



Effect of Urbanization on Agricultural Farm Land in Akure South Local Government Area, Ondo State.

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ABSTRACT

This study assessed the impact of Urbanization on Agricultural farm land in Akure South Local Government Area of Ondo State. The data collected were populated figures and land use for three Epochs (2002, 2012 and 2022). The satellite images were downloaded from the Google Earth. In the analysis, cross change detection analysis and overlay analysis using ArcGIS 10.8 was performed to detect where land use change has occurred and which type of land use agricultural land has transformed too. The GIS analysis revealed that there is an increase in settlement and a decrease in Agricultural land from 2002 – 2022. Results reveal that urbanization has significant effects on Agricultural land in the study area and these effects include, decreasing agricultural land, decreasing in farming activities, decreasing in farm size. All this is as results of increasing settlement and built up area. If the growth in the population of Akure South LGA continues, unchecked, agricultural land will be significantly depleted in the future. The study recommendation that there should be effective.

Law and policy to control population growth sustainably to minimize the negative impact of urbanization in the study area. Also urban agriculture should be encouraged to sustain the food supply, to prevent food scarcity and secure food for future consumption.

INTRODUCTION

Urbanization is the process of people concentrating in cities, driven by natural population growth, rural-urban migration, and reclassification of rural areas. This urban growth is influenced by push factors like rural poverty and pull factors such as city allure. In many developing regions, rural-urban migration is exacerbated by limited agricultural land and food insecurity.

Nigeria faces food security challenges due to low agricultural productivity, exacerbated by issues like herdsman menace and insecurity in rural settlements. The global concern over producing enough food for a growing population has persisted for generations. Food insecurity elimination is a significant focus of the Sustainable Development Goals, addressing pressing needs in developing countries.

Enhancing agriculture is vital to empower smallholders and alleviate poverty. Land use and degradation play a central role in agricultural productivity discussions. Food, as a fundamental human need, necessitates addressing land degradation, which is a pressing issue in developing nations Abah. and Petja, (2015). Maintaining healthy land ecosystems is crucial for global food security and population growth.

Sustainable development, as emphasized by the Food and Agricultural Organization (FAO), aims to meet current and future generations' needs while ensuring profitability, environmental health, and social equity. Sustainability is the foundation of agricultural development, as per McKenzie et al. (2015).

Food security is a universal human right, ensuring everyone's access to adequate food. Achieving this goal is paramount, as per the FAO. To address the challenges of urbanization, population growth, and agriculture, a holistic approach is essential, emphasizing sustainability and food security.

The rural-to-urban migration, a global concern, particularly in developing nations like Nigeria, poses a significant threat to food security. Regular assessments of the impact of urbanization on agricultural land use are essential for informed policy decisions. This study focuses on urbanization's effect on agricultural land use in relation to Sustainable Development Goal (SDG) 2. It analyzes trends in agricultural land from 1990 to 2020 to gauge urbanization's impact on land sustainability.

Urban expansion significantly affects physical development, with numerous studies on this issue globally, particularly in developing countries like Nigeria. Efforts to enhance food security, agricultural productivity, land sustainability, and agribusiness markets are prioritized by governments and stakeholders, but challenges persist, especially for smallholder farmers facing food insecurity and socioeconomic hardships Owolabi, (2018).

To plan for the future, understanding how human needs transform land use is crucial. Urban

changes can be predicted by studying past trends and projecting future developments.

The incessant migration of rural populace to urban areas has imposed a serious concern globally, especially in developing countries like Nigeria due to its accompanying food security threat. Therefore, there is a need to map and evaluate the effect of urbanization on agricultural land used in relation to farming challenges periodically in order to be well-informed policy statements in tackling food security. This study evaluates the effect of urbanization on agricultural land use in relationship to (SDGs) goal no 2. This study will help to carry out trends, what have happen over the years to agricultural land, from 1990 to 2020, with the view of analysing the effect of urbanization on the sustainability of agricultural land. The antecedent impact on the physical development constitutes a major concern. Although there have been studies on the rapid urbanization and urban sprawl of cities in the developing countries and in Nigeria, Globally, approaches for providing sustainable food security for smallholder households have increasingly gained priority in agriculture planning and policy. In addressing food insecurity, governments and relevant stakeholders continue to formulate and implement various agricultural and development planning policies aimed at improving food security, agriculture productivity, land use sustainability, and agribusiness markets Akinluyi et al., (2020). Despite these interventions, higher concentrations of food insecurity and socioeconomic deprivation have been recorded in LMICs, especially among poor smallholder farmers. Collier et al. (2009) He observes that human needs transform the land to different activities and that the quantifiable information of these dominant activities is necessary to develop future planning. Urban changes can be modelled through the observation of the past and projection to the future.

Aim

The aim of this study is to investigate the effects of urbanization on s agricultural land in Akure South Local Government, Ondo State.

Objectives

The specific objectives are to:

- Determine the change in the land classes in the study area between 2002 sand 2022.
- Assess the of urbanization growth on agricultural land in the study area.
- Show how population in the study area has grown between 2002 and 2022

Study Area

The area of study is Akure South Local Government Area of Ondo State. It is located between longitude 5°4'28.83" E and 5° 21'2.30" E, and

Latitude $7^{\circ}5'34.93''$ N and $7^{\circ}21'35.1''$ N. It has an area of about 325.5 Square Kilometer, with a population of 353,211 at the Ajomale (2007). Akure is a medium-sized urban Centre and became the provincial headquarter of Ondo State. It is located within the tropical rain forest region of Nigeria. The land mass of

Akure South is about 250 metres above sea level. The major occupation in the area is agriculture, rearing of animals and trading is a common economic activity among the women.

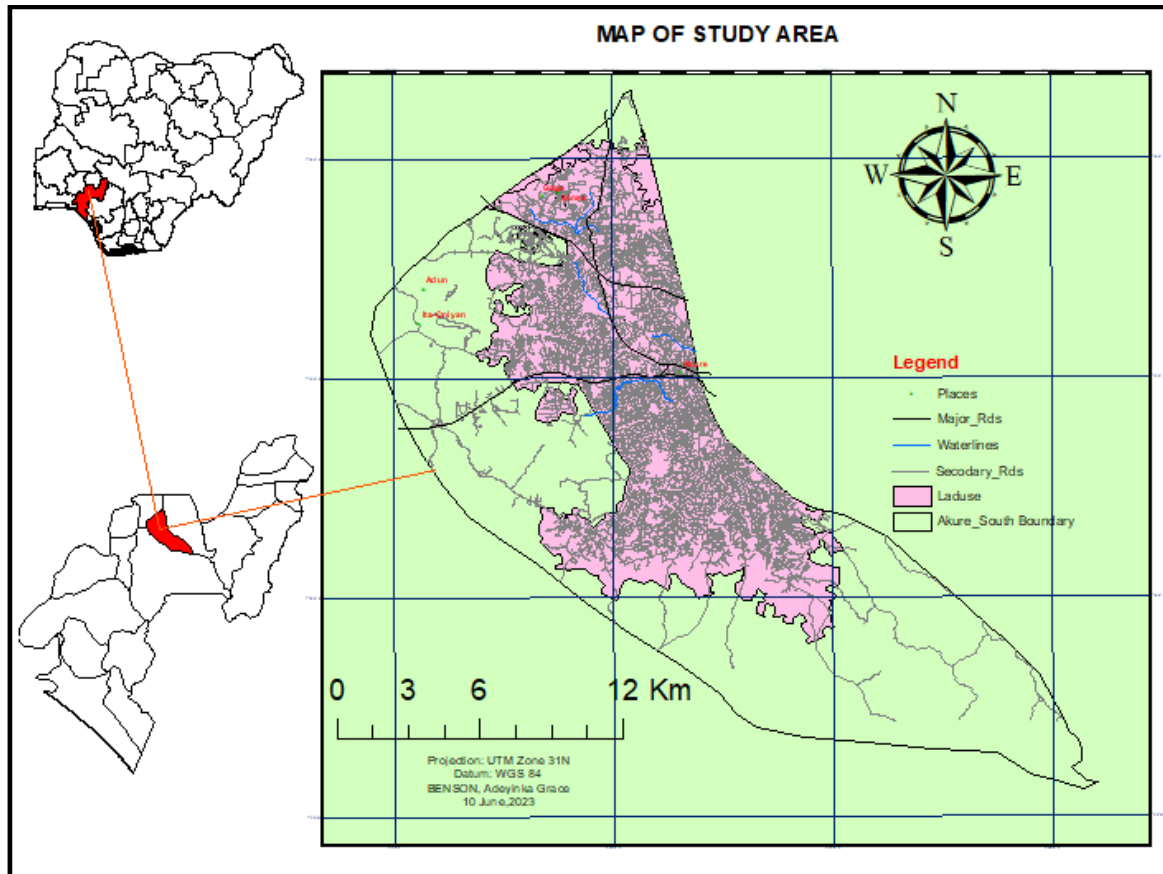


Figure 1: Study area map

METHODOLOGY

Data Collection and Preparation

This research used both primary and secondary data. The primary data were gotten from the Google earth pro software and the population data was acquired from the State National Population Commission.

The Landsat imageries for three decade with the interval of ten years were downloaded, respectively, obtained from USGS Website. 2002, 2012 and 2022. The different Landsat bands were combined to bands in Arc Map to form a false colour composite image. In Erdas imagine, pixels representing vegetation, built-up, area rock outcrop, water body and farmland were identified and selected from the image as training sample. Their signature files were also generated and saved.

Data Analysis

The population data was imported into Microsoft Excel software, Bar chart was generated to show the population growth between 2002 and 2022

The 2002, 2012 and 2023 images of the study area were classified respectively into four classes such as; Built- up, Vegetation, Farmland and Rock outcrop. The land use/ land cover classes data were imported into Microsoft Excel software, where bar charts were generated to show the land use/ land cover in hectares and comparative changes between 2002 and 2022.

The layer of the built-up extracted from the 2002, 2012 and 2022 images respectively were overlaid to show the extent of the population increase in the study area. Farmland of the 2002, 2012 and 2022 respectively, were carved out from the classified image of the study area and overlaid with the built-up layer to show the area covered by agricultural land in 2002 2012 and 2022 areas that have been encroached by built-up.

The farmland data was further imported into Microsoft Excel software, bar chart was generated to show the farmland decrease in hectare between 2002 and 2022.

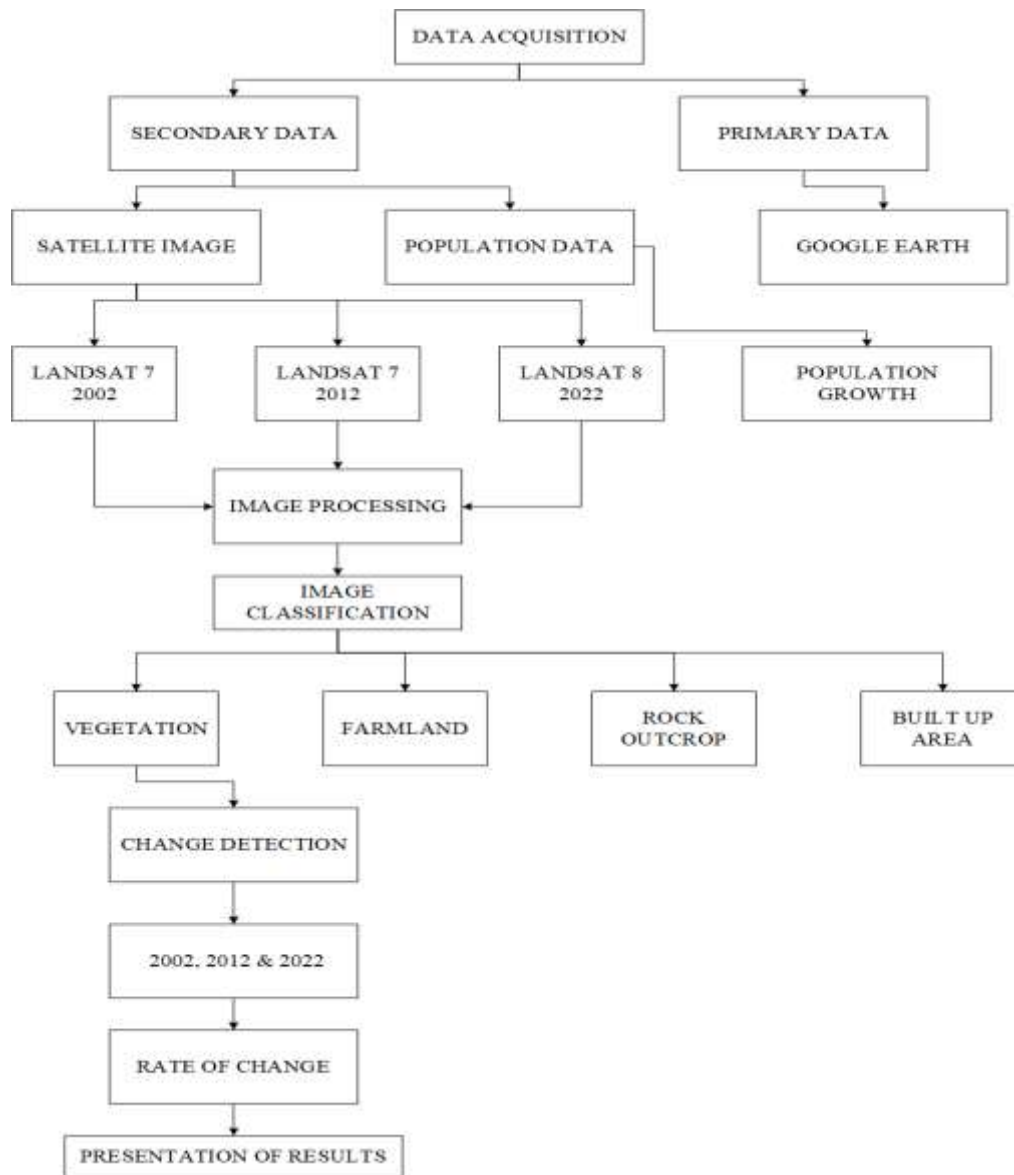


Figure 2: Research work flow diagram.

RESULTS AND DISCUSSION

Results

The Population Data Analysis

Table 1: Showing the population and the growth rate of the study area.

Akure-South Population & Growth rate			
Year	Population	Growth rate	
2002	335	1.75	
2012	526	2.75	
2022	717	3.76	

The bar charts showing the population and growth rate of the study area between 2002 and 2022.

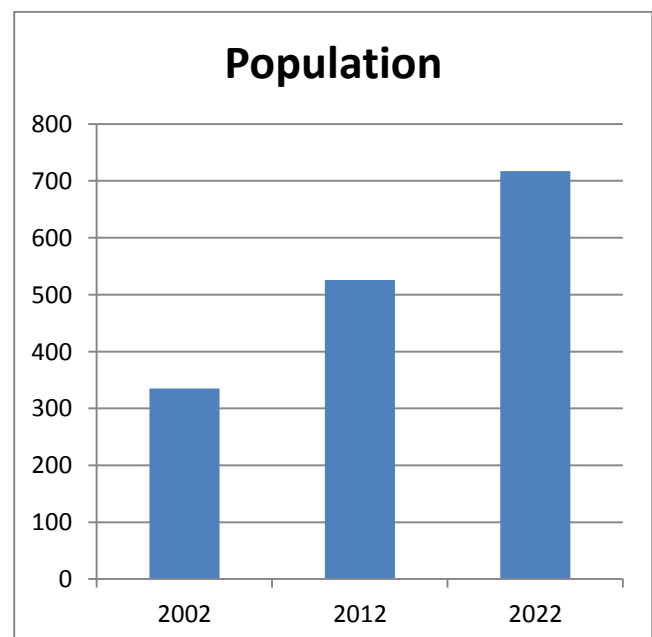


Figure 3: shows the population growths of the study area from 2002 to 2022.

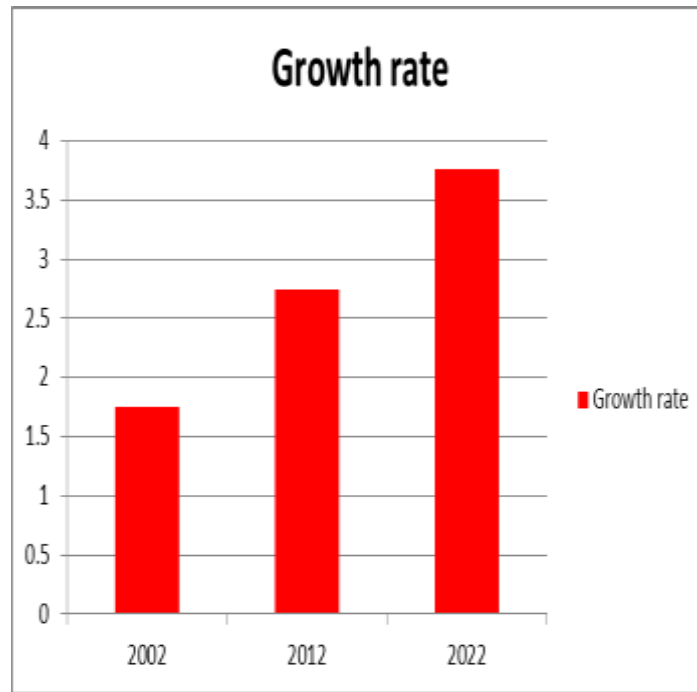


Figure 4: showing the growth rate of the study area from 2002 to 2022.

Image Classification Results

The classification images showed the land use land cover map of the study area from 2002 to 2022.

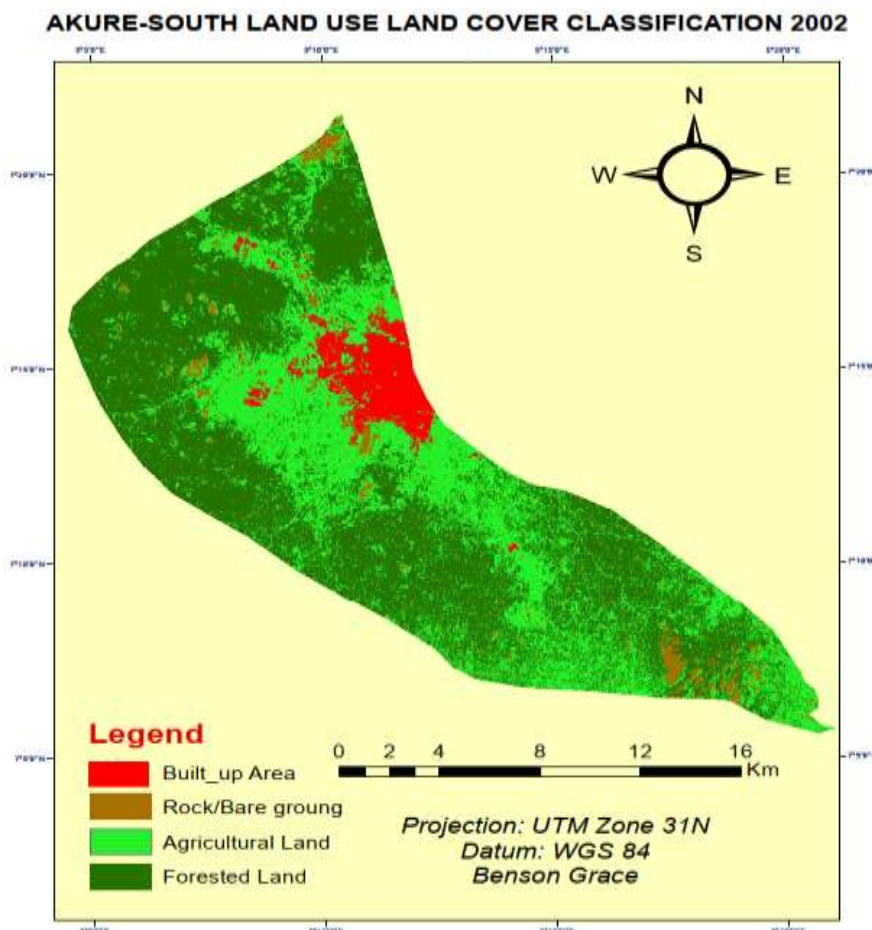


Figure 5: Land Use Land Cover Map of Akure South LGA in 2002

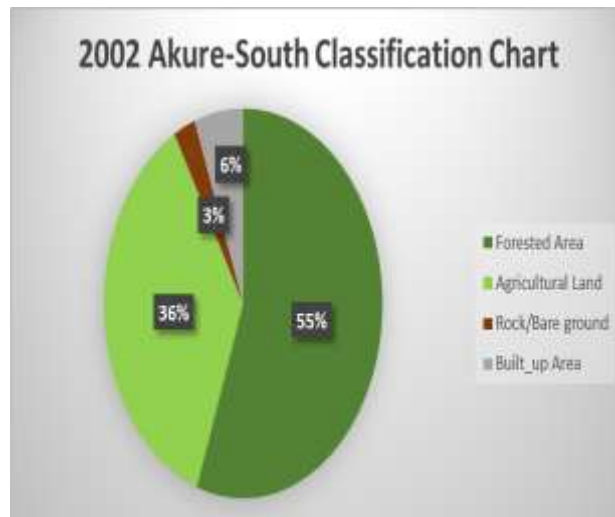


Figure 6: Land Cover Classes and their Respective Area Cover in percentage in 2002

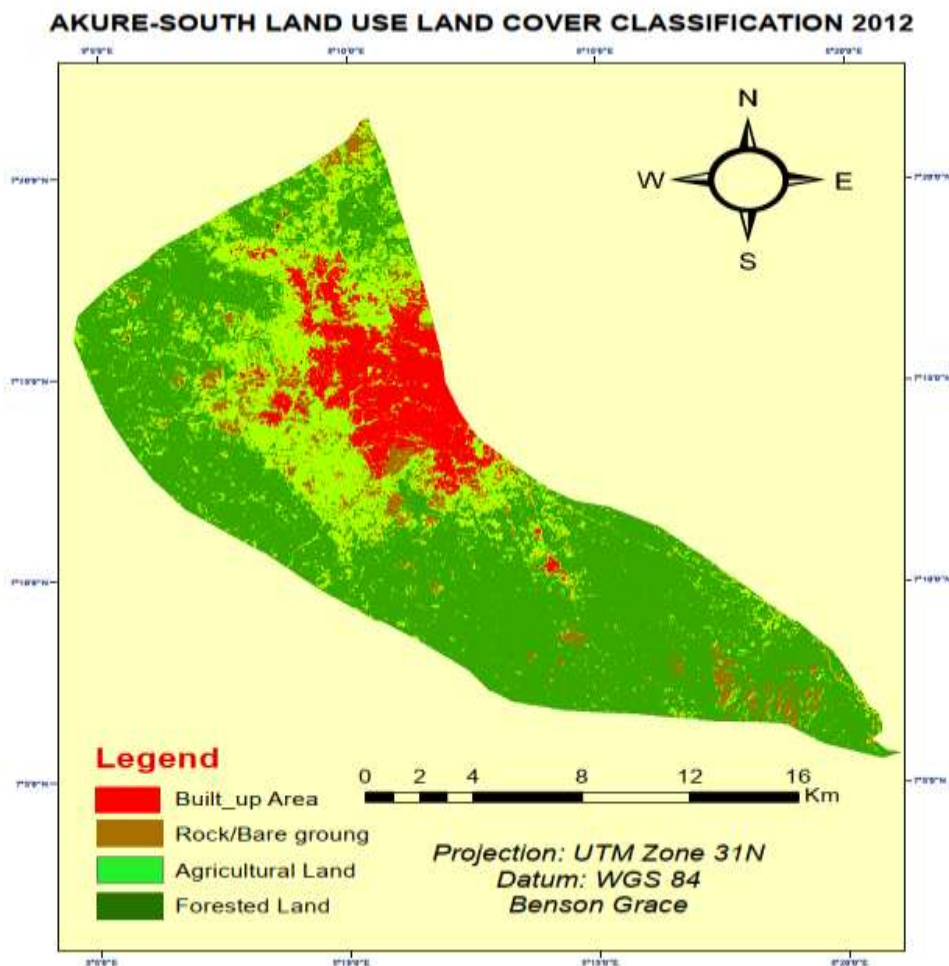


Figure 7: Land Use Land Cover Map of Akure South LGA in 2012.

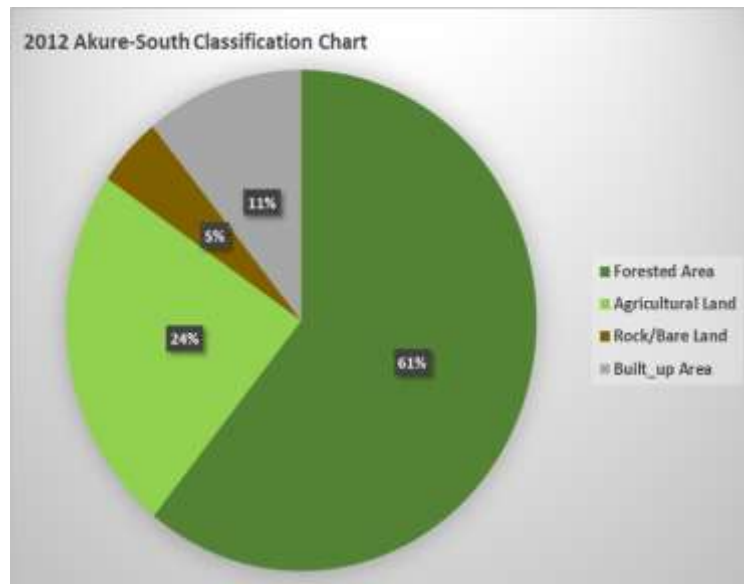


Figure 8: Land Cover Classes and their Respective Area Cover in percentage in 2012.

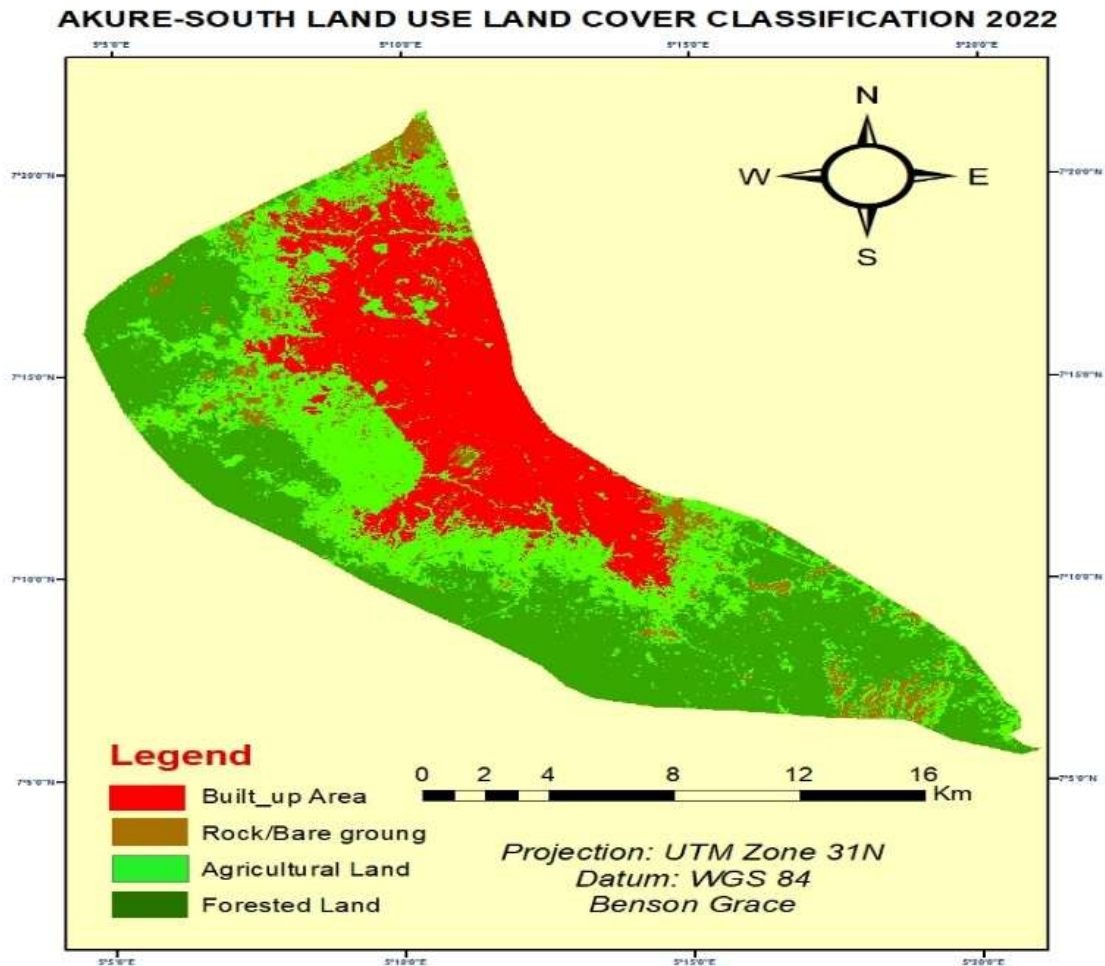


Figure 9: Land Use Land Cover Map of Akure South LGA in 2022.

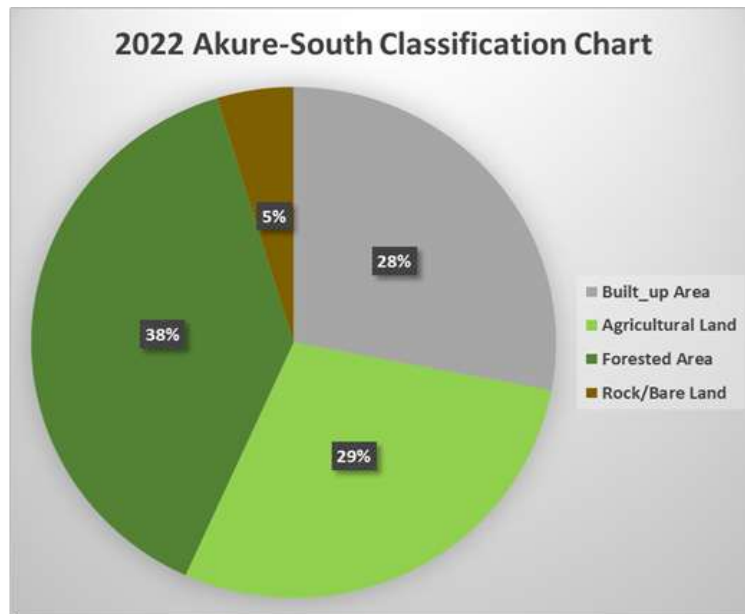


Figure 10: Land Cover Classes and their Respective Area Cover in percentage in 2022.

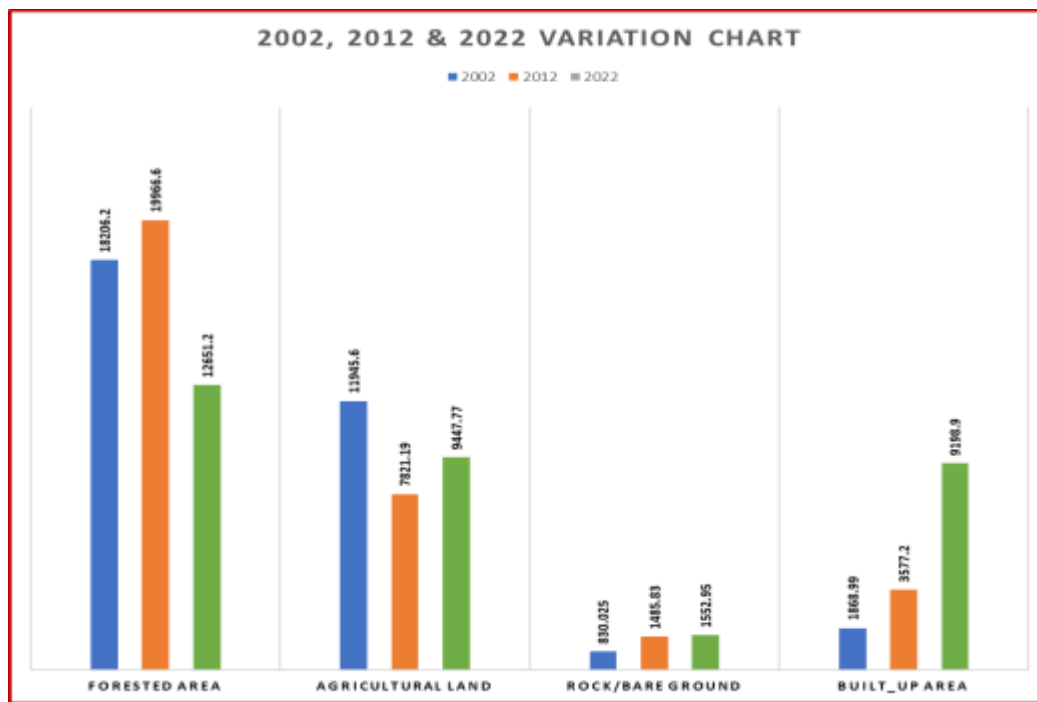


Figure 11: the comparatives changes in land cover classes between 2002 and 2022.

DISCUSSION

Table 1 above shows the steady increment in the population growth of the Akure South LGA from 2002 to 2022. Year 2002 has the lowest population while 2022 has the highest population growth, Figure 3 showing the population growth rate of the study area, in the year 2002 the growth rate was 335% at 1.75 while in the year 2022 the growth was 717% at 3.76 rates. Combined with the population data respectively in other to show the population increase in the study area, in 2002 built up has the population of 1868.99, 2012 built up has population of 3577.2 and 2022 has the population of 9198.9 respectively. The increase in population is an evidence of urbanization in the study area

Figure 4: above shows the land use land cover classified image of the year 2002. From the classified image of the year 2002, the percentage of the agricultural land is 36%, while the built-up area was 6%, the forest area covers 55% and the bare land was 3% respectively. While figure 5 shows the land classes in the year, while figure 6 shows the percentages they occupies in the change analysis, it shows that the forest has the highest percentage. Hence the area is slightly dominated by built up area.

Figure 7 above shows the land use land over of the year 2012. While figure 8 shows the percentages. In the year 2012, the Agricultural land decrease from 36% to 24, while the built up area was increased from 6% to 11%. On the other hand the bare land also experienced little increment from 3% to

5%. The forest area also experienced increment from 61% in the year 2002 to 38% in the year 2012. Hence there is urbanization.

Figure 9 above shows the land use land cover classified image of the year 2022. The built up increased massively due to encroachment in to the forested land area. While the figure 10 shows the percentages changes. Built up covers 28%, Agricultural land 29%, forest land 38% and bare land 5%.

Figure 11 above shows the comparative changes in the land use land cover classes in hectares from 2002 and 2022. The bar chart revealed that the agricultural land cover in the study area decrease from 2002 to 2022, this is due to the advent of urbanization in the study area as some forested and agricultural land has been turned to either settlement or recreation centres. The figure 4.10 also revealed that the built up area kept increasing from 2002 to 2022, this has been attributed to increase in population over the study area which as a result led to urbanization.

Filani, (2011) said agricultural is the life wire of many human being, thus; the major operation of people of Akure South LGA has been identified to be agriculture. The area covered by land kept decreasing from 2002 to 2012 until 2022 while it has lost to 162658 to hectares of land to majorly built up as a result of increase in population in the study area. The area covered by forest decrease rapidly from 2012 to 2022 respectively.

Impacts of Urban Growth

The analysis above has confirmed the advent of urbanization and how it has affected other land cover types, but here, the study is focusing on the impacts of the urbanization on the Agricultural land.

As result of declination in the loss of agricultural farm land, the study orally interviewed some farmers to ask for the possible reasons why such drastically declination might have occurred. The following are their reasons;

- 1 Over 90% of the farmers claimed that urbanization has been one of their major problems as their farmland has been converted to settlement, thereby causing them to look for another farmland.
- 2 The farmers also lamented that with the advent of crude oil in Nigeria, some of the farmers disengage agricultural activity for white cola jobs in the city. More also their children don't see farming as a mean of survival anymore because they need quick money which make them to abandoned farming and go for minor business in town that will bring them easy money.
- 3 Furthermore, the farmers also explain that with the problem of Fulani headsmen.

Encroaching into their farmer always results into crisis between the farmers and the Fulani

headmen which also affect the production of their farm produce.

CONCLUSION AND RECOMMENDATION

Conclusion

In conclusion, the results and discussions presented in Chapter Four shed light on the significant changes that have occurred in the Akure South Local Government Area (LGA) from 2002 to 2022. These changes are primarily driven by population growth and urbanization, which have had profound impacts on land use and land cover in the study area.

The population analysis revealed a steady increase in population from 2002 to 2022, with the year 2022 witnessing the highest population growth. This population growth is indicative of urbanization taking place in the region. The growth rate increased from 335% in 2002 to 717% in 2022, reflecting the rapid pace of urbanization.

The land use and land cover analysis provided valuable insights into the changing landscape of Akure South LGA. In 2002, the dominant land cover was forest (55%), while agricultural land covered 36%. However, by 2022, the built-up area had significantly expanded, covering 28% of the land, indicating the encroachment of urban areas into previously forested and agricultural regions. This shift highlights the urbanization process and its consequences for land use (Fenta.,. *et al* (2017).

The comparative analysis between 2002 and 2022 showed a decrease in agricultural land and a substantial increase in built-up areas. This transformation can be attributed to the effects of urbanization, including land conversion for settlement and recreational purposes. Furthermore, the study revealed that the area covered by forests decreased rapidly from 2012 to 2022, indicating a loss of valuable natural resources.

The impacts of urban growth on agricultural land were also examined, with farmers reporting significant challenges. Urbanization was identified as a major problem leading to the conversion of farmland into settlement areas, forcing farmers to seek new land for cultivation. Additionally, the allure of white-collar jobs in the city and the desire for quick money among the younger generation has contributed to a decline in agricultural activities. Conflicts with Fulani herdsmen further exacerbated the challenges faced by farmers in the region.

In summary, the results and discussions in this chapter illustrate the transformation of Akure South LGA over the past two decades. The region has experienced rapid urbanization, resulting in changes in land use and land cover, and significant challenges for the agricultural sector. These findings underscore the importance of sustainable urban planning and the need for policies that balance urban development with the preservation of agricultural land and natural resources. The implications of urbanization on agriculture and the livelihoods of farmers in the region call for targeted interventions to

address these challenges and ensure the long-term well-being of the local population.

Recommendation

The recommendations aim to address the challenges arising from rapid urbanization and shifting land use in Akure South Local Government Area (LGA) between 2002 and 2022:

1. **Urban Planning and Zoning Policies:** Implement effective urban planning and zoning policies to control urban sprawl, protect agricultural land, and preserve natural resources.
2. **Agricultural Support Programs:** Support farmers by providing alternative land, training, credit access, and market opportunities to mitigate the impact of urbanization on agriculture.
3. **Environmental Conservation:** Launch conservation efforts like afforestation, reforestation, and sustainable land management to protect remaining forested areas and natural resources.
4. **Infrastructure Development:** Invest in infrastructure to accommodate urban growth while minimizing agricultural land conversion, including transportation, housing, and utilities.
5. **Community Engagement:** Engage local communities, including farmers, in decision-making processes for urban development and land use planning to consider local needs.
6. **Youth Employment Programs:** Develop initiatives to create employment opportunities in agriculture for the younger generation through training and incentives.
7. **Conflict Resolution:** Address conflicts between farmers and other groups peacefully to promote coexistence and better land use practices.
8. **Data Monitoring and Analysis:** Continuously monitor population growth, land use changes, and their impacts to inform policy adjustments.
9. **Education and Awareness:** Raise awareness about the consequences of rapid urbanization to encourage responsible development and land use practices.
10. **Collaboration:** Foster collaboration among government agencies, NGOs, community groups, and academic institutions to work on sustainable development initiatives and policy implementation.

These recommendations aim to strike a balance between urban development and the preservation of agriculture and natural resources while improving the well-being of the local population in Akure South LGA.

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