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Abstract

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Abstract

Adequate housing infrastructure is essential for ensuring access to basic services, improving residential quality, and promoting the health and well-being of urban residents. This study assessed the housing infrastructure situation within the residential core area of Akure, Ondo State, Nigeria, with particular emphasis on the socio-economic, housing, environmental and infrastructure characteristics of the area. The study employed a combination of quantitative and qualitative methods. The core area was delineated into 10 residential zones comprising 1,193 buildings and approximately 4,772 households, from which a 5.0% sample of 235 households was selected for the survey. Data were collected on demographic characteristics, building conditions, housing facilities, infrastructure provision, services and environmental practices. Descriptive statistics, and a Housing Infrastructure Quality Index (HIQI) analysis were employed to evaluate the condition and quality of housing infrastructure. The findings revealed ageing infrastructure, diverse housing types, overcrowding, inadequate sanitation, poor waste management and deficiencies in drainage and other neighbourhood infrastructure. The overall HIQI indicated a moderate level of housing infrastructure quality, although substantial variations existed among individual infrastructure components. Water supply recorded the highest normalized index (0.943), while waste management recorded the lowest (0.391), indicating a particularly important environmental infrastructure deficiency. The study concludes that housing infrastructure in the Akure core area requires integrated upgrading rather than isolated interventions. It recommends targeted housing rehabilitation, improvement of drainage and waste-management systems, infrastructure upgrading, improved development control and strengthened environmental management to enhance housing quality, neighbourhood functionality and urban sustainability in the core area.

Keywords: Housing, Infrastructure, Urban Core Area, Akure, Nigeria

1.0 Introduction

Urban core areas are complex environments that present serious challenges to urban planners and policy makers. In many cities, these areas experience physical deterioration due to rapid urbanization, population pressure, changing economic activities, and inadequate urban infrastructure (UN-Habitat, 2022). In Nigeria, the environmental and physical conditions of many urban cores sharply contrast with those of suburban areas, reflecting differences in infrastructure provision, public amenities, security, drainage, and environmental conditions (Alabi, 2021). These conditions are often associated with overcrowding, deteriorating buildings, inadequate sanitation facilities, poor waste management, and increased environmental health risks.

Recent studies have shown that socio-economic characteristics, particularly occupation, educational attainment, and income level, significantly influence housing quality in urban residential neighbourhoods (Olayiwola & Ajala, 2022 Similarly, deteriorating neighbourhoods with poor infrastructure, inadequate waste disposal systems, and neglected public spaces are often associated with deficiencies in livability, security, and residents' quality of life (Adewumi et al., 2021). Physical disorder characterized by littered surroundings, poor drainage systems,

and overcrowded housing contributes greatly to environmental degradation and poor public health outcomes in many developing cities.

The urban core represents the central and historically established part of a city where major economic, social, administrative, and cultural activities are concentrated. It is commonly characterized by relatively high population and building densities, mixed land uses, accessibility, and a concentration of commercial and institutional functions (Olayiwola & Ajala, 2022). Core areas often contain important public institutions, markets, transport routes, and cultural landmarks that promote social interaction and urban identity (UN-Habitat, 2022). However, rapid urban growth and inadequate planning have placed significant pressure on these areas, leading to infrastructural decay and environmental problems.

The delineation of a city's core area is commonly based on factors such as concentration of commercial activities, residential density, accessibility to transportation infrastructure, and the presence of historical and cultural facilities (Akinbamijo & Ayejugbagbe, 2021). These characteristics collectively define the urban core as the most active and densely developed section of the city. In many Nigerian cities, core areas are predominantly occupied by low- and medium-income residents and are characterized by mixed residential and commercial land uses.

Previous studies on the core area of Akure identified several environmental and housing problems, including poor building conditions, high occupancy rates, inadequate sanitary services, poor accessibility, and deficient public utilities (Owoeye & Omole, 2012; Enisan, 2019;). This study therefore examines the core area of Akure using the Housing Infrastructure Quality Index (HIQI) analysis; with particular emphasis on housing conditions, environmental sanitation, socio-economic characteristics of residents, and the physical attributes of buildings within the study area, to provide a composite representation of housing infrastructure conditions in the study area.

2.0 Literature Review: Housing is a fundamental human need that plays a significant role in human wellbeing, social stability, and economic development. Adequate housing provides shelter, privacy, security, and protection against environmental hazards. According to Equere, Ibem, & Alagbe (2021), housing quality encompasses not only the physical structure of buildings but also access to basic facilities such as water supply, sanitation, drainage systems, waste management, and transportation infrastructure. Housing therefore serves as an important indicator of the quality of life and environmental sustainability within urban areas.

Rapid urbanization and population growth have intensified housing challenges in many developing countries, particularly in Africa. UN-Habitat (2022) reported that rapid urban expansion in developing nations has increased pressure on housing supply, urban infrastructure, and environmental resources. Consequently, many urban core areas are characterized by overcrowding, deteriorating buildings, inadequate infrastructure, and poor sanitation facilities. In Nigeria, urban growth has occurred faster than the provision of essential urban services, resulting in the proliferation of slums and environmentally degraded neighbourhoods.

Housing quality is influenced by several socio-economic and environmental factors. Alnsour & Hyasat (2020) noted that residents' satisfaction with housing depends on factors such as income level, occupation, educational attainment, household size, and neighbourhood conditions. Low-income households are often unable to afford decent accommodation and therefore occupy substandard housing in overcrowded urban neighbourhoods. Similarly, Makinde (2021) observed that the shortage of affordable housing in Nigerian cities has forced many residents into poor-quality housing with inadequate facilities and poor environmental conditions.

Environmental sanitation is a major component of housing quality and urban wellbeing. Ezeudu (2020) explained that sanitation challenges in Nigerian cities are associated with poor

waste management systems, inadequate drainage facilities, ineffective sewage disposal, and rapid urban population growth. Poor sanitation practices such as indiscriminate refuse disposal and open dumping contribute significantly to environmental pollution and public health problems. In densely populated urban core areas, inadequate sanitation facilities often expose residents to waterborne diseases, flooding, and unhealthy living conditions.

Overcrowding is another major characteristic of urban housing in developing countries. Ogunbode, Jazat, & Akande (2023) stated that high occupancy rates in residential buildings place excessive pressure on available facilities and infrastructure. Overcrowded housing conditions are commonly associated with poor ventilation, shared sanitary facilities, increased waste generation, and rapid deterioration of buildings. Such conditions negatively affect residents' health, comfort, and overall quality of life.

Housing affordability remains a serious challenge in Nigeria due to increasing urban population, rising construction costs, and inadequate housing finance systems. Jiburum et al. (2021) observed that many low-income households in Nigerian cities are unable to access affordable housing because of high rent costs and limited mortgage opportunities. The private sector dominates housing provision in Nigeria, but most housing developments are targeted toward middle- and high-income earners, leaving low-income residents with limited access to decent accommodation. As a result, many households occupy overcrowded and environmentally poor neighbourhoods within urban core areas.

The provision and maintenance of urban infrastructure also influence housing conditions and environmental quality. Owoeye & Olasemojo (2021) emphasized that poor infrastructure maintenance contributes significantly to environmental decay in residential core areas. Many traditional urban centres in Nigeria are characterized by inadequate drainage systems, untarred roads, poor accessibility, and deficient public utilities. These infrastructural deficiencies reduce the quality of the urban environment and hinder effective waste management and sanitation services.

Urban poverty further contributes to environmental deterioration in many city centres. Adegun (2023) noted that low-income residents often lack the financial resources needed to maintain housing facilities or access quality environmental services. Poverty therefore limits the ability of households to improve sanitation conditions, repair buildings, and manage waste effectively. This situation encourages the development of slums and environmentally degraded settlements.

Waste management remains one of the major environmental problems in urban areas. According to Adekunle, Sangodoyin, & Wahab (2023), ineffective waste collection and disposal systems in Nigerian cities have resulted in indiscriminate dumping of refuse in open spaces and drainage channels. Poor waste disposal practices contribute to flooding, pollution, unpleasant environmental conditions, and health risks. In many urban core areas, waste management services are either inadequate or inaccessible to low-income households.

Socio-cultural factors also influence environmental management and housing conditions. Ezeudu & Chukwudubem (2023) argued that educational background, cultural practices, and residents' attitudes toward sanitation significantly affect environmental quality. Households with low environmental awareness are more likely to engage in improper waste disposal and poor sanitation practices. Therefore, public education and community participation are essential for achieving sustainable environmental management in urban areas.

In Akure, the core area reflects many of the environmental and housing problems associated with traditional Nigerian cities. Studies have identified issues such as overcrowding, poor building conditions, inadequate sanitation facilities, poor waste disposal practices, and insufficient infrastructure within the area (Owoeye & Owoeye, 2021). Buildings within the core are predominantly old structures, many of which have been converted to mixed residential and commercial uses, thereby increasing pressure on available infrastructure and environmental facilities.

Furthermore, the rapid growth of Akure has intensified pressure on housing and urban infrastructure. Akande (2021) observed that inadequate urban planning and poor housing conditions in Nigerian cities contribute significantly to environmental health challenges. Deficiencies in drainage systems, waste management, and access roads have continued to affect the quality of the urban environment, especially in densely populated residential neighbourhoods.

Despite several government interventions aimed at improving housing delivery and urban development, housing deficits and poor environmental conditions remain major challenges in Nigerian cities. Adegun and Adebusuyi (2021) argued that sustainable housing development requires effective urban planning, improved infrastructure provision, access to affordable housing finance, and stronger environmental management policies. Without these measures, urban core areas may continue to experience environmental deterioration and declining living conditions.

From the reviewed literature, it is evident that housing quality, socio-economic conditions, infrastructure provision, and environmental sanitation are closely interconnected. Challenges such as overcrowding, poverty, poor waste management, and inadequate infrastructure continue to affect the sustainability of urban core areas in Nigeria. There is therefore a need for continuous assessment of housing and environmental conditions in traditional urban centres such as Akure to provide information for effective planning and sustainable urban development.

3.0 Methods*:* The data for this study were sourced from both primary and secondary sources. Data from primary source included the use of structured questionnaire, observation and reconnaissance survey; while, secondary data sources included data collected from journal articles, books, unpublished theses, and mimeographs among others. Data was also gathered from the internet resources and google imagery. Data from the two sources were integrated and results presented in form of tables, maps, pie and bar charts. The study area was divided into ten (10) data delineation zones from where samples were taken. The identified zones are as shown in Table 1.

Table 1: Sampling in Akure Core Residential Zones

Zones	No of Buildings	**No of Households (c = b*4)	5.0% of Households
(a)	(b)	(c)	(d)
Stadiun/Odo Ijoka	152	608	30
Eru Oba and Ijofi	252	1008	50
Oshodi / Iloro	80	320	16
Oba's Palace	89	356	9
Democracy Park	42	168	17
Agagu Market	138	552	27
Ijomu	139	556	27
Igbatayo	97	388	19
Alafiatayo	94	376	18
Obanla	110	440	22
Total	**1193**	**4772**	**235**

Source: Author's Fieldwork, 2025.
**** Fasakin, 2000**

From Table 1, the total number of buildings as calculated from the Google imagery was 1,193. With an average of 4 household per building (Fasakin, 2000), a total of 4,772 households was calculated for the study area. A 5.0% sample was adopted to arrive at a sample size of 235; due

to homogeneity permeating the study area (Adukwu, 2001). Therefore, 235 structured questionnaires were randomly administered to household heads in the study area.

3.1 Research Locale: The study was conducted in the **Akure Core Area**, located within Akure South Local Government Area of Ondo State, southwestern Nigeria. Akure is positioned at an approximate latitude 7° 15' north of the Equator and longitude 5^0 15` east of the Greenwich Meridian. Geographically, Akure is situated roughly 700 kilometers to the southwest of Abuja, Nigeria's Federal Capital, and approximately 350 kilometers from Lagos, Nigeria's former capital. The city is nestled within Nigeria's tropical rain forest region, where rainfall is abundant throughout the year. The core area of Akure include Cathedral, Stadium/Odoijoka, Oshodi/Iloro, isolo, Palace Area, Ijomu, and Igbatayo among others. The location of the study area in its national, regional and local settings are as shown in Figure 1.

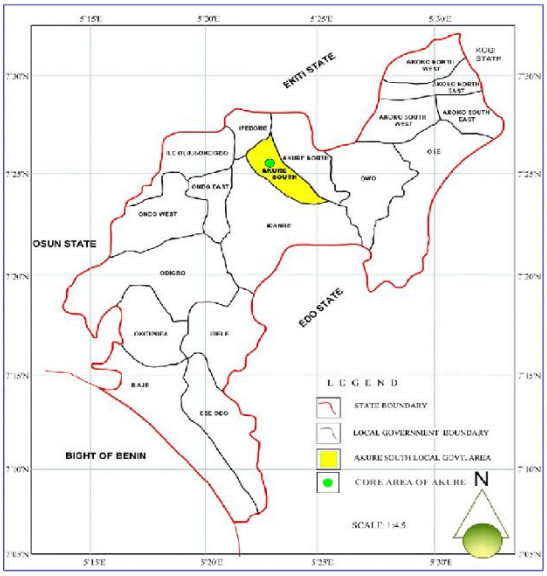
Akure is the capital of Ondo State and functions as an important administrative, commercial, educational and service centre within the region. The city has experienced considerable physical expansion and population growth, resulting in changes in land use, housing demand and infrastructure requirements.

The Akure Core Area constitutes the older, intensively developed part of the city and contains some of the earliest residential neighborhoods of Akure. It is characterized by relatively high-density development, mixed residential and commercial land uses, narrow and congested roads in some locations, ageing housing stock and varying levels of infrastructure provision. The area also contains important commercial activities, traditional institutions, markets, religious facilities and other urban functions that generate considerable pressure on existing infrastructure.

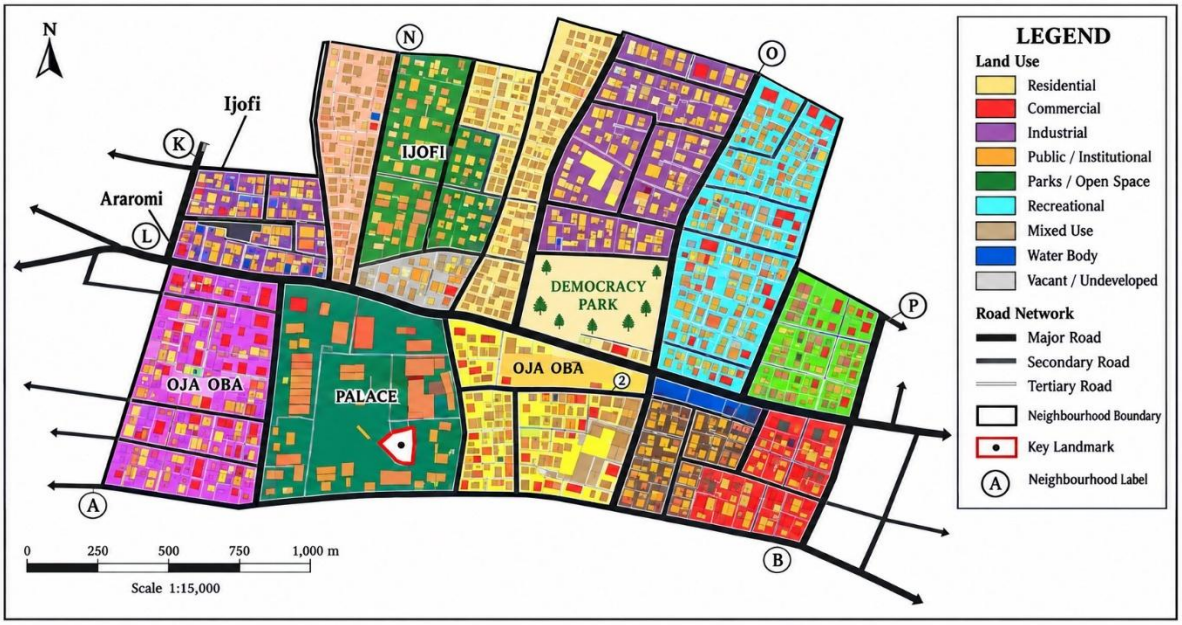
The concentration of older residential buildings and infrastructure within the core makes the area particularly suitable for examining the relationship between housing characteristics, household facilities and neighbourhood infrastructure. Previous studies have identified housing deterioration, inadequate infrastructure, sanitation problems and maintenance challenges within the residential core of Akure (Fakere et al., 2023; Olayiwola & Ajala, 2022; Owoeye et al., 2024). The study therefore focuses specifically on the Core Area as a spatial unit within the wider Akure urban system.



Akure in its National Setting



Akure in its Regional Setting



Digitized Base Map of Akure Core Area.

Figure 1: The Study Area in its National, Regional and Local Settings
Source: Author's Fieldwork, 2025.

4.0 Findings and Discussion of Results:

4.1 Socio-Economic and Demographic Characteristics of Respondents. The socio-economic and demographic characteristics of respondents is as depicted in Table 2. The variables examined include sex, marital status, age, educational attainment, occupation, income level, household size, and religion. These characteristics are important in understanding the social and economic conditions of residents and how they influence environmental sanitation practices within the core area of Akure.

The gender distribution shows that males constitute the majority of respondents with 68.5%, while females account for 31.5%. This indicates that more men participated in the survey, possibly because males are often regarded as household heads and decision-makers in

many Nigerian communities. Their dominance in the survey may also reflect greater involvement in community and environmental matters.

The marital status of respondents reveals that married individuals form the largest proportion with 54.9%, followed by single respondents at 35.7%. Divorced persons account for 6.0%, while widows/widowers represent 3.4%. The high percentage of married respondents suggests the prevalence of family households in the study area, which may influence household sanitation practices and waste generation patterns due to larger family responsibilities.

The age distribution indicates that the majority of respondents are within the economically active population. Respondents aged 36–45 years constitute the highest proportion at 36.2%, followed by those aged 18–25 years at 32.8%. Respondents within 26–35 years account for 16.6%, while only a small proportion falls within 46–65 years (7.6%) and above 65 years (6.8%). This implies that the study area is largely populated by active and productive adults who are likely to engage in income-generating activities and contribute significantly to urban growth and environmental pressures.

Educational attainment among respondents shows that secondary education is the most common level attained, accounting for 51.0% of the respondents. Those with tertiary education constitute 26.4%, while 13.6% have primary education. Vocational education accounts for 6.4%, and only 2.6% are illiterate. This finding suggests that most residents possess at least a basic level of education, which could positively influence awareness of environmental sanitation and hygiene practices. However, the relatively low proportion of tertiary education may limit technical understanding of proper environmental management practices.

Occupational distribution reveals that trading and business activities dominate the local economy, accounting for 46.0% of respondents. Artisans represent 14.9%, while public/civil servants and unemployed respondents each account for 11.9%. Other occupations constitute 12.3%, and farming accounts for only 3.0%. The dominance of trading and informal economic activities reflects the commercial nature of the urban core and suggests that many residents depend on small-scale businesses for livelihood. Such occupations may also contribute to increased waste generation and environmental challenges if waste disposal practices are poorly managed.

The income distribution indicates that most respondents are low- to middle-income earners. The highest proportion of respondents (34.9%) earn between ₦60,001 and ₦80,000 monthly, while 17.9% earn between ₦20,001 and ₦40,000, and 17.0% earn between ₦40,001 and ₦60,000. Only 4.3% earn above ₦100,000 monthly. The relatively low income levels among residents may affect their ability to afford improved sanitation facilities, proper waste disposal services, and quality housing conditions.

Table 2: Socio-economic and Demographic Characteristics of Respondents (N=235)

Variable	Frequency	Percentage
Sex		
Male	161	68.5
Female	74	31.5
Marital Status		
Single	84	35.7
Married	129	54.9
Divorced	14	6.0
Widow/widower	8	3.4
Age		
18-25 years	77	32.8
26-35 years	39	16.6
36-45 years	85	36.2
46-65 years	18	7.6
Above 65 years	16	6.8
Level of Education		
Illiterate	6	2.6
Vocational	15	6.4
Primary	32	13.6
Secondary	120	51.0
Tertiary	62	26.4
Occupation		
Unemployed	28	11.9
Farming	7	3.0
Artisans	35	14.9
Trading/Business	108	46.0
Public/civil service	28	11.9
Others	29	12.3
Level of Income		
< ₦20,000	28	11.9
₦ 20,001- ₦ 40,000	42	17.9
₦ 40,001- ₦ 60,000	40	17.0
₦ 60,001- ₦ 80,000	82	34.9
₦ 80,001- ₦ 100,000	33	14.0
> ₦ 100,000	10	4.3
Household Size		
1-5	164	69.8
6-10	64	27.2
11-15	7	3.0
Religion		
Christianity		67.0
Islam		32.0
Traditionalism		1.0

Source: Author's Fieldwork, 2025.

Household size analysis shows that the majority of respondents (69.8%) have household sizes ranging from 1–5 persons, while 27.2% have between 6–10 persons. Only 3.0% have household sizes between 11–15 persons. Although smaller household sizes dominate, the significant proportion of medium-sized households suggests moderate population density within residential buildings, which may place pressure on available environmental and sanitation facilities.

Religious affiliation indicates that Christianity is the dominant religion in the study area with 67.0% of respondents, followed by Islam at 32.0%, while Traditionalism accounts for only 1.0%. This reflects the general religious composition commonly found in many urban centres in southwestern Nigeria.

Overall, the socio-economic and demographic characteristics of respondents indicate that the core area of Akure is predominantly inhabited by economically active, moderately educated, and low- to middle-income residents engaged mainly in trading and informal economic activities. These characteristics have important implications for environmental sanitation, housing conditions, waste generation, and the overall quality of the urban environment.

4.2 Environmental/Housing Situation in the Core Area of Akure: Table 3 presents the environmental and housing situation of residents in the core area of Akure. The table shows that the dominant toilet facility used by residents is the water closet system, accounting for 39.2% of respondents. This suggests that a considerable proportion of households have access to relatively modern sanitation facilities. However, the presence of pit latrines (25.5%) and bush/open dump site defecation (8.5%) indicates that a significant number of residents still rely on inadequate and unhygienic sanitation methods. The use of open spaces for defecation reflects poor sanitation conditions and poses serious environmental and public health risks such as the spread of waterborne diseases, foul odour, and environmental pollution. Pour-flush toilets account for 17.0%, while flush toilets represent only 9.8% of responses, showing that improved sanitation infrastructure is still insufficient in many parts of the core area.

In terms of building use, residential buildings dominate the study area with 61.7% of the responses, indicating that the core area is primarily residential in nature. Mixed-use buildings account for 27.7%, reflecting the common urban characteristic where residential and commercial activities coexist within the same structure. Commercial, public, and industrial uses constitute only a small proportion of the buildings. The high concentration of residential and mixed-use structures may contribute to overcrowding and pressure on available sanitation and environmental facilities.

The occupancy rate per habitable room reveals a high level of overcrowding within the study area. About 66.4% of respondents indicated that more than five persons occupy a habitable room, while only 3.4% each reported 1–2 persons and 2–3 persons per room. This suggests severe housing congestion, which is a common characteristic of many traditional urban core areas in Nigeria. Overcrowding often leads to rapid deterioration of environmental quality, increased waste generation, poor ventilation, and greater pressure on sanitary facilities.

Regarding bathroom facilities, 41.3% of respondents have self-contained bathrooms, which indicates a moderate level of convenience and privacy. However, 27.2% use makeshift bathroom structures located outside the building, while 20.9% share self-contained facilities. The use of makeshift structures reflects inadequate housing quality and poor environmental planning. Shared bathroom facilities may also create hygiene challenges due to overuse and poor maintenance.

The location of kitchen facilities further reflects variations in housing quality. More than half of the respondents (55.7%) have kitchens located within the building, which is relatively convenient and hygienic. Nevertheless, 26.0% have kitchens attached to the building, while 14.9% cook outside the building. Outdoor cooking may expose residents to environmental hazards and poor sanitary conditions, especially during adverse weather conditions.

Table 3: Environmental/Housing Situation in the Core of Akure. (N=235)

Toilet Facility	**Frequency**	**(%)**
Flush Toilet	23	9.8
Pour-Flush Toilet	40	17.0
Water Closet	92	39.2
Pit Latrine	60	25.5
Bush/Open Dump Site	20	8.5
Building Use		
Residential	145	61.7
Commercial	13	5.5
Industrial	2	0.9
Public	10	4.3
Mixed use	65	27.7
No. of pers/habitable room		
1-2	8	3.4
2- 3	8	3.4
3-5	63	26.8
>5	156	66.4
Location of Bathroom Facilities		
Self-Contained	97	41.3
Self-Contained shared	49	20.9
Compound Shared	23	9.8
Makeshift structure(outside)	64	27.2
Others	2	0.9
Location of Kitchen facilities		
None	8	3.4
Within the building	131	55.7
Attached to building	61	26.0
Outside the building	35	14.9
Method of Refuse Disposal		
Use of dustbin	78	33.2
Refuse dump	124	52.8
Incinerator	23	9.7
Nearby bush	10	4.3
Type of Access to Buildings		
Tarred road	61	26.0
Untarred road	113	48.1
Walkway	51	21.7
Footpath	10	4.3
No access	0	0.0

Source: Authors' Fieldwork 2025.

The method of refuse disposal indicates poor waste management practices in the area. A majority of respondents (52.8%) dispose refuse at refuse dumps, while only 33.2% make use of dustbins. The use of incinerators accounts for 9.7%, whereas 4.3% dispose waste in nearby bushes. The predominance of refuse dumping suggests inadequate waste collection and management services in the core area. Improper waste disposal contributes to environmental pollution, blockage of drainage channels, and increased risk of disease outbreaks.

Finally, the type of access to buildings shows that 48.1% of respondents access their buildings through untarred roads, while 21.7% use walkways and 4.3% rely on footpaths. Only 26.0% have access through tarred roads. This indicates inadequate road infrastructure and poor accessibility within the area. Poor road conditions may hinder effective waste collection, emergency response, and overall urban mobility.

Overall, the findings reveal that the core area of Akure is characterized by inadequate sanitation facilities, overcrowding, poor waste disposal practices, and insufficient infrastructural development. These conditions collectively contribute to environmental degradation and reduced quality of life among residents

4.4 Condition of Housing Facilities in the Core Area of Akure: Table 4 shows the condition of housing facilities in the core area of Akure. From Table 4, housing conditions within the residential core area of Akure reveal significant environmental and infrastructural challenges that affect the quality of life of residents. The assessment focused on road development, water supply, electricity, waste management, security, educational and healthcare facilities, drainage systems, and recreational spaces. The findings indicate varying levels of adequacy in the provision and maintenance of these facilities, with some sectors performing relatively well while others require urgent intervention.

The condition of roads (Figure 2) in the study area presents a major infrastructural concern. Table 4 reveals that, the majority of respondents (66.8%) described the roads as partially developed, while 20.0% considered them poorly developed. Only 12.3% indicated that the roads were well-developed, whereas 0.9% reported the absence of road infrastructure entirely. This suggests that road infrastructure within the residential core area is generally inadequate and insufficiently maintained. Poor road conditions reduce accessibility, hinder transportation, and negatively affect economic and social activities within the neighbourhood. The findings also reflect the typical infrastructural decay associated with traditional urban core areas in many Nigerian cities.



Figure 2: Typical Poor Road Conditions in the Study Area
Source: Author's Fieldwork, 2025.

In contrast, water supply appears relatively satisfactory within the study area. Empirical analysis shows that 86.0% of respondents considered water supply adequate, while 11.1% described it as insufficient and only 3.0% regarded it as scarce. None of the respondents indicated total absence of water supply. This implies that residents generally have access to potable water, which is important for domestic activities, sanitation, and overall public health. However, the proportion of respondents reporting insufficient or scarce supply indicates the need for continuous improvement in water distribution systems to ensure sustainability and reliability. Figure 3 shows an abandoned public water point and a well with poor cover respectively.



Figure 3: Typical Water Supply Systems in the Study Area.
Source: Author's Fieldwork, 2025.

Electricity supply within the area was found to be largely unstable. About 45.1% of respondents described electricity supply as intermittent, while 34.5% regarded it as unstable. Only 20.4% indicated that electricity supply was stable. Although all respondents had access to electricity, the irregularity of supply reflects infrastructural deficiencies common in many urban centres in Nigeria. Unstable electricity negatively affects household comfort, economic productivity, and the functioning of small-scale businesses operating within the residential core.

Waste management constitutes one of the most critical environmental problems in the study area. Findings indicate that 47.2% of respondents considered waste management services as insufficient, while 18.7% stated that such services were completely absent. Only 31.9% rated waste management as adequate and a mere 2.1% considered it very adequate. These findings suggest that waste collection and disposal systems are ineffective within the residential core area. The prevalence of refuse dumps on roadsides, and close to residential buildings and open spaces contribute to environmental pollution, offensive odour, blockage of drainage channels, and increased health risks (Figure 4). Poor waste management practices therefore remain a major contributor to environmental degradation in the study area.



Refuse Dump on Road Median at Oja-Oba Area



Abandoned refuse sacks at Isolo Area

Figure 4: Refuse Disposal Situation in the Core of Akure
Source: Author's Fieldwork, 2025.

The security situation within the study area was perceived relatively positively by residents. Empirical analysis shows that 86.8% of respondents considered their neighbourhood 'safe', while 6.0% described it as 'very safe'. However, 7.2% regarded the area as 'very unsafe'. The findings imply that despite the infrastructural and environmental deficiencies, residents generally perceive the neighbourhood as secure for living and social interaction.

Educational facilities within the residential core area were found to be adequate as about 94.9% of respondents reported that primary and secondary schools were adequately available, while 5.1% described them as abundant. None of the respondents reported insufficiency or absence of schools. This indicates that access to educational facilities is not a major challenge within the study area, thereby supporting educational development and human capital formation.

Accessibility to healthcare facilities was moderately satisfactory. Table 4 further indicates that 81.7% of respondents considered healthcare facilities somewhat accessible, while 8.9% reported very accessible healthcare services. However, 7.2% considered healthcare facilities not very accessible, and 2.1% reported no access at all. This suggests that although healthcare services are available to most residents, there is still room for improvement in terms of proximity, accessibility, and quality of healthcare delivery.

Drainage condition within the study area was generally poor with more than half of the respondents (51.3%) described drainage systems as poorly maintained, while 26.5% indicated that they were only partially maintained. Furthermore, 11.5% reported the complete absence of drainage systems, whereas only 10.7% considered the drainage facilities adequately available and maintained. Poor drainage systems contribute significantly to flooding, water stagnation, erosion, and environmental pollution within the residential core. Figure 5 shows a drainage facility blocked with refuse at Oja Oba area and poor road condition due to lack of drainage facility. The poor state of drainage also corresponds with the poor condition of roads observed in the area, indicating broader infrastructural neglect.



Blocked Drainage Facility at Oja Oba Area



Poor Road condition due to Lack of Drainage Facility

Figure 5: Blocked Drainage and poor Road Condition in the Study Area.
Source: Author's Fieldwork, 2025.

The availability of playgrounds and recreational facilities appears relatively adequate. Figure 6 presents a vast open space (Democracy Park) in the core of Akure with functional eateries/restaurant and toilet facilities. Table 4 shows that 75.7% of respondents considered recreational facilities adequate, while 5.1% described them as abundant. Nevertheless, 19.1% reported the absence of playgrounds within their neighbourhoods. Recreational spaces are important for social interaction, relaxation, and child development; therefore, the absence of such facilities in some parts of the residential core suggests the need for improved urban planning and provision of community recreational infrastructure.



Existing restaurant and toilet facilities at the Democracy Park



Democracy Park at Oja-Oba Area

Figure 6: Existing Recreational Open Space at Oja Oba Area
Source: Author's Fieldwork, 2025.

Overall, the findings reveal that the residential core area of Akure is characterized by a mixture of moderate infrastructural provision and significant environmental challenges. While access to water supply, schools, security, and recreational facilities appears relatively satisfactory, serious problems persist in the areas of road development, electricity supply, waste management, and drainage systems. These deficiencies reflect the broader challenges of urban decay, inadequate infrastructure maintenance, and poor environmental management commonly associated with traditional urban core areas in Nigeria. There is therefore a need for government intervention through urban renewal programmes, improved infrastructure provision, effective

waste management systems, and sustainable environmental planning to enhance the living conditions of residents within the study area.

Table 4: Condition of Housing Facilities in the Core of Akure (N=235)

Variable	Classification	Freq.	(%)	Normalized Index
Road	Well-developed	29	12.3	**0.635**
	Partially developed	157	66.8	
	Poorly developed	47	20.0	
	Non existent	2	0.9	
Water supply	Adequate	202	86.0	**0.943**
	Insufficient	26	11.1	
	Scarce	7	3.0	
	No Access	0	0.0	
Power supply	Stable	48	20.4	**0.620**
	Intermittent	106	45.1	
	Unstable	81	34.5	
	No Access	0	0.0	
Waste Management	Very Adequate	5	2.1	**0.391**
	Adequate	75	31.9	
	Insufficient	111	47.2	
	Absent	44	18.7	
Security Condition	Very Safe	14	6.0	**0.638**
	Safe	204	86.8	
	Unsafe	0	0.0	
	Very Unsafe	17	7.2	
Educational Facilities	Abundant	12	5.1	**0.684**
	Adequate	223	94.9	
	Insufficient	0	0.0	
	None	0	0.0	
Healthcare Facilities	Very Accessible	21	8.9	**0.658**
	Somewhat Accessible	192	81.7	
	Not Very Accessible	17	7.2	
	No Access	5	2.1	
Drainage System	Available	25	10.7	**0.454**
	Partially Maintained	62	26.5	
	Poorly Maintained	121	51.3	
	No Drainage System	27	11.5	
Recreational Facilities	Abundant	12	5.1	**0.556**
	Adequate	178	75.7	
	Insufficient	0	0.0	
	No Playgrounds	45	19.1	

Source: Author's Fieldwork, 2025.

5.0 Integrated Housing Infrastructure Quality Index of the Core Area of Akure: The integrated Housing Infrastructure Quality Index (HIQI) for the core area of Akure is as depicted in Table 5. The integrated HIQI was developed by combining the housing and environmental infrastructure indicators presented in Tables 3 and 4 respectively. Fifteen indicators covering dwelling-level facilities, household environmental conditions and neighbourhood infrastructure were standardized to a common 0 - 1 scale and aggregated using equal weighting. The resulting overall HIQI was 0.598, indicating a moderate level of housing infrastructure quality in the Core Area of Akure. Although the value is close to the threshold for the high category (0.60), the aggregate result indicates that infrastructure provision and quality are not uniformly satisfactory across the study area.

Table 5: Integrated Housing Infrastructure Quality Index of the Core Area of Akure

Housing infrastructure dimension	Source	Normalized index
Toilet facility	Table 3	0.656
Persons per habitable room	Table 3	0.127
Bathroom facility	Table 3	0.686
Kitchen facility	Table 3	0.789
Refuse disposal	Table 3	0.537
Access to buildings	Table 3	0.554
Road infrastructure	Table 4	0.677
Water supply	Table 4	0.943
Power supply	Table 4	0.620
Waste management	Table 4	0.391
Security condition	Table 4	0.638
Educational facilities	Table 4	0.684
Healthcare facilities	Table 4	0.658
Drainage system	Table 4	0.454
Recreational facilities	Table 4	0.556
Overall Housing Infrastructure Quality Index (HIQI)	Tables 3 & 4	**0.598**

Source: Author's Fieldwork, 2025; author's computation, 2025.

The highest component index was recorded for water supply (0.943), followed by kitchen facilities (0.789), bathroom facilities (0.686), educational facilities (0.684) and road infrastructure (0.677). These relatively high values suggest that several basic household and neighbourhood infrastructure services are reasonably available within the core area. Conversely, persons per habitable room recorded the lowest index (0.127), reflecting the substantial overcrowding experienced by households in the area. Waste management (0.391) and drainage (0.454) also recorded relatively low indices, indicating important environmental infrastructure deficiencies.

The overall HIQI therefore demonstrates that the housing infrastructure situation in the Core Area of Akure is characterized by relatively adequate provision of some basic services alongside persistent deficiencies in overcrowding, waste management and drainage. The findings further demonstrate the value of an integrated index because a favourable performance in individual infrastructure components, particularly water supply, can coexist with significant deficiencies in other dimensions of housing infrastructure. The overall score of **0.598**

consequently provides a composite representation of housing infrastructure conditions in the study area and can serve as a basis for identifying priority areas for urban housing and infrastructure improvement.

5.0 Physical Planning Implications of the Findings

The findings have significant implications for physical planning and urban management in the Core Area of Akure. The overall Housing Infrastructure Quality Index (HIQI) of 0.598 indicates a moderate level of housing infrastructure quality, although the component results reveal substantial differences in the adequacy and condition of individual infrastructure facilities. The findings therefore suggest that planning intervention in the urban core should move beyond general infrastructure provision towards targeted spatial upgrading, infrastructure maintenance, residential decongestion and effective development control.

The very low index recorded for persons per habitable room (0.127) indicates a serious residential overcrowding problem; therefore, physical planning authorities should promote residential decongestion through the provision of additional housing units, rehabilitation of underutilized buildings and appropriate infill development among others.

The relatively low scores for waste management (0.391) and drainage (0.454) indicate that environmental infrastructure requires priority attention; therefore, physical planning authorities should undertake coordinated environmental infrastructure upgrading involving properly located waste-collection points with regular maintenance.

Also, road upgrading should be accompanied by drainage, pedestrian facilities and adequate right-of-way protection to avoid situations in which improvement of one infrastructure component creates deficiencies in another.

The relatively high water-supply index (0.943) indicates that water infrastructure is comparatively favourable within the study area. This finding has an important planning implication: future planning should emphasize the maintenance, reliability and equitable distribution of existing infrastructure rather than focusing exclusively on new provision. Infrastructure capacity should also be considered when approving redevelopment or increases in residential density so that population growth does not exceed the carrying capacity of existing water infrastructure.

The power-supply index of 0.620 indicates a less satisfactory situation than water supply. Although electricity is available, the prevalence of intermittent and unstable supply suggests the need for coordinated infrastructure planning. Urban redevelopment programmes should therefore consider electricity distribution capacity, protection of utility corridors and adequate space for infrastructure facilities. Physical planning authorities should coordinate with relevant utility agencies when approving major redevelopment projects in the core area.

The relatively favourable scores for educational facilities (0.684) and healthcare facilities (0.658) suggest that important social infrastructure is relatively accessible. However, spatial accessibility should not be assessed solely in terms of facility presence. Planning should also consider population density, walking distance, road accessibility, service capacity and future population growth. Areas experiencing residential intensification should be assessed against the capacity of existing social infrastructure before additional development is approved.

The findings concerning recreational facilities (0.556) indicate a need to protect and improve public open spaces in the urban core. Physical planning should therefore incorporate small neighbourhood parks, recreational spaces, pedestrian areas and other forms of public open space into urban renewal schemes.

Finally, the HIQI provides a potentially useful planning-support tool for prioritizing infrastructure investment. Rather than applying uniform interventions across the entire core area, planning authorities can use the component indices with GIS mapping to identify infrastructure-deficient neighbourhoods. Areas with particularly low scores can be designated as priority upgrading zones, while areas with relatively satisfactory infrastructure can be

subjected to preventive maintenance and development-control measures. Such an approach would support evidence-based urban regeneration and contribute to a more balanced and sustainable transformation of the Core Area of Akure.

6.0 Conclusion

This study assessed the condition and quality of housing infrastructure in the city core of Akure, with particular attention to the adequacy of basic housing facilities and the severity of infrastructure-related problems experienced by residents. The findings demonstrate that although the core area remains an important residential and activity centre, the quality of its housing infrastructure is uneven and reflects the cumulative effects of ageing housing stock, high residential concentration, inadequate maintenance and pressure on existing infrastructure. The overall Housing Infrastructure Quality Index (HIQI) of 0.598 indicates a moderate level of housing infrastructure quality, suggesting that the housing environment is neither critically deficient nor adequately serviced. The two component indices similarly recorded moderate conditions, with the facilities-related sub-index at 0.558 and the housing-condition sub-index at 0.625.

The severity assessment reinforces this finding by showing that infrastructure problems are concentrated in areas that directly affect environmental quality, public health, accessibility and the functionality of the residential environment. Poor drainage and waste management, inadequate road and neighbourhood infrastructure, overcrowding and the deterioration of existing facilities constitute interconnected problems rather than isolated deficiencies. Consequently, improving housing conditions in the core area requires an integrated approach that addresses both individual housing units and the wider neighbourhood infrastructure system.

The study therefore concludes that sustainable improvement of the Akure core area should move beyond approaches based solely on the construction of new housing. Rehabilitation, infrastructure upgrading, effective development control, neighbourhood renewal and improved environmental management are required to enhance the functionality and livability of the existing housing stock. Physical planning interventions should also recognize the historical and spatial significance of the core area and avoid indiscriminate clearance that could result in displacement and the loss of established urban functions. A coordinated programme of infrastructure renewal and selective redevelopment would provide a more appropriate basis for improving housing conditions while retaining the core area's role within the wider urban structure of Akure.

7.0 Recommendations

Based on the findings, this paper recommends that priority should be given to the rehabilitation and upgrading of existing housing and neighbourhood infrastructure in the study area; while the problem of overcrowding should be addressed through appropriate residential decongestion strategies. Also, drainage infrastructure should be systematically upgraded as existing drains are rehabilitated and properly connected, blocked drainage channels should be cleared, and new drainage facilities should be designed according to local topography and runoff requirements. In addition, solid waste management should receive greater planning and institutional attention.

Furthermore, he responsible authorities should strengthen household waste collection, provide strategically located collection facilities, improve waste evacuation frequency and enforce regulations against indiscriminate dumping. An integrated core-area renewal programme should also be established. The programme should combine housing rehabilitation, road and drainage improvement, waste management, pedestrian accessibility, utility upgrading, environmental improvement and open-space protection. Such intervention should be based on neighbourhood-level infrastructure audits and the HIQI developed in this study, allowing areas of greatest deficiency to be identified and prioritized systematically.

Finally, periodic housing and infrastructure condition surveys should be institutionalized. The planning authority should periodically reassess housing facilities, infrastructure conditions,

overcrowding and environmental problems across the core area and incorporate the results into development plans and urban renewal programmes.

Overall, the planning objective should be to improve the existing core rather than simply replace it. A combination of selective redevelopment, housing rehabilitation, infrastructure upgrading, effective development control and participatory neighbourhood management would provide a more sustainable pathway for improving housing infrastructure and urban livability in the Akure city core.

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iii. **Author Contributions:** The author conceived and designed the study. He conducted the analysis, and prepared the manuscript. He also organized for data collection and interpretation of the findings. The author takes full responsibility for the final manuscript.

iv. **Data Availability Statement:** The data used in this study can be found in the attached manuscript file in the form of Figures and Tables. Further enquiries can be directed to the corresponding author.

i. **Ethical Approval:** The research protocol was reviewed and approved by the School of Post-Graduate Advisory Committee, Federal University of Technology, Akure (FUTA). The research was conducted in accordance with the **Extant Rules and Guidelines** of the School of Post-Graduate Studies, FUTA.

v. **Informed Consent:** Participation was voluntary, and all respondents were informed about the purpose of the study before data collection. Informed consent was obtained from all participants prior to their participation. Respondents were assured that the information provided would be treated confidentially and used solely for academic purposes. No personally identifiable information was collected or reported.

vi. **Data Availability Statement:** The data used in this study can be found in the attached manuscript file in the form of Figures and Tables. Further enquiries can be directed to the corresponding author.

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