Transition from Landuse Cover into Urban Expansion in Babura Local Government Area, Jigawa State, Nigeria

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Abstract. The study utilized landsat imageries of 1987, 1997 and 2017 of Babura Local government Area, Jigawa State, Nigeria. The images integrated into GIS environment to analyse urban growth pattern of the area using change detection approach. However, structured questionnaires were administered proportionally to the population density of the streets in the area using both stratified and random sampling techniques to obtained relevant information on possible causes of urban growth in the area. The study findings revealed that there is urban growth in area. It attracts people from diverse locations for businesses and administrative services. The study area witnessed rapid urbanization especially from 1997-2017.

Keywords: Spatial analysis, GIS, Landuse Land Cover, Urban Expansion

Introduction

Nigeria's urban population has increased rapidly over the past 50 years and will continue to grow relatively fast in the coming decades, although how fast is a matter of some dispute. Nigeria's urban population will nonetheless likely double within the next 30 years, possibly much sooner. The growth of Nigeria's urban population 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 underlying cause of rapid urban population growth and urban expansion in Nigeria is rapid population growth driven by declining mortality and persistently high fertility: urban natural increase plays a significant (and possibly dominant) role in driving urban population growth (Bloch et al, 2015).

While rural-urban migration also contributes to urban growth, the significance of urban natural increase and reclassification due to rural densification have been widely underappreciated while the role of rural urban migration has likely been overstated in Nigeria, and indeed sub-Saharan Africa (SSA) more generally (Bloch et al, 2015).

There has in fact been a huge increase in reclassified ('rural' to 'urban') settlements (on different definitions, of above 10,000, and above 20,000 inhabitants). These 'emerging' towns and cities generally have lower building and population densities than older, established urban settlements with accumulated trunk infrastructure, and may therefore contribute significantly to urban expansion, alongside the ongoing enlargement of existing urban boundaries (Bloch et al, 2015).

In Nigeria, a settlement is generally classified as urban if it comprises 20,000 people or more, which is a relatively high minimum population threshold compared to other countries.

Urbanization has to do with an increase in people moving from rural to urban areas, urban growth has to do with an increasing urban population in general and urban sprawl is when a network of smaller urban communities starts appearing outside of a larger city (Pacione, 2005).

Urbanization is an increasing proportion of a population living in settlements defined as urban centres. This usually results from the net movement of people from rural to urban areas or natural increase (the excess of births over deaths). However, the definition of what qualifies as urban centre differs from one country to another depending on the criteria used. With regard to monitoring urban change processes there are essentially three fundamental sources of

quantitative data on urban population and urban settlement characteristics: population censuses; household surveys; and satellite imagery.

In most of the countries urbanization is the recognized as a crucial phenomenon of economic growth and social change as it affects increased opportunities for employment, specialization, production of goods and services.

Materials and Methods

Description of the Study Area

Babura lies on latitude on latitude $12^{0}38^{I}$N and $12^{0}46^{I}$ as well as longitude $8^{0}58^{I}$E and 9.01^{I}E. The area has a total of 992 km^2 and located north of Jigawa State Nigeria near the Niger Republic border. Babura is about 103.8 kilometres southeast of Kantche, Zinder, Niger Republic (Abdulhakim et al, 2017).

The study area which has a population of 20,8101 people (NPC, 2006) lies in a climatic zone described as semi-arid, hot, tropical zone with high temperatures (average daily maximum more than 33.5°C). The highest mean maximum temperature (40°) is recorded during the period March to May, whereas, the lowest mean maximum temperature is recorded in January (33.1°C). The annual average rainfall is between 600 mm to 1000 mm while the natural vegetation of the study area is the Sudan Savanna type. Vegetation of the area is typically sparse, comprised of annual and perennial grasses, other herbaceous plants, shrubs, and small trees (Abdulhakim et al, 2017).

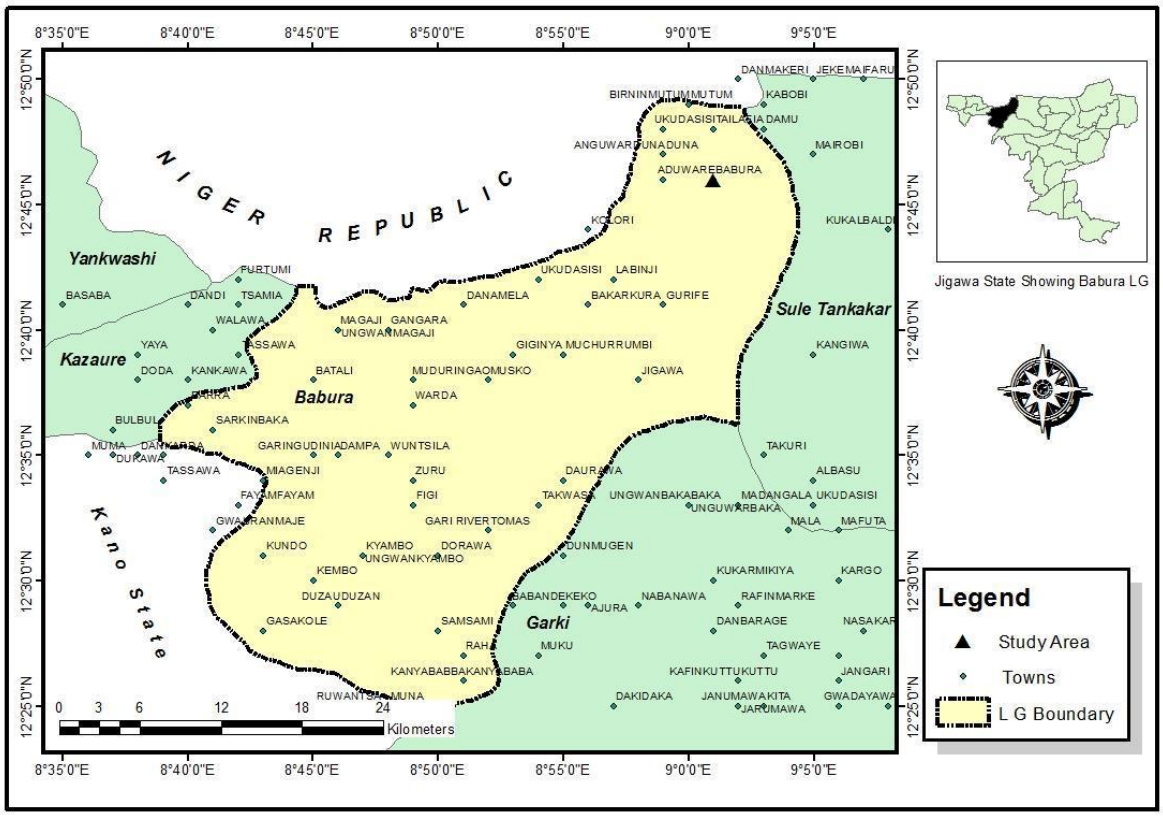

Figure 1. Map Babura Area
Source: Adapted from Abdulhakim et al (2017)

Sources and Types of Data

This study consists of two types of data secondary data from journals and 2006 census data. Primary data consist of remote sensing images data, field survey and semi-structural

questionnaire. The remote sensing images were enhanced and then classified into four land cover classes (Bare surface, Water body, Built-up and vegetation), as shown in Table 1.

Table 1. Land use classification

Classes	
Urban/Built -up	This includes residential, industrial and commercial area
Vegetation	This is made up of forest, shrubs, grasses and agricultural land.
Bare Surface	This includes uninhabited land, mainly desert area or features.
Water	Includes ocean, rivers, ponds, streams, dam and water shed.

Source: GIS Analysis (2019)

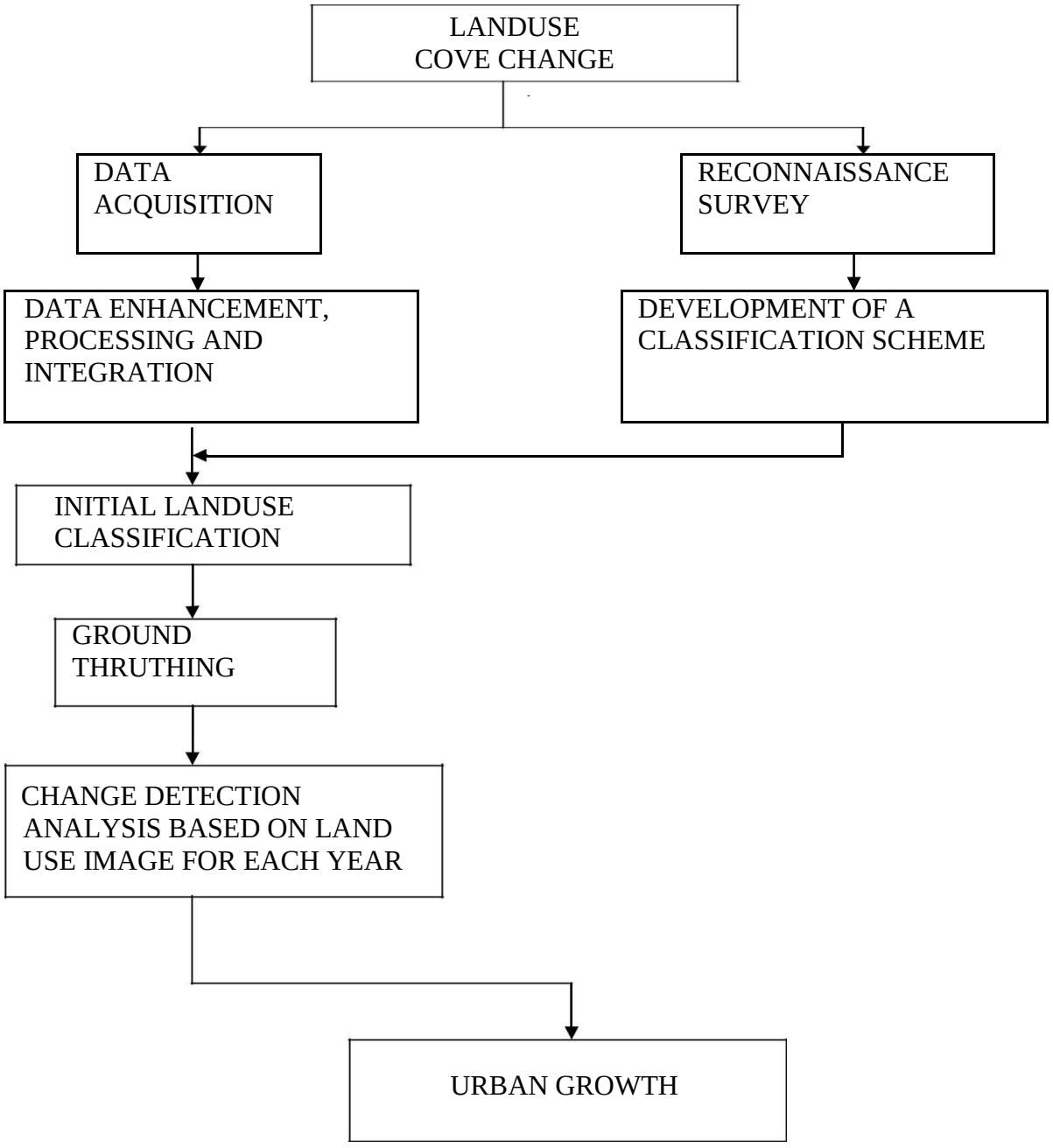

Figure 2. Change Detection Approach
Source: Authors' GIS Analysis (2019)

Sample Procedure

Stratified and systematic random sampling methods were used in administering the questionnaire. One questionnaire for the first house of the street and last house of the second street so that each street is to respond to one questionnaire, this system was used during the administration of the questionnaire.

The study area was stratified in to ten (10) streets, Kofar Gabas, Kofar Yamma, Kofar kudu, Kofar Arewa, Shamakawa/Kofar Fada, Gwaske, Tsallake, Akula Quarters, Sabuwar Abuja, and Arkel. 210 questionnaires were administered base on population density of the area as population density is unevenly distributed.

Table 2. Questionnaire distribution based on population density

S/no	Name	Population density	No of questionnaires
1	Kofar Yamma	More Densely populated	35
2	Tsallake	More Densely populated	35
3	Kofar Kudu	Densely populated	20
4	Kofar Arewa	Densely populated	20
5	Kofar Gabas	Densely populated	20
6	Gwaske	Moderate populated	15
7	Shamakawa/Kofar Fada	Sparsely populated	15
8	Arkel	Sparsely populated	15
9	Sabuwar Abuja	Sparsely populated	15
10	Akula Quarters	Sparsely populated	15
Total			210

Source: Field Survey (2019)

Results and Discussions

The study area is classified into land cover classes: Built-up, Vegetation, Water body and Bare Surface.

Table 3. Landuse classification

Classes	1987	1997	2017
Urban/Built-up	529.7 hectares	839.32 hectares	4045.22 hectares
Vegetation	4291.55 hectares	7240.18047 hectares	8356.72 hectares
Bare Surface	94985.69 hectares	87134.4 hectares	83227.44 hectares
Water	311.3 hectares	4904.28 hectares	4488.82 hectares

Source: Field Survey (2019)

Babura is not an exception in terms of urban growth and development. The trend from 1987 to 2017 indicates rapid urbanization. As the case maybe from 1987 the urbanized area occupied 529.7 hectares of land as urban area. As of that period 1987 Babura was just a town not a local government headquarters until 1989. After creation of Jigawa state in 1991, Babura town was then local government headquarters of Babura local government area. Therefore, all the administrative buildings were located in Babura town. This attracts a number of people administrators and businessmen which mount to the urban growth and expansion. The trends of urbanization changes from 529.7 hectares of land in 1987 to 839.32 hectares of land in 1997 and the most rapid and dramatic urban growth and expansion was witnessed in 2017 where by 4045.22 hectares of land was urbanized.

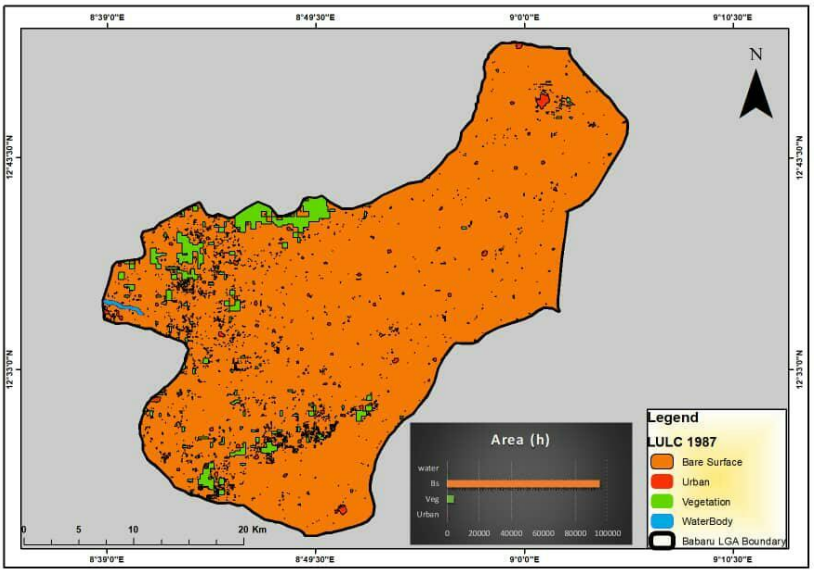

Figure 2a. Classified Landsat Image of 1987 Showing Urban Expansion in the Study Area

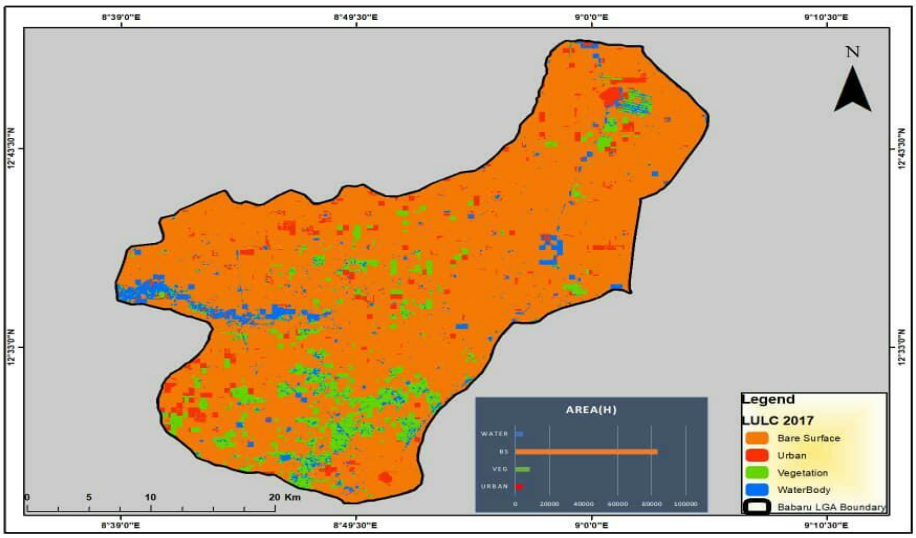

Figure 2b. Classified Landsat Image of 1997 Showing Urban Expansion in the Study Area

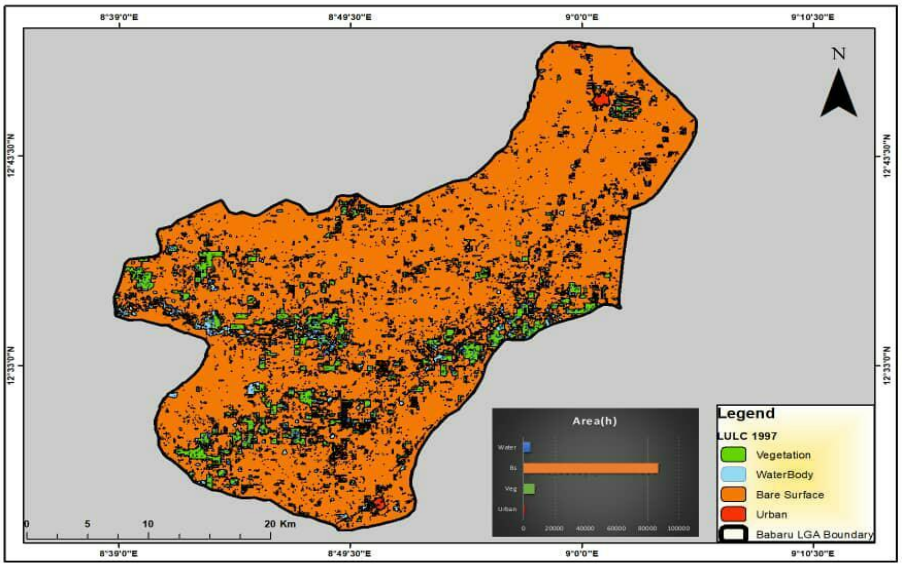

Figure 2c. Classified Landsat Image of 2017 Showing Urban Expansion in the Study Area

Table 4. Socio-demographic characteristics of the respondents

Age	Frequency	Per cent	Valid Per cent	Cumulative Per cent
15-30	114	54.3	54.3	54.3
31-45	69	32.9	32.9	87.1
46-60	15	7.1	7.1	94.3
61 to above	12	5.7	5.7	100.0
Total	210	100.0	100.0	
Education	Frequency	Per cent	Valid Per cent	Cumulative Per cent
None	13	6.2	6.2	6.2
Qur'an	33	15.7	15.7	21.9
Primary	13	6.2	6.2	28.1
Secondary	51	24.3	24.3	52.4
Tertiary	100	47.6	47.6	100.0
Total	210	100.0	100.0	
Trade	51	24.3	24.3	24.3
Farming	46	21.9	21.9	46.2
Civil servant	55	26.2	26.2	72.4
Student	43	20.5	20.5	92.9
Unemployed	15	7.1	7.1	100.0
Total	210	100.0	100.0	

Source: Field Survey (2019)

The population in the area indicates that they are youths at their productive ages. The literary level of the respondents is also average with 47.6 per cent attend tertiary education and 24.3 per cent obtained secondary education. However, 26.2 per cent of the responders are civil servant, 24.3 per cent are traders/ Businessmen (Table 4).

It is generally believed that level of education plays vital role in human development. Larger proportion of the population in the area attend secondary and tertiary institutions which gives them opportunity to either be employee or self-employee which increase their level of income and which is directly proportional to personal development and that might lead to urbanization because the educated and wealthy ones thinks of improving their standard of living by changing life style and building new houses at periphery of the town their by creating expansion and urban growth.

Table 5. Nationality

	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Nigerian	191	91.0	91.0	91.0
Non-Nigerian	19	9.0	9.0	100.0
Total	210	100.0	100.0	

Source: Field Survey (2019)

Owing to the location of the study area along the border few kilometres to Niger Republic and neighbouring villages of Katsina state attracts migrants to settle in the area. A lot of inter-border businesses are taking place which attracts migrants. Administrative officers are also settling and residing in the area some even after retirement, this amount to population increase and urbanization.

Table 6. What attracts people to Babura

	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Seek for employment	61	29.0	29.0	29.0
Live with family	52	24.8	24.8	53.8
Civil service	31	14.8	14.8	68.6
Seek for better job	34	16.2	16.2	84.8
Because of social amenities	32	15.2	15.2	100.0
Total	210	100.0	100.0	

Source: Field Survey (2019)

Different people have different reasons that make them to settle in Babura, due to a number of businesses that are taking in the town attract people to settle and engaged in various businesses especially trans-border businesses. However, some are coming as civil servant and decides to continue with their life over there.

Table 7. Growth of Babura for past 30 years

	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Rapid Growth	162	77.1	77.1	77.1
Normal Growth	48	22.9	22.9	100.0
Total	210	100.0	100.0	

Source: Field Survey (2019)

The general agreement among the respondents indicates that about 77.1 per cent of the respondents attested that there was rapid urbanization in the area compared to 30 years ago.

There is general consensus among the respondents that the study area has rapid growth and expansion and this was as a result of migration (36.7%) from various locations to the area and high birth rate (63.3%) by the entire population in the area

Conclusion

The study concludes that there is urban growth and expansion in the area. Owing to the various parameters that signifies development in a particular geographical location. The study area shows promising development and urban expansion as it attracts more people from diverse location engaging in various actives.

Recommendations

- ✓ There is the need to establish local and modern industries so that they provide job to the youth.
- ✓ There is need for the development of rural infrastructure to reduce the high rate of rural urban migration.
- ✓ Also there is highly need of development of social amenities to reduce pressure in urban social amenities.
- ✓ There is also need of reconstruct the frontier road kwanar dumawa-Babura-Niger republic road for easy accessibility of business and other agricultural commodities that might lead to population increase and urbanization.

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