Assessment of the Integration of Slum Development into the Urban System of FCT, Abuja, Nigeria

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Paper Number: 240345

Abstract:

The inability to meet the housing demands of the growing population, in most cities in the country slums have emerged and continue to proliferate in many developing countries. Growth and expansion of slums can also impact the national and regional economy, both negatively and positively. This study is therefore an attempt to advance the need to integrate slums in the urban areas into the larger urban system of Abuja, particularly as regards housing and infrastructure development problems of the majority. A stratified sampling approach was adopted in the administration of 1568 questionnaires to household heads in the selected slum neighbourhood, where 386 questionnaires were administered in Asokoro, 176 in Mabushi, 217 in Dutse, 141 in Mpape, 100 in Gwarimpa, 80 in Wumba, 70 in Karmo and 398 in Idu. Representatives from relevant agencies were also sampled.Data for assessing the socio and demographic characteristics of the residents living in Abuja slums were analysed using frequency counts, percentages, charts, chi-square analysis, cross-tabulation, and plates, data collected on spatial distribution of slums in Abuja was analysed using Satellite imagery of Worldview-4 and the landuse pattern of slums was analysed by development of geodatabase. Findings reveal that slum areas exhibit diverse land-use compositions, with a predominance of high-density residential developments and inadequate infrastructure. The study emphasizes the need for an inclusive urban development framework that acknowledges slum communities as integral to Abuja's growth. By shifting the focus from demolition to integration, this research proposes policies for sustainable urban development that enhance housing conditions, infrastructure, and socio-economic inclusion.

Keywords: *Geospatial analysis, infrastructure, informal settlements, integration, land use, slum.*

1.0 Introduction

Urbanization in developing countries has witnessed remarkable growth over the last two centuries, with average annual increases of 2% compared to 0.5% in more developed regions (Kuddus *et al.,* 2020; Dijkstra *et al.,* 2021; Wang *et al.,* 2021). This rapid growth poses serious concerns regarding the capacity of cities to absorb future population increases, especially in terms of infrastructure and service provision (Kookana *et al.,* 2020; Tay & Ocansey, 2022).

In Africa, the urban population currently stands at about 48.2%, and is projected to exceed 60% by 2025. Nigeria, the most populous country in Africa, is experiencing one of the continent's fastest urban expansion rates averaging 5.8% annually (Aliyu & Amadu, 2017; Kuddus *et al.,* 2020). With an expected urban population of 400 million by 2050, Nigeria is poised to become the third most populous country globally (Abubakar & Aina, 2019; Jiboye *et al.,* 2020).

Among these, Abuja stands out due to its political significance and rapid population growth 5.15% in 2022 and 4.84% in 2023. However, the city's growth has outpaced its capacity to provide affordable housing and basic infrastructure, leading to increased pressure on services such as sanitation, health care, waste management, and governance (Obiadi *et al.,* 2019; Mac-Trends, 2024).

The inability of cities to accommodate their rapidly growing populations has led to the proliferation of slums, particularly in developing countries. Globally, around 1.1 billion people live in slums or slum-like conditions, with 2 billion more expected over the next 30 years constituting roughly 30% of urban populations in less developed countries (United Nations, 2023).

Slums have historically been a feature of cities, often associated with poverty and substandard living conditions. The UN defines a slum as a group of individuals living under one roof in an urban area lacking basic conditions such as access to water, sanitation, durable housing, secure tenure, and adequate living space (UN-Habitat, 2015).

In Nigeria, slums are a defining feature of major cities. Lagos hosts communities such as Ajegunle, Mushin, Bariga, and Makoko, while Ibadan has Apete and Agbowo. Abuja is home to Durumi, Mpape, Kuchi Bena, and others (Ayuba, 2019). These areas are marked by overcrowding, poor construction materials, inadequate services, and insecure tenure (Morakinyo *et al.,* 2012; Okafor & Onuoha, 2016). Despite these poor living conditions, slum populations continue to rise due to economic hardship, displacement, and rural-urban migration.

Interestingly, slums also contribute to the informal economy. For example, Dharavi in India employs 70% of its residents and has an annual economic

output of approximately US$700 million (Chege & Mwisukha, 2013; Mahabir *et al.,* 2016). This raises questions about how slums are classified and their socio-economic contributions.

Despite being a planned city, Abuja has not been able to effectively manage its population boom. Rapid migration, economic centralization, and government activities have led to an explosion in informal settlements. Many of the city's lower-income workers live in areas like Mpape, Gwagwalada, and Kuchi Bena, where housing is relatively affordable but largely informal (Eneh, 2021; Eze, 2023).

These settlements lack essential services such as potable water, sanitation, and secure land tenure. Yet, they provide critical housing solutions for low-income earners, migrants, and internally displaced persons who are priced out of the formal housing market. However, current urban policies in Nigeria often treat these settlements as illegal, leading to periodic evictions without adequate compensation or relocation plans (Abubakar *et al.,* 2019).

Such eviction policies result in significant economic disruptions, social dislocations, and increased homelessness. They also ignore the role slum dwellers play in supporting the city's economy and urban life. The continued reliance on slum demolition rather than sustainable housing solutions fails to address the root causes of urban poverty and housing shortages.

For Abuja, integrating informal settlements into the formal urban fabric is not only necessary but urgent. It requires policy reform to recognize slum dwellers as legitimate urban citizens with rights to adequate housing and urban services. This entails participatory planning, targeted investments in infrastructure, and the development of pro-poor housing strategies.

The challenges of urbanization and slum proliferation in Abuja reflect broader patterns across Nigeria and many developing countries. While urban growth presents opportunities for economic development, the failure to provide adequate housing and services has led to the expansion of slums and worsening inequality. This study seeks to advance the case for integrating slums into the formal urban system as a strategic response to the ongoing urban management crisis. Using Abuja as a case study, it highlights the urgency of inclusive planning that prioritizes human dignity, spatial equity, and long-term sustainability in the face of rapid urban transformation.

2.0 The Study Area

Nigeria's capital, Abuja, is located in the north-western part of the country. It falls within latitudes 7° 25' N and 9° 20° North of the Equator and longitudes 5° 45' and 7° 39' (Federal Capital Territory Administration, 2011) as shown Figure 1.1. It is situated in the Federal Capital Territory of Nigeria, in the

center section of the country (FCT). Abuja is a planned metropolis that was formed out of sections of Nassarawa, Niger, and Kogi states in 1976 and mostly developed in the 1980s. It took the place of Lagos as Nigeria's capital on December 12, 1991. The latter, however, remains the country's most populous metropolis.

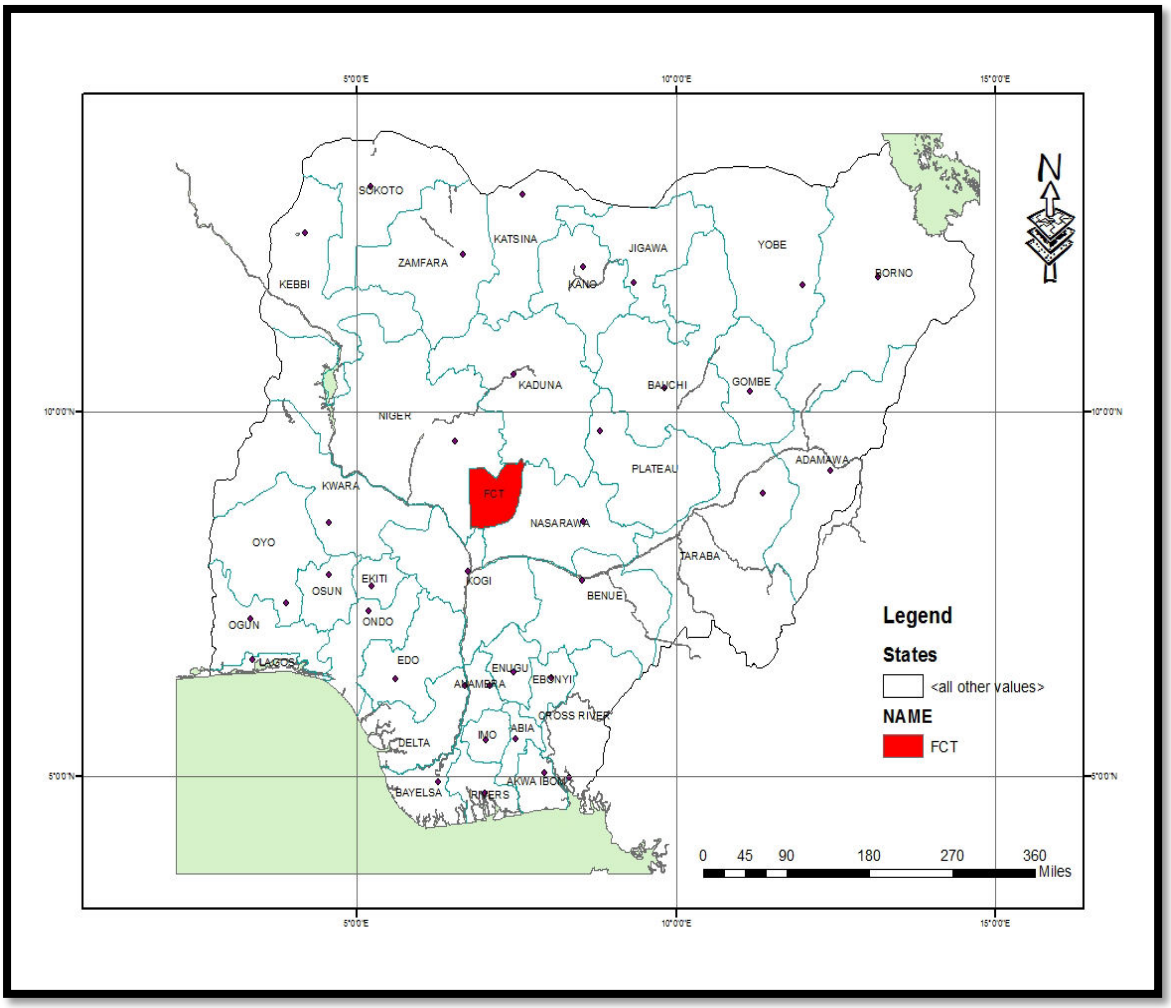

Figure 1. Nigeria showing Federal Capital Territory

Source: Abuja Geographic Information Systems, 2021

2.1 Abuja slums and their characteristics

According to Eneh (2020), respondents identified 87 slums in Abuja, likely reflecting varying perceptions of what constitutes a slum despite prior clarification. Principal Component Analysis (PCA) reduced the list to 30 significant slums, including Apo Mechanic Village, Gishiri, Dei Dei, Dutse, Mpape, Kubwa, Karu, Lugbe, and others. These slums were verified through field surveys. Earlier studies support these findings: Aduge-Ani (2013) listed Kpana and Kado Villages; Isuwa (2016) added 13 more, while Omeje (2017)

expanded the list with 14 additional slums. Most are located within Abuja's 250 km² development area, with suburbs like Kubwa, Nyanya, Karu, and Lugbe overtaken by slum growth. Isuwa (2016) notes that aside from the Central Business Area and Wuse, nearly all districts in Abuja contain slums, reinforcing its status as Africa's fastest-growing capital city.

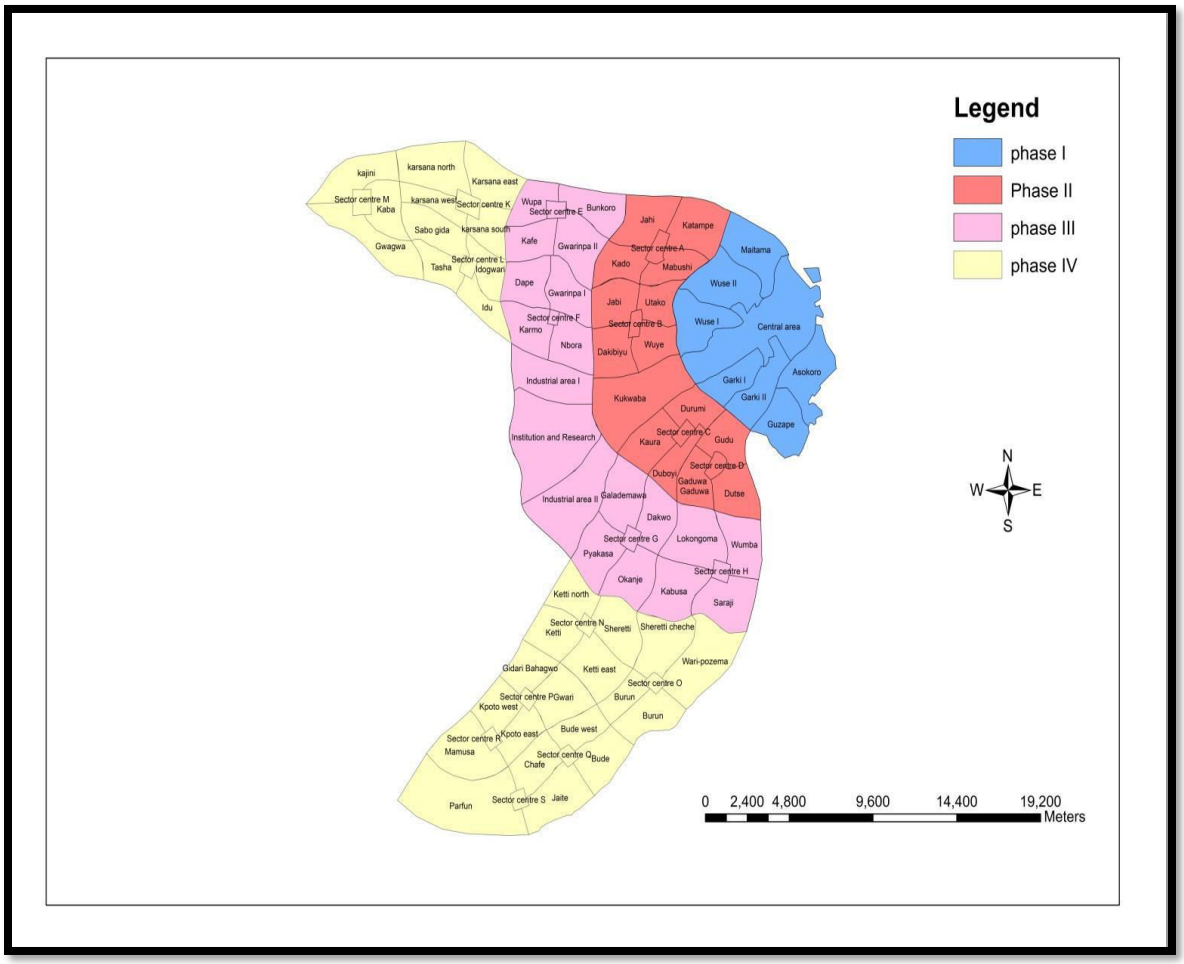

Figure 2. Phases in the Development of the Federal Capital Territory. Source: Abuja Geographic Information Systems, 2021.

The population of people in the informal disorderly and rustic settlements was dense, with hundreds of thousands of residents in 60,000 slums in Mpape, giving upwards of ten people in a slum with a room of less than 8ft wide housing three persons in a few cases and eight persons in most cases (Eneh, 2020). Omeje (2017) submits that Abuja was designed for a population of 1.6 million people and expandable at its sides to 3.2 million people. But, due to an influx of people into the capital city, the population is currently around 6 million people. Indeed, about 80 million Nigerians are living in slums. Around 33% of the urban population in the developing world or about 863 million people lived in slums in 2012.

Ayoade *et al.,* (2012) reported that Mpape had 82 slums per 500 m^2 and average of 10 persons per household. Katampe had 71 slums per 500 m^2 and average of 6 persons per household. Kurudum had 57 slums per 500 m^2 and average of 6 persons per household. Durumi had 68 slums per 500 m^2 and average of 8 persons per household. Zuba had 77 slums per 500 m^2 and average of 10 persons per household. Kabusa had 57 slums per 500 m2 and average of 4 persons per household. Mpape had 82 slums per 500 m^2 and average of 10 persons per household. Kubwa Village had 81 slums per 500 m2 and average of 10 persons per household. Mabushi Village had 52 slums per 500 m^2 and average of 6 persons per household. Garki Village had 69 slums per 500 m^2 and average of 6 persons per household. Gishiri had 63 slums per 500 m^2 and average of 6 persons per household.

3.0 Research Methodology

This research is designed to facilitate the integration of Slum development into the urban system of Abuja, Nigeria. For the purpose of this research, quantitative method was adopted. Also spatial and non-spatial data were collected and analyzed in this study to provide answers to the research questions. The adoption of quantitative and spatial analysis methods in this study was justified by the nature of the research objectives, which required systematic measurement, mapping, and statistical evaluation of slum characteristics within Abuja. Quantitative methods allowed for the collection of structured data from a large number of respondents, enabling objective analysis of socio-economic and environmental conditions through measurable indicators such as population density, income levels, housing quality, and access to basic services. Spatial analysis, on the other hand, was essential for identifying the geographic distribution and land-use patterns of slums, as well as understanding their linkages with the broader urban system. The integration of both methods provided a comprehensive and evidence-based understanding of slum dynamics, supporting the development of a practical framework for their effective integration into the urban planning process of Abuja.

3.1 Types and Sources of Data

The required data were sourced from primary and secondary sources. The primary data for this study was collected on the general perceptions of the respondents about slum activities and socioeconomic development, such as their level of income, availability of basic amenities, general housing and neighbourhood conditions, and also the environmental conditions. These data were primarily gathered from the residents of the slum communities through field surveys.

Secondary data were also collected for the study include population and land use maps, which were sourced from the National Population Commission and the Federal Ministry of Lands, Housing, and Urban Development, respectively.
The collected data were subjected to descriptive, inferential, and spatial analytical tools in Excel and ArcGIS 10.2 environments. Section 3.1.1 shows the flow chart for the research design to be adopted
NigeriaSAT-1 satellite imagery and the rectangular grid coordinate (Easting (x) and Northing (y) of the selected slum locations and features in the study areas were acquired from National Space Research Development Agency (NASRDA). Other secondary data that used were the administrative map, population figure and land use pattern.

3.2 Study Population and Sample Size

Research population is all the respondents in the field of enquiry, which according to Kothari, (2008) constitutes a population or universe. According to Eneh (2020), 30 slums were confirmed to exist in the FCT, and their characteristics were established through a field survey. They include Apo Mechanic Village, Wumba, Dawaki, Dei Dei, Durumi, Dutse, Gwarimpa, Garki Village and Gishiri. Others are Gwagwalape, Idu, Jabi, Kado Village, Karmo, Karshi, Karu, Katampe, Ketti Village, Kpaduma, Kabusa, Kpana Village, Kubwa, Lokogoma, Lugbe, Mabushi, Mpape, Nyanya, Kuruduma and Piya Neuman(1991) as cited in Yusuf (2003) opines that “larger populations permit smaller sampling ratio for equally good sample because as the population size grows, the returns in accuracy for sample size shrink”. Based on these, eight slums area was randomly picked from the 30 identified slums.
The Abuja MasterPlan indicated that Abuja will be developed in phases and it has phases one to five. The urban poorcommunities in phases 1 to 4 have been enumerated by the Abuja government while phase 5 hasnot. This study investigated the urban poor communities (slums) in phases 1 to 4and they have a totalpopulation of 114738 in 2019 as shown in Table 1(Obiadi *et al.,* 2019).

Table1: Household Population for the Slum Dwellers

Phase	**Household Population for the Slum Dwellers**
Phase 1	10830
Phase 2	21700
Phase 3	16714
Phase 4	65494
Total	**114738**

Source: Obiadi *et al.* (2019).

3.2.1 Sample size determination

A sample is a small proportion of a population selected for observation and analysis. The sample size of the respondents was calculated using a simplified formula proportion as illustrated by Glenn (2013).

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

Where;

n = Sample size

N = Population size in the sample unit

e = Level of precision which is + 5% (0.05)

For the purpose of this study, eight slum neighborhoods were selected as the representative of thirty slums neighbourhoods identified due to the homogenous characteristics across all the slums. One slum settlement was selected at phase one, two slum settlements were selected at phase two, four slum settlements were selected at phase three, and one slum settlement was selected at phase four.While two representative each from the agencies (Abuja municipal Area Council (AMAC), Federal Capital Development Authority (FCDA), Federal Housing Authority (FHA), Federal Ministry of Housing, Works , and Power And Federal Ministry Of Lands, Housing and Urban Development were also be sampled.

Phase	**Population (N)**	**Sample Size (n)**
Phase 1	10,830	386
Phase 2	21,700	393
Phase 3	16,714	391
Phase 4	65,494	398
Total	**114,738**	**1,568**

Table 2: Sample size

Sn	**Study Area**	**Sample Size**
	Phase 1	**386**
1	Asokoro	386
	Phase 2	**393**
2	Mabushi	176
3	Dutse	217
	Phase 3	**391**
4	Mpape	141

5	Gwarimpa	100
6	Wumba	80
7	Karmo	70
	Phase 4	**398**
8	Idu	398
	TOTAL	**1568**

Source: Authors Field Survey, 2021

3.3 Method of Data Analysis

Data for assessing the socio and demographic characteristics of the residents living in Abuja slums are mainly quantitative in nature. They include monthly income, house rent per month, household size, housing and environmental conditions, and the informality of land and buildings. The data required for determining the socio-economic and environmental conditions of the residents living in the slum area was derived mainly from the housing unit survey questionnaire.

The analysis of the data was carried out with the use of frequency counts, percentages, charts, chi-square analysis, cross-tabulation, and plates.

The linkage between slums and the urban system were identified to better understand which of the elements of the urbanized area have more impact than others. To achieve this, Pearson's correlation, statistics that provides the relationship between two variables were used to test for the following using QGIS 3 Version to explain the linkage between slums of Abuja and the urban system.

In order to successfully appraise past policies and programmes towards managing of slums in Abuja, the following approaches were thoroughly examined: Demolition and Resettlement program, Slum clearance and slum upgrading.

To develop the three-stage Slum Integrating Programme framework, the methodology integrated both quantitative and qualitative analyses based on the outputs from the previous five objectives. The framework was structured into Stage 1 (Goal Definition), Stage 2 (Policy Domains), and Stage 3 (Operational Interventions), following a systems-thinking approach to urban integration.

Conceptual Database Design: The definition of the entities (and attributes) which are the related to the view of reality was done at this stage. The entities, attributes and the relationships identified for this research work is presented in Table 3.

Table 3: Entities and Attributes

S/N	Entity	Format	Attributes
1	Roads	Line	Name, type, condition
2	Buildings	Polygon	Name, type, date built, use, area
3	Land Use	Polygon	Name, usage
4	Infrastructure	Point	Name, type

Logical Database Design: The conceptual entities and their relationships were translated to a relational schema of tables and other necessary operations were performed to facilitate easy database operations. The attributes were first identified are given unique names which are not more than ten (10) letters.

Physical Database Design: The relational schema was implemented in ArcMap 10.3 In the process of implementation, all the guideline from attribute and data type in the logical design were followed. The project relies on both Primary and Secondary data. The Characteristics of the data used in this study is shown in Table 4.

Table 4: Characteristics of the data used

S/N	Data	Date	Source	Resolution /Accuracy
1.	Worldview-4	2024	Google Earth	0.5m
3.	The Abuja Land Use Map	2018	AGIS	N/A

Stage 1: Image georeferencing

For image rectification, 4 ground control points which are visible on the composited image would be selected for GPS Field Survey with Differential GPS. The acquired coordinates would be used to georeference the composited image by assigning the Northings and Eastings of the ground control points. The resulting image would be rectified to UTM Zone 32, Minna Datum.

Stage 2: Image digitizations

Digitizing was used to populate the database and Land use analysis was carried out to determine the area of each land use within the slums. This was done with using the Geometry Tool in the attributes table of the land use generated through digitizing. Prior to digitizing, the following image processing techniques were carried out on the images:

4.0 Results and Discussion

4.1 Socio-economic and environmental condition

4.1.1 Gender of the respondents

The gender classification of the respondents within the study area was examined. The results are as displayed in Table 5, showing that 65.6% of the respondents were male and 34.4% were female in the study area. This shows that the majority of the respondents in the study area were male. The study area is dominated by male household heads. Additionally, males are predominantly the heads of households in the study area.

Table 5: Gender

Gender	Frequency	Percent (%)
Male	745	65.6
Female	390	34.4
Total	**1135**	**100.0**

4.1.2 Age of respondents

Table 6 shows the age of respondents. The table shows that 30.8% were between 26 and 35 years, 22.9% were between 36 and 45 years, 14.1% were less than 18 years, 12.3% were between 36 and 45 years, 11.0% were between 18 and 25 years, and the remaining 8.8% were above 55 years. The cumulative percentage shows that the majority (54.9%) of the respondents were 26 years of age and older.

Table 6: Age of Respondents

Age	Frequency	Percent (%)	Cumulative Percent (%)
Less than 18	160	14.1	14.1
18-25	125	11.0	25.1
26-35	350	30.8	55.9
36-45	260	22.9	78.9
46 - 55	140	12.3	91.2
above 55	100	8.8	100.0
Total	**1135**	**100.0**	

4.1.3 Marital status

The marital status of the respondents, as shown in Table 7, shows that 53.8% of the respondents in the study area were married, 5.7% were separated, and 40.1% were single. This implies that the majority of the respondents in the study area were married, which might compel them to explore more sources of income including within the urban centre.

Table 7: Marital status

Marital status	Frequency	Percent (%)
single	450	40.5
separated	65	5.7
married	610	53.8
Total	**1135**	**100.0**

4.1.4 Education level of the respondents

Table 8 shows the distribution of survey respondents' educational qualifications. 33.0% of respondents had secondary qualification, 25.1% had primary school qualification, 22.0% had BSC/HND qualification, 18.5% had ND/NCE qualification, and the remaining 1.3% had M.Sc., M.Tech, and above qualification. Therefore, the respondents are adequately knowledgeable.

Table 8: Education level of the Respondents

Educational status	Frequency	Percent
Primary	285	25.1
secondary	375	33.0
ND/NCE	210	18.5
BSC/HND	250	22.0
M.Sc / M.tech and Above	15	1.3
Total	**1135**	**100.0**

4.1.5 Occupational structure of respondents

The occupational structure of slum dwellers in the study area was made up of civil servants, business, private, artisans, students, apprentices, and retired. Table 9 shows that business people (petty traders and retail shops) constituted 49.3% of the respondents; individuals involved in the private sector were 18.9%; 14.1% were civil servants; 9.7% were artisans; 4.8% were students; 2.2% were retired; and 0.9% were apprentices.

Table 9: Occupational Structure of Respondents

Occupation	Frequency	Percent (%)
Civil servant	160	14.1
Business	560	49.3
Private	215	18.9
Artisan	110	9.7
Student	55	4.8
Apprentice	10	9

Retired	25	2.2
Total	**1135**	**100.0**

4.1.6 Monthly income of respondents

The investigation into the average amount of money that respondents accrue at the end of every month was also considered relevant to the achievement of this study's objectives. The fact that people engage in different forms of business of different capacities to make ends meet made it necessary to investigate the average amount of money that accrues to a household head at the end of every month. As a result, the residents' estimated monthly income was considered in ranges to accommodate a degree of precision as well as flexibility. The results from the study area show that 24.2% of the respondents earned below 30,000 naira per month, 30.4% earned between 60,001 and 90,000 naira, 15.9% indicated their monthly income to be between 30,001 and 60, 000 naira, and 15.4% earn between 90,001 and 120,000 naira. The lowest percentage, 14.1%, represents residents who received more than 120,000 thousand naira monthly, as shown in Table 10. Based on the current situation in the Nigerian economy, where a dollar is equivalent to 1530 naira, the majority of the respondents can be grouped as low-income earners.

Table 10: Monthly income of respondents

Monthly income	**Frequency**	**Percent (%)**
Less than ₦ 30,000	275	24.2
₦30,001-60,000	180	15.9
₦60,001- 90,000	345	30.4
₦ 90,001- 120,000	175	15.4
Above ₦ 120,000	160	14.1
Total	**1135**	**100.0**

4.1.7 Ownership of building

The field survey data revealed that the majority (44.5%) of the respondents in the study area reside in rented apartments. This implies that the majority are tenants; 34.8% were owners occupied, meaning they are the original owners of the building they occupy; 10.6% were tenants, 5.7% were inheritors; and 4.4% were free houses. The research findings reveal that most of the buildings in the study area were occupied by tenants, as shown in Table 10.

Table 10: Ownership of building

Occupancy status	Frequency	Percent (%)
Privately rented	505	44.5
Owner occupied	395	34.8
Inherited	65	5.7
free Houser	50	4.4
tenants	120	10.6
Total	**1135**	**100.0**

4.1.8 Method of sewage disposal

The methods of sewage disposal used by the respondents in the study area, as presented in Table 11, include public sewer, septic tank, pour-flush latrine, pit latrine, and open-air defecation. The results revealed that 35.7% of the respondents used public sewers for sewage disposal, followed by 30.0% of the respondents who used septic tanks. In the study area, 29.5% of respondents used pour-flush latrines, while only 3.5% and 1.4% used ventilated improved pit latrines and open-air defecation, respectively.

Table 11: Method of solid waste disposal

Method of solid waste disposal	Frequency	Percent (%)
Public sewer	405	35.7
Septic tank	340	30.0
Pour-flush latrine	335	29.5
Ventilated Improved pit latrine	40	3.5
Open air defecation	15	1.3
Total	**1135**	**100.0**

4.2 Land use Pattern

The discernible land use patterns in the slums of Abuja reveal varying degrees of residential density, mixed-use development, and the presence of community facilities. While Karmo exhibit higher residential densities with significant mixed-use developments. Mabushi and Wumba provide a balance of residential, educational, and recreational land uses. Each slum area is analysed below.

4.2.1 Karmo

In Karmo, the land use is primarily high-density residential area, which occupies 28.17% of the total area. Medium-density residential areas represent 20.20%. Low-density residential zones comprise 8.75% of the land use.

Comprehensive development projects account for 6.76%. Schools make up 5.86% of the total area.Table 12 shows the percentage of land use in Gwarinpa. Figure 3 show the map depicts the diverse land use patterns in Gwarinpa.

Table 12: Percentage of land use in Karmo

Land use	Area	Percentage(%)
Undevelopable land, Flood Area & Steep Ground	438818.52	20.56
Low Density	401868.37	18.83
High Density	589215.24	27.61
Medium Density	248838.88	11.66
Employment Area	122814.64	5.75
Nursery & Primary School	17537.10	0.82
Open Space, Recreation & Undeveloped Land	36132.93	1.69
Commercial	34515.07	1.62
Passive Recreation	6871.43	0.32
Health Centre	4643.41	0.22
Market	7078.20	0.33
Hotels	19024.09	0.89
Mixed Development	206949.02	9.70
Total	2134306.95	100.00

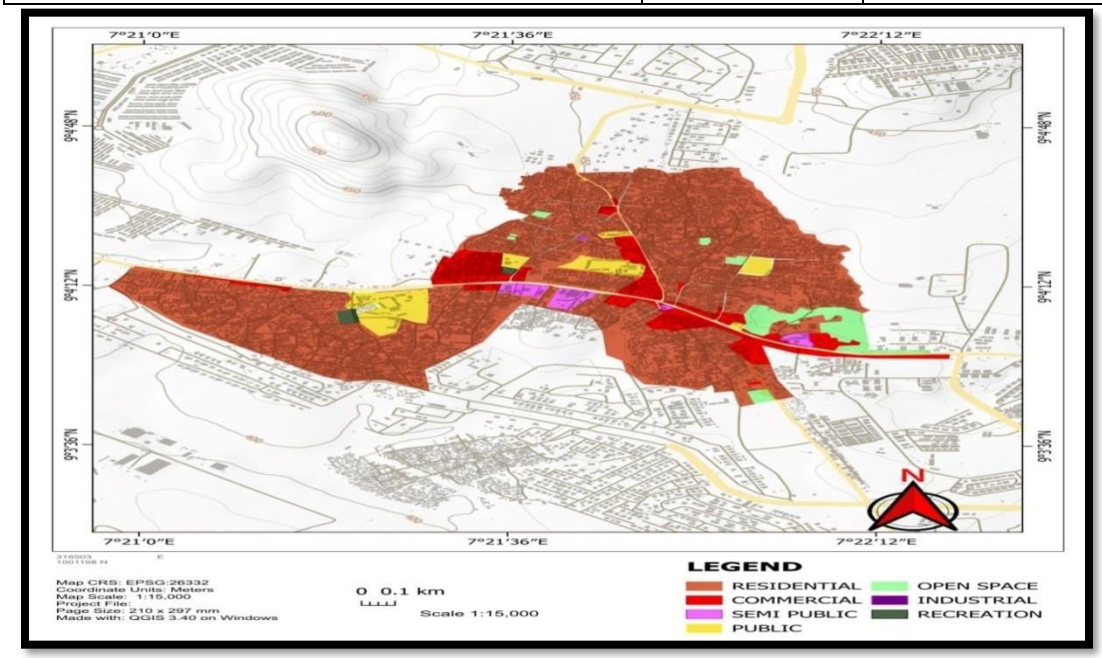

Figure 3: Map showing land use in Karmo

4.2.2 Mabushi

Mabushi's land use is characterized by a significant portion of high-density residential areas, which account for 27.61%. Low-density residential zones represent 18.83%. Medium-density residential areas comprise 11.66% of the land use. Employment areas make up 5.75% of the total area.Table 13 shows the percentage of land use in Mabushi. Figure 4 show the map depicts the diverse land use patterns in Mabushi.

Table 13: Percentage of land use in Mabushi

Landuse	**Area**	**Percentages(%)**
Medium Density	249974.46	6.20
Low Density	34933.89	0.87
High Density	20494.28	0.51
Schools	328493.66	8.15
Cemetery	19283.05	0.48
Active Recreation	18678.09	0.46
Hotels	44559.23	1.11
Health Center	33576.99	0.83
Fire Service	20259.48	0.50
Police Station	31251.85	0.78
Religious Institution	65517.45	1.63
Mixed Dev.	194213.67	4.82
Open Space, Recreation & Undeveloped Land	427015.68	10.60
Commercial	123251.59	3.06
Comprehensive Dev.	2418278.94	60.01
Total	4029782.39	100.00

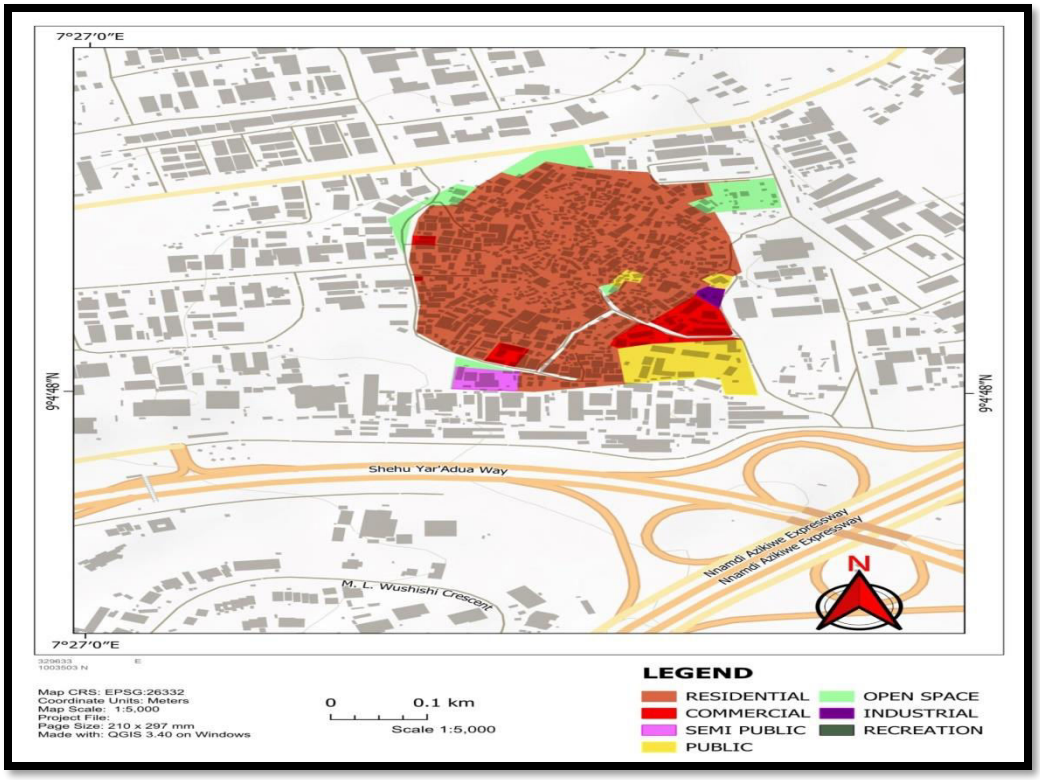

Figure 4: Map showing land use in Mabushi

4.2.3 Mpape

In Mpape, medium-density residential areas represent 19.27% of the total land use Mix development are a significant land use category, covering 10.63%. Low-density residential zones comprise 21.79% of the total area. High-density residential areas account for 44.06%. church make up 0.03% of the land use.Table 14 shows the percentage of land use in Mpape. Figure 5show the map depicts the diverse land use patterns in Mpape.

Table 14: Table showing percentage of Land use in Mpape

Landuse	Area	Percentages (%)
Schools	3230.21	0.123%
Religion institution	943.63	0.036%
Financial institution	325.68	0.012%
Low density	571947.72	21.792%
Medium density	517673.55	19.724%
High density	1156546.15	44.066%
Mixed development	279065.94	10.663%
Comprehensive Dev.	23527.32	0.896%
Open Space	71345.23	2.718%
Total	2624605.45	100.00%

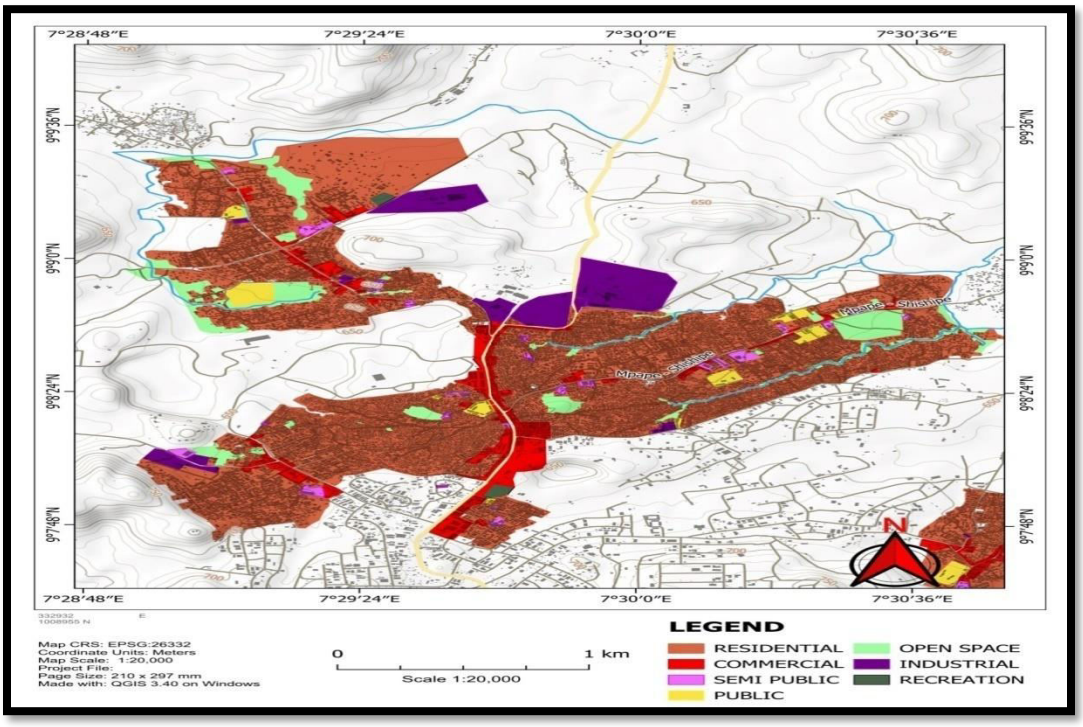

Figure 5: Map showing the land use in Mpape

4.2.4 Idu

In Idu, medium-density residential areas represent 14.0% of the total land use.Undeveloped land is a significant land use category, covering 10.0%. Low-density residential zones comprise 43.0% of the total area. High-density residential areas account for 19.0%. School and church make up 1.0% and 1.0% of the land use respectively.Table 15 shows the percentage of land use in Idu. Figure 6show the map depicts the diverse land use patterns in Idu.

Table 15: Table showing percentage of landuse in Idu

Landuse	Area	Percentages (%)
Low density	949334.26	43.0
School	29693.36	1.0
Religion institution	14057.02	1.0
Undeveloped land	230487.84	10.0
Medium density	30776.22	14.0
High density	426347.24	19.0
Mixed development	158745.27	7.0
Comprehensive Dev.	106190.44	5.0
Total	2222631.69	100.0

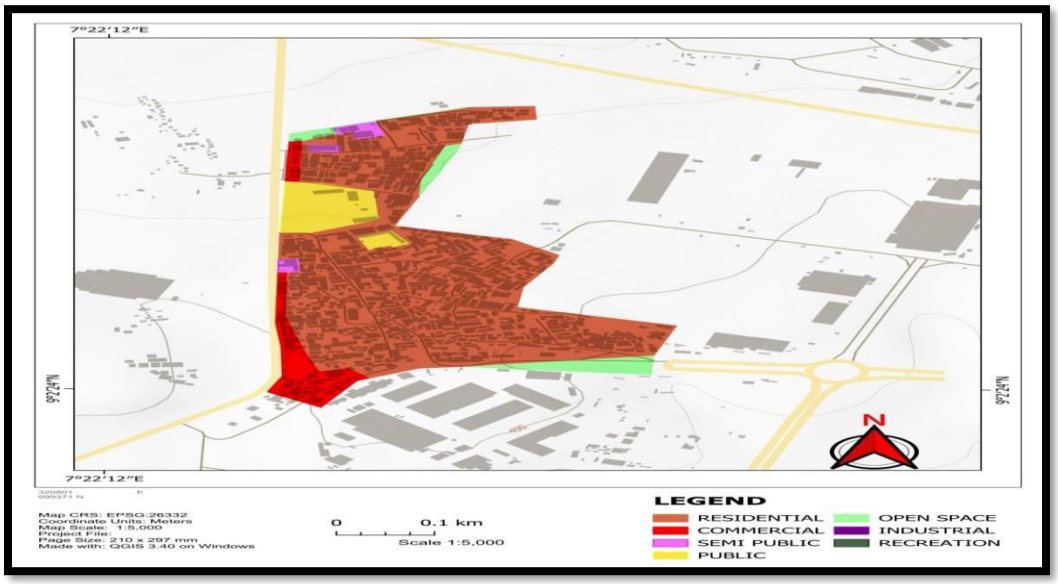

Figure 6: Map showing land use in Idu

4.2.5 Asokoro village (Kpaduma)

Table 16 shows the percentage of land use in Asokoro (Kpaduma). The land use is predominantly characterised by low-density residential areas, which occupy 74.51% of the total land area. Medium-density residential areas cover 9.01% of the total land area as presented in Figure 7. High-density residential zones are significantly smaller, comprising 5.99%. Educational facilities, specifically schools, account for 3.01% of the land use. Health centres occupy a minimal portion, accounting for 0.04% of the total area.

Table 16: Percentage of land use in Asokoro village (Kpaduma)

Landuse	**Area**	**Percentages (%)**
Medium Density	720444.39	9.01
Low Density	5956821.34	74.51
High Density	478782.65	5.99
Schools	240945.08	3.01
Health Centre	3533.90	0.04
Hotel	25923.58	0.32
Police Station	103864.39	1.30
Community and Public Institution	464740.88	5.81
Total	**7995056.25**	**100.00**

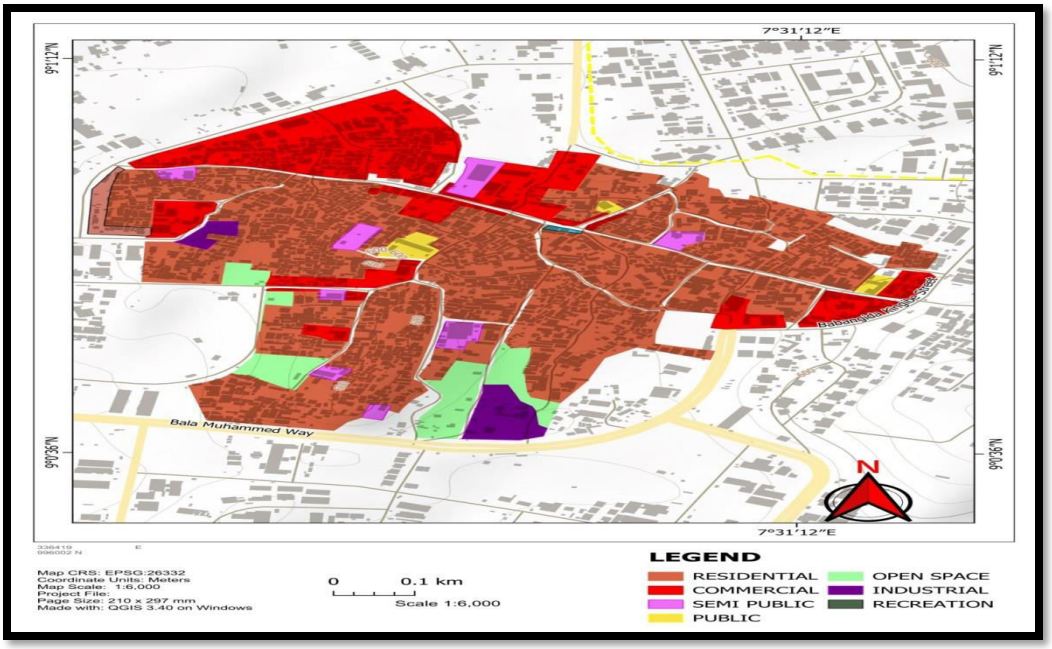

Figure 7. Land use in Asokoro Village (Kpaduma)

4.2.6 Dutse Apo

The land use in Dutse Apo is diverse, with high-density residential areas being dominant, covering 38.05% of the total land. Comprehensive development occupies 26.13%. Medium-density residential areas represent 11.35%. Mixed development areas constitute 2.41% of the land use. Low-density residential areas are the least extensive, covering 1.15% of the total area. Table 17 shows the percentage of land use in Dutse Apo. Figure 8 show the map depicts the diverse land use patterns in Dutse.

Table 17: Percentage of land use in Dutse Apo

Land use	**Area**	**Percentages (%)**
High Density	761425.25	45.68
Low Density	43417.65	2.61
Medium Density	287850.13	17.27
School	9936.62	0.60
Comprehensive development	333505.10	20.01
Health Centre	5508.08	0.33
Hotel	27496.82	1.65
Religious Ins	5421.50	0.33
Commercial	192222.39	11.53
Total	**1666783.57**	**100.00**

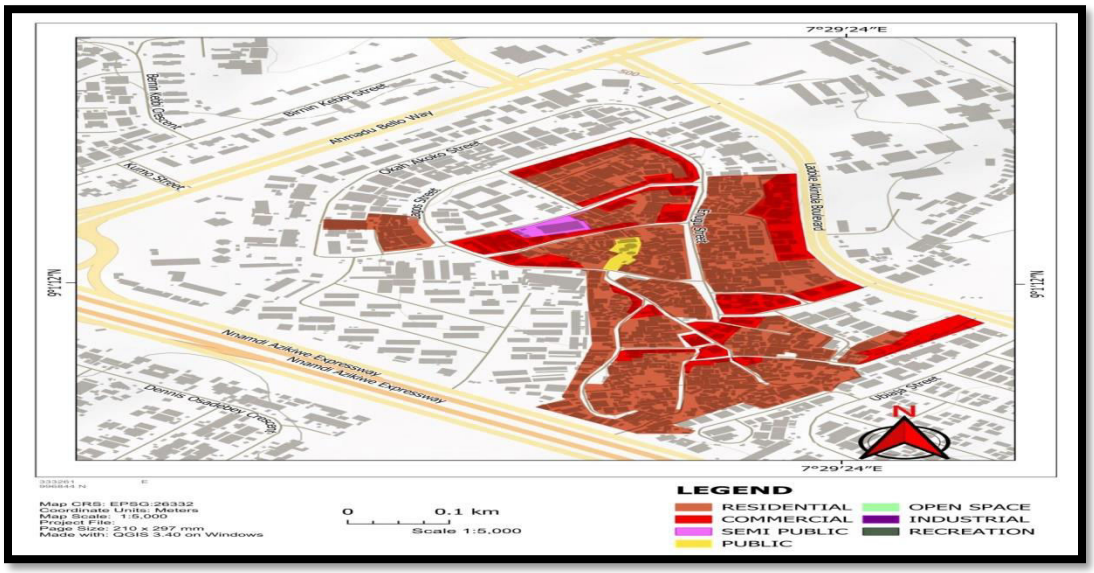

Figure 8. Land use in Dutse Apo

4.2.7 Gwarimpa village (Kado Bimko)

In Gwarinpa village (Kado Bimko), high-density residential areas dominate, occupying 45.68% of the total land area. Medium-density residential areas represent 17.27% of the land use. Comprehensive development account for 20.01%. Low-density residential zones are significantly smaller, comprising 2.60%. Schools make up 0.60% of the land use. Table 18 shows the percentage of land use in Gwarinpa village (Kado Bimko). Figure 9 show the map depicts the diverse land use patterns in Gwarinpa village (Kado Bimko).

Table 18: Percentage of land use in Gwarinpavillage (Kado Bimko)

Landuse	Area	Percentage (%)
Medium Density	733002.91	20.20
High Density	102229.72	28.17
Low Density	317592.56	8.75
Comprehensive Development	245252.37	6.76
Schools	212752.71	5.86
Employment Area	114849.32	3.16
Police Station	64123.51	1.77
Fire Station	9872.80	0.27
Health Centre	36877.99	1.02
Financial Ins	2985.18	0.08
Undeveloped Land	543245.84	14.97
Mixed Dev	130296.51	3.59
Active Recreation	139909.90	3.86

Commercial	56468.38	1.5
Total	**3629527.43**	**100.00%**

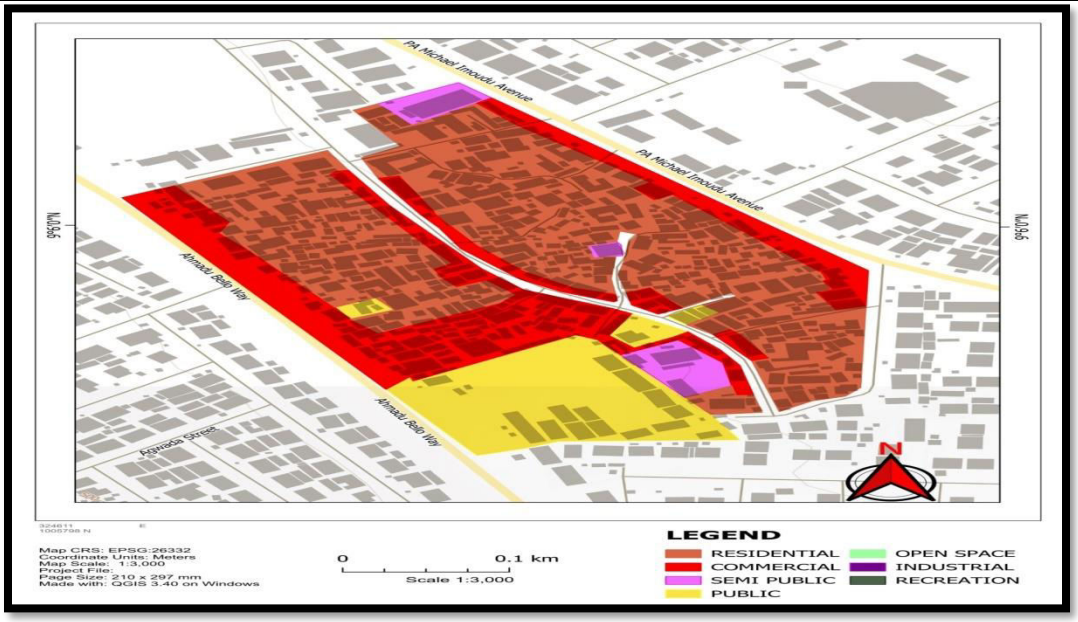

Figure 9. Land use in Gwarinpa village (Kado Bimko)

4.2.8 Wumba

In Wumba, medium-density residential areas represent 6.20% of the total land use. Schools are a significant land use category, covering 8.15%. Low-density residential zones comprise 0.87% of the total area. High-density residential areas account for 0.51%. Cemeteries make up 0.48% of the land use.Figure 10 show the map depicts the diverse land use patterns in Wumba.

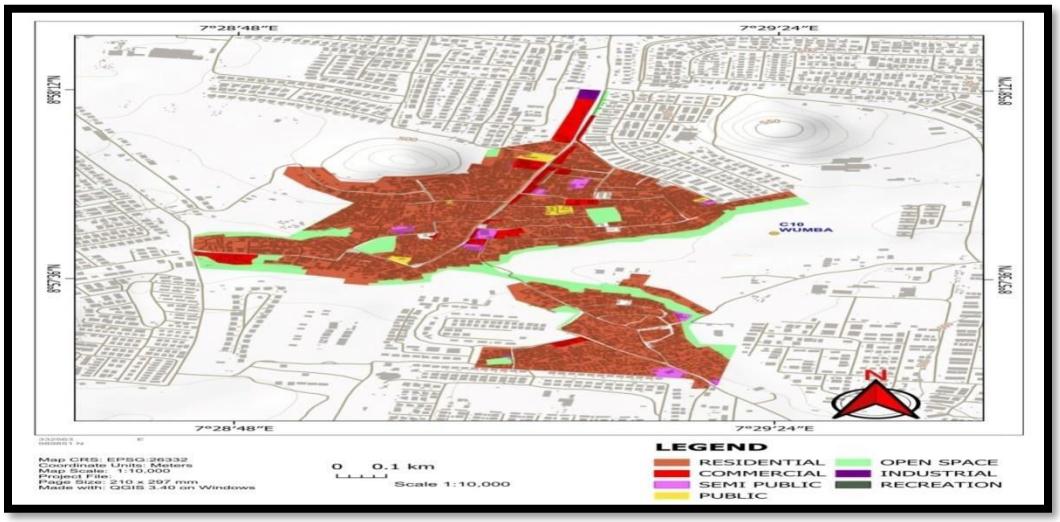

Figure 10. Land use in Wumba

The discernible land use patterns in the slums of Abuja reveal varying degrees of residential density, mixed-use development, and the presence of community facilities. While Karmo exhibit higher residential densities with significant mixed-use developments.
Mabushi provide a balance of residential, educational, and recreational land uses. This finding is consistent with Ayuba's (2019) findings, which reveal that the primary land use in Abuja's slums is residential, characterized by densely packed informal housing units. These settlements often lack proper planning and infrastructure, leading to overcrowding and substandard living conditions. Informal settlements in Abuja frequently exhibit mixed land uses, where residential spaces coexist with small-scale commercial activities, informal markets, and sometimes industrial activities. This mixed-use pattern reflects the adaptive strategies of slum residents to generate income and meet daily needs within their immediate environment (Wahab, 2017).

5.0 Conclusion and Recommendation

The study identifies distinct land use patterns across the slums of Abuja, such as Karmo, Mabushi, Mpape, Idu, Asokoro village, Dutse Apo, Gwarimpa Village and Wumba each exhibiting unique residential densities, mixed-use developments, and community facilities. Despite the diversity, these areas share common challenges, including overcrowding, inadequate infrastructure, poor sanitation, and lack of proper urban planning. High-density residential developments dominate most slum areas, with mixed-use developments and commercial activities reflecting the adaptive survival strategies of residents. The findings align with previous research, highlighting the predominance of informal housing and the dual-purpose use of spaces for both residential and commercial activities.The lack of basic amenities and infrastructure, coupled with unregulated land use, underscores the urgent need for interventions that focus on integrating these slums into Abuja’s formal urban system. Proper planning, infrastructure development, and community engagement are essential to address the substandard living conditions and unlock the potential of these areas as integral parts of the city.

To address the identified challenges and ensure sustainable integration of slum areas into Abuja’s urban system, the following recommendations are proposed:

Develop a city-wide land use plan that incorporates slums, emphasizing balanced residential densities, mixed-use developments, and adequate community facilities.

Establish policies to regulate and formalize existing land use in slums, ensuring compliance with planning standards.

Invest in essential infrastructure, including roads, drainage, electricity, and water supply, tailored to the needs of each slum.

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