



## ASSESSMENT OF EFFECTIVENESS OF FEDERAL HOUSING AUTHORITY (FHA) IN HOUSING PROVISION AND ENVIRONMENTAL SUSTAINABILITY IN FEDERAL CAPITAL TERRITORY (FCT) ABUJA, NIGERIA

\*<sup>1</sup>Mohammed Mohammed Sani; <sup>2</sup>Rayyan Mohammed Tanim; <sup>3</sup>Yusha'u Najibullahi

\*<sup>1,2</sup>Department of Environmental Resource Management, Faculty of Earth and Environmental Sciences, Federal University Dutsin-Ma, Katsina, State, Nigeria

<sup>3</sup>Department of Geography, Faculty of Earth and Environmental Sciences, Federal University Dutsin-Ma, Katsina, State, Nigeria

**\*Corresponding Author's Email & Phone No.**

**[Sanimohammed496@gmail.com](mailto:Sanimohammed496@gmail.com): 08039677157**

### ABSTRACT

*This study assessed the Federal Housing Authority's (FHA) effectiveness in meeting its housing mandate and promoting environmental sustainability in Abuja's Federal Capital Territory. Using descriptive research design and convergent mixed-methods design, integrating both quantitative and qualitative approaches, data collected from 116 FHA residents and key stakeholders identified financial constraints and administrative bottlenecks as major barriers to housing delivery, further hindered by political interference, weak supervision, and limited institutional capacity. While plumbing, ventilation, and drainage systems were generally satisfactory, notable deficiencies were found in water supply, electricity, lighting, spacing, and road access. Respondents demonstrated growing awareness of sustainable building practices, including the use of eco-friendly and durable materials. Although support for energy efficiency was high, implementation was limited due to costs and policy gaps. Water conservation measures such as wastewater recycling were viewed positively, but rainwater harvesting and comprehensive recycling were uncommon. Recognition of green spaces and sustainable urban planning was moderate, showing that ecological concerns remain secondary. Awareness of environmental impact assessments and climate-resilient housing was low, reflecting gaps in integrating sustainability. The study found no statistically significant relationship ( $p = 0.153 > 0.05$ ) between housing needs and houses provided, suggesting housing development has not substantially increased in Abuja over time. It recommends strengthening financial management, improving administrative efficiency, adopting sustainable construction principles, and fostering a maintenance culture to achieve resilient, environmentally sustainable housing in Abuja.*

**Keywords:** Federal Housing Authority, housing provision, Built Environment, sustainability, energy efficiency, eco-friendly materials.

### 1.1 INTRODUCTION

The colonial Government of Nigeria established early housing initiatives that primarily targeted colonial officials through institutions like the Nigeria Building Society and Government Reservation Areas (GRAs), though environmental considerations were minimal during this period (Adelekan et al., 2023). In modern Nigeria, the Federal Housing Authority (FHA), along with other housing agencies, governs national housing development, including in Abuja (Ebenezer &



Olufemi, 2024). Despite these efforts, systemic challenges such as bureaucratic delays, funding limitations, corruption, and inadequate planning continue to hinder effective housing delivery (World Bank, 2024). Environmental sustainability has gained traction as an essential facet of housing development due to escalating urbanization, climate change impacts, and resource constraints in Nigerian cities. Currently, the housing sector faces challenges in adopting sustainable energy practices, efficient water use, proper waste disposal, and green infrastructure integration (Fadamiro & Dada, 2025). Such sustainability gaps aggravate environmental degradation and diminish residents' quality of life. The shortage of adequate housing is exacerbated by aging, dilapidated stock and overcrowding, with many urban residents lacking decent shelter (UN-Habitat, 2022). Housing development has not been accorded proportional priority in national budgets despite its critical socio-economic importance (Akinlusi, 2023). These factors underscore the urgency to integrate sustainable development principles into housing policies and delivery mechanisms comprehensively. This research critically appraises FHA's contribution to qualitative housing provision in Abuja, emphasizing the integration of environmental sustainability dimensions. It aims to reveal existing challenges and potential improvements aligning housing development with sustainable urban growth and resilience.

Despite sustained efforts by the Federal Housing Authority (FHA) and other governmental agencies, Nigeria particularly the Federal Capital Territory (FCT), Abuja continues to experience a considerable housing deficit, one that has resisted reduction despite policy interventions and supply schemes (Adidi et al., 2021; Momoh et al., 2024). Rapid urbanization and population growth have increased pressure on existing housing stock, leading to overcrowding and substandard living environments for many residents. These issues are aggravated by administrative inefficiencies and policy implementation gaps, which have been shown in studies of Abuja's urban development to undermine housing supply and delivery effectiveness (Momoh et al., 2024). Moreover, environmental sustainability remains poorly integrated in many housing projects in Abuja: passive design features and energy-efficient elements are seldom standard, resulting in inefficient energy consumption, poor indoor thermal comfort, and weak resilience to climatic stressors (Abdulkareem & Al-Maiyah, 2025; Sustainable architectural solutions, 2024). These deficits adversely affect occupant well-being and threaten the long-term ecological sustainability and resilience of the city. The study aims to critically assess the effectiveness of the Federal Housing Authority (FHA) in housing provision and environmental sustainability within the Federal Capital Territory (FCT), Abuja. The specific objectives are to: i. evaluate the effectiveness of the Federal Housing Authority in fulfilling its statutory mandate of housing provision within the Federal Capital Territory, Abuja; ii. examine the integration of environmental sustainability principles in FHA housing projects; iii. identify institutional, financial, and policy constraints affecting effective housing delivery and sustainability; iv. assess prospects for enhancing housing quality and environmental compatibility in FHA estates.



## 2.1 LITERATURE REVIEW

Housing provision remains one of the most pressing development challenges in Nigeria, with significant implications for socio-economic welfare and environmental sustainability. Studies consistently demonstrate that the country faces a chronic housing deficit, driven by rapid urbanization, population growth, inadequate policy implementation, and insufficient financing mechanisms (UN-Habitat, 2022; Akinlusi, 2023). Despite successive interventions by the Federal Housing Authority (FHA) and related agencies, the shortfall persists, particularly within the Federal Capital Territory (FCT), Abuja, where urban expansion has far outpaced formal housing supply (Adidi, Alhassan, & Adekiya, 2021). Consequently, the assessment of institutional effectiveness in housing delivery and environmental integration has become central to urban sustainability discourse in Nigeria.

### 2.1.1 Institutional Effectiveness and Housing Delivery

The FHA was established as Nigeria's foremost housing development agency, mandated to provide affordable and quality housing nationwide. However, numerous studies report that the agency's performance has been undermined by structural, administrative, and financial inefficiencies (Adebayo & Yusuf, 2020; Ibrahim & Musa, 2020). Adidi et al. (2021) identified bureaucratic delays, weak project management, and land acquisition constraints as primary impediments to housing delivery in Abuja. Similarly, Okafor, Bello, and Adewale (2021) emphasized that excessive bureaucracy, weak supervision, and inconsistent policy frameworks have contributed to project delays and substandard construction outcomes.

Financial limitations are widely regarded as the most critical barrier to effective housing provision. Recurrent budgetary shortfalls, cost inflation, and delayed fund disbursement constrain the FHA's ability to execute large-scale housing programs (Adebayo & Yusuf, 2020; Bello, 2021). The World Bank (2024) corroborates that inadequate financing and poor fiscal governance have led to project abandonment and insufficient maintenance of existing estates. Furthermore, political interference, favoritism in contractor selection, and corruption exacerbate inefficiency, eroding institutional credibility (Eze & Nwosu, 2022). These systemic challenges collectively underscore the need for financial transparency, capacity strengthening, and effective accountability mechanisms within Nigeria's housing delivery institutions.

### 2.1.2 Quality of Housing Provision

Research on the quality of housing provision by the FHA reveals persistent deficiencies in infrastructure, construction standards, and livability. Akande et al. (2024) argue that Nigerian housing programs often prioritize quantity over quality, with minimal attention to design adequacy and long-term maintenance. In Abuja, issues such as poor structural integrity, inadequate spacing, unreliable electricity, and limited access to basic services are common (Garba et al., 2024; Momoh et al., 2024). These findings align with UN-Habitat's (2022) observations that mass housing



schemes across Sub-Saharan Africa often overlook user comfort and spatial adequacy. The implication is that expanding housing stock without improving design standards and maintenance frameworks cannot ensure sustainable urban development.

### ***2.1.3 Environmental Sustainability in Public Housing***

The growing recognition of environmental sustainability as a pillar of housing policy has prompted research into green construction practices and urban resilience. Environmental sustainability in housing encompasses energy efficiency, sustainable materials use, water conservation, waste management, and green infrastructure (Adelekan, Olajuyigbe, & Alawode, 2023). However, empirical studies reveal limited integration of these principles in Nigerian housing projects. Fadamiro and Dada (2025) observed that most residential developments lack renewable energy systems, efficient water networks, or proper waste management structures. Similarly, Abdulkareem and Al-Maiyah (2025) highlighted that passive design features remain underutilized in Abuja's housing estates, leading to poor thermal performance and increased energy dependence.

Material sustainability also remains underexplored in public housing. Akinlusi, Adelekan, and Olajuyigbe (2023) emphasized that adopting eco-friendly and durable materials can significantly reduce carbon emissions and lifecycle costs. Garba et al. (2024) further demonstrated that integrating locally sourced, low-impact materials such as stabilized earth blocks enhances structural longevity while supporting affordability. Nevertheless, these practices are hindered by limited technical expertise, high implementation costs, and weak regulatory incentives (Ebenezer & Olufemi, 2024). Consequently, sustainability measures in FHA housing projects often exist at a superficial level, with awareness not translating into systematic practice.

### ***2.1.3 Policy and Governance Dimensions***

Institutional fragmentation and policy inconsistency represent enduring obstacles to sustainable housing delivery in Nigeria. The coexistence of multiple housing agencies with overlapping mandates often leads to duplication of efforts and policy contradictions (FMHUD, 2024). Momoh et al. (2024) note that sustainable urbanism in Abuja requires stronger inter-agency coordination, stakeholder engagement, and coherent land-use planning. Similarly, Okafor-Yarwood et al. (2025) argue that weak governance and poor spatial management exacerbate environmental degradation and limit urban resilience. Effective sustainability integration therefore demands holistic governance reforms, coupled with the institutionalization of environmental impact assessments (EIAs) and environmental and social impact assessments (ESIAs) in all public housing initiatives.

### ***2.1.4 Emerging Research Gaps***

Despite the expanding discourse on sustainable housing, critical research gaps remain evident. The extant literature predominantly centers on policy frameworks and architectural design, with limited empirical investigation into institutional effectiveness in achieving environmentally sustainable



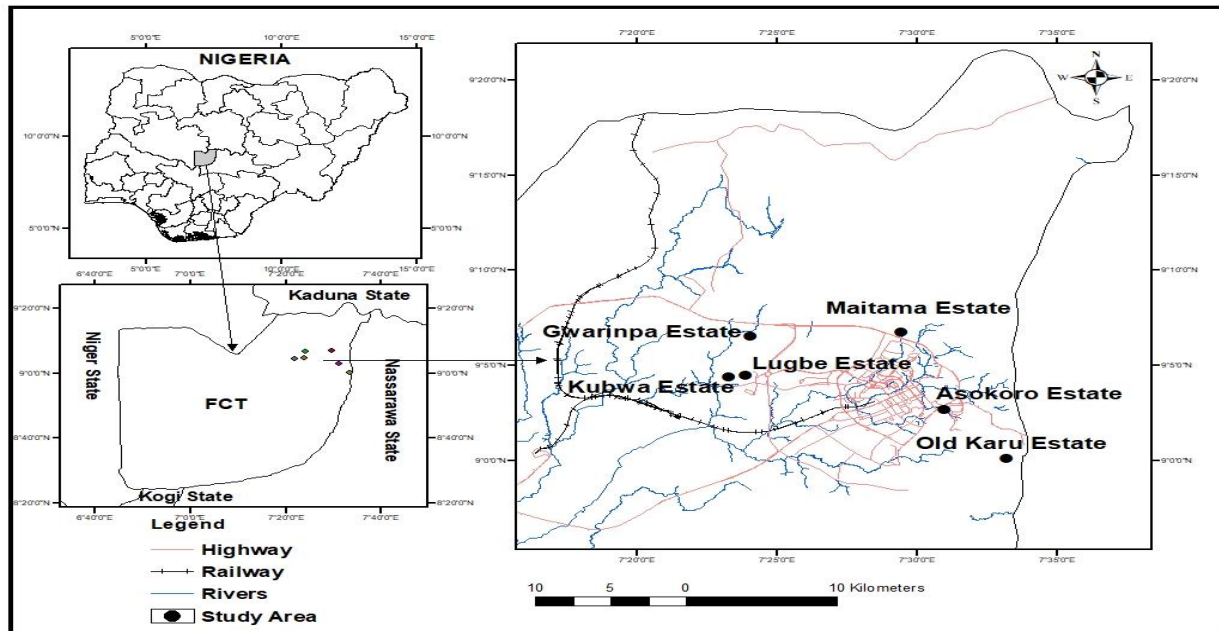
outcomes. Moreover, comprehensive, data-driven analyses that correlate residents' satisfaction, environmental performance, and administrative efficiency within public housing contexts are scarce. Notably, the Federal Housing Authority (FHA) has received insufficient scholarly attention as a focal institution for examining sustainability integration within Nigeria's capital city. Addressing these deficiencies necessitates rigorous mixed-method inquiry that synthesizes institutional evaluation with empirical assessment of environmental performance—a methodological direction advanced by the present study.

### 3.1 METHODOLOGY

#### 3.1.1 Study Area

The study area encompasses selected Federal Housing Authority (FHA) estates within the Federal Capital Territory (FCT) of Abuja, namely Karu Old Estate, Gwarinpa Estate, Kubwa Estate, Maitama, Asokoro, and Lugbe. These estates were strategically chosen to represent a variety of housing typologies, stages of development, and socio-economic activities, reflecting their importance within the FHA's housing delivery framework and their relevance to environmental sustainability concerns in Abuja (Abdulkareem & Al-Maiyah, 2025). Located in central Nigeria, the FCT Abuja covers approximately 8,000 square kilometers and supports a population exceeding 3.4 million. Geographically positioned around latitude 9.07°N and longitude 7.49°E, the territory experiences a tropical savanna climate with distinct wet and dry seasons. Rapid urbanization has led to the expansion of satellite towns and increased demand on infrastructure and resources (Britannica, 2025; Okafor, 2021). Topographically, the area is characterized by gently undulating terrain with crystalline rock foundations, including prominent monoliths such as Aso Rock. The natural vegetation is primarily savanna, comprising grassy savanna, savanna woodland, and shrub savanna, with alluvial and luvisol soils that support agriculture and vegetation growth (IIARD Journals, 2025; Britannica, 2025). Urban development integrates these natural features within a planned city structure, although ongoing expansion has contributed to vegetation loss and localized microclimate alteration. Land use in the FCT includes administrative, residential, commercial zones, and green spaces, amid challenges posed by population growth and infrastructure needs, underscoring concerns for sustainable urban development (Okafor et al., 2025). This context establishes a comprehensive framework for examining FHA housing estates within the environmental and socio-economic dynamics of Abuja's Federal Capital Territory





**Source:** The geographical features of the area were analyzed using data obtained from the Shuttle Radar Topographic Mission (SRTM) Digital Elevation Model (DEM).

**Figure 1:** Map of the FCT (Abuja) showing Federal Housing Authority (FHA) Estates

### 3.1.2 Research Design

This study adopted a descriptive, convergent mixed-methods design, integrating both quantitative and qualitative approaches to assess the effectiveness of the Federal Housing Authority (FHA) in housing provision and environmental sustainability within the Federal Capital Territory (FCT), Abuja.

### 3.1.3 Population and Sampling Techniques

The study population comprised FHA residents, officials, contractors, and sustainability experts. A stratified random sampling technique was employed to select residents from different estates, ensuring representation across income levels and housing types. In contrast, purposive sampling was used to select FHA officials and environmental consultants for in-depth interviews. The sampling strategy aligns with similar housing assessment studies conducted in Nigeria (Akande et al., 2024).

### 3.1.4 Data Collection

Data were collected through multiple sources to enhance validity and depth of analysis. Structured questionnaires were administered to one hundred and sixteen (116) FHA residents to capture quantitative data on housing quality, affordability, access to infrastructure, and sustainability features such as energy efficiency, water use, and waste management. Semi-structured interviews were conducted with FHA officials, contractors, and environmental experts to obtain qualitative



insights on institutional practices and sustainability integration. Field observations complemented these data, focusing on construction materials, green infrastructure, drainage systems, and climate-resilient design elements. Additionally, document analysis of FHA reports, environmental assessments, and housing policy documents provided secondary data for triangulation (FMHUD, 2024).

### 3.1.5 Data Analysis

Quantitative data were analyzed using descriptive statistics (means, frequencies, and percentages) and inferential analyses using Kendal Tau correlation and regression analysis to examine relationships between housing supply, satisfaction, and sustainability indicators. Qualitative data from interviews and observations were also analyzed using Statistical Package for Social Sciences (SPSS).

## 4.1 RESULTS AND DISCUSSION

### 4.1.1 Socioeconomic Characteristics of Respondents

The socioeconomic profile of respondents provides essential context for interpreting their perceptions of the Federal Housing Authority's (FHA) housing performance in Abuja. The results show that male respondents (56.0%) slightly outnumbered females (43.9%), suggesting a relatively gender representation. This distribution reflects increasing female participation in the housing and construction sector, aligning with the findings of Olowu and Anifowose (2019), who observed a gradual shift toward gender inclusiveness in professional housing practice in Nigeria.

**Table 1: Socioeconomic Characteristics of Respondents**

Category	Classification	Frequency	Percentage (%)
Gender	Male	65	56
	Female	51	43.9
Educational Qualification	Secondary	22	19
	ND/NCE	28	24.1
	Degree	40	34.5
	Masters	18	15.5
	Doctorate	8	6.9
Professional Designation	Enginners	56	48.2
	Architects	37	31.8
	Quantity Surveyors	23	19.8
Experiences (Years)	1-5	25	21.5
	6-10	33	28.5
	11-15	24	20.6
	16-20	19	16.3
	21 and Above	15	12.9
Total		116	100%

Source: Author's Computation, 2025



In terms of educational qualification, the majority of respondents possessed a Bachelor's degree (34.5%), followed by Diploma holders (24.1%), while Master's (15.5%) and Doctorate (6.8%) degrees accounted for smaller proportions. This indicates a generally high level of academic attainment among the participants, suggesting that most respondents had sufficient professional knowledge to assess housing project performance objectively. These findings are consistent with Adebayo and Yusuf (2020), who emphasized that educational attainment enhances respondents' understanding of housing management and policy implementation issues.

The professional distribution showed that engineers (48.2%) formed the largest group, followed by architects (31.8%) and quantity surveyors (19.8%). This composition reflects the multidisciplinary nature of housing delivery, requiring collaboration among various professionals in the built environment. Similar patterns were reported by Ibrahim and Musa (2020), who noted that engineers and architects dominate project implementation roles within the FHA and related agencies.

Regarding years of experience, a significant proportion (28.5%) had between 6–10 years of professional experience, while 21.5% had 1–5 years, and 12.9% had over 21 years of experience. This mix suggests that the respondents possessed adequate practical exposure to construction and housing development activities. Such professional maturity enhances the reliability of their opinions, as highlighted by Bello (2021), who found that work experience significantly influences professional judgment in housing project assessments.

#### ***4.1.2 Provision of Housing Units in Federal Capital Territory***

The FHA has over the years provided two bedroom blocks of flat, three bedroom block duplex, three bedroom terrace duplex, four bedroom terrace duplex, new improved five bedroom detached duplex, five bedroom detached duplex, five bedroom detached triplex, with supplementary water supply dedicated transformers, asphalt internal roads with drainage and fitted wardrobe.





**Table 2: Number of Housing Units Provided**

S/N	LOCATION	NO. OF UNITS	REMARKS
1	Abuja, old Karu Estate	251	Estate completed and sold to FCDA
2	Gwarinpa II, Abuja	3,377	Completed, Allocated
3	Abuja, Kubwa Estate (Phase I,II,III,IV)	2,138	Estate completed, the low cost houses allocated on mortgage terms/outright cash payment respectively.
4	Abuja, Maitama Estate	427	2,3 and 4 Brm Block of Flats completed and sold on cash and carry basis.
5	Abuja, Asokoro Estate	162	2,3, and 4 Brm Block of Flats completed and sold on cash and carry basis
6	Brains and Hammers City	3,500	Almost completed.
7	Amina court apo	500	Completed and sold.
8	Sunnyvale	1500	Completed and sold.
9	Sun city	1500	Completed and sold.
10	Games village	1000	Completed and sold.
11	Lugbe Abuja	3734	National Housing program completed and sold units.
12	Kado	1004	National Housing program completed and sold units.
13	New Karu, II Abuja	204	National Housing program completed and sold units.
<b>TOTAL</b>		<b>22,380</b>	

**Source:** Federal Housing Authority (FHA), 2024

#### **4.1.3 Constraints of the Federal Housing Authority (FHA) in Meeting its Housing Mandate in Abuja**

The constraints hindering the Federal Housing Authority (FHA) from effectively meeting its housing mandate in Abuja are summarized in Table 3. The analysis highlights several administrative, financial, and technical challenges that collectively constrain the Authority's ability to deliver adequate and quality housing to meet the city's growing population demand. It is evident that there is a pressing need for housing expansion in Abuja due to the increasing demand for affordable and habitable accommodation. Among the major constraints identified, administrative bottlenecks and financial problems were revealed as the most critical challenges affecting FHA's performance in fulfilling its mandate. These factors underscore persistent institutional inefficiencies and funding limitations that impede project planning, implementation, and delivery. Other important constraints include favoritism in contractor selection, poor feasibility (visibility) studies on projects, frequent policy changes, lack of supervisory capacity,



poorly priced bills of quantities (BOQ), inadequate pre-contract planning, non-involvement of consultants, corruption, inappropriate approaches to project execution, and inflationary pressures. Collectively, these issues contribute to delays, cost overruns, and the substandard quality of housing projects undertaken by the FHA in Abuja.

**Table 3: Constraints of the Federal Housing Authority (FHA) in Meeting its Housing Mandate**

S/N	Obstacles	Mean value	Level of importance
1	Administrative bottlenecks	3.6	Very important
2	Financial problems	3.8	Very important
3	Political factors	3.4	Important
4	Favoritism in choosing contractors	3.4	Important
5	Lack of supervisory capacity	2.9	Important
6	Poor visibility study on projects	3.1	Important
7	Poor priced BOQ for work	2.7	Important
8	Frequent change of policies	2.9	Important
9	Inadequate pre-contract planning	3.4	Important
10	Non involvement of consultants	3.0	Important
11	Corruption	3.2	Important
12	Lack of training for staff	3.0	Important
13	Poor design	3.1	Important
14	Wrong approach to execution of project	3.3	Important
15	Inflation	3.2	Important

**Source:** Author's Computation, 2025

**Decision Rule:** 1.0-2.4 =Not important; 2.5-3.4= Important; 3.5-4.0= very important

The findings of this study showed that consistent financial constraints and administrative bottlenecks as major impediments to effective project implementation. Similar to previous studies, financial challenges were rated as the most significant factor, reaffirming the persistent issue of inadequate funding, poor budgetary control, and delays in fund disbursement that hinder project execution (Adebayo & Yusuf, 2020; Okafor et al., 2021; Olowu & Anifowose, 2019).

The prominence of administrative inefficiencies also aligns with prior observations that excessive bureaucracy, limited supervisory capacity, and weak monitoring systems contribute to project delays and cost overruns (Ibrahim & Musa, 2020). In addition, recurrent issues such as political interference, favoritism in contractor selection, and corruption corroborate previous evidence linking governance challenges with poor project outcomes (Eze & Nwosu, 2022; Bello, 2021).

Furthermore, the continued occurrence of technical and managerial deficiencies including inadequate feasibility studies, poor design quality, and limited staff training supports earlier findings that highlight the need for improved institutional and professional capacity. Collectively,



these alignments emphasize that enhancing financial transparency, administrative efficiency, and accountability frameworks remains critical to strengthening project performance and sustainability in the sector (Abdullahi & Suleiman, 2020; Nwachukwu et al., 2023).

#### 4.1.4 Respondents' Perception of the Quality of Housing Provision

The perception of housing quality among residents of the Federal Housing Authority (FHA) estates in Abuja reveals marked disparities across indicators of habitability, infrastructure access, and structural soundness.

**Table 4: Respondents' Perception of the Quality of Housing Provision**

S/N	Category	Classification	Frequency	Percentage (%)
1	Security conditions	Excellent	20	17.2
		Very good	36	31
		Good	41	35.3
		Poor	19	16.4
2	Electricity	Excellent	28	24.1
		Very good	32	27.6
		Good	36	31
		Poor	20	17.2
3	Apartments Size Adequacy	Very Adequate	13	11.2
		Grossly Adequate	20	17.2
		Fairly Adequate	47	40.5
		Inadequate	25	21.6
		Grossly inadequate	11	9.5
4	Structural Conditions	Intact	50	43.1
		Cracking	42	36.3
		Dilapidated	24	20.7
5	Conditions of Roofing	Intact	15	12.9
		Leaking	54	46.6
		Sagging	19	16.4
		Dilapidated	30	25.9
6	Proximity to Infrastructures	Very far	36	31
		Far	40	34.5
		Near	33	28.5
		Very Close	7	6
Total			116	100%

**Source:** Author's Computation, 2025

As shown in Table 4, security was rated as excellent by 17.2% of respondents, while 16.4% considered it poor. Although this suggests moderate satisfaction, the relatively low perception of excellence reflects concerns over estate security systems. These findings align with Garba et al. (2024) and Momoh et al. (2024), who reported that weak estate management, insufficient



perimeter fencing, and limited surveillance undermine residential safety in Nigerian public housing estates.

Regarding electricity, only 24.1% of residents rated supply as excellent, whereas 17.2% rated it poor. This moderate performance underscores persistent energy insecurity. Fadamiro and Dada (2025) similarly observed that unreliable power infrastructure in urban Nigeria increases energy costs and diminishes housing performance and comfort.

The findings on apartment adequacy indicate that a majority (40.5%) of respondents rated their apartments as fairly adequate, while only 11.2% described them as very adequate. This suggests that most housing units do not meet desired spatial and functional needs, echoing UN-Habitat (2022) findings that mass-housing schemes in sub-Saharan Africa often prioritize quantity over spatial quality.

In terms of structural conditions, 43.1% of the buildings were reported as intact, 36.3% exhibited cracking, and 20.7% were dilapidated. These results point to age-related deterioration and insufficient post-occupancy maintenance. Roof conditions were also concerning, with 46.6% of respondents reporting leakages, confirming issues of construction quality and maintenance highlighted by Akinlusi et al. (2023).

Accessibility remains a challenge as 65.5% of residents live far or very far from essential infrastructure, while only 6% are very close. This spatial disconnection between housing and services supports World Bank (2024) findings that poor estate siting and weak urban integration hinder accessibility and overall livability in public housing developments.



**Table 5: Quality of Housing Provision and Environmental Sustainability**

S/N	Category	Classification	Frequency	Percentage (%)
1	Plumbing	Excellent	25	21.5
		Very good	31	26.7
		Good	40	34.4
		Poor	20	17.2
2	Ventilation	Excellent	20	17.2
		Very good	46	39.6
		Good	23	19.8
		Poor	27	23.2
3	Water supply	Excellent	9	7.7
		Very good	31	26.7
		Good	30	25.8
		Poor	46	39.6
4	Access road	Very good	36	31.0
		Good	29	25.0
		Poor	51	43.9
5	Design of house	Very good	20	17.2
		Good	60	51.7
		Poor	36	31.0
6	Septic disposal	Very good	6	5.1
		Good	66	56.8
		Poor	44	37.9
7	Sanitary Appliance	Very good	20	17.2
		Good	57	49.1
		Poor	39	33.6
8	Material	Excellent	6	5.1
		Very good	24	20.6
		Good	60	51.7
		Poor	26	22.4
9	Drainage system	Very good	42	36.2
		Good	56	48.2
		Poor	18	15.5
10	Lighting	Good	47	40.5
		Poor	69	59.4
11	Finish	Excellent	19	16.3
		Very good	30	25.5
		Good	40	34.4
		Poor	18	15.5
12	Spacing	Excellent	7	6.0
		Very good	29	25.0
		Good	31	26.7
		Poor	30	49
Total			116	100%

Source: Author's Computation, 2025





Table 5 shows the results of the respondents' perceptions on the Quality of Housing Provision and environmental sustainability. The findings on Plumbing and Sanitation showed that 82.6% of respondents rated plumbing as good or better, inadequate maintenance leaves 17.2% facing poor systems. The low performance in septic disposal (37.9% poor) echoes findings by Akinlusi et al. (2023) and UN-Habitat (2022), which identified weak regulation and maintenance as drivers of groundwater contamination and public health challenges in urban housing.

The results on Ventilation and indoor Quality indicated that about 76.6% reported adequate ventilation, consistent with Abdulkareem and Al-Maiyah (2025), who emphasize that passive design remains underutilized in tropical public housing, limiting energy efficiency and thermal comfort.

The findings on Water Supply revealed that only 7.7% reported excellent water availability, while 39.6% experienced poor supply mirroring Yu and Xue's (2023) and World Bank's (2024) reports of chronic water insecurity in Sub-Saharan cities, where intermittent supply and infrastructure decay persist.

The results on Access Roads and Design showed that 44% poor road rating and 31% dissatisfaction with design align with Garba et al. (2024) and Momoh et al. (2024), who found that inadequate urban planning and weak inter-agency coordination reduce livability and sustainability in Nigerian housing estates.

On the Sanitation Infrastructure indicated that despite functional sanitary fixtures, over one-third reported poor sanitation, reinforcing earlier findings that hardware installation often lacks safe fecal sludge management (Akinlusi et al., 2023).

Building Materials and Construction: The 22.4% reporting poor materials parallels Garba et al. (2024), highlighting procurement irregularities and cost-cutting practices that compromise sustainability.

Drainage and Flood Resilience: With 84.4% rating drainage as satisfactory, this element performs better than most; however, 15.5% poor ratings confirm ongoing flood vulnerability consistent with World Bank (2024) urban resilience analyses.

Lighting and Comfort: Nearly 60% reporting poor lighting aligns with Abdulkareem and Al-Maiyah (2025), indicating design flaws that increase energy dependency and reduce wellbeing.

Finishing and Spacing: While finishing quality is acceptable, the 49% poor estate spacing rating substantiates UN-Habitat's (2022) and Momoh et al.'s (2024) concerns over overcrowding, reduced green space, and compromised microclimate regulation.



**Table 6: Multi Linear Regression Analysis**

Variables		Housing Demand	Housing Supply
HOUSING DEMAND	Correlation co-efficient	1.000	0.163
	Sig. (1-tailed)	.	0.153
	N	30	30
HOUSING SUPPLY	Correlation co-efficient	1.63	1.000
	Sig. (1-tailed)	1.53	.
	N	30	30

Level of significance is at 0.05

**Table 7 Multiple regression summary**

Exp no Housing Demand	Housing Supply	Multiple Regression	P. Value	r	r <sup>2</sup>	Strength of hypothesis	Remark	Action on relationship
		1.000	0.153	0.163	0.0266	2.66	N.S	Accept Ho

Level of significance is at 0.05

From table 7 (Multiple regression summary) the probability value of 0.153 is greater than 0.05, the level of significance therefore, there is no statistical significant relationship existing between the housing need of Abuja and the number of houses provided over the years meaning that there has been no significant increase in housing development in Abuja.

#### **4.1.5 Environmental Sustainability for Housing Estate Provision in the Study Area**

Table 8 shows the perception and integration of environmental sustainability principles for housing provision within Federal Housing Authority (FHA) housing estates in Abuja. These results highlight both progress and critical gaps in implementing sustainable housing practices across multiple domains, including materials selection, energy efficiency, water management, waste control, green infrastructure, and climate resilience.



**Table 8: Environmental Sustainability for Housing Estate Provision in the Study Area**

S/N	Aspects	Frequency	Percentage (%)
<b>1</b>	<b>Sustainable Building Materials</b>		
	Use Eco-friendly materials	50	43.1
	Use Durable materials	46	39.7
	Use sustainable non-building materials	20	17.2
<b>2</b>	<b>Energy Efficiency</b>		
	Incorporate renewable energy sources	60	51.7
	Use energy-saving appliances	56	48.3
<b>3</b>	<b>Water Conservation and Management</b>		
	Rainwater Harvesting	18	15.5
	Wastewater Recycling systems	98	84.5
<b>4</b>	<b>Waste Management</b>		
	Establish 5 Recycling (Refuse, Reduce, Reuse, Repurpose, Recycle) Systems	39	33.6
	Proper Waste Disposal Mechanisms	77	66.4
<b>5</b>	<b>Green Spaces and Vegetation in Housing Estate</b>		
	Integrated Green Spaces	28	24.1
	Parks	43	37.1
	Landscaping	45	38.8
<b>6</b>	<b>Sustainable Urban Planning</b>		
	Efficient Roads	53	45.7
	Well-structured Drainages	45	38.8
	Proper Incineration	18	15.5
<b>7</b>	<b>Environmental Impact Assessment</b>		
	Conduct EIA before projects start	44	37.9
	Conduct ESIA before projects	35	30.2
	Conduct ESIA after projects	37	31.9
<b>8</b>	<b>Climate Resilience and Adaptation</b>		
	Green Infrastructure	30	25.9
	Tree Planting	71	61.2
	Design house to withstand climate stresses such as flooding, heatwave	15	12.9
<b>9</b>	<b>Community Awareness and Participation</b>		
	Engage communities in sustainable practices	96	82.8
	Engage communities in safeguarding the practices	20	17.2
	<b>Total</b>	<b>116</b>	<b>100%</b>

**Source:** Author's Computation, 2025

The results on Sustainable Building Materials showed that a substantial proportion of respondents emphasized the use of eco-friendly (43.1%) and durable (39.7%) materials, indicating a growing consciousness of sustainable construction principles among residents and professionals. This finding corroborates Akinlusi, Adelekan, and Olajuyigbe (2023), who identified material sustainability as a pivotal factor in reducing the ecological footprint of Nigeria's housing sector.



Similarly, Garba et al. (2024) observed that durable and low-impact materials enhance structural longevity and resource efficiency. However, the low recognition of sustainable non-building materials (17.2%) suggests a limited perception of sustainability beyond primary structural components a challenge also reported in studies of low-cost housing across West Africa (Momoh et al., 2024).

The results on Energy Efficiency indicated that respondents demonstrated considerable awareness of energy efficiency, with 51.7% supporting renewable energy integration and 48.3% endorsing energy-saving appliances. These findings align with Abdulkareem and Al-Maiyah (2025), who reported increasing interest in passive design strategies and renewable energy adoption in Abuja's housing estates. Nonetheless, the findings also reveal an implementation gap: while awareness is relatively high, actual energy-efficient installations remain limited due to high costs and the absence of enabling policy frameworks.

The findings on Water Conservation and Management revealed significant progress in wastewater recycling adoption (84.5%) but limited engagement with rainwater harvesting systems (15.5%). This partial integration mirrors global urban housing trends in developing economies, where advanced recycling systems are prioritized over decentralized rainwater systems due to technical or policy constraints (Yu & Xue, 2023a&b). The low utilization of rainwater harvesting underscores the need for design innovations and public sensitization on water-efficient technologies in housing development.

About Waste Management the results showed that proper waste disposal was recognized by 66.4% of respondents; however, only 33.6% acknowledged the use of the 5R recycling framework (Reduce, Reuse, Recycle, Recover, Redesign). This suggests that while basic waste handling practices exist, circular economy principles remain poorly internalized. Ebenezer and Olufemi (2024) similarly noted that institutional fragmentation and limited public education hinder effective adoption of the 5R model in Nigerian cities. Strengthening municipal infrastructure and public-private partnerships is therefore critical for advancing sustainable waste governance in housing communities.

The results on Green Spaces and Vegetation shows that Green infrastructure remains underdeveloped within FHA estates, as evidenced by moderate recognition of parks (37.1%) and landscaping (38.8%). UN-Habitat (2022) underscores the ecological and social benefits of urban greenery, particularly for microclimate regulation, carbon sequestration, and mental well-being. The limited emphasis on green spaces reflects the tendency of Nigerian housing projects to prioritize structural density over ecological functionality (Momoh et al., 2024). Enhancing landscape planning could therefore improve urban livability and resilience.

Sustainable Urban Planning results indicated that efficient road networks (45.7%) and drainage systems (38.8%) were widely acknowledged, proper incineration facilities received minimal



recognition (15.5%), indicating infrastructural and operational deficits in urban sustainability planning. The World Bank (2024) emphasizes that inadequate solid waste and drainage infrastructure significantly undermines urban resilience in Sub-Saharan Africa. These findings demonstrate that while FHA estates exhibit some infrastructural strengths, sustainability remains secondary to conventional development imperatives.

The findings on Environmental Impact Assessment (EIA) revealed that only about one-third of respondents were aware of environmental impact assessment (EIA) or environmental and social impact assessment (ESIA) procedures, reflecting weak environmental compliance in housing projects. Akinlusi et al. (2023) similarly observed that environmental assessments in Nigeria are often treated as formalities rather than integral components of sustainable development planning. The limited institutional monitoring in FHA projects may therefore perpetuate unsustainable construction practices and ecological degradation.

The results on Climate Resilience and Adaptation showed that tree planting received significant support (61.2%), yet only 12.9% of respondents recognized the importance of climate-resilient housing design. This highlights an adaptation gap, wherein mitigation-oriented actions (like tree planting) are prioritized over structural resilience strategies. Momoh et al., (2024); Yu & Xue, (2023) argue that integrating climate-resilient architecture such as passive cooling, thermal insulation, and flood-resistant designs is essential for building long-term housing sustainability in Abuja's rapidly urbanizing landscape.

The findings on Community Awareness and Participation majority of respondents (82.8%) acknowledged the importance of community participation in sustainability practices, but only 17.2% emphasized the need for long-term institutionalization. This aligns with Ebenezer and Olufemi (2024), who emphasize that community-based participation enhances environmental ownership and accountability but requires sustained engagement frameworks. The lack of continuity mechanisms suggests that sustainability initiatives risk short-term implementation without enduring governance structures.

## CONCLUSION AND RECOMMENDATIONS

The study concluded that while the Federal Housing Authority (FHA) has contributed significantly to housing provision in Abuja, its overall effectiveness remains constrained by financial limitations, administrative inefficiencies, and technical shortcomings. Persistent funding challenges, poor budget control, and bureaucratic delays were identified as major impediments to efficient project execution. Political interference, favoritism, and corruption further undermine institutional integrity, resulting in delayed and substandard housing delivery. Although certain aspects of FHA estates such as ventilation, drainage, and plumbing were rated satisfactory, the general housing quality remains inadequate due to unreliable infrastructure and weak environmental integration. These deficiencies reflect broader institutional and governance gaps in achieving sustainable and inclusive housing development. To address these challenges, the study





recommends institutional reforms to enhance administrative efficiency, improved financial management for sustainable funding, and continuous professional capacity building for technical personnel. It also emphasizes the need for consistent policies, transparent governance, and the integration of environmental sustainability through green building practices, renewable energy, and efficient water management. Furthermore, developing strong maintenance systems and fostering inclusive stakeholder participation are essential for ensuring long-term housing quality, accountability, and environmental resilience within FHA estates in Abuja.



## REFERENCES

- Abdulkareem, M., & Al-Maiyah, S. (2025). Improving the thermal environment of Abuja's affordable housing through passive design solutions. *Sustainability*, 17(18), 8435. <https://doi.org/10.3390/su17188435>
- Adebayo, T., & Yusuf, M. (2020). Assessing the impact of professional competence on housing delivery in Nigeria. *Journal of Building and Construction Management*, 5(2), 44–57.
- Adelekan, I. O., Olajuyigbe, A. O., & Alawode, O. J. (2023). Sustainable urban housing in Nigeria: Challenges and prospects under climate change. *Environmental Management*, 71(3), 567–579. <https://doi.org/10.1007/s00267-022-01732-x>
- Adidi, J. E., Alhassan, M. M., & Adekiya, O. A. (2021). Challenges of housing development in the Federal Capital City, Abuja. *Environmental Technology and Science Journal*, 12(1), 32–40. <https://www.ajol.info/index.php/etsj/article/view/224248>
- Akande, O. K., Obi-George, L. C., Lembi, J. J., Umar, I. A., Tarni, A. M., Nwokorie, A. J., & Baba, P. H. (2024). Public housing project delivery in Nigeria: Quality versus quantity. *Journal of Contemporary Urban Affairs*, 8(1), 37–56. <https://doi.org/10.25034/ijcua.2024.389>
- Akinlusi, A. O., Adelekan, I. O., & Olajuyigbe, A. E. (2023). Environmental sustainability practices and materials use in Nigerian housing delivery systems. *Journal of Environmental Management*, 338, 118558. <https://doi.org/10.1016/j.jenvman.2023.118558>
- Bello, A. (2021). Work experience and professional performance in Nigeria's housing construction sector. *Nigerian Journal of Environmental Studies*, 9(1), 85–96.
- Britannica, T. Editors of Encyclopaedia. (2025, September 19). Abuja: Geography, development, map, & population. Encyclopaedia Britannica. Retrieved from <https://www.britannica.com/place/Abuja-national-capital-Nigeria>
- Ebenezer, A. O., & Olufemi, B. O. (2024). Urban waste governance and the 5R recycling system in sub-Saharan Africa: Prospects for circular cities in Nigeria. *Sustainable Cities and Society*, 109, 105482. <https://doi.org/10.1016/j.scs.2024.105482>
- Eze, C. O., & Nwosu, P. N. (2022). Political interference and favoritism in public procurement processes in Nigeria. *Journal of Governance and Development*, 11(4), 67–82.
- Fadamiro, J. A., & Dada, T. (2025). Integration of renewable energy technologies in Nigerian housing: Current status and future directions. *Renewable and Sustainable Energy Reviews*, 179, 113501. <https://doi.org/10.1016/j.rser.2023.113501>
- Federal Ministry of Housing and Urban Development (FMHUD). (2024). National housing and urban development report. Abuja: Government of the Federal Republic of Nigeria.



- Garba, B. M. P., Umar, M. O., Umana, A. U., Olu, J. S., & Ologun, A. (2024). Sustainable architectural solutions for affordable housing in Nigeria: A case study approach. *World Journal of Advanced Research and Reviews*, 23(3), 434–445. <https://doi.org/10.30574/wjarr.2024.23.3.2704>
- Ibrahim, M. S., & Musa, T. I. (2020). Administrative bottlenecks and project implementation delays in the public sector. *Nigerian Journal of Administration and Policy Studies*, 6(1), 14–29.
- IIARD Journals. (2025). Spatial characteristics of outdoor spaces that support environmental quality in Abuja. *International Journal of Geography and Environmental Management*, 11(2), 189–201. Retrieved from <https://iiardjournals.org/get/IJGEM/VOL.%2011%20NO.%202%202025/Spatial%20characteristics%20189-201.pdf>
- Momoh, J., Medjdoub, B., Ebohon, O. J., Ige, O., Young, B. E., & Ruoyu, J. (2024). The implications of adopting sustainable urbanism in developing resilient places in Abuja, Nigeria. *International Journal of Building Pathology and Adaptation*, 42(5), 693–715. <https://doi.org/10.1108/IJBPA-03-2022-0043>
- Okafor, C. J., Bello, Y. M., & Adewale, S. O. (2021). Evaluating the effects of administrative challenges on project success in Nigeria. *International Journal of Development Administration*, 5(2), 32–46.
- Okafor-Yarwood, I., Sani A. M.; Shuaibu, A. A.; Jenkwe, E. D. (2025). Spatiotemporal dynamics and governance in Abuja, Nigeria. *Land Use Policy*. Retrieved from <https://www.sciencedirect.com/science/article/abs/pii/S0264837725003035>
- Olowu, D., & Anifowose, T. (2019). Gender inclusiveness and workforce dynamics in Nigeria's built environment. *Journal of Sustainable Development and Planning*, 14(4), 203–217.
- United Nations Human Settlements Programme (UN-Habitat). (2022). *Sustainable housing in Africa: Addressing urbanization and housing deficits*. Nairobi: UN-Habitat.
- World Bank. (2024). *Nigeria urban housing development project: Environmental sustainability and social inclusion*. World Bank Report No. 2024/0742.
- Yu, C., & Xue, D. (2023a). Water conservation and climate-resilient housing design in tropical urban areas. *Building and Environment*, 229, 109837. <https://doi.org/10.1016/j.buildenv.2023.109837>.
- Yu, C., & Xue, X. (2023b). Water recycling and rainwater harvesting for sustainable urban housing: Lessons for developing economies. *Journal of Cleaner Production*, 397, 136476. <https://doi.org/10.1016/j.jclepro.2023.136476>.