

ANALYSIS OF THE INTERPLAY OF MIGRATION AND URBAN EXPANSION, ON HEALTH AND THE ENVIRONMENT: THE CASE OF LAGOS, NIGERIA

By

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SUMMARY

The study examined the associated impact of migration and urban expansion in Lagos, Nigeria and attempted to draw the implications of these on the environment and the well-being of the people in Lagos. Extensive review of literature was done, Stakeholders' meeting was held to harvest some basic data and these were complemented with survey data. Lagos is the commercial nerve centre of Nigeria with an estimated population of about 12 million. About 15 of the 20 Local Government Areas (LGAs) in the State make up Lagos metropolis. These 15 LGAs were purposively categorized based on population density and income profile of the residents and six (6) of these were randomly selected within their categories. The six LGAs represented relatively high-income and low population density (i.e. Eti-Osa and Ikoyi LGAs), relatively middle-income and of medium population density (i.e. Kosofe and Surulere LGAs) and relatively low-income and high population density (i.e. Ajeromi/Ifelodun and Agege LGAs) sectors of the city. Three hundred and sixty (360) respondents were randomly covered. Furthermore, the Chairmen of the 6 selected LGAs and Permanent Secretaries/Directors of relevant State Ministries and Departments were interviewed on the plans and activities of their organisations regarding the urban expansion and the needs of the increasing population. Samples of water and street foods were collected for biochemical analysis to determine the impact of environmental pollution on them. The study established that about two-thirds of the migrants to Lagos stopped over in several locations especially Ilorin (Kwara State); Ibadan (Oyo State), Benin (Edo State) and Sagamu (Ogun State) before finally moving on to Lagos. The employment opportunities and some social amenities not present in the places of origin of the migrants were the critical factors attracting people to Lagos. However, migrants found it easier to get employment than to get accommodation. Most migrants reside in relatively environmentally poor areas and lived under poorer conditions than the residents in other areas. The Geographical Information System (GIS)

carried out revealed that there had been a drastic expansion of developed areas in Lagos leading to a rapid loss of biodiversity and other forms of environmental degradation.

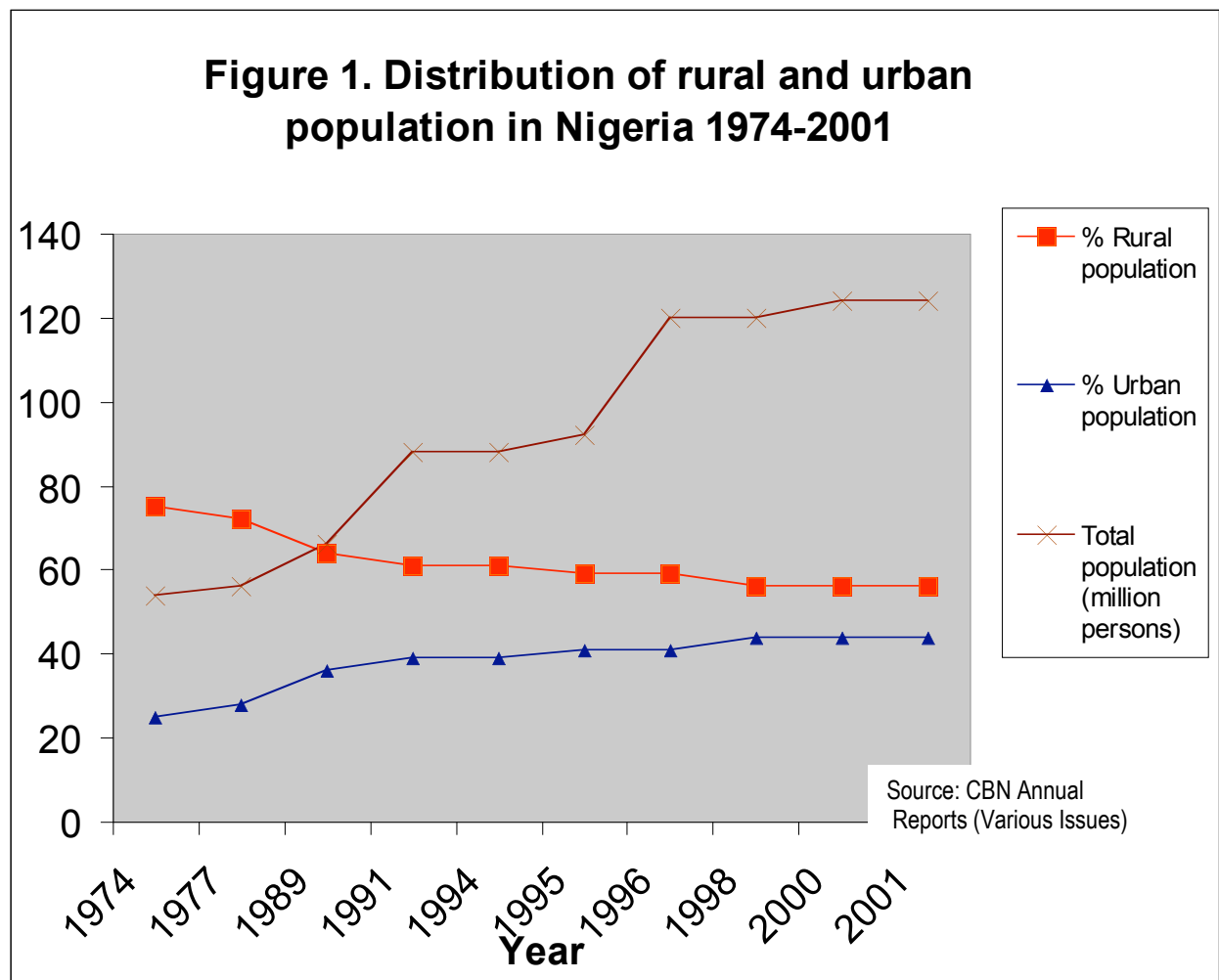
This uncoordinated growth has consequently resulted into: a mosaic of shanties/ blighted areas in many older areas of the city; a mosaic of disjointed, badly serviced areas in terms of urban infrastructures such as roads, health centers, police stations, electricity, water, drainage systems, waste management, etc. Lagos parades one of the highest numbers of uncompleted buildings among major cities in the world today. It has a high rate of urban sprawl, cases of property encroachment and unplanned changes to other land use types. Infrastructural development was at a rate lower than the influx of population and hence heaps of wastes were found in many localities far more than in the 1990s. In terms of urban expansion, whereas for low income areas of Agege LGA, the % of developed parts increased from 12.5% in 1962 to 100% in 2000 as against 3.4% increasing to 32.2% for high income Eti-Osa LGA in the same periods with concomitant population density. It was also found that the street foods and water consumed in low income LGAs were more contaminated than those of high income LGAs. The average income of the migrants was higher than those of their contemporaries in their places of origin.

Even though the State and the Local Governments had good plans for the development of these areas, implementation methodologies and finance were deficient. Land use changes and infrastructural development need to be planned and taken much more seriously for environmental sustainability and improvement in well-being to be achieved in Lagos and other Nigerian cities. Given the fact that migrants to Lagos transited in some towns, if the attractions that make people move to Lagos are available in the transiting towns, the problems arising from unplanned urban expansion would be greatly reduced. This observation enabled a migration map which can be used to stem migration to Lagos if employment opportunities and other socio-economic attractions can be provided in transit towns/cities and in deed in places of origin.

Introduction

In many developing nations, there had been a rapid growth of urban population far more than that of rural population. Nigeria is a typical example of this, where there had been a tremendous expansion of urban areas consequent to the rapid rural urban migration. In 1974 rural population was 75% of the total population but by 2001 urban population had assumed a high dimension of 44% of the country's population. This rapid urban growth portends serious implications on the environmental and the well being of the citizenry.

Figure 1 shows the population dynamics of the country between 1974 and 2001, in terms of rural and urban population distribution. This situation demands a critical investigation on the state of affairs of the country and particularly the quality of life of the urban dwellers. This is what informed this study with particular reference to Lagos the former capital of Nigeria but still the commercial nerve centre of the country. Such study should serve as a window for possible solutions or investigation of similar urban centers.



Lagos provides a classical case for studying migration and urban expansion and their consequences on health and the environment. It is the most cosmopolitan city in West

Africa with an estimated population of over 10 million persons inhabiting the metropolis alone (not the whole of Lagos State). Lagos is a melting pot and mini-Nigeria. It has all the ethnic groups fully represented albeit with the Yoruba as most prominent ethnic group (Fadayomi *et al*, 1992). The city has a long history from its pre-colonization origins through colonial administration to becoming the commercial nerve-centre of Nigeria. The city lies approximately between longitudes 2° 24' and 3° 42' and latitudes 6° 22' and 6° 52' along the Atlantic coastline just above the Gulf of Guinea (Figure 2).



Figure 2. Map of Nigeria showing the location of Lagos

Objectives

The overall objective of this study was to investigate the interplay of migration and urban expansion on the environment and the health of the people in Lagos, Nigeria.

Specifically, the project

1. Investigated the explicit factors influencing migration to Lagos;
2. Developed a functional map of migration to Lagos;
3. Explored the environmental impacts of migration and urban expansion in Lagos;
4. Established the type of urban expansion and attempted to draw a correlation between this and the environmental situation in Lagos;
5. Investigated the developmental changes in Lagos and their implications on the livelihoods of the people, and
6. Highlighted the implications of project findings for development planning and sustainable environment in urban centers.

Migration and Urbanization

Much of the migrations which featured predominantly in the pre-colonial era were of colonization movements. It took the form of sporadic, massive movements and was

demographically undifferentiated. These were essentially “political” or forced movements of population. Unlike economics-motivated migrants who predominated in subsequent periods, political migrants usually migrate under compulsion as members of a group.

Historically, Yorubas -the dominant ethnic group in Western Nigeria are migratory. The subsequent amalgamation of villages or “colonial settlement” among indigenous people led to the formation of a few towns. However, some of these newly formed towns were dislocated as a result of internal warfare and resulted in a large scale forced migration of people from the devastated towns to those which were favourably placed for defense. Abeokuta, Ogbomoso, Ile-Ife, Iwo among others grew as a result of such influx of refugees. Indeed “the 19th century was a period of town coalescence and growth in response to the need for defense and security” (Mabogunje, 1967).

With respect to the Hausas, the pattern of movement was initially east to west (Odumosu et. al., 1976). The settlements at the eastern areas of Hausa land involved in the migration of militarily superior Kanuris from Lake Chad basin towards the end of eleventh century. Religion also partly contributed to the migration of some northerners in the past, apart from pastoralism which was a major occupation.

The Ibo (Igbos) had no centralized political organization above the level of the local headman and council of elders and therefore had nothing of the myths of origin personified by migratory ancestors (Odumosu, et.al 1976). This is not to deny that their present home involved migration. In fact, three waves of migration from the east, west and north dominated the pre-colonial migrations into Iboland. From the east, especially around the Cameron Mountain and central Africa, the Ibo moved to Nri.

The political and social disturbance which accompanied the early Jihad just below the river Benue led to a north-south movement of population into the forest zone. The west-east movement into Iboland is closely linked with the activities of Benue warriors and traders on the Niger.

The pattern of migration in Nigeria during the Colonial Period

The major interest of the British in Nigeria had been to promote trade. With their effective occupation of the country, they took various steps to achieve these objectives. Three of the steps taken, substantially modified the pattern of migration within the country (Odumosu et.al 1976). The first was to lay the foundation of a modern transportation system over which the articles of trade could move. The network was supplemented by feeder roads in 1920's. Prothero (1968) observes that 'the advent of widespread colonial administration in the late 19th century and early 20th century led to some population dynamics associated with conditions of political and social instability. At the same time the conditions for peace and security with which they were replaced, enjoyed new forms of population mobility to the areas.

Between 1953 and 1962, the urban population increased at more than twice the rate of rural population growth. The United Nations (UN) team of experts on urbanization observed from a study of three groups of regions

When economic opportunities, including employment, in rural areas are impacted by changes in prices and other socio-economic factors brought about by trade liberalisation and/or other forces, migration is encouraged. Typically, migration from rural areas to urban centres by people seeking to improve their economic potentials can have both negative and positive impacts on both the areas they leave as well as the cities they move into. Migration into cities can also affect the health of urban centers. The F.A.O. estimated that by 2005 over half the world's population would live in cities. In Latin America and the Caribbean 75 per cent of the population already lives in cities. This figure is expected to climb to 83 per cent by 2030. Comparable figures for Asia and the Pacific are 37 and 53 percent and for Africa are 38 and 55 per cent. At present, twenty cities in the world have populations of over 10 million people (FAO, 2002). In the next 30 years almost all population growth will be concentrated in urban areas. The pace of growth is expected to be fastest in developing countries, where the urban population is forecast to increase from 1.94 billion to 3.88 billion. The number of people in African cities is predicted to rise from 297 million to 766 million, or more. In Asia the urban population is expected to almost double from 1.35 billion to 2.61 billion (The World Bank, 2002). Observable impacts that may result from increasing urbanisation include

rising urban poverty rates, crime, poor health and environmental degradation. In many parts of the developing world in particular, urban poverty rates already exceed 50 per cent. With some populations growing at rates of up to 10 per cent per year these costs may be prohibitive for many countries. Migration often leads to increased demand for social services and when this is lacking, the places of destination of migrants quickly becomes slums, where poverty and poor sanitation prevails (Doughty, 1979; Escobar and Collar, 1987; Guyer and Murray, 1988; Oliveira-roca, 1990; Bakhit, 1991, Brink, 1991). Uncontrolled urban expansion, lack of planning and management of such cities could lead to the emergence of diseases, harvesting of avoidable environmental hazards, urban shanties and colossal wastes of the potentials of men and women including putting into jeopardy the lives of future generations.

Research Methodology Adopted

This started with a review of available documents from national and international organisations to obtain more data for this project and provide a foundation on which further investigations can be carried out. A stakeholders' meeting was held involving among others relevant Ministries and local governments. The meeting led to the choice of LGAs, the need for remote sensing/GIS on the chosen LGAs, etc. Government officials' views were also harvested.

From this starting point, socio-economic and environmental investigations were then carried out in Lagos. A total of 360 randomly selected respondents were covered and these were drawn from six purposively selected Local Government Areas (LGAs) representing relatively high-income and low traffic (Eti-Osa and Ikoyi), relatively middle-income and traffic (Kosofe and Surulere) and relatively low-income, high traffic (Ajeromi/Ifelodun and Agege) sectors of the city. In each LGA, the street listings of the 1991 National Census were used to draw a random list of six streets from which 10 respondents were selected. Only 350 interview guides were however analyzed given the dearth of relevant data from the remaining 10. The interview guides were then subjected to descriptive statistical analyses to draw out trends and patterns in the socio-economic, environmental and health variables determined in the study.

Samples of food and water were collected from the LGAs and analysed for any pollutants. Also, geographic information on the sequential expansion of Lagos, housing distribution and the state of the environment were obtained through the satellite imageries

Major Findings of the Study

a) Socio-Economic Issues

The results showed that over 80% of the migrants in Lagos came from 11 States of the Federation (Figure 3). Of these, migrants from, Ogun, Osun and Oyo States in Southwest Nigeria dominate with about 42.3% of the respondents. The first reason that readily comes to mind is proximity to Lagos. This factor has not got a sufficient mention in the literature as a reason for peoples' decision to migrate. Furthermore, as shown in Figure 4,

about two-thirds of the migrants in Lagos stopped over in many locations especially Ilorin (Kwara State); Ibadan (Oyo State), Benin (Edo State) and Sagamu (Ogun State) before finally moving on to Lagos. The import of this is that if the attractions that make people move to Lagos are available in the transition towns, the problems arising from immigration to Lagos would be greatly reduced. A migration map for migrants to Lagos has been developed as shown in figure 5.

Poverty and Employment Status

This section examined changes in occupational status of migrants and their levels of incomes. It then compared the consumption patterns before and after migration.

Most of the respondents migrated to Lagos within the last 20 years (Fig 6).

As shown in Table 1, over 60% of the respondents were students, unemployed or farmers before migrating to Lagos. Once in Lagos, farming was no longer an occupational choice, but the diversity of occupational prospects becomes higher and the proportions that engaged in Civil service, Teaching and Business, etc increased.

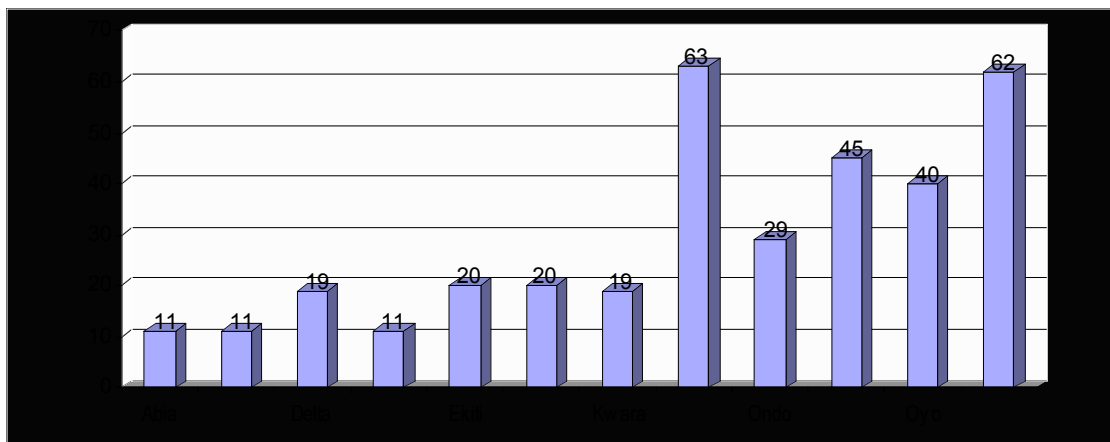


Figure 3. The States of origin of most migrants to Lagos

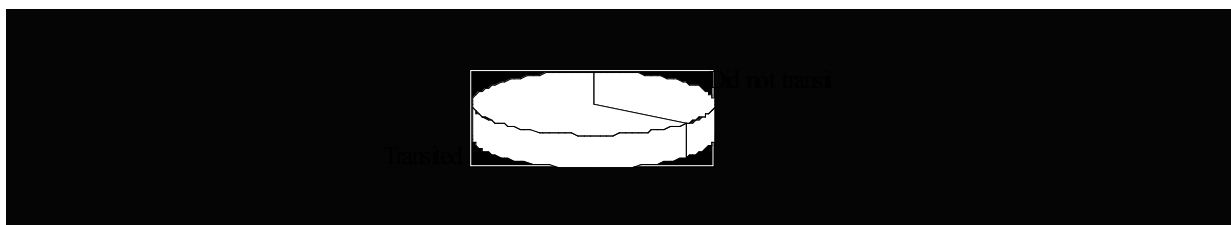


Figure 4. Proportion of migrants who transited through other town(s) before finally moving to Lagos

This finding suggests that efforts at improving the practice of agriculture to make it more attractive to the youths can not be found in continuous rural-urban migration but rather in stemming it and developing rural infrastructure and economic incentives.

Over 80% earned incomes less than N5, 000 before moving to Lagos and more than 70% were earning incomes above N20, 000 after migrating to Lagos (Figure 7). This finding

lends credence to the argument that economic considerations are the overriding factors in the decision of rural people to migrate.

It was also found that the respondents consumed more of proteineous food items than carbohydrates. These were either in form of larger quantity of the items or increased frequency of consumption per week. As shown in Figure 8, most of the respondents ate regularly at home and occasionally at restaurants.

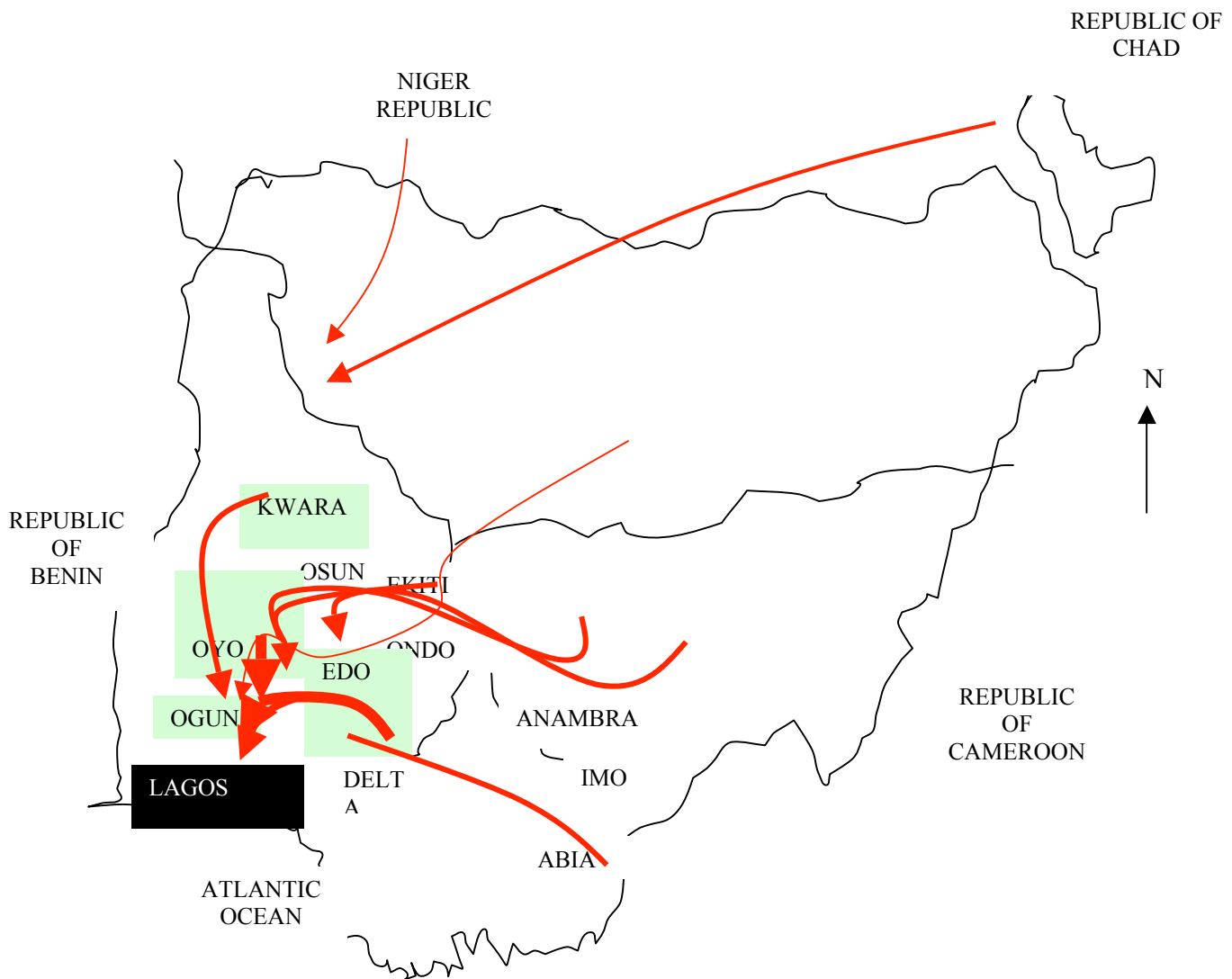


Figure 5 Migration Map of Nigeria showing the States of origin and main routes of most migrants in Lagos



Transition States



Lagos – The place of destination

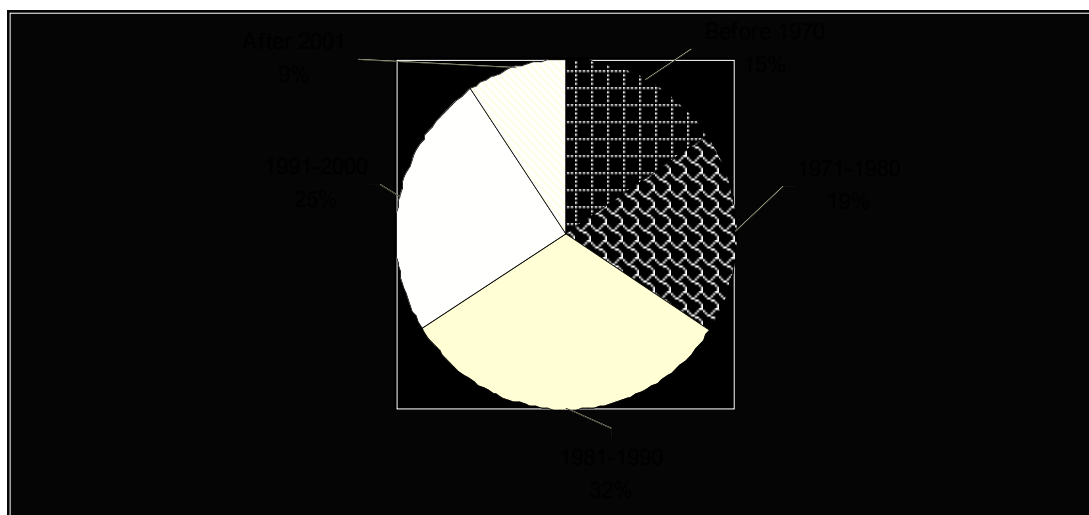


Figure 6. Distribution of respondents by the period of migration to Lagos

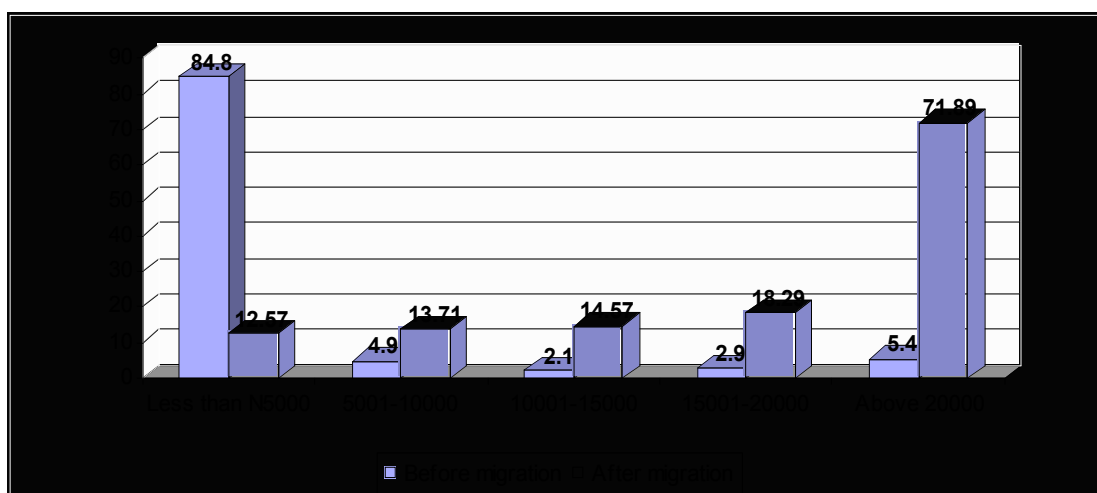


Figure 7 Migrants' income levels before and after migration to Lagos by Income brackets

About 64% of the respondents did not want to return to their places of origin (Figure 9) and (73%) were not even considering moving to another town (Figure 10). In fact, most of them (72.8%) claimed that nothing would make them leave Lagos (Figure 11).

Table 1. Major occupation s of respondents before and after migration

Occupation	Before migration	%	after migration	%
Student	125	36	14	4
Unemployed	47	13.4	6	1.7
Farming	44	12.6	0	0
Trading	27	7.7	56	16
Teaching	26	7.4	55	15.7
Business	15	4.3	31	8.9
Civil service	11	3.2	47	13.4
Apprentice	7	2	5	1.4
Others	48	13.4	136	38.8
	350	100	350	99.9

Note: Others were those occupations that did not feature much before migration but had less than 3 respondents after migration

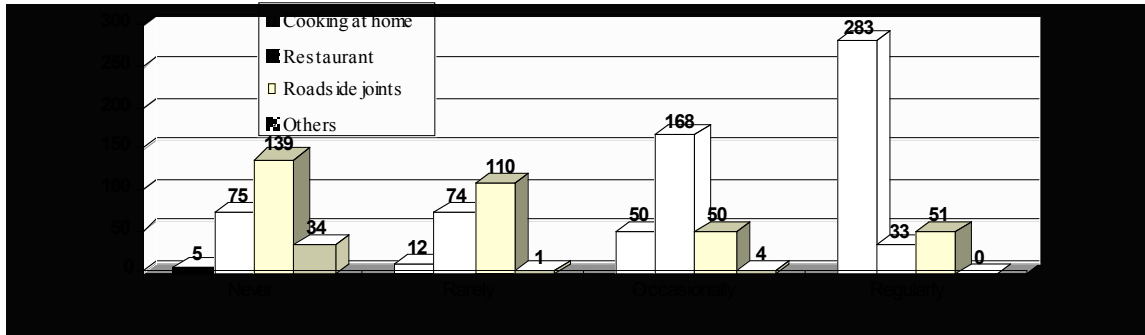


Figure 8. Migrants' normal eating patterns in Lagos

Table 2 Consumption level (kg/month) and frequency of consumption by respondents before and after migration

Item	Average Quantity consumed (kg/month)		No. of times taken per week	
			Places of origin	Lagos
	Places of origin	Lagos		
Rice	10.0	16.5	3	5
Garri	19.0	16.0	5	5
Beans	10.1	11.9	3	4
Cocoyam	4.2	1.8	1	1
Beef	7.7	11.0	5	4
Pork	1.2	2.0	1	0
Chicken	2.8	4.9	3	2
Fish	7.5	9.9	5	5
Eggs	1.4	3.0	2	3
Groundnut oil	1.6	3.0	3	4
Milk (lts.)	0.9	3.2	3	3
Bread	3.0	7.1	3	4
Salt/spices	0.8	2.9	7	8
Electricity (₦)	214.5	550.65	5	14
Water (lts)	869.0	1,108.9	5	6
Rent on Housing (₦)	1,252.55	8,995.31	5	26
Transportation(₦)	264.63	1702.33	4	5

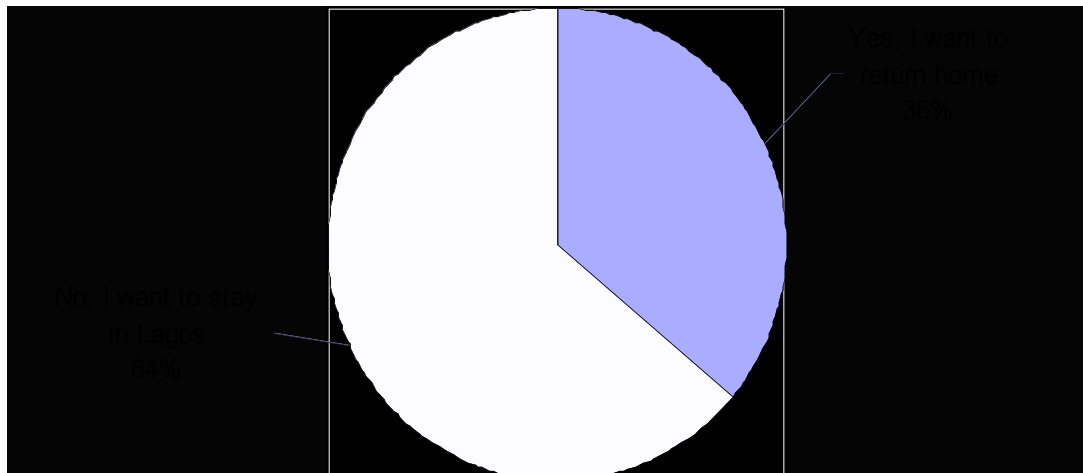


Figure 9 Proportion of respondents who felt like returning to their places of origin

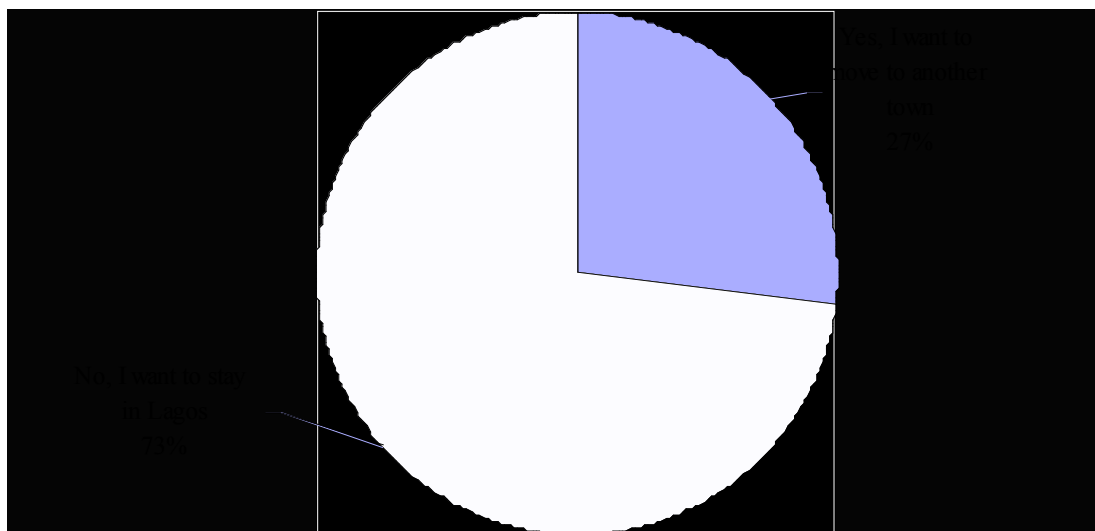


Figure 10 Proportion of respondents who felt like moving to another town

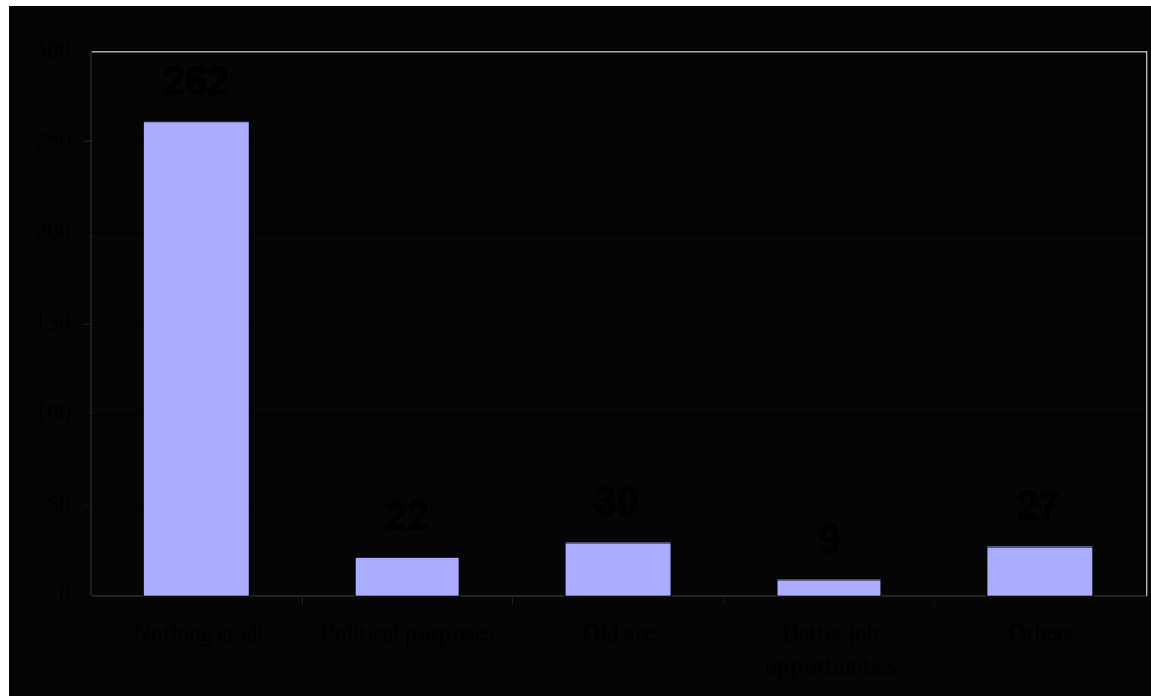


Figure 11 Factors that respondents' felt would make them return to their places of origin

Effects of rural-urban migration on sustainable livelihoods of urban settlers

Rural-urban migration in Nigeria has been known to provide labour (often cheap labour) to places of destination, including serving as house-helpers, daily paid casual labourers at construction sites and even as prostitutes. Migrants also pay taxes to the local government areas in which they live and work voluntarily or by force. Migrants pay rents to their landlords thereby contributing to the revenue of the area, which are further used for some development purposes.

Perhaps the other very important effort of migration is that of mutual cultural diffusion which takes place between the migrants and their hosts. In Nigeria, it has been observed that the migrants (particularly women and children) learn the language of their host locality to enhance survival and acceptability. On the other hand, in many parts of the cocoa belt; the local Yoruba women have adopted the migrants' (Ibo, Isoko and Urobo) styles of dressing. The migrants have introduced new religious sects, which have gained adherents from among their hosts. In some cases, the migrants have also adopted the preparation for sale and consumption of some food items of their host culture while at the

same time introducing some crops (particularly some variety of leafy vegetables used for the preparation of soup) to their hosts. However, despite these, the migrants usually have their separate sections where they sell some of the food items specially demanded by people from their own home area. These items are also usually supplied or obtained directly from their areas of origin.

The possible negative effect of migration on urban areas includes the strains it puts on existing urban services such as water supply, transportation, health facilities and general sanitation, housing and employment opportunities. Native-born urbanities may be eased out of jobs, as migrants are often willing to take on any job at relatively lower wages than these urbanities.

Development and Environmental Issues: A Remote Sensing and GIS Approach

Given the high rate of rural-urban migration to Lagos, it has turned to one of the world's fastest growing metropolitan areas in terms of population. UN projections on Lagos population even had to be adjusted upwards from 4.5million in 1980 to 13.5million in 1996, despite the fact that many of the world's Less Developing Countries' (LDCs) cities' population projections had to be scaled down in the face of operating realities. The population growth has been accompanied by a large urban sprawl despite the physical barriers of wetlands and \water around the metropolis. A major characteristic of the urban sprawl is the highly uncoordinated fashion of its growth as more people migrate to and settle in Lagos in a random and unplanned manner.

This uncoordinated growth has consequently resulted into: a mosaic of shanties/ blighted areas in many older areas of the city; a mosaic of disjointed, badly serviced areas in terms of urban infrastructures such as roads, schools, health centres, electricity, water, etc. It appears that Lagos parades the highest number of uncompleted buildings among major cities in the world today which in many cases serve as places of abode to the migrants and hoodlums. Of greater importance is the high rate of the urban sprawl, the massive cases of property encroachment and unplanned changes to other land use types in the City. This massive sprawl will continue to be difficult to understand given its incremental occurrence unless it is weighed along with the rate of immigration to the city and the need for an understanding of productive environmental sustainability in Lagos.

Data from satellite imageries have been used in this section to illustrate the rates at which such human induced changes have been occurring in Lagos and how they can serve as an input into the urban management decision making process. This section is an attempt at mapping the urban sprawl in the present Agege, Surulere, Ajeromi/Ifelodun and Eti-Osa LGAs from 1962 to 2000 to capture the LGAs covered and the bulk of the period migrants moved to Lagos. By this the study was able to assess the urban sprawl in the LGA's over a long period.

The study concentration is on four of the LGAs covered in the survey (Fig. 13). The choice of the LGAs was made to represent a typical population density profile in the city and the density of housing, in the low income areas (Agege and Ajeromi-Ifelodun), middle income areas of Surulere and high income areas of Eti-Osa LGA.

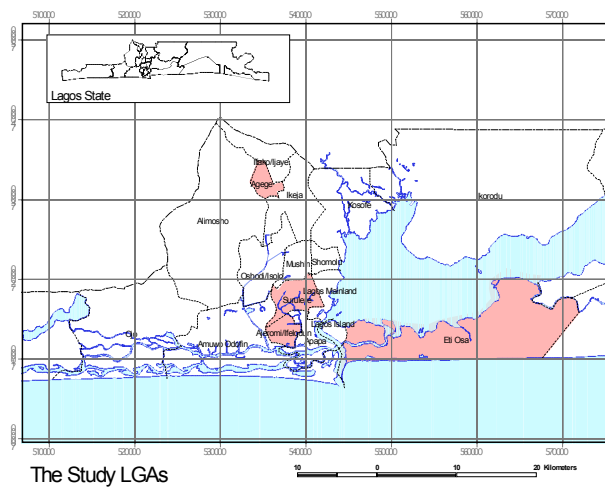


Figure 13. Lagos State (in set) and the Study LGAs

The projected population density for 2000 from 1991 census in the LGAs at 2.8% is given in table 3 below

Table 3. Projected population density (2000) in selected LGAs in Lagos

LGA	Area(Km ²)	Population Density 2000 (persons/km ²)
Agege	11.17	48,090
Surulere	22.95	25,889
Ajeromi/ Ifelodun	11.90	64,057
Eti-Osa	159.01	1,272

Methodology

- All map and image processing were done using Arc View 3.3 as well as the image and spatial analyst extensions
- The administrative area boundary polygons were digitized.
- 1962 data sets were scanned and geo-referenced to UTM Zone 31 Grid (Figures 14 and 15).
- The data equally served as the base map
- On-screen digitizing was made to extract all features (built up and non built up categories) within the LGA's of interest.
- The Landsat ETM data were geo-referenced using the scanned 1962 data and some current known points on the imagery. The multiple band data were pan sharpened and re-sampled to 15 metres The screen polygon extraction of the built up and non built up areas were also extracted from the image (Figures 16 and 17).
- All area calculations were done using Arc View software on LGA basis.
- In deriving the extent of the urban sprawl, the map products from 1962 and 2000 data sets were topographically overlaid to generate the areas and extent of change consequential to immigration to those parts of Lagos.

Results and discussion

Fig. 15 is the map sheet of the four LGAs covered in this exercise.

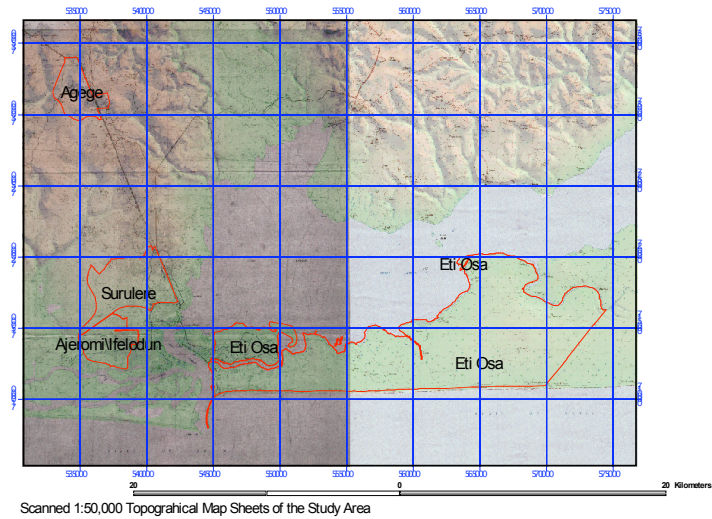


Figure 15. Scanned topographical Map Sheets of the Study LGAs

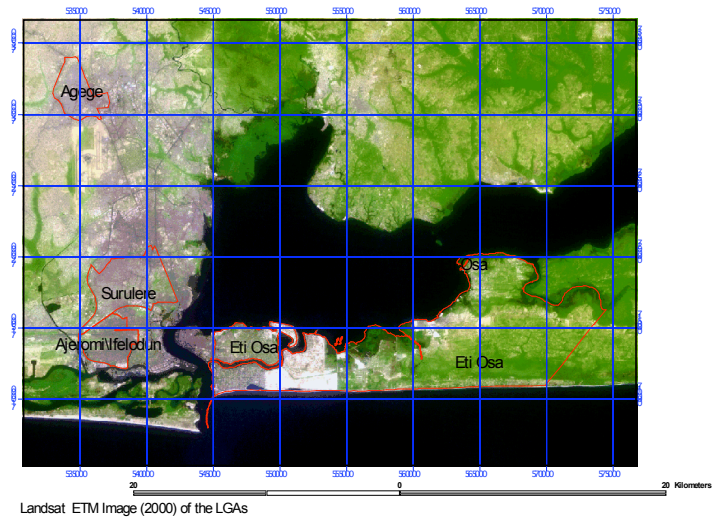


Figure 16. Landsat ETM Coverage of the LGAs

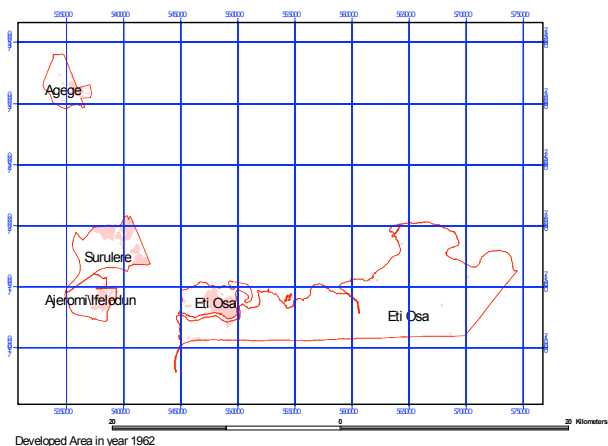


Figure 17. Developed Area in 1962

Table 4. Developed Areas in 1962

	Agege		Surulere		Ajeromi/Ifelodun		Eti-Osa	
	Ha	%	Ha	%	Ha	%	Ha	%
Developed	138.9	12.4	578.3	25.2	235.7	19.8	544.4	3.4
Undeveloped	978.4	87.6	1716.4	74.8	954.6	80.2	15357.3	96.6
TOTAL	1,117.3		2,294.7		1,190.3		15,901.7	

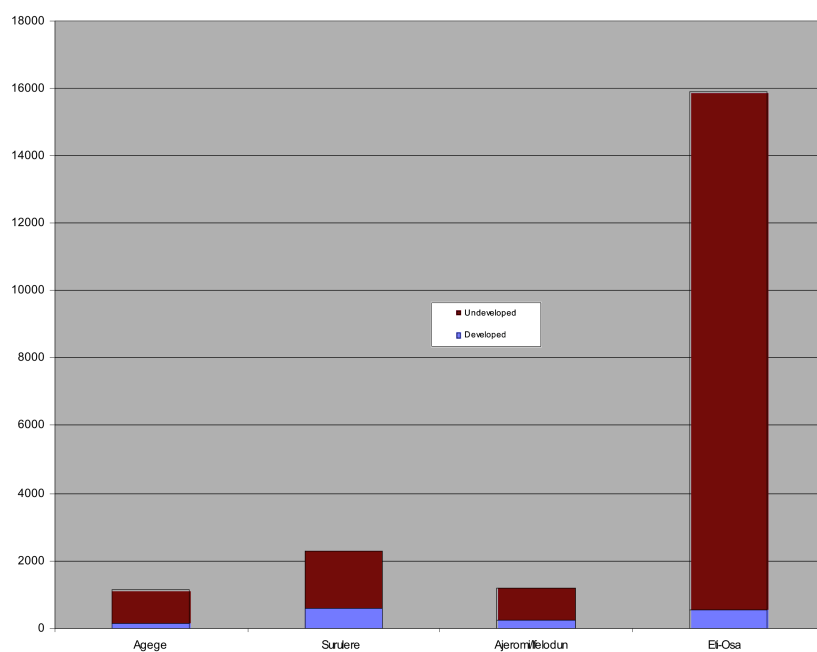


Figure 18. Developed and Undeveloped Areas in 1962 (ha)

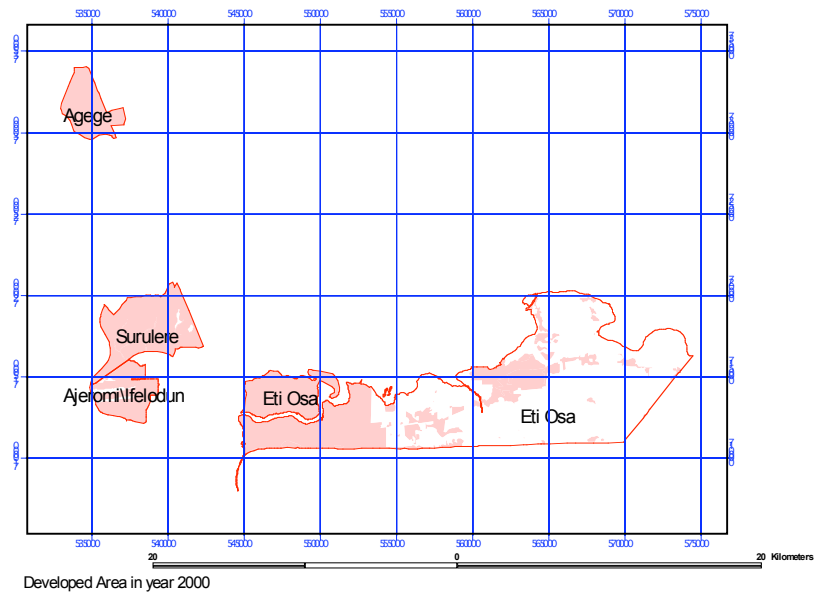


Figure 19. Developed Area in 2000

Table 5. Developed Areas in 2000

	Agege		Surulere		Ajeromi/Ifelodun		Eti-Osa	
	Ha	%	Ha	%	Ha	%	Ha	%
Developed	1,117.3	100.0	2,223.5	96.9	1086.6	91.3	5123.6	32.2
Undeveloped	0.0	0.0	71.2	3.1	103.7	8.7	10778.1	67.8
TOTAL	1,117.3		2,294.7		1,190.3		15,901.7	

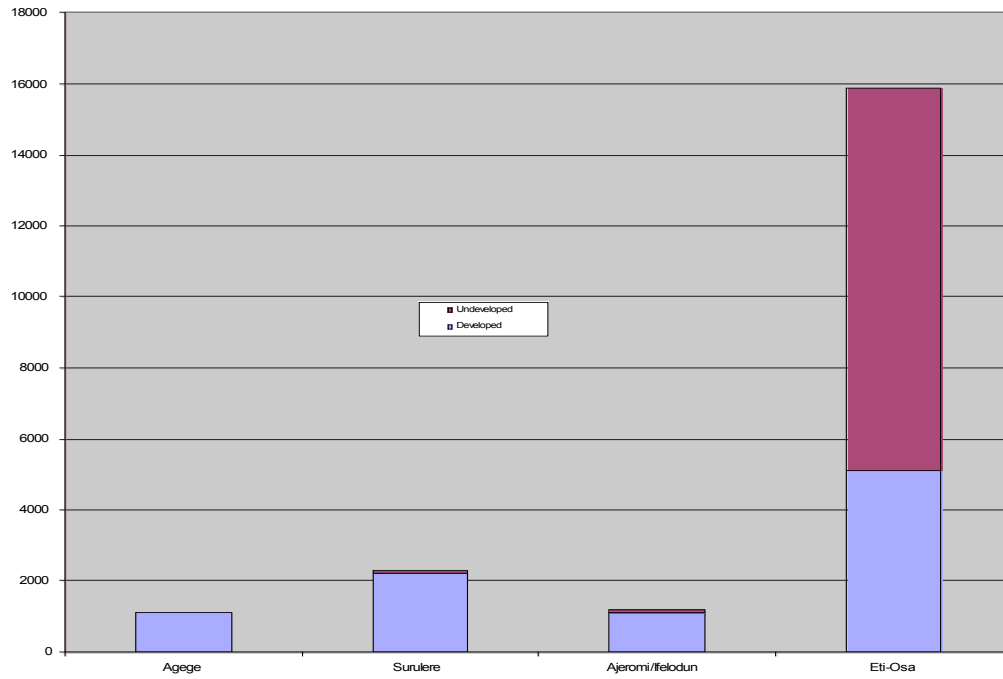


Figure 20. Developed and Undeveloped Areas (ha) in 2000

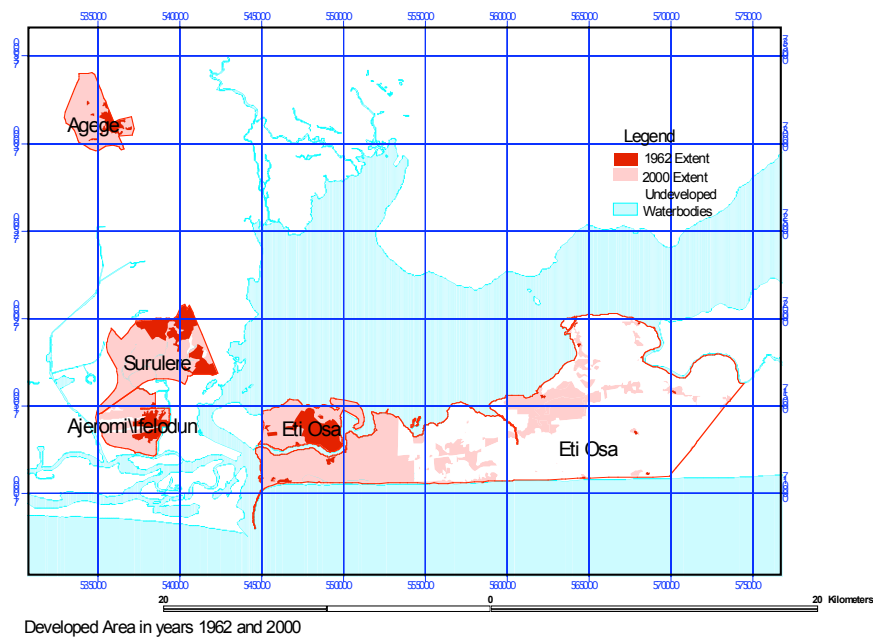


Figure 21. Developed Areas in 1962 and 2000 Compared

Environmental Issues

As shown in Figure 22, about 62% of the respondents observed several dump sites in their areas of abode while 38% did not. This division was along the lines of relative income disparity of different locations from which the respondents were drawn. Even so, 51% of the respondents opined that there has been an increase in the number of dumpsites in their areas of abode in the last one year which may be attributable to increases in the number of people living in the area (Table 6). Even though, about 8 % of the respondents' claimed that the dump sites in their areas of abode were never evacuated (Table 7), almost 46% said that they made private arrangements to evacuate the dumps in their areas. The fact that over 27% of the respondents recognized and mentioned government as being responsible for evacuating waste dumps in their areas suggest that some public funds are committed to handling solid waste in Lagos which had not yielded much but needed to be intensified.

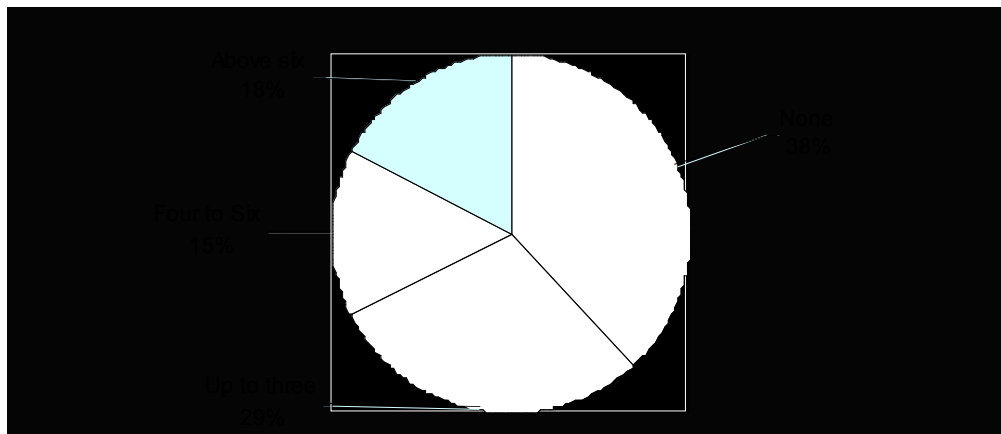


Figure 22. Number of waste dump sites, respondents observed in their areas of abode in Lagos

Table 6 Reasons adduced for increases in the number of dumpsites in their areas of abode

Reason	Frequency	Percent
Care free attitude of people	22	6.3
Increase in number of people	144	41.1
Lack of government action	40	11.4
Don't Know	144	41.1
Total	350	100

Table 7 Methods of evacuation of waste dumps in respondents' areas of residence

Method	Frequency	Percent
Burning	3	0.9
By run off water	13	3.7
By the State government	29	8.3
By the Local government	67	19.1
By community effort	49	14.0
Not evacuated at all	29	8.3
Private	160	45.7
Total	350	100

Housing

A large proportion of the respondents (42%) in Lagos lived in buildings with rooms facing each other often called in Nigeria as “face-me-I-face you houses” and flats (34%) as shown in Figure 22. Even though most of the respondents (50%) felt that in terms of general aesthetics, Lagos of 2003 was better than 1995, they were not happy about the state of decadence and poor maintenance of the environment e.g. poor drainage facilities (gutters), refuse dump sites, pervading smell, etc which often led to floods and bad roads (Table 6).

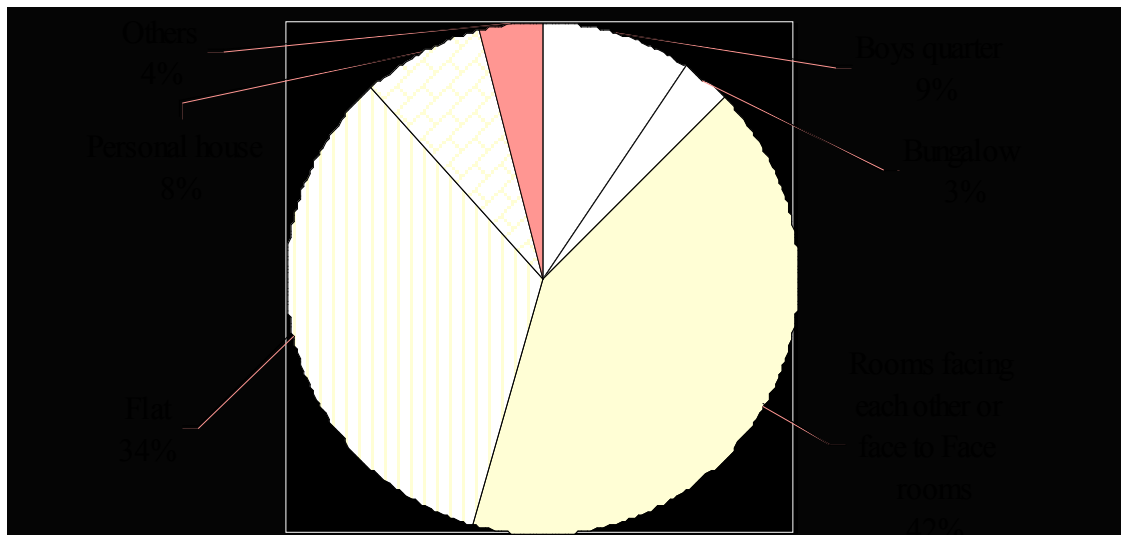


Figure 22. Types of housing those migrants live in Lagos

Table 8 Perception of environmental problems in Lagos between 1995 and 2003 given the influx of migrants (N = 350)

	General aesthetics	Gutters	Smell
1995 better than 2003	38.0	42.0	41.7
2003 better than 1995	50.0	48.3	41.7
There is no difference	10.6	8.3	15.1
No response	1.4	1.4	1.8

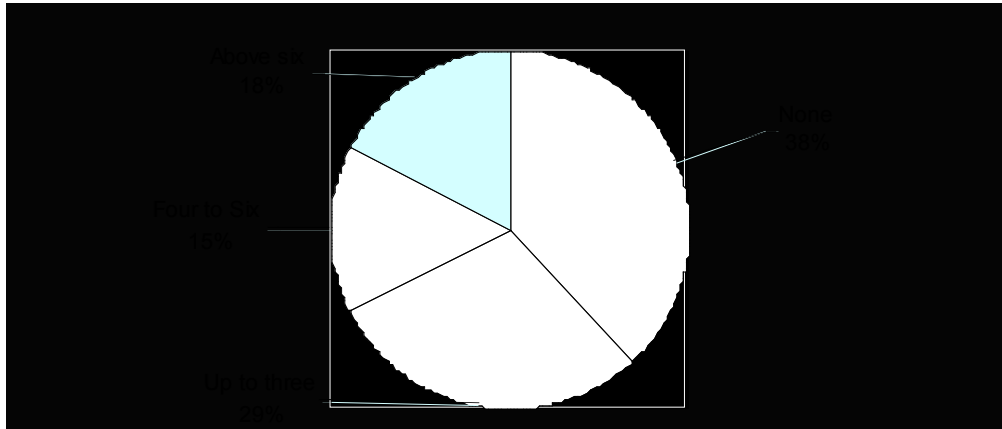


Figure 23. Number of waste dump sites, respondents observed in their areas of abode in Lagos

Table 9 Reasons adduced for increases in the number of dumpsites in their areas of abode

Reason	Frequency	Percent
Care free attitude of people	22	6.3
Increase in number of people	144	41.1
Lack of government action	40	11.4
Don't Know	144	41.1
Total	350	100

Traffic Situation

The traffic situation in Lagos is nothing but hectic. The roads are only good for those the Federal government maintain and fairly good for those the state control. The poorest are basically those expected to be maintained by the third tier of government, the Local government. Typically the heavy traffic causes disturbances and heavy pollution mainly because of the old and rickety vehicles with inefficient combustion systems. Similarly, the road side traders add more to the ugly situation mainly because of inadequate marketing facilities. It is a general picture to see so many markets almost covering 50% of the roads. The picture below shows the level of poor traffic situation in Lagos with heavy mass movement by rickety vehicles. The exhaust pipes of these vehicles discharge carbon monoxide, and heavy metals such as lead, iron, cadmium and Zinc. In the midst of

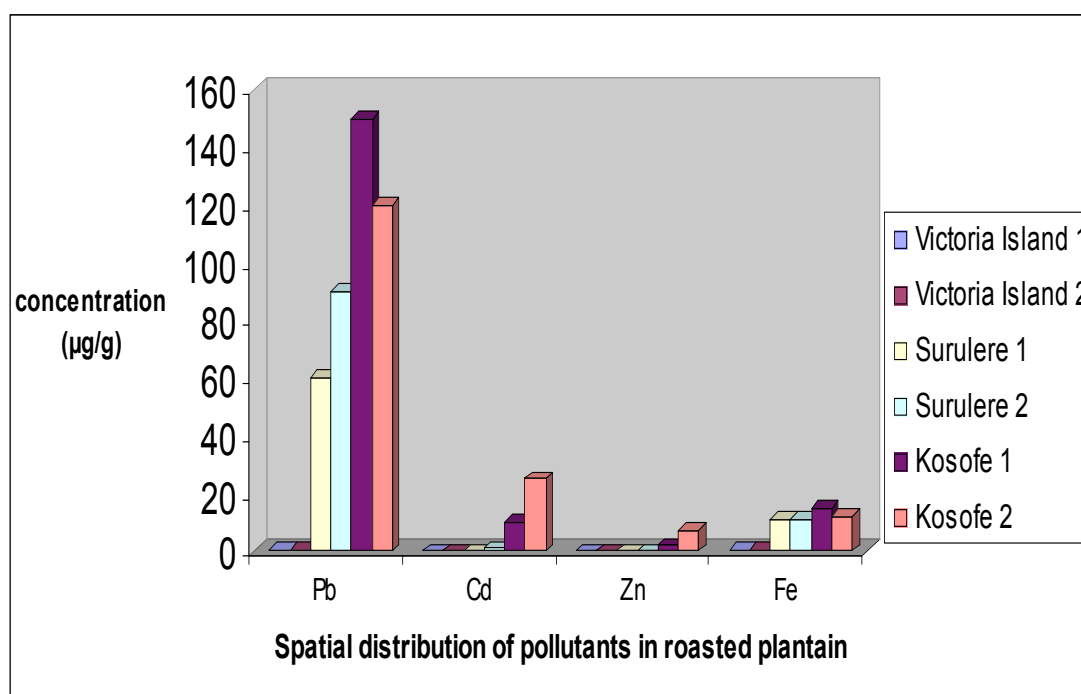
these terrible traffic situations are many street food sellers which are exposed to fumes and dust. Commonest among these street foods are roasted corn, roasted plantain, gala, roasted yam sausage rolls and meat pies. These are of high demand particularly by the low and middle income earners.

Health Issues

Samples of street foods and domestic water were analysed. The study revealed that street foods in Kosofe L.G had the highest level of contaminants such as Lead (Pb), Cadmium (Cd), Zinc (Zn) and Iron (Fe). The lowest value was in Eti-Osa LGA.

The trend of heavy metals' levels which are prominent chemical pollutants is presented in figure 10. Samples from Kosofe LGA (a low income, high density and high traffic area) had the highest levels of various categories of contaminants while samples from Eti-Osa LGA (a relatively high income, low density and low traffic area) had the least. Lead levels ranged between 0.2 – 120 µg/g with the highest value observed at the low income, high population density and high traffic area. Cadmium, Zinc and iron levels also followed a similar trend, they ranged between 0.8 – 25 µg/g, 2.0 -7.0 µg/g and 0.3 – 15.0µg/g respectively. That is, the highest pollutant levels were observed at the low income, high density and high traffic density areas followed by the medium while the high income, low population density; low traffic density area had the least form of pollution. This work is consistent with the findings of Adekunle and Akinyemi (2004) who reported elevated levels of lead in street vended smoked fish in a Nigerian market. Also Bamgbose, et al (2001), reported similar observation in Abeokuta domestic water. They established vehicular emissions as a major source of pollution of the samples investigated. There appears to be a strong positive correlation (Correlation coefficient = + 0.798 and +0.628) between pollutants concentration, traffic density as well as population of inhabitants.





In all the sample sites, the aerobic mesophilic organisms, mould and *staphylococcus aureus* were present in all the samples (Table 11). The aerobic mesophilic organisms ranged between 680 CFU/g in V1 – 3 to 752 CFU/g in Ko – 3. The trend of microbiological contamination is similar to those of chemical pollution in the sample locations. Mould ranged between 40 cfu/g in V1 – 1 to 62 CFU/g in Ko – 1. *Staphylococcus aureus* occurrence was highest for Ko – 3 while no growth was observed for VI – 1 and VI-3. Results of the microbiological analysis is in line with the work of Garin *et al* (2002) who reported the presence of pathogens in ready to eat foods such as sandwiches, ice creams sold in streets ; some of the contaminants identified include E.coli, *Staphylococcus aureus*, *Salmonella* spp, amongst others.

The WHO guideline limits for drinking water quality are 0.001mg/L, 0.005mg/L, 5.0mg/L and 0.3mg/L for Lead, Cadmium, Zinc and Iron respectively. In all the sample sites, the aerobic mesophilic organisms, mould and *staphylococcus aureus* were present in all the samples (Table 2). The aerobic mesophilic organisms ranged between 680 CFU/g in V1 – 3 to 752 CFU/g in Ko – 3. Similarly, mould ranged between 40 cfu/g in V1 – 1 to 62 CFU/g in Ko – 1. *Staphylococcus aureus* occurrence was highest for Ko – 3 while no growth was observed for VI – 1 and VI-3.

Table 10

EFFECTS OF ENVIRONMENTAL POLLUTION ON STREET FOODS QUALITY IN LAGOS

Some pollutant levels in Street Foods of Lagos

Pollutant	Low Income	Mid. Income	High Income	WHO Limit
Lead µg/g	150.0	75	0.2	0.001
Iron µg/g	15.0	10.9	0.4	0.3
Zinc	4.5	0	0	Nil
Bacteria Isolated	<i>Staphylococcus aureaus</i>	<i>S. aureaus , Proteus spp</i>	<i>Proteus spp</i>	Nil
Moulds	60	55	45	Nil
Cadmium	14	11	0	Nil
Aerobic Mesophylic Organisms	752	717	690	Nil

Table 11

Pollutant levels in Domestic Water Samples

Pollutant s	Low Income Local Govt Area (LGA)	Mid.Income LGA	High Income LGA	WHO Limit
Lead mg/L	0.53	0.39	0.39	0.001
Iron mg/L	0.45	0.23	0.18	0.3
Nitrate mg/ L	4.47	4.87	4.29	0.1
Aerobic Mesophylic Organisms	46	40	21	Nil
E-Coli	10	6	0	Zero
Coliform MPN/100ml	28	9	0	Zero

Policy Implications and Prescriptive Measures

The study has demonstrated that there are significant relationships between migration and urban expansion as they both impact negatively on the health and the environmental stability of Lagos. Whereas urban population growth alone can increase the problems of undeveloped infrastructures in Lagos, the addition to already large urban population from migration which is at a very high rate like in Lagos, makes a rapid worsening of the already poor state of Lagos people's health and the environment. The issues can be viewed from three perspectives. Firstly, the State government needs to review the existing housing policy as it affects the private sector not properly registering their plots before building and the government's conception, funding, construction methodologies, maintenance, lease or outright purchase and ownership patterns. The present situation does not permit effective monitoring and appropriate command and control measure. Also, sustainable measures need to be put in place to ensure a regenerative approach for housing development in urban areas in a manner that would provide opportunity for a long term revolving housing loan facility.

The second issue is the need for collaboration between the State and Local governments on one hand and the private sector, communities and companies alike, on the other. Such collaboration will permit having an idea of the possible number of people/migrants entering an area. Such would reveal the needs of the population and how possibly the people can be involved in the funding and management of their infrastructural needs. The statistical arms of the government will need to be further beefed up to be able to cope with this. Satellite towns should be developed round the peripheries of major Cities in a manner that will provide some levels of protection to urban areas.

The third step is all embracing in that the influx of people from various sections of the country would suggest that the problem is a national one. Hence the other States of the Federation need to take active role through the development of their major towns in terms of infrastructures and employment opportunities. These are the core reasons for migrating to Lagos. The transited towns are eminently qualified to reduce the high influx of migrants to Lagos and therefore should be developed systematically to serve as a sieve and a thin tube for attraction to Lagos. The level of environmental degradation is becoming so monumental that this state of development should attract a national conscience for joint action. Just as the Niger Delta is receiving a loud cry from many stakeholders, Lagos should be so scored and perhaps because of the high population involved be treated a high level of preference.

Lastly, there is the need to mount at various levels capacity building programmes that will engender the funding of environmental management activities in each Local Government Area and at the State level. Such training programmes should be participatory and grassroots in nature for sustainability. The owners of truck waste carriers or the refuse collectors and other stakeholders need to be trained on ways of evacuating and disposing the refuse rather than the current manner whereby they only disperse the refuse collected. A bottom top approach for the solution of this situation will go a long way in Africa.

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