PREDICTIVE MODELING OF URBAN SPATIAL EXPANSION AND IMPLICATIONS FOR LIVELIHOOD AND SUSTENANCE IN PERI-URBAN AREAS OF OGBOMOSO, NIGERIA

By

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1 INTRODUCTION

The problem of rapid and uncontrolled urban growth and its inevitable consequences on the city and regional landscape, especially in the developing countries have been a serious concern for scholars in urban and regional affairs as well as city managers. Perhaps more worrisome is the surreptitious city encroachment on fertile agricultural land and other socio-economic implications on the peri-urban areas of most cities The scope and magnitude of problem of urbanization transcend the city limit to include the peri- urban areas, where resources consumed in the cities are obtained and urban wastes are dumped with ominous implications on vegetative cover and human health. In most cities of developing countries, the problems are compounded by phenomenal population explosion and sporadic physical development in the context of unwillingness and inability of urban governance to minimize negativities associated with rapid growth while maximizing urban benefits. Also and more importantly there is lack of population data and, its discontinuity and unreliability where available, to analyze, predict and plan the process of urban development so as to ensure maximum benefit derivable from economy of scale that human agglomerations in cities offer. However, one of the most dramatic illustrations of consequences of urbanization is the surreptitious city encroachment on rural hinterland. The quantum of rural hinterland engulfed by a given city over time would thus provide insight into the processes and implications of urbanization and the opportunity to evaluate impact of city growth beyond urban limit. In a situation like Nigeria, with inadequate population data, the use of data on changing sizes of built-up areas of cities as a surrogate measure of consequences of urbanization is

imperative and attractive with the availability of such techniques as GIS and information on vegetation and land use changes. This is the major pre-occupation of this study.

Described as the contiguous space to the city which is affected favourably and unfavorably by that contiguousness (Gutman and Dascal, 1987), the peri-urban area is neither rural nor urban, but an interface where there is increasingly less provision for the various urban services, and when compared to the rural system, there is also increasingly less provision of the ecological services. The peri-urban population is a mixture of rural and urban dwellers. While the rural component of the population are denied the ecological services of unpolluted air, fertile land for farming, and are divested of ownership of landed property, the urban component lacks access to basic urban services. In any case, the peri-urban communities is dominated by low income earners that rely on resources from the rural area and cities in constructing their livelihood and sustenance, two composite variables which are indicators of the consequences of urban encroachment into the immediate peri-urban communities, whose landuses are being perforated by different forms of urban development.

The concern about peri-urban areas of cities begins with conceptual issue of its inclusion or exclusion in the scheme of things in urban and regional policies. Governments and their agencies often exclude the area in their programmes, thus allowing peri-urban communities to function and have a fabric dictated by what Morello et al (2000) called "geophagy" a concept that describes the interaction and competition between urban and rural land uses. As cities continue to grow in population sizes, complexities of functions and areal extents, more and more rural hinterlands and peri-urban communities are encroached; without due consideration for the effects of such increasing areal extents on the "helpless" and "accommodating" peri-urban communities.

This paper is a follow up to an earlier work (Adeboyejo and Abolade 2007) under the title, "Household Response to urban encroachment on rural hinterland in Ogbomoso urban fringe". While the earlier paper focused on city expansion (1914-2007) and responses of households and communities in the city hinterland to the onslaught of urban expansion, the current work is concerned with predictive modeling of city spatial expansion based on observed growth between 1914 and 2007 and the implications of growth on communities, (largely dominated by low-income earners) whose reliance is on

resources from both the rural and urban centers in constructing their livelihood and sustenance. The questions to be addressed include: given the rate of urban expansion of the city generally, and along major corridors, where will the city limit be in 20 years time, that is, by the year 2027; what quantum of land area and by implication the amount of rural land that would have been engulfed; what communities along the corridors, beyond the current city limit would be affected. In what aspects of life would the people of the peri-urban areas be affected? Or more specifically, what would be the effects of such city expansion on the "livability" and "sustenance" in the peri-urban area? Analysis of the trend, pattern and direction of urban expansion in relation to the physical characteristics as well as the livability and sustenance of peri-urban households and communities would aid decision making on restriction and encouragement of urban growth pattern as well as programmes on capacity building for communities.

2 AIM AND OBJECTIVES

Aim

The major purview of this study is a predictive modeling of the pattern of expansion of Ogbomoso by 2027, based on observed rates and pattern between 1914 and 2007 and an examination of the implications of city growth on the construction of livelihoods and sustenance in the peri-urban communities.

Objectives

The objectives of the study include:

1 estimation of the rates and pattern of city expansion between 1914 and 2007 using GIS and an examination of the underlying processes of city expansion.

2 prediction of total rates and quantum of land to be engulfed and differential rates and quatum along six corridors in different time periods between 2007 and 2027

3 examination of the implications of growth for the construction of livelihoods and sustenance in the communities to be engulfed by city expansion

3 METHODOLOGY

The methodology employed for this research is a multi-stage approach. The first stage involves determination of the rate, pattern and direction of growth of Ogbomoso between 1914 and 2007 using Geographical Information system (GIS). The data required for this stage is the vegetation and land use map of Ogbomoso for different time periods. The earliest land use maps of the city were those for 1914 and 1949, which were obtained from the Nigerian Baptist Theological Seminary as compiled by the Missionaries. Land use maps for the periods 1978 and 1995 were derived from the following imageries: Landsat MSS Imagery (1976 – 1978). SPOT XS Landsat TM (1993 – 1995), ERS – S SAR (1993 – 1995). They were obtained from the Ministry of Agriculture and Natural Resources. The 2003 map, which was an update of 1995 land use map, was extracted from Akinbola (2004) and then through fieldwork, the 2003 map was updated this year 2007 to produce the current land use map. The maps were geo-referenced and overlaid using Arc view 3.2. Although maps are obtained for very irregular periods, their outputs are sufficient enough to analyze changes in city spread and examine the implications of city growth on the rural hinterland. The maps produced from the first stage were examined and the areas of the city, where growth rate is most dramatic are identified. The impact of city growth on rural hinterland was discussed.

The second stage involved the use of calculated amount of land engulfed at six different time periods: 1914, 1949, 1978, 1995, 2003 and 2007 (Adeboyejo and Abolade, 2007) and using arithmetic progression method to extrapolate for eight more periods (1924, 34, 44, 54, 64, 74, 88 and 2000) in order to have adequate observations for the regression model. The observed and extrapolated data were used as dependent variable and length of time as independent variable to generate regression model of the form;

$y = ax + b$, where:

y= average annual expansion for a given period

x= length of time

a and b = constants

The generated model is then used to predict the average annual expansion at different time periods: 2007- 2010, 2010-2015, 2015-2020, and 2020-2027.

In the third stage, the study combines households (359) and (18) communities in Ogbomoso urban fringe as units of analysis. The choice of the communities was purposive, being those at the city frontier, and with established organic linkage with the city. For purpose of questionnaire administration, the settlements were categorized into three, based on observed direction of rapid city expansion, population size, and, the distance of communities to the city center, with the underlying assumption that, the nearer the city, the greater the impact of urban encroachment and the more pronounced the response of households and communities.

To explain the consequence of urban expansion on the peri-urban communities, two indices 'sustenance' (of rural/peri-urban activities) and 'liveability' (of the communities) were computed for each community using certain measure of socio-economic characteristics of the people of the peri-urban/ rural communities (appendices 1 and 2). Based on the profile of the communities on the indices, they were categorized into low, moderate, and high areas of 'sustainance' and 'liveability' (using the scheme: Less than 0.5 standard deviation below the mean as 'low'; 0.5 standard deviation around the mean as 'moderate'; and greater than 0.5 standard deviation above the mean as 'high') (appendix 1 and 2). The communities were later grouped according to this scheme and the indices discussed in relation to the corridor of growth along which the sampled communities fall.

4 THE URBANIZATION OF OGBOMOSO

Ogbomoso is a pre-colonial urban center and the second largest city, both in terms of population and spatial extent, in Oyo State, Nigeria. The city is located at a distance of about 100km north of Ibadan, the Oyo state capital and about 80km from both Ilorin and Osogbo, respectively the Kwara and Osun State capital. (See figure 1). It is one of the main gateways to the northern part of Nigeria from the Yoruba land. It is bounded by river Ora to the east, while no major physical barrier is encountered to the north, west and south. It develops laterally towards the north and south along Ibadan-Ilorin road. The city is surrounded by a number of villages and medium sized towns such as Ikoyi, Odo-Oba and Iressa Apa which all have organic linkage with it, but at distances considered far enough to be out of range of influence of expansion of Ogbomoso.

The city of Ogbomoso is one of such numerous Yoruba settlements, South-West of Nigeria, where urbanism as a way of life predates European Colonization of the country. Like the origin and development of most Yoruba settlements in the early 18th century, the city emerged from the activities of five different waves of migrants, who settled in different areas of the present city. It was the last wave of migrants, led by Soun Ogunlola, who as a result of warring prowess, subjugated and pacified the separately developing villages and harmlets in the surrounding areas into a large settlement that is known today as Ogbomoso

The initial impetus for the growth of the city was provided by torrential influx of refugees from the internecine wars in Yoruba land in the early 19th Century, and of those fleeing from the Fulani Jihadists who over run most of the Northern towns including Ilorin which was about 80km away from Ogbomoso. Ogbomoso successfully repelled the Fulani warriors and this victory further attracted other fleeing refugees to the town. By the end of the 19th century, a continuously built up compact settlement had evolved from the scattered harmlets covering an extensive area of land. Table 1 shows the population size of the city between 1855 and 2006

Table 1: Population of Ogbomoso 1855 to 2006

Year	Population
1855	40,000 *
1911	80,000 *
1921	84,000 *
1931	86,200 *
1952	136,535 [2]
1963	227,471 [2]
1977	321,411 [3]
1985	391,608 [3]
1995	501,291 [3]
1991	166,034 [2] 553,331 [3]
2000	691,035[3]
2006	801,389[3]

* Estimated figure as provided by Missionaries

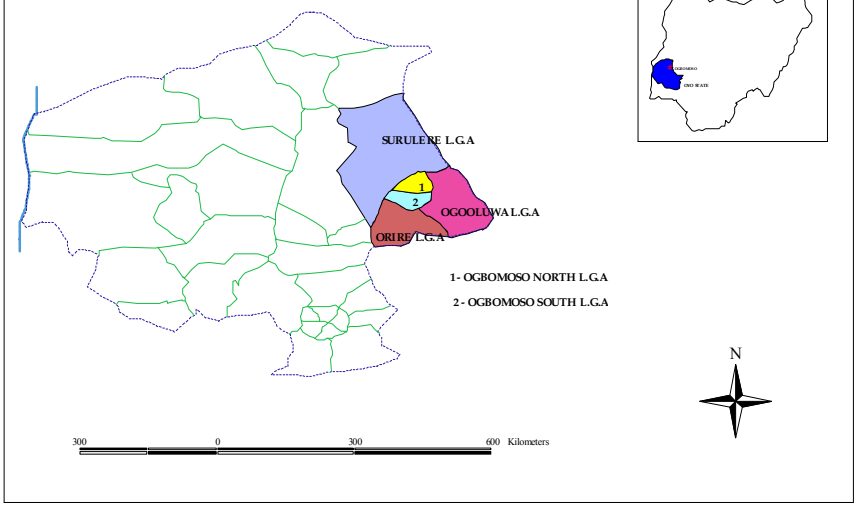
[2] Census figure

[3] Projected figure based on 1963 census at the rate of 2.5%

A quantitative description of the town as made by Henry Townsed of the Church Missionary Society in 1855, shows that Ogbomoso had a population of about 40,000 people by this period. While the 1952 census puts the population of the town at 136,535, about ten years later, in 1963, this figure had increased to 227,471. Although the 1991 Census puts the population of the town at 166,034 (a very controversial figure), today, the population of the town may be conservatively put at about 800,000.

Although, river Ora is a limiting factor to the development of the town towards the east, it is obvious that an important factor governing the growth and spatial structure of Ogbomoso is the Ilorin-Ibadan Federal (trunk A) road, the alignment of which ensures a north-south spatial structure, and the division of the town into two local government areas (Ogbomoso North and Ogbomoso South) for purpose of political administration. The over 10km section of the Ilorin-Ibadan road is an important Central Business District (CBD) in the city. In this stretch are located: major motor parks (Osogbo, Ibadan and Ilorin motor parks) and other activity centers such as Baptist Medical Centre, the State General Hospital, the Baptist Theological Seminary and the state University – Ladoke Akintola University of Technology. Important roads and streets radiate from or terminate along this high way. Apart from this highway, other CBD in the town include: Oja-Igbo where the King's palace and Ogbomoso Central Mosque are located.

FIG. 1: THE REGIONAL CONTEXT OF OGBOMOSO



5 RESULTS AND DISCUSSIONS

5.1 The Nature and Rate of Expansion of Ogbomoso (1914-2027)

Like most other cities of the world, particularly, those of the developing countries, the rate and pattern of urban expansion in Ogbomoso is observed to reflect certain socio-economic cum political developments and conjunctive demographic changes witnessed at different historic epochs.

Table 2: Urban Growth Estimates (1914-2027)

	Spatial Extent (In hectares)	Land Engulfed at Each Period	Cumulative Amount of Land Engulfed	Expansion Rate (%)	+Observed Average Annual Rate	+Average Annual Expansion Rate (%)
1914*	139.2					
1924**	157.2	18.0	18.0	12.90	1.4	1.29
1934**	177.2	20.0	38.0	12.72		1.27
1944**	197.2	20.0	58.0	11.29		1,29
1949*	207.2	10	68.0	5.07		1.01
1954**	314.76	107.56	175.56	51.91	12.5	10.38
1964**	583.66	268.90	444.46	85.43		8.54
1974**	852.56	268.90	713.36	46.07		4.61
1978*	960.2	107.64	821	12.63		3.16
1988**	1493.9	533.70	1354.7	55,58		5.56
1995*	1909.0	415.1	1769.8	27.79	5.8	3.47
2000**	2388.89	479.89	2249.69	25.14		5.03
2003**	2748.8	359.91	2609.6	15.07	4.4	5.02
2007*	3129.0	380.2	2989.8	13.83	3.46	3.46
2010***	3331.5	202.5	3192.3	6.47		2.16
2015***	3763.3	431.8	3624.1	12.96		2.59
2020***	4221.9	458.6	4082.7	12.19		2.44
2027***	4966.08	744.18	4826.88	17.63		2.52

Source: Author's Result of Regression with base data from Adeboyejo and Abolade (2007)

1 * computed from land use changes map: Adeboyejo and Abolade 2007
2 ** estimated based on observed size changes in 1
3 *** predicted based on 1 and 2 (i.e. extrapolation: y= 1.34x – 27.39, and a + (n-1)d; where :y, x, a, n and d as defined in the methodology)
4 + the proportion of the initial extent added at the end of each year

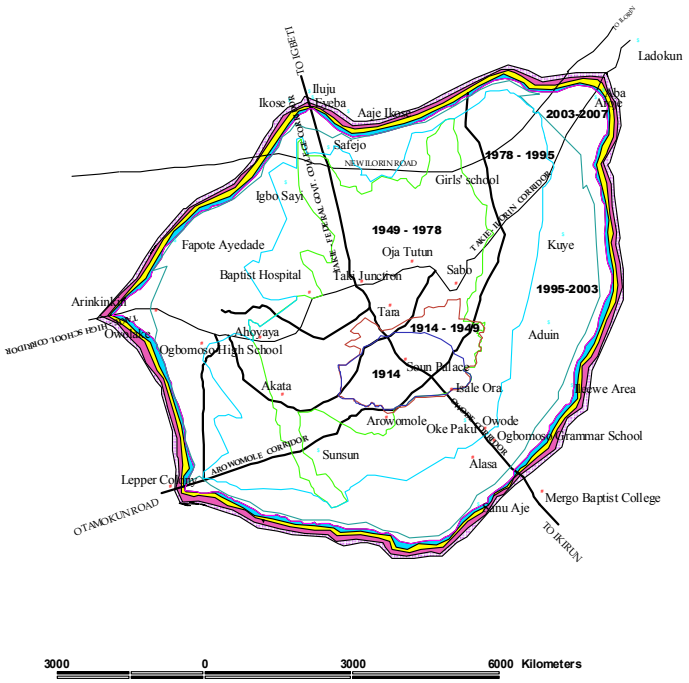
From Table 2, the size of the city in 1914, (then a coalescence of earlier settlements like Okelerin, Isale-Afon, Ijeru, Ebu-Akandie, Masifa, among others), is observed to be about 139.2 hectares. In almost 30 years, between 1949 and 1978, the total spatial extent increased from about 207 to 960 hectares; there was, however, a slight decline in rate of increase (51.9% to 12.63%) largely as a result of colonial urban policy (the development of railway, that by-passed Ogbomoso) which did not favour the city. The political upheaval of the early independence era, which pitched Ogbomoso against other areas in Western region, and relatively general economic and physical development stagnation brought about by the civil war of 1967-1970 in the country.

From the late '70s, specifically in 1978 the city size increased from 960.2 hectares at an increasing rates (to reflect the prospects and consequences of oil boom in the country) to reach about 1,909 hectares in 1995. With the establishment of the State university and its attendant socio-economic development, the built-up area of the city has continued to increase over time to attain about 2,749 hectares and 3,129 hectares respectively in 2003, and 2007.

Given the prevailing socio-economic and political processes and growth trajectory, particularly from 1978 to 2007, regression analysis result produced relatively stable annual growth rates of about 2.16, 2.59, 2.44, and 2.52 in 2010, 2015, 2020 and 2027 respectively. Based on estimated rates from the regression analysis the projected built-up area of the city are 3,332 hectares, 3,763 hectares, 4,222 hectares and 4,966 hectares respectively in 2010, 2015, 2020 and 2027.(see figures 2 and table two)

What is of great concern is the way and manner such growth (which is observed to be unplanned) is encroaching the relatively fertile agricultural hinterland, and more so, the accompanying negativities on sustenance and livelihood of the people in the peri-urban communities of the city. For example, while about 68 hectares of rural/ peri-urban land was consumed between 1914 and 1949, an alarming size of land of about 948 hectares was lost to urban expansion in the period (between 1978 and 1995)! Also in just 4 years, 2003 to 2007, as much as 380 hectares of rural land was engulfed. And the trend is projected not to show any appreciable drop in the future, with estimated amount of land to be engulfed in the next twenty years (2007) and (2027) put as 1,837.1 hectares!, that is 202.5, 432, 459 and 744 respectively in 2010, 2015, 2020 and 2027. The implication is

Fig. 2: OGBOMOSO CITY EXPANSION 1914 - 2007 AND PREDICTED EXPANSION BY 2027



Source : Adeboyejo et al (2007)

that, by the year 2027, peri-urban communities such as Aroje, Abaa, would have become part of the built-up area of the city, in the same way that Sabo, Caretaker were then surb-urban communities,

Unless a deliberate and adequate planning is carried out to pattern and accommodate the quantum and direction of such foreseeable growth, the negativities of uncontrolled urban expansion are bound to multiply in the peri-urban as well as rural communities that are likely to be affected by such growth.

To be able to put such measures in place, there is the need to study the observed and predicted capacity of the peri-urban and rural communities to receive such encroachment. This shall be done with recourse to the established degrees, nature and rates of encroachment along different corridors of the town, as well as the consequences of city expansion on the communities as measured by the composite variables of "sustenance" and "livability" in different peri-urban communities.

6 PREDICTED URBAN EXPANSION ALONG MAJOR CORRIDORS

Having established the total growth rates at different stages of urban expansion in Ogbomoso, it is observed that such expansion may not be unconnected with certain land marks of physical development which constitute growth poles at their various locations. Such existing and emerging physical development land marks in Ogbomoso include the state university, Nigerian Television Authority (NTA), Federal Government College, Divisional Police headquarters, markets, new express road, etc. The spatial distribution of these "growth poles" determines the rate of urban expansion and/or incursion into its peri-urban and rural communities at different directions or corridors of the city. Since the city expansion is not uniform in all directions, different peri- urban communities would be impacted upon differently depending on their location and relative growth rates in that direction.

In this study, and as shown in figure 2, six corridors of growth were identified: Orita Naira corridor; Arowomole; Owode; Takie – Federal Government School; Takie-High school; and Takie –General Hospital roads. The urban expansion along each of the corridors accounted for the coalescence of pockets of settlements which later grew into an urban fabric called Ogbomoso today. The continual expansion along these corridors

also gave rise to the absorption of more peri-urban and rural communities and their farmlands which are being continually perforated by various forms of urban development. Eighteen of such peri-urban and/or rural communities which are located along or around the corridors of urban expansion were sampled.

One striking commonality among the corridors as observed from fieldwork is the fact that growth along them is more rapid than in any other direction. However, the built-up area varies along each corridor and also among different corridors ranging from 0.2hect to about 0.9hect and in some places 1.25hect. The average built-up area for each corridor was estimated from field measurements to predict expansion and land to be engulfed in 2010, 2015, 2020 and 2027.for each of the five corridors. The results are shown in table 3

Table 3: Estimated City Expansion along different corridors in Ogbomoso (2007-2027)

CORRIDOR OF GROWTH	2007	2010		2015		2020		2027	
	*Expan-sion (in hect.)	Expan-Sion	Land engulfed	Expan-Sion	Land engulfed	Expan-Sion	Land engulfed	Expan-Sion	Land engulfed
Takie–General	175.0	188.07 **(7.47)	13.07	216.28 **(15.0)	28.21	247.64 **(14.5)	31.36	294.69 **(19.0)	47.05
Takie-High School	125.0	133.59 **(6.17)	8.59	151.63 **(13.5)	18.04	171.65 **(13.2)	20.02	203.41 **(18.5)	31.76
Owode	87.5	92.29 **(5.47)	5.47	104.29 **(12.96)	12.00	116.81 **(12.0)	12.52	136.67 **(17.0)	19.86
Arowomole	100.0	105.50 **(5.5)	5.50	118.16 **(12.0)	12.66	131.75 **(11.5)	13.59	155.2 **(17.8)	23.45
Takie-Fed Govt College	100.0	106.72 **(6.77)	6.77	120.86 **(13.2)	14.09	136.57 **(13.0)	15.71	161.29 **(18.1)	24.72

Source: Authors' computation (2007)

* The base year (2007) estimate for each corridor was obtained by multiplying the corridor length by 250m, the minimum average built-up area along the corridors

** The overall expansion rates in Table 2 were adjusted for each corridor according to the knowledge of the distribution of existing 'growth poles' and development potentials in the city.

From Table 3 it is observed that corridors with most rapid expansion rates are the Takie-General and Takie-High School Corridors. The projected amount of land to be engulfed along Takie –General corridor are 13.07 hectares, 31.36 hectares and 47.05 hectares respectively between 2007 and 2010, 2015 and 2020 and between 2020 and

2027. The corresponding figures along Takie –High School corridor are 8.59 hectares, 20.02 hectares and 31.76 hectares. The reason for the high expansion rates along these corridors may not be unconnected with the presence of the State University, The State General Hospital and the fact that the corridor links the south with the northern part of the country.

On the other hand, the Owode and Arowomole corridors are observed to have least propensity to encourage urban expansion. While marginal urban growth for Arowomole is projected to be 5.5 hectares between 2007 and 2010, and 23.45 hectares between 2020 and 2027, that of Owode is as comparatively low as 4.79 hectares between 2007 and 2010 and 19.86 hectares between 2020 and 2027. The reason for the low rate of urban expansion along Owode corridor has been observed to be the repelling nature of the physical barrier of River Aduin over time and the emerging or renewed conflicts and land disputes among certain traditional rulers, both of whom had on several occasions, contested the citing of certain "growth poles" along the corridor. The same is in part, true of the Arowomole corridor.

Takie-Federal Government corridor, however, has its growth estimates observed to be relatively moderate. The land to be engulfed along this corridor is estimated to be 6.77 hectares between 2007 and 2010, 14.09 between 2010 and 2015, 15.71 between 2015 and 2020, and 24.72 hectares between 2020 and 2027. The reason for the relatively moderate expansion along this corridor is not unrelated to the presence of scanty developments in the area. The presence of Nigerian Television Authority in the area is a recent development, specifically 2005 .

The implications of the nature and pattern of observed and predicted effects of urban expansion on sustenance and livelihood in the peri-urban communities are examined in what follows..

7 IMPLICATIONS OF CITY GROWTH ON SUSTENANCE AND LIVELIHOOD

Two indices: "sustenance" and "livability" are derived and used to discuss the implications of city expansion on sustenance and livelihood. These are computed for the

eighteen sampled communities that are found to locate along/ around the six corridors of expansion (see figure 2). Table 4 shows the variable components of the indices.

The variable components of the sustenance index depict the characteristics of a typical peri-urban/ rural community. This is an area where occupation is predominantly farming (S1); where bungalow buildings are common(S2); where owner-occupied houses are predominant(S3); and where farms are not far from houses(S4), except affected by urban incursion Ability to sustain these characteristics is what is described here as sustenance. The higher the score of a community on the index, the less the impact of city encroachment and the more sustainable the community.

TABLE 4: VARIABLE COMPONENTS OF INDICES

SUSTENANCE INDEX (SI)	LIVABILITY INDEX (LI)
1 % in farming	1 % false to many farmers abandoned farming
2 % in face-me-face you bungalow	2 % false to increased crime incidence
3 % owner-occupied building	3 % of people not far at all from main water source
4 % yes to farm located within a walking distance	4 % of those without decreasing access to farmland, and
5 % yes to belonging to farmers association	5 % of those without decreasing access to housing

The variables measuring “livability” were used because they negate good living and working environment in the peri-urban areas. First, considerable proportion of farmers may abandon farming (L1) due to either shortage of farmland or high rental value consequent upon urban expansion. Second, there is a correlation between incidence of crime(L2) and livability of an environment. Third, a relationship exists between people’s distance from or access to water (L3) and the quantity and quality of water for domestic and other uses. This also has serious implications for the environmental sanitation and

health, status of the people. Fourth, decreasing access to farmland(L4) and housing (L5) (for farmers) is also an indication of difficult living and working environment.

Based on their profile on the sustenance index, the eighteen peri-urban communities are categorized into:

(a) Communities of low sustenance of peri-urban/rural activities. In this category are: Aduin, Kuye, Okepaku, Igbosayi and Esanu-Aje. These are peri-urban communities that have been seriously encroached upon and have less power to retain peri-urban and rural activities. This is not only because they are located along corridors of rapid urban expansion (Takie-General and Takie-Federal Government corridor) but also their proximity to the city.

(b) Communities of moderate sustenance of peri-urban/rural activities. These include Abaa, Ileewe, Ajeikose, Arinkinkin, Safejo, Ikose and Iluju. Those are villages relatively far from the city centre. However, sustenance of rural activities is observed to be moderate (not high, as will be expected because of their distance) because of their locations along main and good road, both of which have encouraged urban development There is organic linkage with the main city, through periodic marketing activities. The implication of this also, is that except adequate planning is undertaken, peri-urban corridors with market and transport route potentials tend to encourage urban incursion into them.

(c) Communities with high sustenance of peri-urban/rural activities/land uses. These include Aroje, Eyeba, Fapote, Susun, Ladokun and Owolanke. These are communities where peri-urban and rural activities still thrive. With the exception of Aroje which has witnessed a considerable degree of urban development, because of its location along the corridor of highest urban expansion, (Takie-General corridor) and Sunsun that is relatively close to the city, all others which are relatively distant from the city have little or no urban development perforations.

Similarly, using the composite variable of "livability" the eighteen communities were categorized into three to reflect the effect of urban

encroachment on livability and by implication quality of life in the peri-urban communities:

(i) Communities with low livability are Kuye, Fapote, Sunsun and Owolaake. These are relatively close peri-urban communities to the city found along relatively moderate and low expansion rate corridors. The implication of the low livability of these communities is that they exhibit the characteristics of the theoretical peri-urban communities which lack urban municipal services; and as a result, are made less livable. A survey of these areas attests to the fact that while some of them do not have portable water supply and functional electricity among others, some have less green scenery expected of quiet peri-urban and rural communities, due to unplanned urban growth especially in Kuye and Sunsun,

(ii) Communities with moderate livability, include Abaa, Eyeba, Ile-ewe, Okepaku, Igbosayi, Ajeikose, Safejo and Ikose. These are settlements found along both low and high corridors of urban expansion, but have their livability level dictated by access to water supply, market and transportation route (especially Ajeikose, Ikose and Ile-ewe). The implication of this is that irrespective of the pattern of urban growth, peri-urban and rural communities encroached upon or less encroached, may still be livable if access to infrastructural facilities and services is not hampered by such encroachment or these are provided in adequate quantity and quality

(iii) Communities with high livability index, include Aroje, Abaa, Esanu-Aje, Ladokun, Arinkinkin and Iluju. These are also settlements around both low and high urban expansion corridors. Their relatively high livability index is attributed to extension of urban services like electricity and borehole water to the less distant peri-urban communities like Aroje and Esanu Aje, and rural electrification and boreholde water supply in places like Ladokun and Abaa. The implication of this is that irrespective of the directions of urban growth, peri-urban communities and rural hinterland can be made livable if urban municipal services could be extended or provided for them.

8 CONCLUSION

In the foreseeable future, cities in the developing countries and in Nigeria in particular would increase not only in number but also in sizes through a continuous process of urban growth. The same is true of Ogbomoso, a typical moderate sized city in a highly urbanized and urbanizing south western Nigeria. The city growth has been traced from 1914 through major historic epochs to the present time, while the future growth rates and patterns are predicted. While the amount of peri-urban land engulfed in different periods and along six major corridors were estimated, the effects of such expansion on "sustenance" and "livability" are also examined. It is observed that not in all instances is urban expansion negative, as observed in the assessed "livability" in each of the communities along different corridors of growth. It is noted however, that urban expansion is usually negative in "sustenance" of peri-urban and/or rural activities, particularly farming.

As observed from the implications of the "sustenance " and "livability" in the sampled communities, however it is suggested that deliberate regional planning be put in place to guide and predetermine the direction of city growth or corridors that should have more of expansion than the other. In this, study, it has been predicted that, owing to the locations of the State University at the northern corner of the city, The New Ultra modern Market and New Ilorin-Ibadan Express road, the Takie-General Hospital and Takie-Federal government roads, in that order, have the highest propensity to accommodate city expansion. Efforts should therefore be made to study the soil and other physical characteristics of the areas in those directions and those in others to be able to put appropriate measures in place to encourage or otherwise future growth along those corridors.

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