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Perceptions and Importance of Urbanization on Land Use and Land Cover: A case study of Argungu Metropolis, Kebbi State

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ABSTRACT

This study examines the perceptions and importance of urbanization on land use and land cover in Argungu Metropolis, Kebbi State, Nigeria. The study adopts a mixed-methods approach, combining quantitative data from 380 questionnaire respondents with qualitative insights from 8 key informants comprising planners, traditional leaders, and community stakeholders. The sample size was determined using the Krejcie and Morgan table, based on a population of 45,584. Quantitative data were analyzed using descriptive statistics in SPSS, while qualitative data were analyzed using thematic analysis. The findings reveal that urbanization in Argungu is rapid and largely unplanned, with 87.9% of respondents observing significant changes in land use and land cover. Major transformations include increased built-up areas, loss of farmland, and reduction in vegetation cover. The primary drivers identified are population growth, in-migration, and land speculation. While urbanization has contributed to improved economic opportunities and infrastructure development, it has also led to adverse socio-economic and environmental impacts, including loss of agricultural land, rising land costs, soil erosion, flooding, and environmental degradation. Furthermore, the study highlights weak governance and planning systems, characterized by poor policy awareness, limited community participation, and ineffective land use control. The study concludes that urbanization in Argungu presents both opportunities and challenges, and emphasizes the need for sustainable and participatory urban planning, stronger policy enforcement, and environmental management strategies to ensure balanced development.

Keywords: land use, land cover, development, urbanization

1.1 INTRODUCTION

Urbanization is widely recognized as one of the most transformative processes shaping contemporary landscapes, economies, and social systems across the globe. It involves the concentration of population in urban areas, accompanied by the expansion of infrastructure, economic activities, and built-up environments. In developing countries such as Nigeria, urbanization is occurring at an unprecedented rate, driven by rapid population growth, rural–urban migration, and increasing demand for housing and services. Notably, this growth is no longer limited to major cities but is increasingly evident in smaller and emerging urban centers such as Argungu in Kebbi State. As urban populations expand, there is a corresponding shift in land use patterns, characterized by the conversion of agricultural land, forests, and other natural landscapes into residential, commercial, and infrastructural uses. This transformation often results in significant environmental and socio-economic consequences, including land degradation,

biodiversity loss, reduced agricultural productivity, and changes in traditional livelihood systems (Ahmed et al., 2020; Budnukaeku, 2025).

In the Nigerian context, the pace and pattern of urbanization have raised serious concerns about sustainable land management and environmental protection. Rapid urban growth is frequently associated with unplanned development, weak enforcement of land use regulations, and inadequate urban planning frameworks. These challenges are particularly pronounced in smaller urban centers where institutional capacity and planning systems are often limited. Argungu, historically known for its agricultural productivity and rich cultural heritage, is increasingly experiencing urban sprawl, expansion of informal settlements, and growing infrastructure development. These changes have direct implications for land use and land cover (LULC), influencing ecological balance, food security, and the overall sustainability of the urban environment. Empirical studies have shown that such transformations can lead to increased environmental stress, including soil erosion, flooding, and depletion of natural resources (Ahmed et al., 2020; Budnukaeku, 2025).

Despite the growing evidence of land use changes associated with urbanization, there remains a significant gap in understanding how these changes are perceived at the local level, particularly in towns like Argungu. Most existing studies have focused on spatial and quantitative assessments of LULC change, often overlooking the experiences, perceptions, and adaptive responses of local communities. However, understanding local perspectives is crucial for developing context-specific and sustainable urban planning strategies. In Argungu, there is limited empirical research that captures how residents, traditional leaders, and other stakeholders perceive the impacts of urbanization on land use, the environment, and livelihoods. Addressing this gap is essential for informing policy decisions and promoting inclusive and participatory land management approaches (Aniah et al., 2025; Enwin & Johnbull, 2025).

1.2 Statement of the Problem

Urbanization is a key driver of land use and land cover (LULC) change across developing countries, often resulting in profound transformations in physical, ecological, and socio-economic landscapes (United Nations, 2018; Duan et al., 2025). In Nigeria, the rapid expansion of urban areas has intensified pressure on land resources, leading to the conversion of agricultural lands, wetlands, and forests into residential, commercial, and infrastructural uses (Agumagu et al., 2025; Ogunbode et al., 2025). Argungu, a semi-urban town in Kebbi State, is experiencing similar patterns of transformation, characterized by increasing urban expansion and land conversion, often occurring without adequate planning or proper documentation.

Despite these observable changes—such as the conversion of farmlands into housing estates, the proliferation of commercial structures, and growing environmental degradation—there remains a lack of systematic and context-specific studies that examine the drivers and impacts of urbanization in Argungu from a local perspective. Furthermore, the heavy reliance on GIS and remote sensing techniques in existing studies has often limited attention to the social and human dimensions of land use change, particularly community perceptions and lived experiences (Mashi et al., 2018; Osman et al., 2025). This study seeks to bridge this gap by employing qualitative and field-based approaches to provide a more holistic understanding of the effects of urbanization on land use and land cover in Argungu.

Objectives of the Study

- i. To identify the major forms of urban expansion occurring in Argungu Metropolis.
- ii. To assess the perceived effects of urbanization on land use and land cover patterns in the area.
- iii. To examine the socio-economic and environmental consequences of land use changes associated with urbanization.
- iv. To evaluate the role of government policies and planning in managing urban growth in Argungu.
- v. To provide recommendations for sustainable land use practices in response to urban expansion.

2. LITERATURE REVIEW

2.1 Conceptual Review

Urbanization refers to the process through which rural areas transform into urban centers due to population growth and economic development. Land use involves the ways in which human beings utilize land resources (e.g., for farming, housing, or industry), while land cover refers to the physical surface characteristics of the land (e.g., vegetation, water, buildings). Urbanization typically leads to changes in both land use and land cover, often resulting in increased built-up areas and decreased natural or agricultural lands (Siamian et al., 2025; James, 2024).

These transformations can be beneficial—promoting economic development and modernization—but they also pose challenges, including environmental degradation, displacement, and land scarcity. Understanding how communities perceive and adapt to these changes is critical for sustainable development, particularly in towns like Argungu where planning frameworks may be weak or absent (Chunwate et al., 2025; Danladi et al., 2025).

2.2 Empirical Review

Agumagu et al. (2025) investigated land use and land cover change dynamics in the Niger Delta region of Nigeria from 1986 to 2024. Using satellite data analysis, the study found significant encroachment into wetlands and agricultural areas due to urbanization and oil exploration.

Arowolo and Deng (2018) employed statistical modeling to explore the drivers of cultivated land change in Nigeria. Their analysis revealed that population growth, policy failure, and economic expansion were primary contributors to farmland reduction across multiple regions.

Aniah et al. (2025) examined the dynamics and perceived drivers of LULC in Ghana's Kassena-Nankana West District. Through household surveys and key informant interviews, they identified population pressure and changing livelihood strategies as key drivers.

Asiyambi and Abolade (2025) analyzed the effects of in-migration on land use and livelihood in suburban areas of Southwestern Nigeria. Using qualitative interviews, the study found that migration has disrupted indigenous land ownership patterns and contributed to unplanned settlements.

Murtala et al. (2025) assessed LULC changes in Auyo Local Government Area of Jigawa State through field observation and geospatial analysis. The study found continuous farmland conversion due to housing development and weak land regulation enforcement.

Onanuga et al. (2022) studied the impacts of urbanization on land and water resources in Ijebuland, Southwestern Nigeria. Using GIS and environmental monitoring, they reported depletion of water bodies and deforestation as consequences of unplanned urban expansion.

Chunwate et al. (2025) explored local perspectives on changes in a gazetted forest reserve in Nasarawa State using community surveys and focus groups. Their findings revealed that agricultural encroachment, population pressure, and poor governance were main drivers of LULC change.

Mashi et al. (2022) assessed stakeholders' perceptions of LULC change drivers in Abuja through interviews and participatory mapping. They emphasized poor urban planning, weak policy implementation, and speculative land markets as key drivers.

Duan et al. (2025) conducted a geospatial and statistical analysis to understand how LULC changes influenced land surface temperature and urban heat island effects in Nigerian cities. Their results showed a strong correlation between increased built-up areas and local temperature rise.

Budnukaeku (2025) analyzed urban morphology and microclimates across Port Harcourt, Lagos, and Jos. The study combined spatial data and climate modeling to demonstrate that rapid urban expansion contributed to localized heat islands and disrupted wind and humidity patterns.

These empirical studies provide comprehensive insights into the multi-dimensional impacts of urbanization and reinforce the need for locally grounded and participatory assessments of land use dynamics in towns like Argungu.

2.3 Theoretical Review

This study is grounded in two key theoretical frameworks:

Urban Ecology Theory views urban areas as dynamic ecosystems where human activities interact with natural processes. It helps explain how urban growth leads to environmental consequences such as habitat loss, pollution, and altered land cover (Pickett et al., 2001; Haile et al., 2025).

Political Economy of Land Theory focuses on how land use is shaped by institutional power, governance structures, and economic interests. It is particularly relevant for understanding how traditional land tenure systems and urban planning policies intersect and sometimes conflict in towns like Argungu (Rocheleau, 1995; Yaro, 2010; Adegoke & Balogun, 2016).

3. Methodology

The study adopted a mixed-methods research design, combining both quantitative and qualitative approaches to provide a comprehensive understanding of the effects of urbanization on land use and land cover in Argungu Metropolis. The study population comprised 45,584 residents (Mindat, 2016). A sample size of 380 respondents was selected for the questionnaire survey using the Krejcie and Morgan (1970) sample size determination table, which is appropriate for ensuring representativeness in large populations. The quantitative component involved the administration of structured questionnaires to residents using a stratified and random sampling approach to capture diverse perspectives across the metropolis. In addition, a purposive sampling technique was used to select 8 key informants, including urban planners, traditional leaders, and community stakeholders, for in-depth interviews based on their knowledge and experience with land use changes.

Data collection involved primary sources, including questionnaires and semi-structured interviews, supported by field observations. Quantitative data obtained from the questionnaires were analyzed using the Statistical Package for the Social Sciences (SPSS) to generate descriptive statistics such as frequencies and percentages. Meanwhile, qualitative data from interviews were analyzed using thematic analysis, which enabled the identification and interpretation of key patterns and themes related to urbanization and land use dynamics. The integration of both analytical techniques enhanced the validity and depth of the findings, as it allowed for triangulation of results from different data sources. This approach is consistent with previous studies that emphasize the importance of combining statistical analysis with qualitative insights to better understand land use and land cover changes (Aniah et al., 2025; Osman et al., 2025).

Ethical Considerations

All participants were informed about the purpose of the research and their voluntary involvement. Informed consent was obtained, and confidentiality and anonymity were assured. The study avoided any harm or exploitation of participants and complied with ethical standards for field-based research in social science, in line with practices by Osman et al. (2025).

4. RESULT AND DISCUSSION OF FINDINGS

This chapter presents the analysis and discussion of data collected on the perceptions and importance of urbanization on land use and land cover (LULC) in Argungu Metropolis. Both quantitative data (from 380 questionnaires) and qualitative data (from interviews with planners, traditional leaders, and community stakeholders) are all presented in order to provide a comprehensive understanding of the phenomenon.

4.1 Data analysis for questionnaire

Table 1. Respondent Characteristics

Variable	Category	Frequency	Percentage (%)
Age	Under 20	38	10.0
	21–30	95	25.0
	31–40	114	30.0
	41–50	76	20.0
	Above 50	57	15.0
Gender	Male	228	60.0
	Female	140	36.8
	Prefer not to say	12	3.2
Education	No formal	76	20.0
	Primary	95	25.0
	Secondary	133	35.0
	Tertiary	76	20.0
Years in Argungu	<5	57	15.0
	5–10	76	20.0
	11–20	133	35.0
	>20	114	30.0

Source: SPSS output 2026

The results in Section A indicate that the majority of respondents fall within the economically active age group (21–40 years), suggesting that the data reflects perspectives from individuals who are actively engaged in economic and land-related activities. The gender distribution shows a higher proportion of males, which may reflect greater male involvement in land ownership and decision-making within the study area. In terms of education, most respondents possess at least secondary education, indicating a reasonable level of awareness and capacity to understand issues related to urbanization and land use change.

Furthermore, a significant proportion of respondents have lived in Argungu for over 10 years, implying that they have adequate experience and historical knowledge of changes in land use and land cover. This enhances the credibility of the responses, as long-term residents are more likely to accurately observe and report trends in urban expansion and environmental transformation. Generally, the demographic profile supports the reliability and relevance of the data collected for the study.

Table 2. Response on perceptions and impacts of urbanization on land use and land cover in Argungu Metropolis, Kebbi State

Section	Variable	Category	Frequency	Percentage (%)
B	Observed Change	Yes	334	87.9
		No	46	12.1
	Increased Housing	Yes	310	81.6
		No	70	18.4
	Loss of Farmland	Yes	295	77.6
		No	85	22.4
	Reduced Vegetation	Yes	305	80.3
		No	75	19.7
	Infrastructure Growth	Yes	280	73.7
		No	100	26.3

Section	Variable	Category	Frequency	Percentage (%)
C	Driver of Change	Population Growth	152	40.0
		In-migration	95	25.0
		Government Projects	57	15.0
		Land Speculation	76	20.0
	Agriculture Affected	Yes	300	78.9
		No	50	13.2
		Not sure	30	7.9
	Loss of Farmland	Yes	285	75.0
		No	95	25.0
	Reduced Farm Income	Yes	210	55.3
No		170	44.7	
Rising Land Cost	Yes	295	77.6	
	No	85	22.4	
Economic Opportunities	Yes	240	63.2	
	No	95	25.0	
	Unsure	45	11.8	
D	Soil Erosion	Yes	260	68.4
		No	120	31.6
Flooding	Yes	230	60.5	
	No	150	39.5	
Vegetation Loss	Yes	300	78.9	
	No	80	21.1	
Pollution	Yes	210	55.3	
	No	170	44.7	
Environment Worsened	Strongly Agree	140	36.8	
	Agree	150	39.5	
	Neutral	40	10.5	
	Disagree	30	7.9	
	Strongly Disagree	20	5.3	
E	Awareness of Policy	Yes	110	28.9
		No	190	50.0
		Not sure	80	21.1
Consultation	Always	40	10.5	
	Sometimes	120	31.6	
	Rarely	140	36.8	
	Never	80	21.1	
Planning Effectiveness	Very Effective	30	7.9	
	Effective	70	18.4	
	Neutral	80	21.1	
	Ineffective	130	34.2	
	Very Ineffective	70	18.4	

Source: SPSS Output, 2026

The results presented in the combined table indicate that a significant majority of respondents (87.9%) have observed noticeable changes in land use and land cover in Argungu, particularly in the form of increased housing development, loss of farmland, and reduction in vegetation. These findings suggest that urbanization is visibly transforming the physical landscape of the area. The dominant drivers identified—population growth (40%), in-migration (25%), and land speculation (20%)—reflect the typical pattern of urban expansion, where increasing population and economic activities drive the conversion of rural land into urban uses, consistent with the general understanding of urbanization as the expansion of built-up areas due to population concentration.

Furthermore, the findings reveal that urbanization has both socio-economic and environmental implications. A large proportion of respondents reported negative impacts such as loss of farmland (75%), increased land costs (77.6%), and environmental challenges including vegetation loss (78.9%), soil erosion (68.4%), and flooding (60.5%). Although 63.2% acknowledged the emergence of new economic opportunities, the overall perception indicates that environmental conditions have worsened, with over 76% agreeing to this effect. In addition, governance issues are evident, as half of the respondents are unaware of land use policies and a majority perceive planning systems as ineffective. This suggests that weak institutional frameworks and limited community engagement are contributing to uncontrolled urban expansion and its associated challenges.

4.2 Thematic Analysis of Interview Responses

Table 3: Summary of Themes from Key Informants

Theme	Planners	Traditional Leaders	Community Stakeholders	Supporting Evidence
Urban Expansion Pattern	Rapid, unplanned expansion; peri-urban growth	Farmlands converting to residential plots	Increase in houses, markets, roads	Urban expansion leads to built-up growth and farmland loss
Drivers of LULC Change	Population growth, migration, weak regulation	Population pressure, land demand	Economic benefits, land sales	Drivers include population growth, infrastructure, and policy factors
Socio-economic Impacts	Rising land cost, infrastructure pressure	Loss of farmland, land disputes	Loss of livelihood, improved business	LULC change affects livelihoods and agricultural productivity
Environmental Impacts	Drainage stress, environmental degradation	Decline in vegetation, land degradation	Flooding, erosion, pollution	Vegetation loss and soil degradation are key outcomes
Governance Issues	Weak enforcement, limited planning capacity	Exclusion of traditional institutions	Lack of community participation	Poor land governance and tenure issues drive land change
Suggested Solutions	Strengthen zoning, monitoring systems	Integrate traditional authority	Improve infrastructure, protect farmland	Policy integration and stakeholder involvement are critical

Author's Compilation

The thematic analysis reveals that urbanization in Argungu Metropolis is characterized by rapid and largely unplanned spatial expansion, driven primarily by population growth, rural–urban migration, and increasing demand for land for residential and commercial purposes. Across all respondent groups—planners, traditional leaders, and community stakeholders—there is a shared perception that agricultural land is being progressively converted into built-up areas, particularly in peri-urban zones. While planners emphasized weak regulatory enforcement and infrastructure pressure, traditional leaders highlighted the erosion of customary land systems and increasing land disputes, and community members pointed to economic incentives such as land sales and business opportunities as key motivating factors.

In terms of impacts, the findings indicate a dual outcome of urbanization. On one hand, it has enhanced economic activities, improved accessibility, and created new livelihood opportunities. On the other hand, it has led to significant environmental and socio-economic challenges, including loss of farmland, declining agricultural productivity, vegetation depletion, flooding, and pollution. A recurring theme across all groups is the weakness of governance structures, particularly poor implementation of land use policies and limited community participation in planning processes. Overall, the thematic analysis underscores the need for integrated and participatory urban planning approaches that balance development with environmental sustainability and protect local livelihoods.

5. CONCLUSION AND RECOMMENDATION

This study concludes that urbanization in Argungu Metropolis has significantly altered land use and land cover patterns, with clear evidence of rapid and largely unplanned expansion. The findings show that population growth, in-migration, and economic incentives are the primary drivers of this transformation, leading to the conversion of agricultural land and vegetation into built-up areas. This aligns with broader empirical evidence that urban expansion in developing regions typically results in declining green cover and increased infrastructure development. While urbanization has contributed to improved economic activities and increased access to services, it has simultaneously caused substantial challenges, including loss of farmland, rising land values, environmental degradation, and increased vulnerability to flooding and erosion.

The study further reveals that the impacts of urbanization in Argungu present a dual outcome: economic benefits on one hand and environmental and socio-cultural disruptions on the other. Residents and stakeholders acknowledged improved business opportunities and urban development; however, these gains are offset by declining agricultural productivity, land conflicts, and weakening traditional land management systems. Additionally, weak governance structures—characterized by poor enforcement of land use regulations, low awareness of planning policies, and limited community participation—have intensified uncontrolled urban growth. These findings underscore the need for a more integrated and inclusive approach to urban management that balances development with sustainability.

In response, the study recommends that government authorities strengthen land use planning frameworks and enforce zoning regulations to control indiscriminate land conversion. There is also a need to adopt participatory planning approaches that actively involve local communities and traditional institutions in decision-making processes. Furthermore, policies should prioritize the protection of agricultural land, promote environmental sustainability through urban greening and improved waste management, and enhance institutional capacity through training and digitization of land administration systems. Public awareness campaigns should also be implemented to educate residents on sustainable land use practices. Collectively, these measures will support a more balanced, inclusive, and sustainable urban development trajectory for Argungu Metropolis.

5. Limitations and Suggestions for Future Research

This study is not without limitations. First, the reliance on questionnaire-based survey data means that responses are based on individual perceptions, which may be subject to bias, misinterpretation, or incomplete recall. Perception studies often show discrepancies between subjective views and actual spatial realities, which can affect the accuracy of findings. Additionally, survey methods tend to simplify complex and dynamic processes such as land use change, making it difficult to capture long-term or evolving patterns of urban transformation. The absence of advanced spatial techniques such as GIS and remote sensing also limits the ability to validate observed land use changes quantitatively. Furthermore, the study is geographically limited to Argungu Metropolis, which may restrict the generalizability of the findings to other urban areas with different socio-economic and environmental contexts.

Future research should address these limitations by adopting a more integrated methodological approach. Specifically, combining GIS and remote sensing techniques with perception-based surveys would provide a more comprehensive and accurate understanding of land use and land cover dynamics. There is also a need for longitudinal studies to capture changes over time and better understand the evolving nature of urbanization. Expanding the study to include multiple cities or comparative analysis across regions would

improve generalizability and deepen insights into urban processes. Moreover, future studies should explore additional dimensions such as climate change impacts, land governance systems, and urban resilience, while also improving survey design standardization to enhance reliability and reproducibility of findings

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