

AN ASSESSMENT OF URBAN GROWTH AND PATTERN OF URBANISATION IN KOGI EAST, NIGERIA

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Abstract

The study examined emerging form and pattern of urbanization in Kogi East, Nigeria. Both geospatial data and questionnaire were used to gather data for the study. Across the Ankpa, Anyigba and Idah and hinterland communities, 1408 questionnaire copies were administered. Land-sat imageries of Ankpa, Anyigba and Idah were acquired for two different epochs, 2001 and 2013 with the aid of Landsat Gapfill Tool, while ArcGIS 10.1 and Idrisi Selva were used to estimate area extent of change for 12 years. Questionnaire data was analysed using tables and simple percentages. Result obtained revealed that the three locations experienced urbanisation which was shown in their area extent with Ankpa recording the highest rate of urban growth of 191.8%, closely followed by Anyigba with 163.2%, while Idah recorded the lowest growth rate in 12 years of 94.4%. The order of growth of Ankpa, Anyigba and Idah was more towards the northern, eastern and western axes. The results further showed that with increasing urbanization, the three locations were becoming nucleated occasioned by the in-filling of previously, open spaces left undeveloped as the town grew onward or evolve over the time period.

Key Words: *Urban growth, Push and pull factors, Emerging urban forms, Kogi East*

Introduction

Urbanisation is increasingly recognised as one of the defining phenomena of the twenty-first century. It is indeed a global phenomenon which is at present sweeping through developing countries like a wild fire (Ejaro and Abdullahi, 2013; Opoko and Oluwatayo, 2014). Over half of the world's population now live in towns and cities and it is projected to rise to 75% by 2050 (United Nations Population Division, 2014), with the largest part of this urban growth concentrated in Africa and Asia

(Opoko and Oluwatayo, 2014; Awumbila, 2017). As a result of the magnitude and speed of urbanisation in Africa and Asia, many governments appear overwhelmed and unable to cope with its challenges. Urbanisation is the process in which the number of people living in cities increases compared with the number of people living in the rural areas (Abalaka, 2015). A country is considered to be urbanised when over 50% of its population lives in urban places (Population Reference Bureau, 2009).

Today urbanization is occurring at a very fast rate in developing countries of the world which has promoted urbanization of poverty which in itself is posing a challenge to traditional urban planning and environment management (Opoko and Oluwatayo, 2014; van Neuss, 2015; Abalaka, 2015). Modern urban planning emerged in Europe as a response to industrialization and the resultant urban growths (Hague, 2008; Abalaka, 2015). Urbanization is fast occurring in developing countries especially those in Africa and Asia (United Nations, 2004; Boudreaux, 2008). Migration has often played an essential role in the livelihood and development strategies of both rural and urban populations in Africa (Awumbila, 2017). Unlike the Western European experience, urbanization in Africa is caused by migrants going into urban areas in search of economic opportunity such unprecedented urbanization has resulted in the emergence of many megacities in many regions of the world (Boudreaux, 2008; Awumbila, 2017).

In Africa and other developing countries on the other hand, both migration and natural increase were the main cause of urbanization and migration is attributed to rural-push (Abalaka, 2015; Oke *et al.*, 2017). The rate of urbanization is also rapid. Nigeria's population mostly her urban has increased speedily over the past 50 years and it will continue to grow comparatively fast in the coming decades. The current urban rate of population increase in Nigeria is around 50 percent with an overall population estimated at 170 million; this value is expected to double in the next 30 years (Bloch *et al.*, 2015). Nigeria's urban population growth in both absolute and

relative terms has been accompanied by the expansion of existing built-up areas and the emergence of new and identifiably 'urban' settlements (Bloch *et al.*, 2015).

The urbanisation in Kogi State like most other states in Nigeria is a consequence of the "push" of the rural areas and the "pull" of the town. The majority of Nigerian urban centres developed and continues to develop as commercial – administrative and servicing entities. In Kogi like in most other states, the growth of the tertiary sector is often a symptom of poverty and stagnation rather than economic development (Abalaka, 2015). Consequently, urbanisation in most of the States in Nigeria is characterized by a growing gap between employment opportunities and demand, and an over increasing shortage of urban services and facilities which are accessible to a diminishing share of urban population. The implication is this deplorable and alarming situation which aggravates the already acute housing and transportation problems (Abalaka, 2015). The contributory effects of urbanisation on urban growth have received the attention of scholars. Studies have been carried out to examine the drivers (trends and issues) of migration and urbanisation in Africa (Oucho, 1998; Adesina, 2007; Hague, 2008; Awumbila, 2017; Oke *et al.*, 2017). These studies are basically descriptive in nature without empirically assessing the rate of urban growth, form and pattern associated with urbanisation. The effects of urbanisation on urban growth have also been studied (Tiwari *et al.*, 2012; Oyinloye, 2013; Ejaro and Abdullahi, 2013; Ukoje, 2016; Tokula and Ejaro, 2017). These studies were only concerned about the area extent (urban

expansion) of different locations in relation to increasing urbanisation. Efforts to examine the emerging form and pattern associated with increasing urbanisation were not looked into. Studies have also been carried out to examine urbanisation trends and how it affects housing delivery, socioeconomic and infrastructural and development (Otto, 2008; Opoko and Oluwatayo, 2014; Aliyu and Amadu, 2017). These studies among several others only examined the positive and negative implications of urbanisation without assessing the form and pattern of urbanisation over time. It is against this foregoing discussion that the present study is carried out. The present study examined the urban growth, emerging form and pattern of urbanisation in Kogi East, Nigeria using both geospatial data and questionnaire.

Materials and Methods

Study Area

The study area is Kogi East which is located between Longitudes 6°35'16" and 7°53'58"E and between Latitudes 6°28'4" and 8°06'07"N (Fig.1). Kogi East is located in the derived and southern Guinea savanna zones of Nigeria (Adegbola and Onayinka, 1976). The area has a tropical savanna climate. The area has an annual rainfall of between 1,100mm and 1,300mm. The vegetation consist essentially of short to tall grasses, trees of various sizes and height with shrubs, high forest and hills dominated by rubber trees. Agriculture is the most significant economic activity in Kogi East (Ukwedeh, 2003). The KGSMBP (2004) reported that about 80% of the population is farmers, engaging mostly in subsistence farming with over 65% of these farmers being women and children. Food and cash crops which include; yams, cassava, guinea corn, maize, millet, beans, and palm produce: kernels and oils are cultivated extensively in the area.

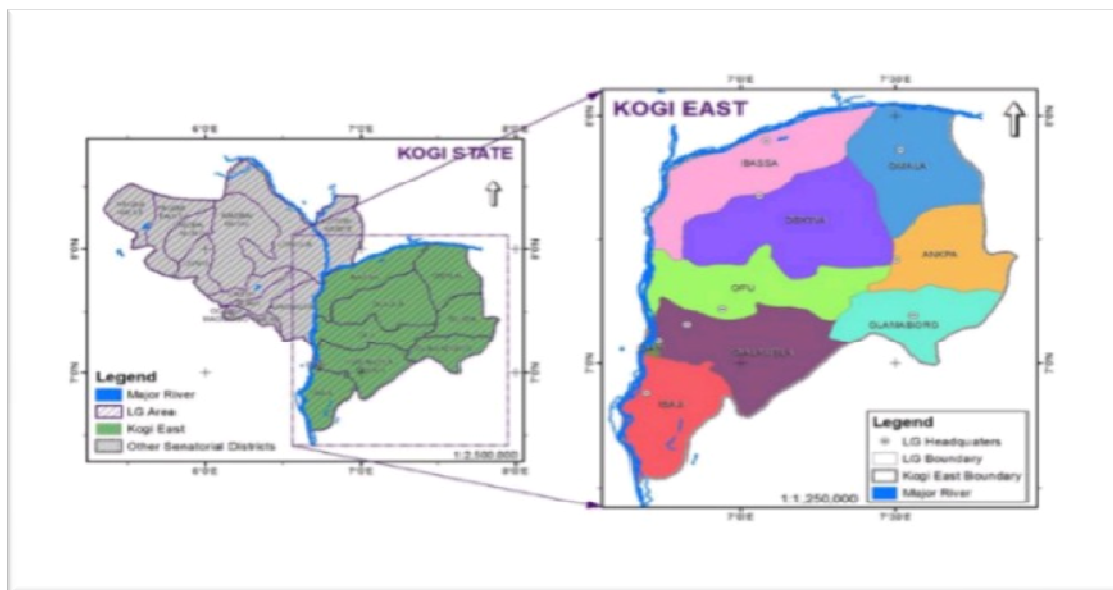


Fig. 1: Kogi State showing Kogi East LGAs

GIS Data Types and Sources

The main dataset used for the Land use/cover analyses was the Landsat ETM. Two epochs of the same satellite imageries were used to derive the land use/cover for an earlier and a later date. The dates chosen were 2001 and 2013. This represented a 12-year interval, this duration was chosen because it was expected that very obvious and discernible changes within the remits of the medium resolution of Landsat ETM would have taken place. Furthermore, these dates were chosen in order to clearly see the extent of change caused by urban growth in the study area triggered with the establishment of educational institutions and other administrative activities that pushed people to the area. The main software used for the Land use/cover analysis was the Landsat Gapfill Tool, the ArcGIS desktop 10.1 and the Idrisi Selva. Other software used was the Microsoft Word 2010 and the Microsoft Excel 2010. The ArcGIS 10.1 software was used to render the cartographic outputs as well as extract relevant quantitative (statistical) parameters, while the Idrisi Selva was the actual software for the land Use/Cover classification as well as the post classification comparison completed. It is noteworthy that the Idrisi software has limitations with regards to cartographic outputs and the extraction of relevant statistics hence the need for its synergy with the ArcGIS. In this connection, a handheld GPS receiver, a personal computer and a printer were used.

Sources of Data for Processes and Pattern of Urbanization

A well designed questionnaire was used to collect data on urbanisation pattern.

Sampling Technique

Multi-stage sampling was carried out involving three stages. In the first stage, stratified sampling technique was used to divide Kogi East senatorial district into three zones: Kogi-East North, Kogi-East Central and Kogi-East South. Out of the 25 settlements identified during the pilot survey, only three (3) settlements were found to witness significant changes in population size, land cover between 2001 and 2013. In the second stage, sampling of hinterland settlements, that is, villages and hamlets located within the metropolitan region of Idah, Anyigba and Ankpa within 15km radius of these settlements were carried out in this research. To aid the sampling process, the selected study locations viz- Idah, Anyigba and Ankpa and their surrounding hinterlands were zoned into four sections viz North-East, South-East, South-West and North-West. In each of the four sections or zones within Idah, Anyigba and Ankpa metropolitan regions, 2-3 settlements NE, SE, SW and NW were randomly selected based on built up area, population size and distance for investigation of the push-pull factors, patterns, effects and problems of urbanization. Thus in Idah, Anyigba and Ankpa (8 hinterland settlements) were sampled for investigation in the course of this study.

Thirdly, sampling of respondents in the three urbanizing settlements and 24 hinterland settlements study locations was done through a two stage process. In the three fast urbanizing settlements, respondents were selected through a combination of multi-stage random and systematic sampling techniques. On this basis, 2 or 3 residential neighbourhoods were selected from inner core and urban fringe zones, making a total of 4-6

neighbourhoods for each urbanizing area. In the same vein, 3 streets in each residential neighbourhood were randomly selected for the study based on road hierarchy, length and land use intensity for the selection of buildings for the study. Finally respondents were selected from buildings using systematic sampling techniques at a sampling interval of 7 buildings along the three major/minor streets earlier identified for sampling. In

each of the 24 hinterland settlements, 10 questionnaire copies were administered making a total of 240 questionnaire copies.

Sample Size

In order to determine the number of respondents for the survey, the Yaro Yamane formulae of (1964) cited by Anatsui and Fagbemi (2014) was adopted. The Yaro Yamane formula is expressed below:

$$n = \frac{N}{1+N(e)^2}$$

Where N = Population of study location(s)

n = Sample size

e = Sample error (taken at 0.05 at 95% (confidence level)

Applying the formulae, the sample size of the study locations are computed as follows;

$$\text{Idah} = \frac{75,789}{1+75,789(0.05)^2} = 399.9 = 400$$

$$\text{Anyigba} = \frac{48,240}{1+48,240(0.05)^2} = 399.17$$

$$\text{Ankpa} = \frac{68,046}{1+68,046(0.05)^2} = 400$$

This gives a total of 1,199.17 (Approximately= 1,200) respondents plus 240 respondents that were sampled in the various hinterland settlements giving a grand total of 1440 respondents.

Method of Data Analysis

Two methods of data analysis were performed. First, the Land Use Change Modeler (LCM) of the Idrisi Selva was used to perform the Post-Classification comparison of the study. The modeler shows the absolute change from one LU/C class to another including classes that have remained unchanged across the

two study epochs. Secondly, mapping, derivation of statistics and graphing were carried out. The output of this analysis was presented in three levels of increasing details. Data obtained from the administered questionnaire was analysed with the aids of tables, bar and pie-charts as well as simple percentages.

Results and Discussion

Percentage Growth of Ankpa, Anyigba and Idah

Table 1 gives vital information on the percentage growth or extent of urbanization in Ankpa, Anyigba and Idah for 12 years (2001 to 2013). It showed that in 2001, the area extent of Ankpa was 400232.7sq.m, this value increased by 191.8% to 1167790.4sq.m in 2013. For Anyigba, its area extent in 2001 was 3559019.6sq.m and in 2013, it increased by 163.2% to 9367695.4sq.m. The result for Idah showed that in 2001, the area extent was 4509563.9sq.m and in 2013,

this value increased by 94.5% to 8760352.9sq.m. The results in Table 1 simply suggest that the three locations have experienced urbanisation which is shown in their area extent. It also shows that among the three locations, Ankpa recorded the highest rate of urbanisation which is portrayed in its growth rate of 191.8%, this was closely followed by Anyigba with 163.2%, while Idah recorded the lowest growth rate in 12 years of 94.4%. The area extent or growth pattern of the three locations is confirmed by the satellite images in Figures 2 to 4.

Table 1: Percentage growth (from 2001 – 2013) of Ankpa, Anyigba and Idah

Locations	2001 (sqM)	2013 (sqM)	(2013 - 2001)sqM	Growth (%)
Ankpa	400232.7131	1167790.401	767557.6882	191.8%
Anyigba	3559019.558	9367695.392	5808675.834	163.2%
Idah	4509563.862	8760352.924	4250789.061	94.3%

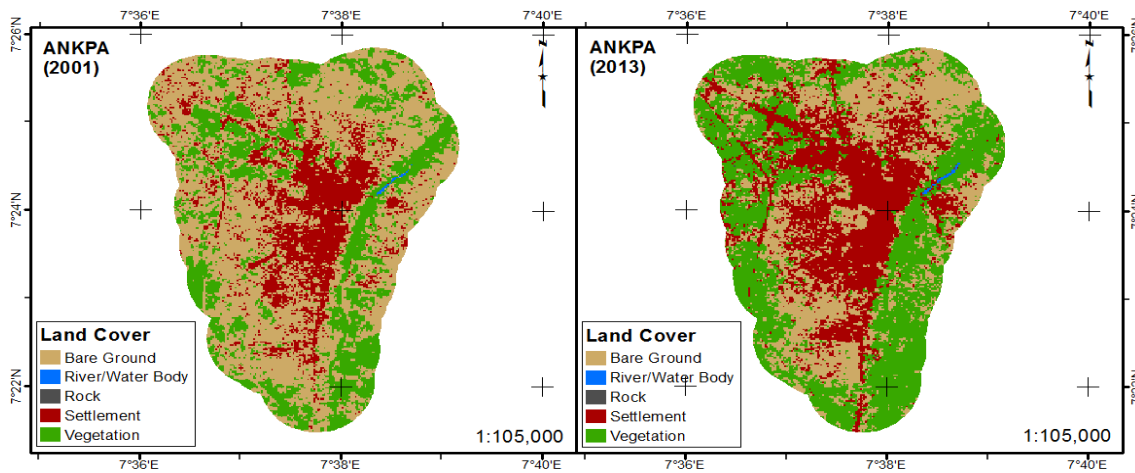


Fig. 2: Growth pattern of Ankpa from 2001- 2013

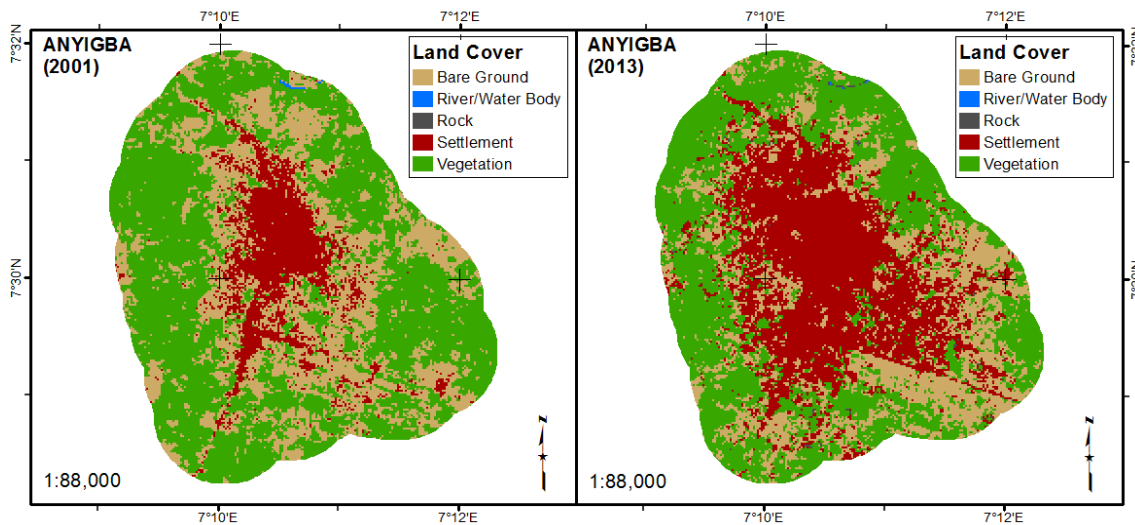


Fig. 3: Growth pattern of Anyigba from 2001- 2013

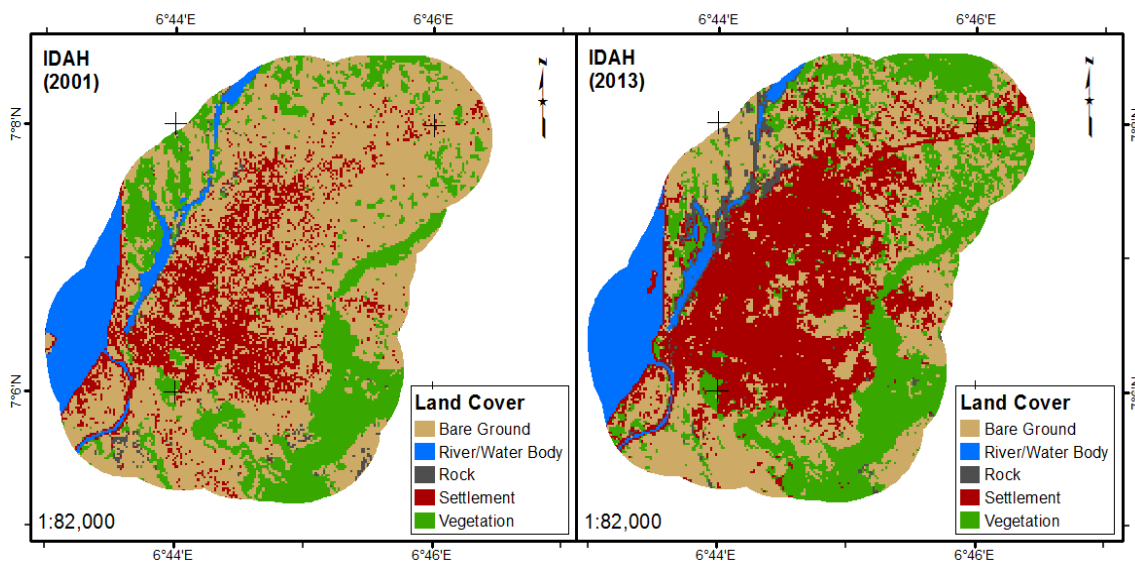


Fig. 4: Growth pattern of Idah from 2001- 2013

Urbanisation Pattern in Kogi East

Table 2 shows the direction of growth in Ankpa, Anyigba and Idah towns between 2001 and 2013. Most respondents in the study area perceived changes in growth of their towns to be northwards within the last 12 years. The result showed that 52.0% of the respondents observed that Ankpa grew

northwards within the period, while 241 (53.2%) stated that for Anyigba and 69.2% of the respondents shared the same view for Idah. Significant percentage of outward growth was witnessed in the east direction with frequencies of 21.0% for Anyigba; this was followed by Ankpa with 17.0% (83) and Idah with the least value of 9.0%.

Similarly, Ankpa was seen to witness more southward growth with obtained frequency of (17.6%), Idah (12.2%) and Anyigba (5.1%). The statistic further revealed that all three towns experienced territorial growth in all directions particularly in Anyigba with 17.7%, Idah (9.2%) and Ankpa (8.4%). The results in

Table 2 therefore show that the order of growth of the three towns has been more towards the northern, eastern and western axes. This is affirmed by the satellite images in Figures 2 to 4 on the growth pattern for the three towns from 2001-2013.

Table 2: Direction of growth in the study locations between 2001 and 2013

Locations	Undirectional	North	East	South	West	Total
Ankpa: Frequency	41	254	83	86	24	491
Percentage. (%)	8.4	52.0	17.0	17.0	4.9	100.0
Anyigba: Frequency	80	241	95	23	17	456
Percentage. (%)	17.7	53.2	21.0	5.1	3.1	100.0
Idah: Frequency	42	317	41	56	5	461
Percentage	9.2	69.2	9.0	12.2	0.4	100.0
Total: Frequency	163	812	219	165	49	1408
Percentage	11.7	58.0	15.7	11.8	2.8	100.0

Emerging Urban Forms for Kogi East

To further investigate the shape (that is the areal forms) of Kogi East, the views of residents were examined as shown in Table 3. The result showed that 29.9% of the respondents in 2001 and 49.2% in 2013 described the settlements as being more of nucleated increasing from 2001 to 2013. The extent of change for the respective locations showed that for Ankpa, it changed from 41.2% in 2001 to 38.5% in 2013; Anyigba it increased from 24.0% in 2001 to 57% in 2013, while for Idah it increased from 23.5% in 2001 to 52.5% in 2013. It is not surprising therefore that the number of respondents who describe these towns as scattered or dispersed generally decreased for Anyigba (32.3% (2001) to 1.1 (2013), Idah (22.2% in 2001 to 16.6% in 2013), but marginally increased for Ankpa (27% in 2001 to 16.6% in 2013). Table 2 further revealed that Ankpa and Anyigba were still perceived to be

witnessing significant growth along existing network of inter-settlement roads due to their locational factor as nodal towns. Frequencies obtained on those indicating linear growth in Ankpa increased from 15.2% in 2001 to 21.7% in 2013; those for Anyigba increased from 33.5% in 2001 to 41.0% in 2013. On the other hand, residents who described Idah as being more polygonal in shape had percentages of 4.8% and 25.7% for 2001 and 2013 respectively (the town is constrained on its western flank by River Niger. The findings from the result in Table 3 show that with increasing urbanisation rate, all the three towns are becoming nucleated occasioned by the in-filling of previously, open spaces left undeveloped as the town grew onward or evolve over the time period. Compact nucleated settlements are more economical in urban land management rather than outward sprawling.

Table 3: Up-and-coming urban forms for Kogi East

Locations	Linear		Nucleated		Oblong		Polygonal		Dispersed	
	2001	2013	2001	2013	2001	2013	2001	2013	2001	2013
Ankpa: Freq.	74	106	201	188	19	11	66	28	132	155
Percentag	15.2	21.7	41.2	38.5	3.1	2.3	13.5	5.7	27.0	31.8
Anyigba: Freq.	144	188	103	261	34	0	14	4	139	5
Percentage	33.5	41.0	24.0	57.0	7.0	0.0	3.3	0.9	32.5	1.1
Idah: Freq.	213	17	108	241	18	7	22	118	102	76
Percentage	46.4	3.7	23.5	52.5	3.1	1.5	4.8	25.7	22.2	16.6
Totals: Freq.	431	311	412	690	71	18	102	150	373	236
Percentage	31.3	22.1	29.9	49.1	4.3	1.3	7.4	10.7	27.1	12.8

Discussion

The annual growth rate for the three towns directly correlates with annual population growth rates for cities in Nigeria (Onokhehaye 1995, Ukoje, 2016). In terms of the reasons for this growth rate, this finding of this study observe that massive migration from rural areas (immediate rural hinterlands) in for search of jobs; better living conditions and work related reasons are responsible. Again the finding agrees with results from similar studies in many parts of Nigeria and Africa (Awumbia, 2017). In terms of pattern of growth of Idah, Ankpa and Anyigba, the result clearly reveals they initially grew outward, along existing network of roads in all directions although more growth happen to take place in the northern and eastern flanks. Thus from an initially linear and dispersed settlement pattern in 2001, nearly the three towns grew to become more nucleated through gradual in-filling of inbuilt spaces left in-between existing road network previously undeveloped. In terms of inter urban variations in the observed pattern of growth; Ankpa and Anyigba appear more nucleated than Idah. This result is largely corroborated by Google maps obtained for the three towns from the US Navy Satellite Images in 2014. It is also

consistent with the findings of Ukoje (2016).

The towns are however, reasonably nucleated at their centres, one to gradual but progressive intensification of land using activities. This is particularly true for Anyigba which has no national barrier or constraint to its outward territorial growth and land use intensification efforts. Such changes appear to be moderated in Ankpa town due to the Olamaboro River that runs parallel to the town on its eastern flank on one hand and associated gully erosion on the north-eastern and south-western axes due to the sharp topography of the town. The presence of River Niger on the western flank of Idah has had profound effect on the growth pattern and urban crystallisation process.

This is not surprising since with its marine location, it has enjoyed a commercial status as a river port since the colonial era linking Lokoja and Baro ports to the north and Onitsha and Burutu ports to the south linking the Atlantic Ocean. Also historically, it is the headquarters of the ancient and modern Igala kingdom and seat of Attah Igala who is the head and spiritual leader of the kingdom for over a thousand years running. It is the administrative headquarter of Idah LGA, diocesan

headquarter of Idah Catholic diocese and serving as regional headquarters of UEC/CFN churches in Kogi East. Its growth pattern has been mostly defined by its history, geographical location and road network entering the town from the North- East and South- East and recently North- West through the Government Residential Area (GRA). From the result of this study, Anyigba is the fastest growing town within Kogi East duly largely to the existence of the Kogi state university.

Its pattern of growth has been defined by the road networks that transverse the town, a thriving regional market and commercial activities, as well as, relative influence it enjoys as the emerging political capital of Igala people being headquarters of Kogi East Senatorial district. Anyigba is a nodal town located centrally in Kogi-East 60km from Ankpa, 48km from Idaho and 30km from Dekina towns. It enjoys direct connectivity to most local government headquarters in Kogi East. Ankpa is the Local government headquarters of Ankpa local government council area, it lies on the East-west A333 federal highway that runs from Otukpa in Benue state to Lokoja, the capital of Kogi state, its growth pattern has been mostly constrained by Olamaboro river and attendant effects of gully erosion on the eastern axis of its location. The result of this study indicates that the singular cause of rapid urbanisation in Ankpa, Anyigba and Idah is rural-urban migration to seek for employment, higher revenues, and higher education and improve standard of living. These findings agree with those of Bergman and Renwice (1999) Onokerhorhaye (1995), Ajaero and Onokala (2013) and Awumbia (2017). Usually, urban areas

provide more diversified consumption opportunities than rural areas since many shopping centres, theatres, cinema houses, conventions halls and recreational facilities available make it more attractive for ruralites and encourage massive migration. It must be stated however that the decision as to whether a person should migrate or not is personal and conditioned by the attitude of the individual (Ukoje, 2016; Oke *et al.*, 2017).

Conclusion

This study has shown that in 13 years, Anyigba, Ankpa and Idah has tremendously urban growth attributed to the presence of social service in the form of industry or government presence like administrative offices, establishments, educational institution. The presence of these services or infrastructures propels urbanisation to take place. The study shows that economic considerations and search for higher education and better health services constitute the main attractions for rural-urban migration. Apparently, with government presence in these locations and the existence of educational institutions, more people have moved and are still moving to these areas for better condition of living and education. This in the long-run results in urban growth.

With the changes in land use and expansion of settlements to meet the increasing demands of migrants, the urban forms of the study locations are subject to further modification. And the area extent increases as a result of the increase in residential houses, roads, commercial areas and other man-made activities. In order to reduce the rate of urban change and put to control the increasing rate of rural-urban, the State

and local government in Kogi East must give higher priority to the establishment of rural industries. Government must also try to create other forms of employment other than government work and give more incentives to investors and provide basic infrastructure facilities for the enjoyment of basic necessities of life. To develop the rural areas, educational institutions should also be cited to reduce movement to urban in search of education. To this end government should also embark on massive campaign to change the current impression that when someone leaves an urban centre for the village there is reversal of fortunes.

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