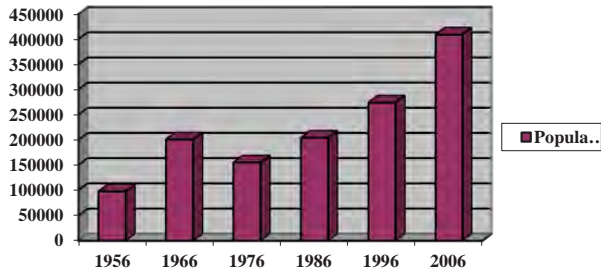


Fig. 8: Population of Ado-Ekiti- 1956 to 2006.

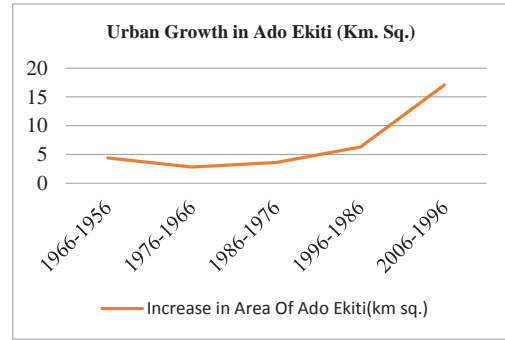


Fig 9- Urban Growth in Ado-Ekiti- 1956 to 2006.

Table 4: Land Use Types by Zones in Ado-Ekiti- 1956 to 2006

| Types of Use | 1956-1966 (%) | 1966-1976 (%) | 1976-1986 (%) | 1986-1996 (%) | 1996-2006 (%) | Others (%) | Others (%) |
|--------------------------|---------------|---------------|---------------|---------------|---------------|------------|------------|
| Educational | 30.9 | 9.8 | 25.3 | 15.8 | 21.8 | 23.9 | 16.0 |
| Health | 17.5 | 15.2 | 8.9 | 3.2 | 6.4 | 7.0 | - |
| Residential | 53.6 | 40.2 | 44.3 | 46.3 | 73.1 | 43.7 | 76.0 |
| Religious | 18.6 | 9.8 | 10.1 | 7.4 | 10.3 | 18.3 | 4.0 |
| Cemetery | 5.2 | 1.1 | - | - | 3.8 | 1.4 | - |
| Abattoir | 4.1 | 2.2 | 2.1 | - | 2.6 | 2.8 | - |
| Industry | 6.2 | 3.3 | 5.1 | 1.1 | 1.3 | 1.4 | - |
| Government | 5.2 | 2.2 | - | 3.2 | 1.3 | 1.4 | - |
| Agriculture | 11.2 | 3.3 | 3.8 | 1.1 | 5.1 | 1.4 | - |
| Motor Park | 7.2 | 2.2 | 1.3 | 1.1 | 1.3 | - | 4.0 |
| Civil | 5.2 | 2.2 | 1.3 | 1.1 | 1.3 | - | 4.0 |
| Cultural/ Traditional | 8.2 | 1.1 | 2.5 | - | 1.3 | - | 4.0 |
| Others | 4.1 | - | 3.8 | 7.4 | 1.3 | 1.4 | 4.0 |

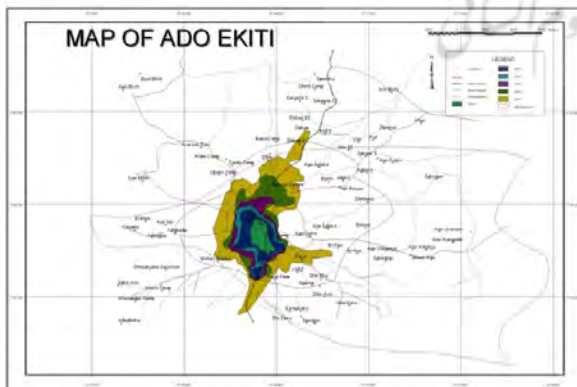


Fig. 10: Decadal Over-laid Map of Ado Ekiti from 1956-2006
(Source: Oriye, 2008)

a map and information related to these aspects for perspective planning and management of the edge-city of Ado-Ekiti. There is need to strengthen the Development Control mechanism by providing a Masterplan for Ado-Ekiti and environs to enable adequate planning and execution of development control schemes and integration of various planning scenarios for decision making.

The population data were collected from the Demographic Division, Deputy Governor's Office, Ado-Ekiti, Ekiti State in 2006. The Table 1 above shows that the total population of Ado-Ekiti in 1956 was 94,964 persons, this increased to 200,885 persons in 1966, which reduced to 155,181 in 1976 and increased to 204,300, 274,205 and 409,090 in 1986, 1996 and 2006 respectively. This resulted in an overall growth rate of 105 percent per annum for the first decade.. The population increased and this also reflected on the increase in urban growth

and urban land uses. Further analyses of the population data in Table 4 above shows the correlation of urban growth and urban land uses to the urban population of the particular period. For instance, where the population dropped in the year 1976 to 155,181 there was a corresponding drop in urban expansion as against that of year 1966 where the population stood at 200,855; the drop in population had a corresponding reflection on the urban growth and urban land uses/urban development.

The growth of any city is a good sign of development, but the way the expansion takes place calls for concern in the context of urban land use /land cover change and urban land use. The most productive farmland is being lost to urban encroachments into rural land over the past thirty years and the unchecked physical expansion and population of Ado-Ekiti has resulted in sprawl and unplanned developments around the city, uncontrolled and unauthorized urban developments have also taken place without having basic civil amenities on the city. Despite the limited land within the city geographical boundary there is a multifaceted demand for land space for all manner of developmental programmes by government and the private sector keep shooting up. In order to meet the demand for land space requirements, rural settlements such as Ilokun and Aba Opopo have absorbed into the main city. These changes in the city have not been planned resulting in haphazard development which in turn yielded problems for the proper functioning of town in terms of structure, transportation and infrastructure. The city exhibits common problems to varying degrees which include inadequate housing, economic decline, poverty, slums, over-crowding, ill-health, social polarization, traffic congestion and environmental pollution, amongst others.

Most fundamentally, the character of urban environment throughout the world is the outcome of interactions among a host of environmental, economic, technological, social, demographic, cultural and political forces operating at a variety of geographic scales ranging from the global to the local.

There is also the need for capacity-building in terms of manpower development and equipment for the development planning and control agencies. This will enable proper estimation and acquisition of large scale maps and very high resolution satellite data such as IKONOS and QUICKBIRD covering all Ado-Ekiti should be used.

Preservation of prime agricultural lands on the periphery of Ado-Ekiti is necessary for maintaining open space and environmental quality. Land use control and regulation are important tools and instruments for planning of the city and to regulate growth and associated sprawl. Hence, various development and legislative measures are to be adopted.

CONCLUSION

Population growth, urban expansion and unplanned land use in Ado-Ekiti has brought a number of problems of like housing, infrastructural services and congestion besides the loss of agricultural land. These problems require immediate attention

of the planners and administrators and government. The following are the suggestions which are expected to ameliorate the challenges and provide a lasting basis for sustainable growth and balance and development of Ado-Ekiti

Safeguarding of the fertile land around the city and maintenance of environmental quality.

Control of urban spread out into agricultural land by an effective urban design mechanism and reduction of individual land holdings and enforcement of professional standards.

Provision of adequate infrastructure for the city to convert to a high-rise city.

Jurisdictional, legal limitations should be applied for encroachment of rural land.

There is a need of research on encroachment of urban activities into rural lands.

There is need for generation of digital Topographical Data base for Ado-Ekiti and the use of high resolution data for planning and urban information generation.

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