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HOUSEHOLD RESPONSES TO URBAN ENCROACHMENT ON THE RURAL HINTERLAND IN THE OGBOMOSO URBAN FRINGE, NIGERIA

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Abstract

This paper examines the responses of households located in urban frontiers of Ogbomoso, a pre-colonial though rapidly expanding city situated in S.W. Nigeria, to negativities of city expansion such as the increasing shortage of farmland, rising land rent/price, increasing house rents and food expenses, as well as basic services. The paper begins by examining the issue of spatial changes in Ogbomoso city between 1914 and 2007 using GIS. In order to examine the responses of households to urban encroachment, the study combines households and communities in the Ogbomoso urban fringe as units of analysis. Data was collected with the aid of structured questionnaires and focus group discussions. A total of 359 questionnaires were submitted to randomly selected households in eighteen communities of the Ogbomoso urban fringe to gather information concerning the socio-economic and demographic characteristics of respondents, as well as data concerning the impact of city expansion on their livelihoods. One session of focus group discussions was also conducted among community elders in five communities in order to investigate the changing economic base of the communities under analysis. Results indicate that in response to changes in the economic base of communities, the occupations of households have tended to shift from farm-

ing and fishing to a trading economy. Individual land holdings, with an observed decrease in farm size/holdings and an increase in the distance of farms, are now widely adopted in response to changes in land tenure systems, from the customary/community ownership and increase in number of landless adults and dependants. In terms of positive policy, it is suggested that: government should establish farm settlements in designated places situated on the urban fringes and that land should be allocated to farmers based on need as well as the provision of other farm input subsidies and necessary services. These measures will help to revitalize economic activities on the urban fringes, to improve living standards and to serve as a check to prevent any further spatial expansion of the city.

Key words: *Urban encroachment; Household response; Urban fringe.*

1. Introduction

The literature on urban encroachment and its impact on, or implications for, the rural hinterland includes a wide range of theoretical discussions (Li and Yeh, 2000; Sui and Zeng, 2000; Xie *et al.*, 2005a; Xie and Batty, 2006; Heikkala *et al.*, 2003) and empirical analysis (Xie *et al.*, 2005b; Xie *et al.*, 2006; Jaiyebo, 2003). For instance, while attempts have been made to simulate incremental urban change in the rural areas of the Pearl River Delta in China using physical models based on cellular automata developed by Li and Yeh (2000), measurements of the resultant peri-urban settlement pattern were attempted by Sui and Zeng (2000). Furthermore, different methods for identifying the distinctive features of urban and rural areas in urbanizing regions have been explained using ideas drawn from fuzzy sets (Heikkala *et al.*, 2003).

However, the negativities associated with rapid urbanization, particularly the environmental consequences in cities and peri-urban areas, are among the most documented issues in urban environmental research (World Bank, 1997). In the studies that focus on mega-cities (Shahab, 2000 in India) and on medium and small sized urban places (van den Berg *et al.*, 2003; UNDP, 2000; Jenkins, 2003), there is a consensus of opinion in the literature concerning urbanization processes and the associated consequences. For example, it has been noted that although there are relatively few mega cities in Africa (i.e. cities with 10 million inhabitants or more), the urbanization process, unlike in Asia and Europe, is taking place in the absence of significant industrial ex-

pansion (Kwasi, 2004). Furthermore, the process is manifested primarily by an outward expansion of built-up areas and the conversion of prime agricultural lands for residential and industrial purposes (Brennan, 1999; Kwasi, 2004).

The documented impact of city expansion on rural hinterlands includes: changes in ecological balance (Xie *et al.* 2006); the encroachment on or loss of agricultural land (Jaiyebo, 2003; Adriana, 2003; USDA, 2001; Xie *et al.*, 2005b) and land speculation (Adriana, 2003) with a variety of implications for farming practices and food security (van den Berg *et al.*, 2003); and pollution of the peri-urban areas where urban wastes are deposited (Hardoy *et al.*, 2001; UNCHS, 1996; Redman, 1999; Bruce *et al.*, 2002), again with the attendant implications for environmental quality and by extension population morbidity (Kates and Parris, 2003; McMichael, 2000).

The urban hinterland is clearly subject to the direct impact of urban expansion, resulting in hugely significant stress on the ecological footprints of natural resources (Wackernagel and Rees, 1996; Rees, 1992; Chambers *et al.*, 2001). Furthermore, as observed by Kwasi (2004), the conversion of farmlands and watersheds for residential purposes implies negative consequences for food security, water supply and the health of local populations, both in cities and in peri-urban areas. In different parts of the world, especially China and parts of urban Europe in the mid 19th century, rapid urbanization often produced unique settlement morphologies in peri-urban areas, a pattern characterized by an intensive combination of agricultural and non-agricultural activities. Known as *desakota* (village town) in China (McGee, 1989, 1991; Lin, 2001), this pattern is characterized by the spontaneous transformation of peri-urban lifestyles and activities into their urban varieties (Xie *et al.*, 2005a), albeit with the aid of modern technologies rather than the usual movement from the countryside to the towns with subsequent outward growth, as in 19th century Britain (Kloosterman and Musterd, 2001) and in most cities in developing nations. In the present context, the transformation of peri-urban lifestyles and activities is likely in any case to be mediated for the most part by urban encroachment and facilitated by modern technology through the diffusion of innovations.

In developing countries generally and in Nigeria in particular, in view of the increasing pace of urbanization, the extent and severity of the diversification and intensification of underlying processes and the

impact of city expansion are bound to increase, particularly in the hinterland areas of small and medium-sized cities. While research in the field has continued to focus on the environmental consequences of urbanization and the ecological footprints of cities, the responses of households and communities in city hinterlands to the onslaught of urban expansion has yet to be examined extensively in academic research. The main purpose of this study is to remedy this deficiency. The need to understand how communities and households respond to the impact of city encroachment on rural hinterland is important both for scientific and for practical purposes.

First of all, it is observed that the analysis of the interaction between man and the environment has been partial to the extent that man's role in the relationship is conceived merely as a modifier of environmental variables and as a passive recipient of the effects of urban encroachment. We argue here that households and communities respond to the adversities mediated by the process of urban encroachment, though with different levels of success. An assessment of the response of households will help to identify objects of positive policy and to formulate programs aimed at strengthening households and communities to be able to respond satisfactorily to the inevitable consequences of city growth. Another purpose of this paper is to understand and expand our knowledge of the dynamics of the connection between populations and the environment.

Secondly, while the parameters of the impact of cities on the hinterland have near universal features, differences in regional ecosystems and variations in urban population size and the rate of growth mean that the fundamental nature, scope and severity of environmental problems differ from place to place and change overtime, and that there can be no universal solution. What is required therefore is a tailor-made, city-specific environmental strategy based on the diversity and enormity of the issue and the structure and functioning of existing institutional frameworks.

Thirdly, it can be noted that most research into the environmental impact of urbanization has been carried out at a national level (UN, 2004; Brockherhoff, 2000; Cariboni, 2002; El-Shakhs and Amirahmadi, 1993). The problem with national data is aptly summarized by Boyle (2005): "national data is too coarse for the environmental improvement of urban areas." He suggests therefore that "data and research at

the local level need to be developed to provide the local governments with the information they need to make decisions."

Lastly, it has been argued that to understand the impact of new urbanization on the environment and people, these processes need to be examined in medium and small cities rather than restricting our inquiries to the largest and frequently over-studied megacities (Redman and Jones, 2004).

2. Aims and objectives

This study focuses on the response of inhabitants of the urban hinterland to city encroachment on farmlands in the peri-urban areas of Ogbomoso, a pre-colonial though rapidly urbanizing community.

The objectives of the study include:

1. The determination of the rate, pattern and direction of city development between 1914 and 2007;
2. An estimation of the rate of city growth and the amount of rural farmland absorbed by city expansion between 1914 and 2007;
3. An analysis of households and community response to city encroachment.

3. Methodology

The methodology used for the purposes of this research involves a multi-stage approach. The first stage involves determining the rate, pattern and direction of growth of Ogbomoso between 1914 and 2007 using Geographical Information System (GIS). The data required here 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, obtained from the Nigerian Baptist Theological Seminary and 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), and were obtained from the Ministry of Agriculture and Natural Resources. The 2003 map, an update of the 1995 land use map, was extracted from Akinbola (2004); through fieldwork, the 2003 map was then updated in early 2007 to produce the current land use map. Al-

though maps were obtained for very irregular periods, their outputs are sufficient for the purposes of analyzing changes in city spread and for examining the implications of city growth on rural hinterlands. The maps produced during the first stage were examined and the areas of the city where growth rates were most dramatic were identified.

In the second stage, household surveys (359) were conducted in 18 communities of Ogbomoso's urban fringe. The communities were chosen on the grounds that they are situated at the edge of the city' and because they have an organic connection with the city. For the purposes of questionnaire administration, the settlements were categorized into three groups based on the observed direction of 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. Table 1 shows the three categories of settlements, their population size and number of questionnaires administered in each settlement. A total of 359 questionnaires were administered in the 18 communities, as shown in Table 1.

Table 1 – Characteristics of selected settlements and distribution of questionnaire

Local Government Area (LGA)	Settlement	Category/ Population size	No. of question-naires
Ogbomoso North	Aduin*, Ile-ewe*, Igbo sayi*, Oke Paku*, Kuye*	A/*	21 each
	Ikose*	B/*	16
	Eyeba	B/188	16
	Aje Ikose	B/372	20
Ogbomoso South	Ayedaade*, Suusun*, SaanuAje*	A/	21 each
	Safejo*	B	18
	Arinkinkin*	B	17
	Owolaake	B/793	20
Surulere	Ladokun	C/274	18
	Aroje	A/415	22
	Abaa	A/206	16
Oriire	Iluju*	B/*	20

* Population figure not available for settlement alone but for group of settlements.
A: 1-3 km to city centre; B: 4-6 km to city centre; C: 6-8 km to city center.

The third stage of the study involved a focus group session in five communities where, based on the analysis of stages one and two, some of the most dramatic effects of urban encroachment are in evidence. These sessions were conducted among community elders, as a surrogate of a life course model, to investigate the changing economic base of these communities as well as the responses of households to the impact of urban encroachment.

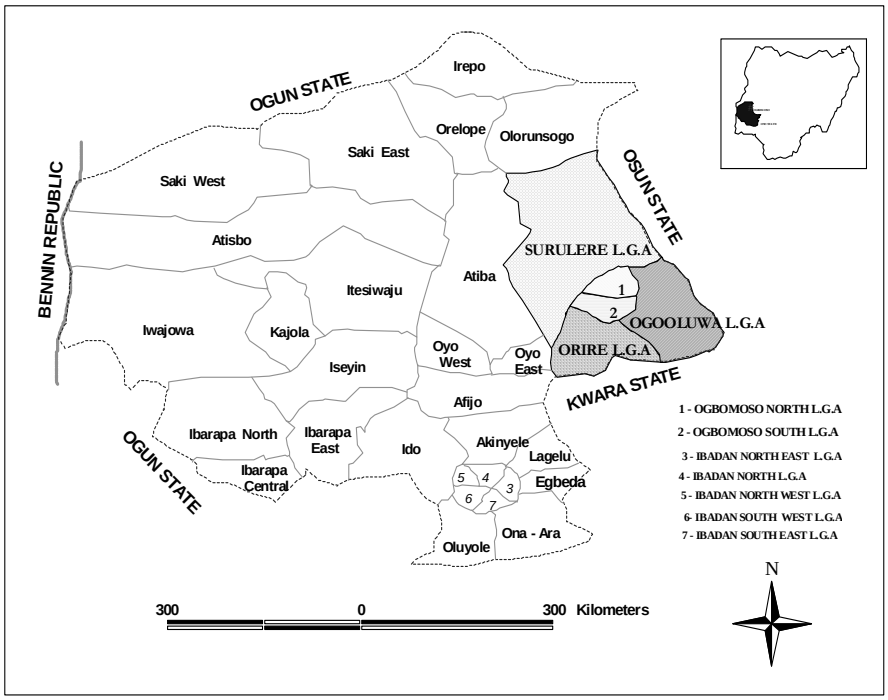
4. The urbanization of Ogbomoso

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 approximately 100 km north of Ibadan, the Oyo State capital, and roughly 80 km from both Ilorin and Osogbo, respectively the Kwara and Osun State capitals (see Figure 1). It is one of the main gateways to the northern regions of Nigeria from the Yoruba land, and is bounded by the river Ora to the east; there are no major physical barriers to the north, west and south. Ogbomoso develops laterally towards the north and south along the 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 connections with it, but at distances considered far enough to be beyond the influence of the expansion of Ogbomoso.

The city of Ogbomoso is one of many Yoruba settlements situated to the south-west of Nigeria, where urbanism as a way of life predates the 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 their warring prowess, subjugated and pacified the separately developing villages and hamlets in the surrounding areas to form a large settlement known today as Ogbomoso.

The initial impetus behind the growth of the city was provided by a substantial influx of refugees from the internecine wars in Yoruba land in the early 19th century, and of refugees fleeing the Fulani Jihadists who overran most of the northern towns, including Ilorin, situated approximately 80 km from Ogbomoso. Ogbomoso successfully

Figure 1 – The regional context of Ogbomoso



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 and compact settlement had evolved from the scattered hamlets covering an extensive area of land. Table 2 shows the population size of the city between 1855 and 2006.

A quantitative description of the town carried out by Henry Townsend of the Church Missionary Society in 1855 shows that by this period Ogbomoso had a population of approximately 40,000. While the 1952 census estimates the population of the town at 136,535, roughly ten years later, in 1963, the figure had increased to 227,471. Although the 1991 Census estimates the population of the town at 166,034 (a highly controversial figure), a conservative estimate of the current population of the town is 800,000.

Although the river Ora is a limiting factor in the development of the town towards the east, it is clear that an important factor governing the growth and spatial structure of Ogbomoso is the Ilorin-Ibadan fed-

eral road (trunk A), 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 the purposes of political administration. The 10-km section of the Ilorin-Ibadan road represents an important Central Business District (CBD) in the city. Important roads and streets radiate from or terminate along this highway. Apart from this highway, other CBD in the town include Oja-Igbo, where the King's palace and Ogbomoso's central mosque are located.

Table 2 – Population of Ogbomoso, 1855 to 2006

Year	Population
1855	40,000[1]
1911	80,000[1]
1921	84,000[1]
1931	86,200[1]
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]

[1] Estimated figure as provided by missionaries.
[2] Census figure.
[3] Projected figure based on 1963 Census at a rate of 2.5%.

5. The pattern and rate of urban encroachment

Figure 2 shows the pattern of city expansion and encroachment in rural hinterlands in six different periods. Table 3 provides a summary of the estimated built-up areas of the city and the amount of rural land engulfed between these periods.

In 1914, the built-up area of the city was the traditional unplanned area, and included, among others, Oke-Elerin, Masifa, Ijeru and Isale-Afon, with an estimated built-up area of approximately 140 ha. However, the size of this area increased by about 49%, reaching 210 ha in 1949 and 960 ha, 1,910 ha, 2,750 ha, and 3,129 ha respectively in 1978,

1995, 2003, and 2007, during which periods scattered settlements and rural communities were engulfed to become part of the built-up area. For example, Sabo (the name of a settlement of non-indigenous northern Nigerians), located at the outskirts of the city around 1920, had become part of the built-up area by the early years of independence, as had Ahoyaya, Caretaker, and Fapote to the west, Aduin and Kuye to the east, and Owode to the south-east.

Figure 2 – Ogbomoso City expansion 1914-2007

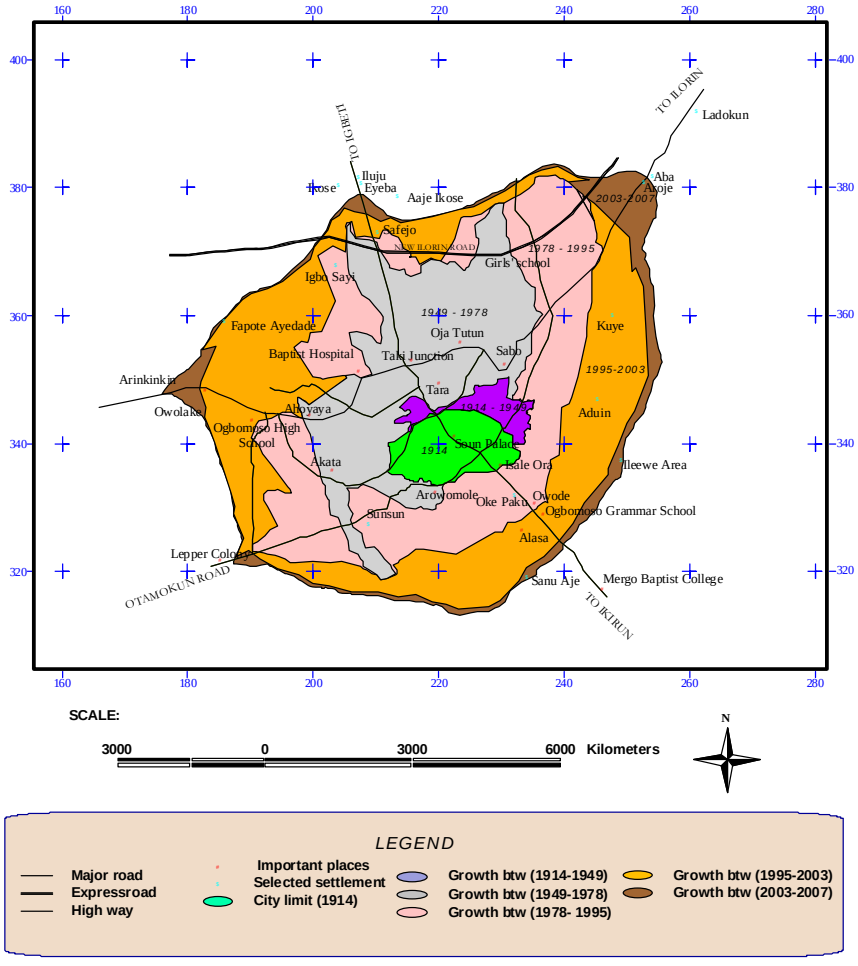


Table 3 – City limit and spatial changes 1914-2007

Year	Built-up area (hectares)	Amount of land developed (hectares)	Rate of expansion (%)	Average annual rate (%)
1914	139.2			
1949	207.2	68.0	48.8	1.4
1978	960.2	753.0	363.4	12.5
1995	1,909.0	948.8	98.8	5.8
2003	2,748.8	839.8	44.0	4.4
2007	3,129.0	380.0	13.8	3.5
Total	3,129.0	2,989.6		

While the process of outward expansion and consequent encroachment on rural land remained imperceptible over a period of roughly 35 years (1914 to 1949), with just 70 ha of farm land engulfed, the rate of expansion and encroachment was phenomenal between 1950 and 1978 (363.4%), during which time 750 ha of rural hinterland were engulfed, which is more than three times the size of the city in 1949. The total amount of rural land engulfed by 2007 was 2,989 ha.

The population of Ogbomoso was and to a large extent still remains agrarian. The areas surrounding the city in each successive period were farmland. Because of socio-economic and political development within the town and as a result of its status as an important city in the south-west geopolitical zone, the period between 1949 and 1978 was marked by dramatic changes in the city landscape.

Significant growth factors in the colonial era included the establishment of the Baptist Theological Seminary, one of the pioneering theological schools in S.W. Nigeria, the Baptist Hospital, and the construction of the Ibadan-Ilorin highway, which runs through the city, linking southern and northern parts of the country.

In the early years of independence, more land areas were acquired for educational, commercial, health and other public uses. Specifically, the outskirts of the city were the preferred locations for important educational institutions such as Ogbomoso Grammar School in the S.E., Ogbomoso High School in the S.W., and Ogbomoso Girls School in the north, located on a site now occupied by the State University. The educational institutions served not merely as growth points

that opened up new areas, thus forcing farmers to relocate further into the hinterland, but also facilitated a rapid expansion towards their locations and beyond.

Today, the most important growth factor is the establishment of the State University, Ladoke Akintola University of Technology, in 1990. With the increasing rate of student admission and staff strength, the outward expansion of the city in this area has been phenomenal, as previously low levels of development have been reinvigorated and increased.

The primary casualty of this phenomenal process of urban expansion is the farmland and farmers located in the hinterland, where socio-economic activities are either land-based or land-related. The issues raised here include: To what extent have the farming households and communities remained passive recipients of urban encroachment? How have they responded? What are the variations in responses? These are just some of the issues examined in the discussion that follows. In the first instance the socio-economic characteristics of the respondents are examined as a prelude.

6. Socio-economic characteristics of respondents

6.1. Age-sex distribution of respondents

The age distribution of respondents varies, but a modal value of 50 and a mean of 53 indicate that they are for the most part mature and thus relevant as a surrogate of life course model approach to the relation between population and the environment. As shown in Table 4, the different ages are grouped and related to sex distribution. Table 4 indicates that most of the respondents were male (58.4%) and mostly within the 41-50 years age group (41%). Significant proportions of the male respondents were also in the 51-60 years (29%) and 61-70 years (15%) age groups. The fact that household heads are male is typical of most Nigerian communities.

Table 4 – Age-sex distribution

Age group	Sex				Total	
	Male		Female			
	No.	%	No.	%	No.	%
25-40	15	46.9	17	53.1	32	9.0
Column %		*7.2*		*11.5*		
41-50	86	57.3	64	42.7	150	42.1
Column %		*41.3*		*43.2*		
51-60	60	64.5	33	35.5	93	26.1
Column %		*28.8*		*22.3*		
61-70	33	54.1	28	45.9	61	17.1
Column %		*15.0*		*18.9*		
71-93	14	70.0	6	30.0	20	5.6
Column %		*6.7*		*4.1*		
Total	208	58.4	148	41.6	356	100.0

6.2. Education and income of respondents

A careful examination of Table 5 indicates that respondents' educational level and annual income is a combination of rural and urban socio-economic features, in line with Ramachandran's (1989) definition of rural-urban fringe as "the area of mixed rural and urban populations and land uses…" However, the predominance of ruralness is evident in the fact that most respondents had no formal education (35.2%) and were mainly situated in low income groups, with a majority earning below ₦20,000 (~US$167) (32.8%) per annum. There were significant proportions of educated elites with a secondary school certificate (15.8%), constituting the bulk (23%) of those in the high income group (₦61,000-₦100,000 (~US$830) per annum). There is a significant relationship between the level of education and the income of respondents ($p<.001$).

Table 5 – Educational status and annual income (in Naira: US$1 = ₦120)

Education		Annual income (×₦1,000)						
		No response	<20	21-30	31-40	41-60	61-100	Total
No formal	No.	1	49	37	6	10	11	118
	%	22.5	41.5	31.4	5.1	8.5	3.3	35.2
Primary incomplete	No.	5	13	9	8	7	7	45
	%	62.5	28.9	20.0	17.8	15.6	15.6	13.5
Primary complete	No.	1	14	10	7	5	8	44
	%	12.5	31.8	22.7	15.9	11.4	18.2	13.1
Secondary incomplete	No.	-	11	7	2	8	5	33
	%		33.3	21.2	6.1	24.2	15.2	9.9
Secondary complete	No.	-	15	13	7	6	12	53
	%		28.3	24.5	13.2	11.3	22.6	15.8
Teacher's College/ NCE/Poly	No.	-	6	7	5	6	6	30
	%		20.0	23.3	16.7	20.0	20.0	9.0
University	No.	1	2	-	3	1	4	11
	%	12.5	18.2		27.3	9.1	7.5	3.3
Total	No.	8	110	38	43	4.3	53	335
	%	2.4	32.8	11.3	12.8	12.8	15.8	

6.3. Marital status and occupation of residents

Table 6 indicates that the bulk of respondents were married (78%), followed by widows or widowers (11.8%). Farming (32.7%) petty trading (31%) and artisanship (17.7%) were the major occupations. There was also a significant concentration of civil servants (8.7%) and retired public servants (4.5%). The bulk of married respondents were either farmers (36.4%) or petty traders (36.4%). The large farming population is a distinctive feature of the peri-urban areas, while the participation of a significant proportion of the population in non-agricultural occupations, particularly trading, is a major feature shared in common with urban areas. This duality of the peri-urban areas has also been observed in other situations, particularly in the Asian context (McGee, 1991).

Table 6 – Marital status and occupation of residents

Marital status		Occupation						
		Unemployed	Farming	Petty trading	Civil servant	Artisan	Retired	Total
Single	No.	2	4	6	3	7	1	23
	%	8.7	17.4	26.1	13.0	30.4	4.3	6.5
Married	No.	9	101	101	25	51	11	278
	%	3.2	36.4	36.4	9.0	18.3	4.0	78.3
Separated	No.	-	2	2	1	1	-	6
	%		33.3	33.3	16.6	16.6		1.7
Widowed	No.	6	10	18	1	3	4	42
	%	14.3	23.8	42.9	2.4	7.1	9.5	11.8
Divorced	No.	-	1	3	1	-	-	5
	%		20.0	60.0	20.0			1.4
Total	No.	18	118	110	31	63	16	355
	%	5.1	32.7	31.0	8.7	17.7	4.5	100

6.4. Nativity and length of stay

Results of the analysis suggest that the bulk of respondents were natives (70.3%) of the various communities and had spent all of their lives in these settlements. Though most of the non-indigenous respondents had stayed between 5 and 10 years (64%), a significant proportion had stayed for longer periods: 11-20 years (14.6%), 21-30 years (16.9%), and over 30 years (4.5%). This implies that the respondents were knowledgeable about local circumstances concerning the dynamics of environmental and socio-economic conditions.

The increasing presence of newcomers or non-indigenous populations in the peri-urban areas causes a process described by Hanson and Wackernagel (1999) as the disembedding or decontextualisation of society from nature. As a result of modernization (brought about by newcomers in the community), previously important relationships between the population and local ecosystems are losing significance while local lifestyles are becoming less adapted to the current context (Rupa, 2004). Nevertheless, the process is required in this part of the world to

ensure the transformation of society from a largely agricultural to a non-agricultural (economic activities based) society.

7. Responses to effects of urban encroachment

7.1. The response process in context

In the peri-urban areas of Ogbomoso, household responses to urban encroachment involves the decisions made by family heads and other adult members of the peri-urban communities to live above subsistence levels through a reconstruction of their livelihoods from lansed or related activities to non-farm enterprises. This process is reminiscent of the Household Responsibility System (HRS) introduced in China in the early 1980s and which constituted an official policy instrument known as "rural construction", which provided strong incentives for rural towns and villages to diversify and expand their economies by developing non-agricultural enterprises (Xie *et al.*, 2006). Yet unlike in China, there is no official policy at the state or local level that enables households to respond to local conditions or circumstances by developing small-scale factories and individual or family enterprises with raw materials drawn from the immediate environment. Although many individual households have diversified livelihood strategies including agriculture, activities are nevertheless centered around petty trading, since development initiatives are not supported by local entrepreneurs with foreign capital, as they tend to be in the coastal regions of China (Wuxian City Statistical Bureau, 2001), or indeed any form of government aid. Responses have thus been largely spontaneous, with the result that land uses are uncoordinated, thus producing amorphous physical development patterns, while economic activities remain at the level of petty trading. Without basic facilities and services, the emerging settlement pattern can be characterized as a network of impoverished communities that have resulted from a process that can best be described as the "slumisation" of peri-urban areas. These hastily developed communities lack basic facilities and services, such as electricity, drinking water, and motorable roads.

The imperatives of planning and policy formulation indicate the need to examine the effects and responses to urban encroachment within the administrative units that comprise the households and

communities considered in this study. Nevertheless, specific community reports are highlighted for immediate remedial action. We investigated the effects of urban encroachment and the responses of households and communities to this encroachment on agricultural land (including the implications for biodiversity and the local ecosystems), farming practices, land ownership, housing, and health, among others. The focus group discussions and questionnaires in five communities provide the basis of the analysis and discussions outlined below.

7.2. Response to incursion on agricultural land

A major effect of urban encroachment on rural hinterlands in the study area is the incursion onto fertile agricultural land causing a shortage of nearby farm land, which forces farmers to cultivate increasingly distant lands. The focus group discussions indicated that the areas bordering the city of Ogbomoso were once vibrant agricultural lands, with a variety of cash and food crops such as cola nut, locus bean, cocoa, mangoes, yam, and cassava. These lands have now been taken over by residential developments. In the Aroje community, one of the peri-urban settlements situated along the Ogbomoso-Ilorin road, the elders reported that the area which is now built-up had been largely composed of farmland. Pointing to a few cola nut trees, remnants of a once thriving plantation, one elder lamented:

> "Houses have taken over what used to be big cocoa and cola nut farms and farmers have been forced to move further into distant places."

Similarly, in the Aduin area of Ogbomoso North, one of the areas with the most rapid rate of incursion, an elder who was one of the first people to settle in the area in the year 2000 said:

> "Everywhere was used as farmlands, there were only three buildings partially completed but occupied, but today there are about 220 buildings excluding unroofed houses."

With the exception of those in the Ikose community, situated 8 km from the city, all the participants were unanimous in claiming that there was a reduction in the extent of farmland available for cultivation. This may be because of distance decay effects of encroachment on Ikose. The instinctive response of the predominantly agrarian popu-

lation to incursion on agricultural land has been to move further away from the settlements to pursue their farming activities.

7.3. Response to increase in distance of farmland

One inevitable outcome of the sale of farmlands commonly situated around built-up areas of communities in the urban fringes for the purposes of residential development is the need for farmers to cultivate distant lands. One participant in the focus group at the Owolaake settlement declared:

> "There is no land for farming again. In the past, you came out of the house and start farming, now you have to move far away before you can farm, usually trekking."

Another elder lamented:

> "All the huts [referring to land around huts] have become buildings with no more land around, except far places, because the population is increasing."

In a similar vein, another participant in Ikose said:

> "We used to farm nearby land, but now the farm has moved further away. Because of distance, we go to farm early in the morning and come back in the evening, just to eat and sleep."

Further investigations reveal that, on average, the distance of farms is approximately 3 km from the household, though some may be as far as 6 to 8 km. Since the farmlands are for the most part not located along established transport routes, thus making any form of vehicular transport impossible, most farmers go to work by trekking (54.2%), with 28.8% and 3.4% riding bicycles and motorcycles respectively. The obvious implication of this is the effect on farm size, which is the object of section 7.4.

7.4. Reduction in farm size in response to shortage of nearby farmland

In addition to the observation that farming is the main source of income of respondents (37.1%), further results show that well over 60% had worked in the farming business for over 50 years and were actually able to recount their farming experiences. When asked whether

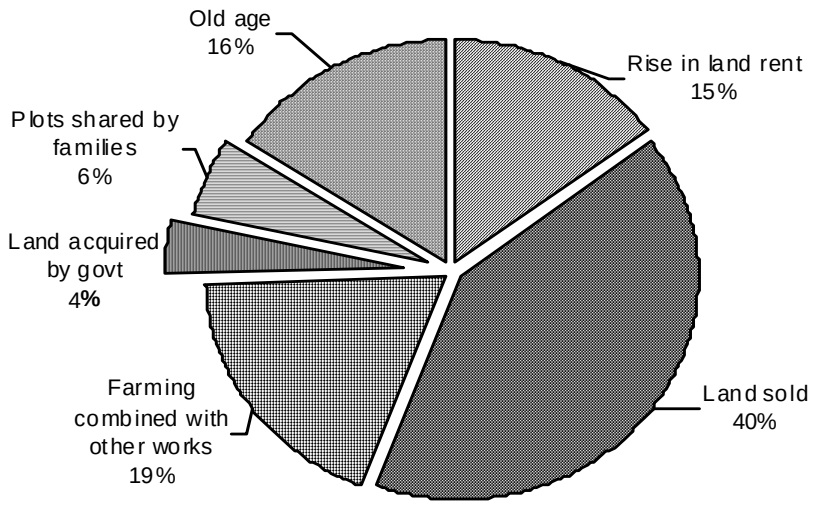
the size of farmlands had increased over time, 29.5% answered negatively, while 18.1% claimed that there was an actual increase in farm size. Most of the recorded cases of increases in farm size were from households in Surulere and Ogbomoso South that were able to pay for hired laborers. The presence of a farm settlement in Owolaake is noteworthy. Table 7 compares the sizes of farms when farmers began to farm roughly 50 years ago and current farm sizes. A number of observations are in order:

(a) There is an overall decrease in the size of farms;
(b) The number of farmers cultivating over 6 ha has decreased from 7 to 4 (43%), while the number of farmers cultivating 3.1-6 ha, 2.1-3 ha, and 1.1-2 ha has decreased respectively by 40%, 48%, and 11%;
(c) The above observation is most pronounced in Ogbomoso North, in the South and in the Oriire Local Government Areas, i.e. the areas with the most rapid rate of incursion (see Figure 2);
(d) The only exception is the local government of Surulere, where the proportion of farmers in the large-size farm category increased from 3.0 to 10.3%;
(e) Perhaps as a response to the increasing shortage of land and rising costs, farmers are reducing the size of their farmland, although the absolute number of farmers is still on the increase. This may be a response to recent programs, particularly the cassava revolution, aimed at the promotion of agricultural activities by the Obasanjo administration.

Table 7 – Variations in the sizes of farmlands and the proportion of farmers in the past and today

Size of farm (ha)	North		South		Surulere		Oriire		Total No. of farmers	
	% then	% now	% then	% now	% then	% now	% then	% now	No. then	No. now
<1.0	72.3	84.6	72.6	89.0	57.6	59.0	71.4	77.8	181	242
1.1-2.0	13.9	10.9	17.8	8.5	6.1	15.4	7.1	5.6	35	31
2.1-3.0	8.8	3.2	8.2	2.4	27.3	12.8	14.3	16.7	29	15
3.1-6.0	1.5	1.3	1.4	-	6.1	2.6	-	-	5	3
> 6	5.0	-	-	-	3.0	10.3	7.1	-	7	4
Total No.	137	156	73	82	33	39	14	18	257	295
Total %	53.3	52.9	28.4	27.8	12.8	13.2	5.4	6.1		

Figure 3 – Reasons for reduction in farm size



Concerning the reasons for the decrease in farm size, Figure 3 illustrates the response pattern, with the sale of parts of land (40.5%) being the most important reason, followed by the fact that farmers now combine other types of work with farming (18.8%), old age (15.8%), and increase in price of land (14.8%).

7.5. Response to the changing economic base of communities

One fundamental implication of these observations is the changing economic base of communities around the city and the city itself, from cash crop production to a trading economy and food crop production. Evidence drawn from communities such as Aroje, Okepaku, and Ile-ewe point to the fact that colanut, tobacco, locust beans and cocoa were widely grown by farmers in these areas. However, these have been simplified and are currently limited to food crop production. For example, within the city, just two of the numerous cocoa beans merchants obtained their produce from the Ajaawa area in Ogo Oluwa LGA in the southern part of the city. Traces of a once lucrative to-

bacco business are now apparent in buildings once used as tobacco offices and now converted into shops, and in the naming of an area of the town, "Ile-ewe" (meaning 'house of tobacco leaves'), in reference to an area that once served as center for the collection of tobacco from farmers. The area is now characterized by informal activities and residential developments.

7.6. Occupational diversification in response to the declining fortune of farmers

The combined effect of scarce farmland and the high cost of living (including farm inputs) is low farm productivity. The imperatives of subsistence have thus resulted in a process of occupational diversification within the possibilities offered by available capital (in the case of trading and transport related businesses) or other accessible physical and social assets. However, the observed occupational diversification, particularly the combination of farming with crafts, needs to be seen as a kind of return to, or at least a gain in importance of, trades learnt by young adult males in the area. It is customary for every male member of society to learn a trade as a form of security for the purposes of guaranteeing sustenance in case of a failure of farm produce. In the past, these trades, which include hair-cutting, cobbling, taxi driving, tailoring, and bicycle and vehicle repair, were merely a pastime since the proceeds were barely sufficient to maintain a family, however large. Yet recently, investment in transport businesses, particularly motorcycle taxis, is rapidly gaining in popularity, since these have been found to provide quick returns. The required initial capital is the only constraint for prospective entrepreneurs.

Asked why farmers seek complimentary sources of income in addition to farming, an elder in Arinkinkin settlement promptly replied: "*Ona kan o woja*," meaning: "more than one road leads to the market." In other words, the inadequacy of any one means of survival, particularly farming, is fundamental. While some farmers were known in the past to have maintained large families and to have been able to afford school fees (even up to university level) purely on the basis of farm proceeds, this is no longer possible today. In some cases, total farm proceeds are barely higher than input costs. A more fundamental trend is the low return from farm produce as a result of the work of middlemen, who buy off farm produce at a cheaper rate from farmers, then

transport the produce to large cities such as Ibadan and Lagos where it is sold at significantly higher prices.

Figure 4 indicates that petty trading (40.4%) was the most important secondary source of income for farmers, followed by remittance from children (25.7%). Other such sources included artisan work such as crafts (14.7%) and the sale/resale of landed property (12.5%).

Figure 4 – Secondary sources of income for farmers

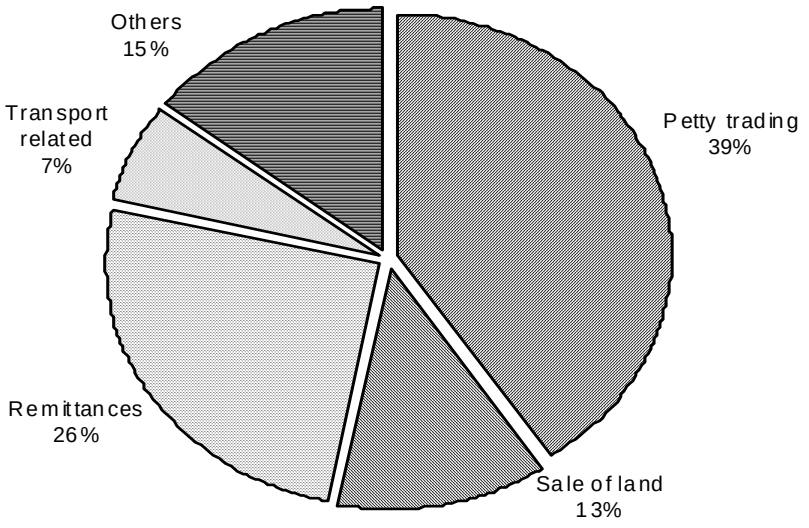


Table 8 shows that this observation applies to Ogbomoso North and Surulere Local Government Area. In Oriire local government, remittance from children (37.5%) was found to be the most important source of income for respondents. As one elder observed:

> "We cannot farm around here as we used to do. Any person wishing to farm must go far, that is why some of us are not working, but depend on whatever our children send for feeding."

Table 8 – Variations in importance of other income sources combined with farming

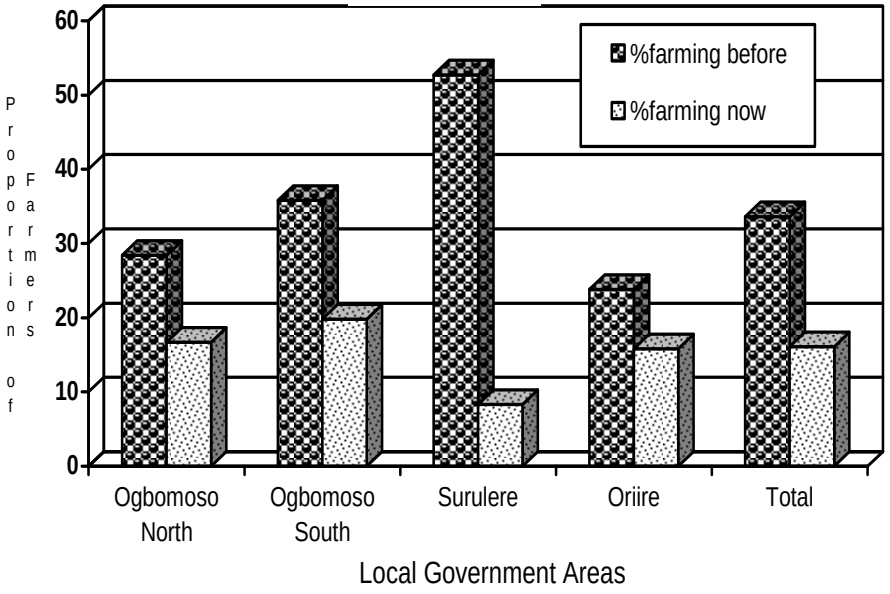
Local Government Area		Petty trading	Sale of land	Remit-tances	Trans-port business	Others (gifts)	Total
North	No.	34	5	17	5	11	72
	%	47.2	6.9	23.6	6.9	15.3	52.9
South	No.	11	12	9	3	5	40
	%	27.5	30.0	22.5	7.5	12.5	29.4
Surulere	No.	8	-	6	1	1	16
	%	50.0	-	37.5	6.3	6.3	11.8
Oriire	No.	2	-	3	0	3	8
	%	25.0	-	37.5		37.5	5.9
Total	No.	55	17	35	9	20	136
	%	40.4	12.5	25.7	6.6	14.7	100

7.7. Change in occupation in response to declining fortune of farmers

While some respondents combine farming with other types of business in response to the increasing unprofitability of farming, others have abandoned farming altogether. For instance, of the 188 respondent (33.6%) who claimed that farming was their first occupation, just 52 (16.1%) are still currently engaged in farming. Figure 5 shows the decrease in the proportion of farmers in the four Local Government Areas.

Among the reasons why farmers continue to abandon farming, the need to supplement income as a result of the rising cost of living was the most frequently cited reason (54 respondents or 30.0%), while old age (29 respondents or 16.1%) and the non-availability of farmland (4 respondents or 2.2%) were the next most important reasons, followed by the high cost of farm input (5 respondents or 2.8%). However, one of the community heads cited the following reason to explain why most people abandoned farming. According to him:

Figure 5 – Proportion of respondents who were formerly farmers and those still currently engaged in farming



> "Those who abandoned farming did so because they had sold off their land, and were not willing to cultivate rented farmland which would make them subservient farmers [a status associated with alien migrant farmers who were once labourers in other farms but now rented farms of their own from landowners] in their own community."

Further analysis reveals that the proportion of petty traders increased from 21.7% to 32.3%, while the proportion of unemployed workers increased from 2.3% to 6.2%, which shows that farmers tend increasingly to leave farming in favor of petty trading. If this trend persists, the regional economic base will shift from a food basket to trading, where articles of trade are the products of industrial cities. The increasing number of unemployed workers has implications for the security of lives and property, and thus the livability of hitherto relatively peaceful communities. In short, while more farmers have abandoned farming, the number of petty traders and unemployed persons has increased.

7.8. Response to divestment of land

One major consequence of urban encroachment in the rural hinterland is the increasing demand for land, either as a result of land speculation or for development. The improvement in the socio-economic status of urban dwellers results for the most part in demand for land, usually at the urban fringe on account of cheaper land prices. Pressed by the need to meet social and other economic exigencies, land owners in the urban fringe exchange land for money, often from a disadvantaged and socially inferior position.

Results of our analysis reveal that an increasing number of households and communities are being divested of land assets. Concerning the issue of the highest number of hectares of land ever possessed by respondents, Table 9 shows the variations in the response patterns adopted by local governments. In total, the size of landed property owned by all of the respondents declined from 258.67 ha to 201.67 ha, or a 22% decline), a mean decrease from 1.01 to 0.68 ha.

Table 9 – Variations in the number of hectares previously and currently possessed by Local Government Area

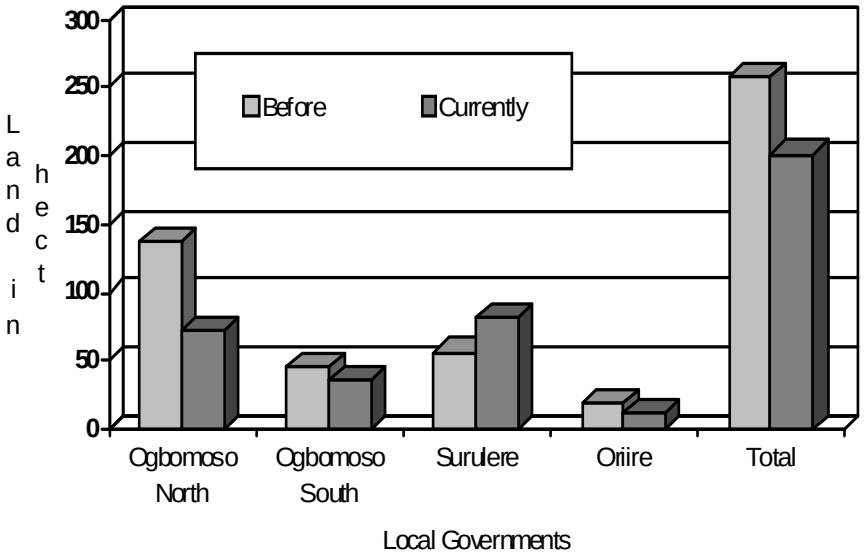
Statistics	North		South		Surulere		Oriire		Total	
	Ever had	Currently have	Ever had	Currently have	Ever had	Currently have	Ever had	Currently have	Ever had	Currently have
Mean No.	1.01	0.47	0.61	0.43	1.71	2.11	1.42	0.65	1.01	0.68
Range	12	7	4	3	8	20	10	3	12	20
Variance	141.35	26.7	26.2	11.3	176.9	533.8	246.7	27.16	121.3	99.0
Std dev.	11. 9	5.17	5.12	3.37	13.3	23.1	15.7	5.21	11.02	9.95
Sum	137.33	72.8	44.8	35	56.5	82.2	20	12	258.67	201.67
No. of respond.	137	156	73	82	33	39	14	18	257	295

The decrease is above 50% in Oriire and Ogbomoso North, i.e. from 8.57% to 3.8% and 6.01% to 2.80% respectively, the only exception being Surulere, where the average size of land holdings increased by 23% (from 1.71 ha to 2.11 ha).

Figure 6 illustrates the variations and changes in the total landed property of communities and households in the four Local Govern-

ment Areas. The figure compares the situation observed roughly 50 years ago with current trends, and shows that apart from Surulere local government, where the total size of landed property increased from 56.5 to 82.2 hectares (45%), the size of landed property held by households and communities decreased from 137.3 ha to 72.8 ha in Ogbomoso North, from 20 ha to 12 ha in Oriire, and from 44.8 ha to 35 ha in Ogbomoso South. The figure presents a picture of highly depleted assets held in possession by households in different Local Government Areas and an implication of increasing vulnerability and landlessness, except of course where the revenue accrued was invested in other profitable businesses, which was not the case in most instances.

Figure 6 – Local government variations in total landed property held by respondents in the past and currently



Further analysis shows that over 50% of inherited lands had been sold, mainly to outsiders and usually for residential purposes. This is particularly the case in Ogbomoso North, where the rate of urban expansion is most rapid. In Ogbomoso South, respondents who inherited less than 6 ha had sold off everything. These results are similar to

the findings of analyses carried out in India, where Rupa (2004) found that approximately 40% of the agricultural lands in Chawala and over 50% of agricultural lands in Kanjhawala, two urbanizing villages in Delhi city region, had been sold by farmers, mainly to outsiders and largely for urban land uses.

While most respondents (64.1%) were unable to provide any specific reason for selling off their inheritance, "pressure from people who wanted to buy" was most frequently mentioned (17.7%), followed by the need to pay for school fees (10.6%), the need to offset family debt (4.5%), engaging in other business (2.0%), and the purchase of other property (1.0%).

These findings suggest first of all that community and family lands are increasingly being held in possession by individuals, signaling a shift away from communal land holding to individual land holding in a society where the land tenure system was traditionally communal in nature, with family land held in trust by the family head. Thee importance and respect of any community or family head is founded partly on the size of land held in trust (with the attendant ownership implications). The most respected head wielded much influence over his subjects and was thus able to maintain law and order or at least to exercise some form of control over the community or family members. The removal of this source of authority implies the disappearance of one of the instruments of social cohesion, with far reaching implications for the structure and functioning of society.

Secondly, accessibility to land is more difficult when litigations over land and related disputes are more pronounced. In four of the five communities where focus groups were conducted, the facilitator was informed that even if he wished to purchase a plot of land, he would not even be able to obtain one. One participant in the focus group at Oke Aduin recalled how he had purchased the same plot twice from different groups of family members who claimed to own it. In other situations, locals claim to own just one or two economic trees left by a developer long after selling the land. The increase in the number of landless adults is an inevitable consequence of this trend.

7.9. Response to the rising cost of accommodation

One major observation concerning the impact of urban expansion is the increasing demand for housing and the resulting impact on rising

prices. For those whose income lags behind rent increases within the city, responses include the readjustment of living conditions for cheaper and lower housing quality or smaller apartments. In some cases, it is the movement of people from urban to peri-urban areas in search of cheaper accommodation or the development of poorly built houses. There appears to be a consensus of opinion concerning the negative impact of city growth on house rents in different communities, since roughly 87.5% of respondents answered in the affirmative that urban expansion had resulted in an increase of house rents in all Local Government Areas.

This analysis shows that the bulk of rent paying respondents (66.3%) had their first accommodation in Ogbomoso before moving to their present residence in peri-urban communities. 35.7% left the urban area roughly 20 years ago. In their first accommodation in their current domicile, most rent-paying respondents occupied just one room (43.1%), while 42.7% occupied two rooms. Very few occupied three (5.2%) or four rooms (6.6%). On average, respondents paid between ₦75 and ₦100 (US$ 0.62-0.83) monthly, and in some cases paid merely a token rent by way of establishing their rent-paying status. Others had rent-free accommodation, where the owner required a company of people to help maintain the building.

However, the bulk of respondents (81.0%) in the rent-paying category had changed accommodation twice (35.6%), three times (16.7%) or four times (6.7%). Most of the changes in accommodation occurred between 1981 and 1990 (34.3%) in response to the rising cost of accommodation. There have been very few recent changes in accommodation (just 7.2% between 2001 and 2007), possibly because newer apartments are more expensive and new tenants in new residences pay more than old tenants in old dwellings.

Increase in family size was the most important reason (26.5%) why respondents changed accommodation, followed by the rise in house rents (17.06%) and change of occupation (11.5%) accompanied by a higher income and status which necessitated relocation. The increase of house rents is a logical outcome of the pressure of populations on the existing housing stock.

Although most respondents lived in owner-occupied buildings (51.0%) or in houses owned by relatives (17.4%), they were not impervious to the rising cost of accommodation and the general cost of living since they tend to readjust living conditions to sublet parts of

previously occupied buildings in order to increase their income. However, additional households in traditional bungalows result for instance in a higher occupancy ratio and additional stress on already poor facilities, such as kitchen, bathroom and toilet, where these are available. The implications for environmental sanitation and health, particularly in a poorly served environment, with or without drinking water and lacking any means of waste disposal, are obvious.

7.10. Response to the rising cost of healthcare

Measuring the impact of urbanization on human health in the hinterland is difficult since causal relationships cannot be established between disease etiology and prevalence rates. However, certain health-related issues can still be associated with the process of urban incursion. First of all, given the new contacts between animals and humans prompted by the spread of cities into former agrarian and undeveloped lands, it is hardly surprising that a reemergence of old and the evolution of new infectious diseases such as HIV, tuberculosis, yellow fever and dengue fever are currently observed (Barrett *et al.*, 1998). At the global level, this is accounted for by the combined influence of global trade and mobility (McMichael, 2000). At the local level, the pressure of population on housing and the consequent increase of prices, and the rise in the cost of living, generally imply reduced expenditure on food and a low-calorie intake, causing greater susceptibility to infectious and communicable diseases, which are often aggravated by poor environmental sanitation.

It should be noted that in the present circumstances, contact between animals and humans is in no way new since the keeping of domestic animals by households is as old as the communities themselves. Adult members, particularly women, tend to keep poultry birds and goats, albeit on a small scale. Households used these as sources of protein or sometimes as a means of exchange for money to purchase non-farm produce. This age-long contact has not been associated with health or related problems.

Secondly, the movement of people of different socio-economic backgrounds and statuses towards peri-urban areas may result in the diffusion of communicable/infectious diseases such as HIV/Aids, especially since new residents tend to carry with them more permissive urban lifestyles. In any case, the exact nature of the relationship be-

tween incursion and health requires further investigation. Suffice to note here that of the diseases affecting respondents in the past six months, 42.6% indicated that they had experienced a bout of malaria, making it the most prevalent disease in all communities. Other reported cases include typhoid (9.5%), cholera (3.1%) and diarrhea (1.7%). Concerning the issue of treatment locations, results show that perceived cost-saving measures such as self-medication were widely practiced (40%), followed by medicine vendors (15%) and chemist shops (9%).

Apart from the health and related services provided by new residents who work as paramedics for community members, other positive effects of city growth in the peri-urban areas of Ogbomoso are incidental, including the provision of earth roads and the expansion of electricity to remote areas of communities in most cases by new residents. The effect of the urban lifestyles of the more educated newcomers in these communities is an important motivating factor contributing to an increase in demand for western education.

Some of the major benefits of urban incursion into the peri-urban areas in the study area result from the presence of professionals – particularly paramedics – who have become consultants and service providers in all health-related areas for the benefit of community members. They provide treatment for common ailments such as malaria, diarrhoea, etc., and prescribe, and most times dispense, common drugs from their mini chemist shops or bags/boxes. In some cases, antenatal and midwifery assistance is also provided for women who are unable to afford the cost of healthcare in government or private hospitals.

8. Summary and conclusion

The extent of city expansion in Ogbomoso between 1914 and 2007 has been phenomenal, with a total of 2,890 hectares of rural land engulfed in a period of approximately 90 years, resulting in a total expansion rate of 2.15 per thousand in the period under consideration. Visible impacts of this process include encroachment on fertile agricultural land, increased stress on the natural environment, with ominous implications for the economic base, socio-economic and demographic characteristics, and the health and well-being of communities in peri-urban areas.

Conceived as a process of individual decision-making by family heads and other adult members of the communities to live above subsistence levels through a reconstruction of their livelihood and sustenance, the responses of households and communities in peri-urban areas to the process of urban encroachment vary greatly, including measurable variables such as: sale of property; rudimentary occupational diversification, including petty trading and low skilled jobs in the growing public sector in urban areas, and the reduced scale of farming. However, this process is not in any way shaped by government policy, but is instead left to emerge and grow spontaneously, thus leaving in its wake a network of impoverished communities that lack basic services and suffer from an unplanned morphology. Individual land tenure is now widely practiced as a response to changes in the land tenure systems away from customary/community ownership, with a resulting increase in the number of landless adults. Another observable trend is the readjustment of living conditions as rooms are rented out in previously owner-occupied buildings. Concerning the issue of the rising cost of food stuff, residents rely increasingly on locally produced farm products (largely carbohydrates), while essential non-farm items are exchanged for farm products and purchased in small quantities to ensure the continued availability of three meals per day. Furthermore, household expenditure profiles are adjusted to minimize expenditure on health. In most cases, traditional medicine and self-medication are widely practiced (with doubtful efficiency), except in critical and emergency situations, in which case clinics or hospitals are consulted. However, in the present situation, the nature of the relationship between city incursion and health requires further investigation. The increasing presence of city dwellers in peri-urban areas as new settlers and the continuous interaction of peri-urbanites with the city population as urban workers or traders imply a transformation and potential improvement in peri-urban lifestyles through greater access to urban goods and services. But the beneficial effects of the process of urban encroachment on rural hinterlands have yet to be fully realized, though further research is currently underway to investigate this issue.

Although psycho-social behaviors including aggression, depression, crime, prostitution, domestic violence, ritual practices, cultism, etc., are just some of the deviant behaviors associated with any significant agglomeration of human beings in different societies, prevalence rates and varying forms and degrees of sophistication, reported in some

of the communities covered in peri-urban areas, may be indirectly connected with frustrations arising from the rising cost of living in the context of a declining earning power and the need for individuals to meet societal expectations of the "responsible and successful adult."

9. Planning and policy issues

As objects of positive policy, it is suggested that:

1. Governments at all levels need to realize that agricultural land is a limited natural resource and thus specific policies and programs need to be implemented to discourage further encroachment into peri-urban areas.
2. Generally, the immediate need for residential and urban uses within cities should be pursued through the implementation of relevant portions of the 1992 Urban and Regional Planning Decree No. 88, with particular reference to the establishment of development control agencies at the federal, State and local government levels. This is expected to lead to the development of an improved land market within the city.
3. Development plans need to be drawn for peri-urban areas by local planning authorities, with an adequate provision made for agricultural development.
4. As part of the above, the government should establish farm settlements at designated places located at the urban fringe, particularly in Aroje and Abaa, and land should be allocated to farmers based on needs as well as the provision of other farm input subsidies and necessary services. These measures will help to revitalize economic activities at the urban fringes and gradually to improve living standards, and will also serve as a check to prevent any further spatial expansion of the city. They will also encourage vertical as opposed to horizontal city expansion.
5. It is also strongly recommended that urban growth boundaries be demarcated by adopting the use of a green belt area around the city. This will enhance the aesthetic value of the environment, but will also serve to slow down the rate of urban spatial expansion.
6. Nevertheless, there is the need for layout design and close monitoring of development in areas around Adwin, Aroje, Abaa and Sunsun to forestall the development of slum and squatter settlements. In

this vein, urban development planning and management should assume a metropolitan status, where a holistic approach to development control, urban planning and management are pursued within a regional framework.

7. An urgent provision of basic infrastructures, such as electricity and drinking water in Adwin, a rapidly expanding slum, is also required. The need to monitor development closely in this area is important to prevent the flagrant violation of development control measures.
8. The formalization and reinvigoration of farmer associations, just as the government is promoting Community Development Associations within cities for the improvement of urban localities, is also recommended. Through these associations, farmers can receive direct financial assistance and other farm input subsidies and logistic support from the government and extension workers. The fear of unions becoming militant movements, as illustrated in Western Nigeria where farmers revolted against government policy concerning agricultural prices in the popular "Agbekoya" revolt – meaning *farmers resist oppression* – is baseless, since only an appropriate pricing of farm products will serve to ensure product availability.

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