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ASSESSMENT OF HOUSING QUALITY IN THE SUB-URBAN AREAS OF AWKA SOUTH LGA, ANAMBRA STATE

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Abstract

This study assessed housing quality in the sub-urban areas of Awka-South Local Government Area, Anambra State. The study was guided by 3 research questions and one null hypothesis. The research design adopted for the study was a mixed methods research design. The study was carried out in five various suburban communities of Awka South namely: Isiagu, Nibo, Nise, Amawbia, and Okpuno. The projected population was 145,704, from which a sample of 582 respondents comprising household heads, government officials, urban planners, environmental health officers and estate developers was selected using multistage sampling. Data collection was done through the use of a structured questionnaire, field observation and interview. SPSS version 25 was used for analysis, while descriptive statistics and Chi-square were used in hypothesis testing. Out of 582 questionnaires issued out,560 questionnaires were retrieved. It represented a response rate of 96.2%. The findings revealed that the physical state of housing units was generally fair, with a cluster mean of 3.20, although paintwork and plumbing fittings were inadequate. Housing infrastructure was generally inadequate, particularly water supply and safety, roads and drainage, with a cluster mean of 2.87. Residents' overall satisfaction with housing quality was also below the benchmark, with a cluster mean of 2.95. The hypothesis revealed a significant relationship between housing quality and residents' satisfaction, $\chi^2(9) = 471.756$, $p = .001$. The qualitative findings from Key Informant Interviews revealed institutional and regulatory challenges, including speculative developers bypassing central planning desks, aging building stock with structural fatigue, professional negligence by commercial builders, and critical structural anomalies such as setback violations, compromised foundations, and structural dampness. The study recommends improved housing maintenance, reliable water supply, road rehabilitation, functional drainage systems, improved electricity and enhanced security in the study area.

Keywords: Housing Quality, Residential Satisfaction, Suburban Housing, Awka South, Housing Infrastructure.

1.0 INTRODUCTION

1.1. Background to the study

Housing is one of the basic necessities of human life and an important determinant of the health, safety and well-being of individuals and households. It provides shelter, security, privacy and protection from environmental hazards. The World Health Organization (2018) noted that adequate housing contributes to improved health, quality of life and social well-being. Housing quality therefore extends beyond the physical structure of a building to include the condition of building components, availability of basic facilities and the quality of the surrounding environment. Thus, the quality of housing can be assessed through factors such as the condition of walls, roofs, floors, ventilation, space, water supply, sanitation, drainage, roads and waste management.

Housing quality has become a major concern in developing countries because of rapid population growth, urbanization, inadequate infrastructure and limited resources. The expansion of cities into surrounding areas has increased the demand for residential accommodation, often resulting in housing development that is not adequately supported by essential infrastructure and environmental services. The Federal Ministry of Housing and Urban Development (2024) identified inadequate housing quality, housing deficit, high housing costs and poor environmental conditions as continuing challenges in Nigeria. This indicates that the Nigerian housing problem involves not only the availability of housing but also the physical and environmental quality of residential areas.

The situation is particularly relevant to Anambra State, where rapid urban expansion has increased residential development around major urban centres. Awka, the state capital, has experienced considerable population and physical growth since it became the capital of Anambra State in 1991. This expansion has extended into surrounding communities in Awka South Local Government Area, creating increasing demand for housing and supporting infrastructure. As residential development expands, concerns arise regarding the physical condition of housing units, water supply, sanitation, roads, drainage and waste management. The suburban communities of Amawbia, Nibo, Okpuno, Isiagu and Nise form part of this expanding residential environment. These communities have experienced increasing housing development associated with the growth of Awka and its surrounding areas. However, the availability and quality of housing and neighbourhood facilities may differ across the communities. Poor building conditions, inadequate water supply, insufficient sanitation, poor road conditions, blocked drainage and ineffective waste management can reduce the quality

and habitability of residential environments. These conditions may also influence residents' satisfaction with their housing.

Previous studies have examined different dimensions of housing quality in Nigeria. Ibem (2011) and Akinbamiro (2012) examined physical housing conditions, including building materials, structural stability, amenities, sanitation facilities and state of repairs. Amao (2012) and Aloko (2012) further identified inadequate infrastructure, poor environmental conditions and socioeconomic factors as important influences on housing quality. In Awka, Obi, Nwankwo, Ugwu and Eze (2021) examined environmental quality in residential areas, while Nomeh (2024) and Nnatu (2024) highlighted waste management, drainage and environmental health challenges. However, these studies generally examined specific dimensions of housing or environmental quality rather than providing an integrated assessment of housing conditions, water supply, sanitation, roads, drainage, waste management and residents' satisfaction within the selected suburban communities of Awka South. This creates a gap that the present study seeks to address in Amawbia, Nibo, Okpuno, Isiagu and Nise.

1.2. Statement of the Problem

Housing is essential to the health, safety and well-being of residents. Adequate housing should provide structurally sound buildings, sufficient water supply, sanitation, drainage, accessible roads, effective waste management and other essential neighbourhood facilities. However, rapid urbanization, population growth and unregulated residential development have created housing and environmental challenges in many suburban communities in Nigeria. These challenges may affect the physical condition of housing units and the quality of the surrounding residential environment.

Previous studies have identified inadequate water supply, poor sanitation, ineffective drainage, poor waste management, overcrowding and deteriorating infrastructure as major housing problems in Nigerian communities (Ibem & Aduwo, 2016). Studies in Awka have also reported environmental and infrastructure-related challenges, particularly in relation to waste management, drainage and residential environmental quality (Obi et al., 2021; Nomeh, 2024; Nnatu, 2024). These conditions indicate the need for continuous assessment of housing quality, particularly in rapidly developing suburban areas.

Despite these studies, there is limited empirical information that provides an integrated assessment of housing quality in the selected suburban communities of Amawbia, Nibo, Okpuno, Isiagu and Nise in Awka South Local Government Area. In particular, limited evidence exists on the physical state of housing units, the quality of water supply, sanitation,

roads, drainage and waste management, residents' satisfaction with housing quality, and the challenges affecting housing conditions in these communities. The absence of such integrated information makes it difficult for government agencies, planners, housing professionals and other stakeholders to develop interventions that respond adequately to the specific housing needs of these communities.

Therefore, the present study was undertaken to assess housing quality in the selected suburban communities of Awka South Local Government Area, with particular attention to the physical condition of housing units, neighbourhood infrastructure and environmental services, residents' satisfaction, challenges affecting housing quality, and sustainable strategies for improvement.

1.3. Aim and Objectives

Aim

The aim of this study is to assess housing quality in the sub-urban areas of Awka-South LGA, Anambra State.

Objectives

To achieve this aim, the following specific objectives were followed:

1. to examine the physical state of housing units in the suburban areas of Awka South;
2. to assess the quality of housing condition (water supply, sanitation, roads, drainage and waste management) in the study area;
3. to examine the level of satisfaction of resident with housing quality in the study area

1.4. Research Questions

1. What is the physical state of housing units in the suburban areas of Awka South L.G.A?
2. What is the quality of housing conditions (water supply, sanitation, roads, drainage and waste management) in the study area?
3. How is the level of residents' satisfaction with housing quality in the study area?

1.5. Research Hypothesis

To further tackle the research objectives, a research hypothesis was postulated:

H_0: There is no significant relationship between housing quality and residents' level of satisfaction in the study area.

2.0 LITERATURE REVIEW

2.1.1 Physical State of Housing Units

Physical condition. This refers to the structural condition, functional state, durability, and overall maintenance of residential buildings. It relates to the visible aspects of a home that state what kind of shelter it gives, whether it is safe, healthy, comfortable, and secure for its dwellers. This characteristic includes the condition of the foundation walls, roof, floors, doors, windows, ceilings, and finishes, as well as the condition of the plumbing, electrical installations, ventilation, and lighting, sanitation facilities and the general maintenance of the residential building. It is generally considered as one of the most influential and significant indicators of housing quality as maintained and well-maintained buildings contribute much to ensuring the health safety comfort and comfort of all people living in them. The World Health Organization (2018) states that the physical condition of a home is fundamental to the health and safety of its dwellers, and in rooms that are structurally sound, provided with adequate ventilation, natural, and artificial lighting, maintained, and free from dampness brings protection from environmental health risks, reduces communicable diseases injuries dampness, indoor air pollution and excess heat or cold. However, dilapidated housing like leaking roofs, broken walls, poorly ventilated spaces, faulty electrical systems and lack of sanitation can compromise safety and pose health hazards. Institutional analysis by Baig and Sarwar (2024) also supported this notion by identifying that the physical condition of the structure determines appropriateness and habitability of the dwelling. The organization stated that quality housing should offer long lasting construction materials with structural integrity, sufficient living space, healthy levels of daylight and ventilation, access to water, sanitation, and electricity, and nurturing with maintenance.

Ibem, Opoko, Adeboye, and Amole (2017) defined adequate physical qualities of housing units to mean criterion to include - quality and durability of construction materials, structural condition, internal adequacy, provision of basic facilities, functionability of services and maintenance conditions of residential structures. In the same way, in Aigbavboa and Thwala (2018), the structural conditions of dwellings were identified as indicators of housing quality in developing countries. It was opined by the authors that presence of defective roofing, declining walls, imperfect flooring, inadequate installation of windows and doors, lack of

ventilation as well as poor maintenance practices are indicators of housing deterioration that also have implications for the safety and comfort of occupants. The authors highlighted the importance of building maintenance and rehabilitations in maintaining the physical quality and durability of housing units. Also, Ibem and Aduwo (2021) articulated that the physical condition of dwellings could only be measured with the technical conditions of occupancy; that is, the adequacy of internal facilities and building services, and the extent of travel distance to access reliable services like potable water supply, electricity, fire hearth and waste disposal facilities, toilet facilities, kitchens, baths, and indoor space requirements. In addition, current research by Akinola, Ibem, Opoko, and Akinola (2026) also identified the link between the state of physical housing and environmental sustainable development.

In the same way, the recent literature of Akinola, Ibem, Opoko, and Akinola (2026) also revealed the interrelationship between physical condition of housing and environmental sustainability. Akinola, et al (2026) maintained that in sustainable housing, residential buildings should be physically enduring, energy-efficient, environmentally sustainable and could cater for both current and future accommodation requirements. These authors asserted that physical condition of housing should include such factors as: dwelling durability, elements of maintenance, physical factors used in construction, energy consumption, environmental conditions and climate change. Akinola et al (2026) added that physical condition of housing should add factors about structural integrity, component durability, state of repair, architectural quality, internal, and external quality of finishes, sanitary appliances and drainage, lighting, and heating, general cleanliness, ventilation, and condition of the walls, floors, roof structures, ceilings, windows, electrification, plumbing and sanitation, emerging health hazards and also the quality of the neighborhood. And, about deterioration of the physical condition of housing, Anokye et al identified it as one of the measure for quality of housing around the world. The researchers explained that physical assessment involves investigating the stability of buildings, the quality of building materials, the state of architecture, walls, and ceilings flooring plumbing and sanitation lighting heating and ventilation.

The physical state of most housing units in Nigeria in particular in high density suburbs has become a paramount concern due to the effects of urban renewal, rapid urbanization, planning abuses, poor implementation of building regulations, inadequate maintenance culture and the inability to acquire adequate financial resources. Such states will lead to structural defects, lack of basic facilities deprivation congestions and peri-urban deviant

environment. Concerns for the physical state of housing units have become imperative to identify what is lacking that needs policy attention and financial support. For this work, the physical state of housing units will be determined by the condition of the roof walls foundation floors ceiling, doors, and windows ventilation lighting plumbing power supply, sanitary facilities, maintenance of the building blocks and structural stability of residential buildings in Awka South Local Government Area, Anambra State.

2.1.2 Quality of Housing Condition, Water Supply, Sanitation, Roads, Drainage and Waste Management

It is a broad measurement of quality that also encompasses the conditions of provision of basic environmental infrastructure and public services within the residential environment like safe water supply, water rendering sanitation services, road network facilities, drainage; solid waste services etc. is an important indicator of quality housing as they directly affect the health of the residents, as well as the quality of life of individuals in general in the environment. Because of this, the analysis of housing quality should involve the combined assessment of the dwelling and residential environment.

As per World Health Organization (2018), quality housing encompasses a healthy environment providing access to safe drinking water sanitation river/sea/lake access drainage disposal of wastes ventilation lighting and protection from environmental hazards. The organization pointed out that deficiency in any of these services will have adverse effects on health through increased burden of communicable diseases, environmental pollution and injuries. That's why, the quality of house should be determined by structural and environmental indicators. Same thing, Baig and Sarwar (2024) described that providing access to adequate house is the adequacy of the wall floors roof, drainage sewerage electricity, road, and access to institutions, garbage disposal, health care and transportation in addition of providing basic amenities like safe water, toilet, and foods. As concluded by the organization, neighbourhood infrastructure is the essential dimension of housing quality as it influences the liveability accessibility sustainability and safety of dwellings.

2.1.3 Quality of Housing Condition

The quality of housing condition refers to the structural integrity, functionality, durability, safety, maintenance status, and overall habitability of residential buildings. It includes the condition of foundations, walls, roofs, floors, ceilings, doors, windows, plumbing systems,

electrical installations, ventilation, lighting, and internal facilities. Ibem, Opoko, Adeboye, and Amole (2017) observed that housing condition is one of the most widely used indicators for measuring housing quality. According to the authors, structurally sound buildings with adequate internal facilities provide better living conditions and higher residential satisfaction than poorly maintained buildings with structural defects. The study further noted that regular maintenance significantly improves housing performance and prolongs the lifespan of residential buildings. Similarly, Akinola, Ibem, Opoko, and Akinola (2026) argued that housing condition should be assessed through objective indicators such as structural stability, building materials, maintenance status, durability, internal facilities, and energy efficiency. The authors emphasized that quality housing should remain safe, functional, environmentally sustainable, and capable of meeting occupants' present and future needs.

Theoretical Framework

2.2.1 Post-Occupancy Evaluation (POE) Theory

Post-Occupancy Evaluation (POE) Theory was developed through the works of Preiser, Rabinowitz, and White in 1988 as a systematic approach for evaluating the performance of buildings after they have been occupied and used by residents. The theory emerged from the recognition that the true performance of buildings can only be determined after occupants have experienced living or working within them. According to POE Theory, buildings should be evaluated based on how effectively they satisfy the functional, technical, behavioural, environmental, and aesthetic needs of their occupants. The theory argues that the success of housing should not be measured solely by architectural design or construction quality but also by the experiences and satisfaction of those who occupy the buildings. The theory identifies several dimensions of housing performance. The technical dimension focuses on structural stability, durability of construction materials, roofing, walls, foundations, ventilation, lighting, plumbing systems, electricity, and maintenance conditions. These factors determine whether buildings remain physically safe and functional throughout their lifespan. The functional dimension evaluates whether the available spaces adequately support household activities such as cooking, sleeping, studying, sanitation, recreation, and storage. It also considers room sizes, accessibility, circulation spaces, and flexibility of housing layouts. The behavioural dimension examines residents' perceptions, experiences, comfort, privacy, satisfaction, and interaction with the housing environment. Occupants' opinions are considered valuable indicators of housing quality because users experience the strengths and weaknesses of

buildings daily. The environmental dimension assesses external conditions surrounding residential buildings, including waste disposal systems, drainage, access roads, noise levels, air quality, water supply, electricity, security, landscaping, and neighbourhood infrastructure. According to POE Theory, quality housing cannot be separated from the quality of its surrounding environment.

Post-Occupancy Evaluation is a methodological and theoretical approach that systematically assesses buildings after occupancy by evaluating how the actual lived experience of residents aligns with the original design intentions and planned performance targets of the built environment. This theory is particularly relevant to housing quality assessment as it provides a structured framework for gathering user-centric feedback on the performance of residential buildings and associated infrastructure after they have been occupied and used over a period of time. A systematic review of residential POE studies underlines the importance of user-centric feedback in improving building performance, thermal comfort, and overall satisfaction Post-Occupancy Evaluation is particularly relevant to this study because it provides practical indicators for assessing housing quality in suburban communities. Through questionnaires, field observations, interviews, and housing assessment checklists, researchers can evaluate both the physical condition of residential buildings and the satisfaction levels of occupants. The major strength of POE Theory is its comprehensive approach to housing evaluation, combining objective building assessment with occupants' subjective experiences. However, one limitation is that residents' perceptions may differ significantly depending on their personal expectations, cultural background, income level, or previous housing experiences. Consequently, two households living in similar buildings may report different levels of satisfaction. To address this limitation, the study also adopts the Actual-Aspiration Gap Theory.

2.2.2. Actual-Aspiration Gap Theory

The Actual-Aspiration Gap Theory was developed by Morris and Winter (1978) as part of their Housing Adjustment Theory. The theory explains housing satisfaction by examining the difference between a household's current housing situation (actual housing conditions) and the housing conditions the household desires or expects (housing aspirations). According to the theory, households continually compare their existing housing conditions with socially accepted housing standards and their personal aspirations. When the difference between actual housing conditions and desired housing standards is small, residents are generally

satisfied with their housing. Conversely, when the gap becomes large, dissatisfaction increases, and households may seek to improve their dwellings, relocate, or adjust their expectations.

The theory suggests that housing aspirations are influenced by several socioeconomic factors, including household income, educational attainment, occupation, family size, cultural values, age, and government housing policies. Higher-income households generally possess higher housing aspirations than lower-income households because they have greater financial capacity to obtain improved housing. In the context of this study, residents of suburban areas in Awka South Local Government Area may aspire to live in houses with reliable electricity, potable water, adequate drainage, good road networks, sanitation facilities, spacious rooms, proper ventilation, and secure neighbourhoods. However, due to financial constraints, rapid urbanization, inadequate infrastructure, or poor housing supply, many households may occupy dwellings that fall below these expectations. The Actual-Aspiration Gap Theory therefore provides an explanation for differences in residents' levels of satisfaction even where housing conditions appear objectively similar. It recognizes that housing quality is not only determined by physical standards but also by occupants' expectations and perceptions. The theory is particularly relevant because this study seeks to assess not only the physical quality of housing but also residents' satisfaction with their housing conditions. By examining the gap between actual housing conditions and residents' expectations, the researcher can identify specific areas where housing improvements are most needed.

3.0 METHODOLOGY

3.1. Research Design

This study adopted a mixed methods research design. Creswell and Creswell (2018) describe mixed methods research as an approach to inquiry that involves collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone. The convergent parallel design was considered most appropriate for this study because the researcher sought to obtain both quantitative data on the physical state of housing units, infrastructure availability, and measurable indicators of housing quality, as well as qualitative

data on residents' experiences, perceptions, satisfaction levels, and the lived challenges associated with housing quality in the sub-urban areas of Awka South LGA.

3.2. The Study Area

3.2.1. Location

The study focused on the suburban Areas of Awka South LGA. One of the 21 LGA in Anambra State Nigeria (Fig 3. 1). Awka-South LGA is one of the LGAs in Anambra State. It is approximately 15 km northeast of the Niger River and is bounded by the L. G. areas of Awka North, Orumba North, Njikoka, and Anaocha (Fig 3. 2). It is made up of nine towns Amawbia, Awka, Ezinato, Isiagu, Mbaukwu, Nibo, Nise, Okpuno, and Umuawulu. It is situated at Latitude 6 10'N and 6 15'N and Longitude 7 00'E and 7 10'E (Awka South LGA, 2023) and covers a land mass of 164.3 Km^2. The population density is about 1,600 per Km^2. The population of the study area was projected as 366, 715, (NPC, 2024) in the total population of Awka South L.G.A. and this was adopted as a contextual background information for the study area. The five study communities were selected out of the nine towns of Amawbia, Nibo, Okpuno, Isiagu, and Nise. The Awka South L. G. A. experience two seasons i. e. the wet season and the dry season. The area has an average annual rainfall of 2,950 mm, temperature is about 27C with relative humidity of about 70%. The communities in the study are within Amawbia, Nibo, Okpuno, Isiagu, and Nise

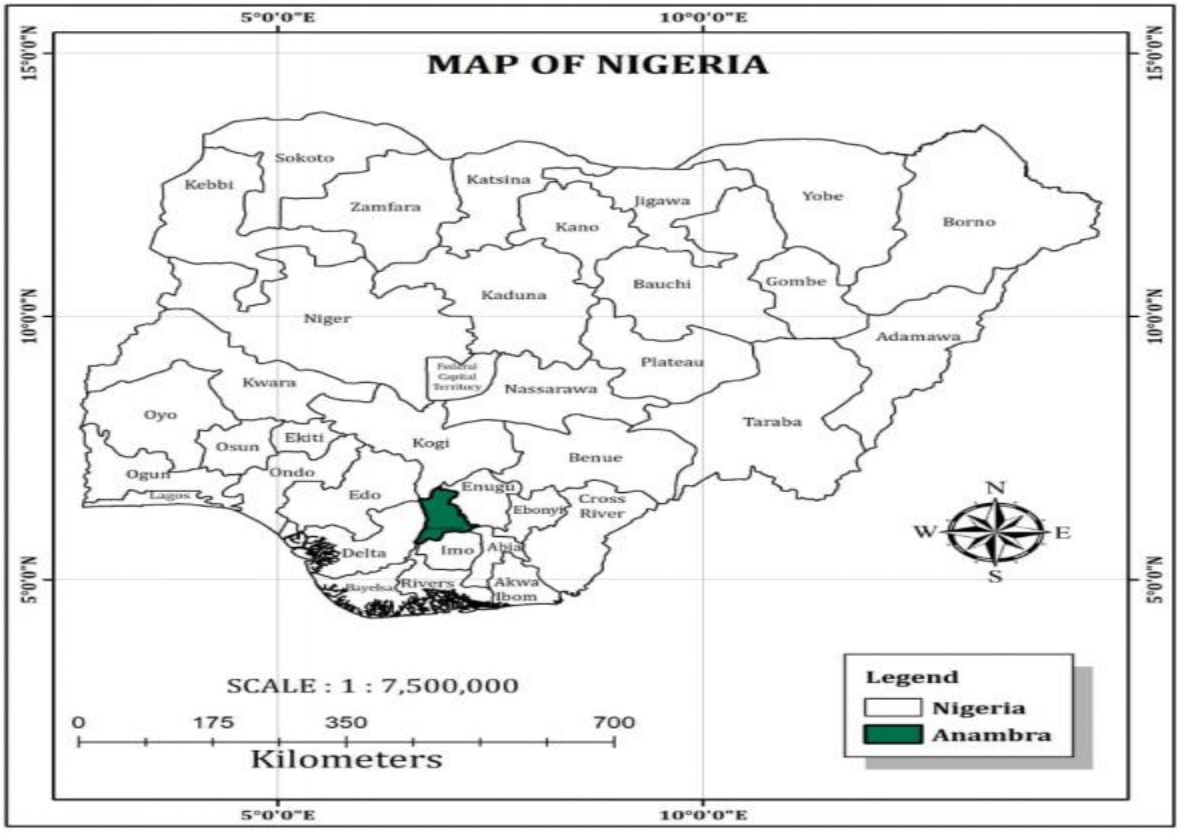


Fig 1. Map of Nigeria showing Anambra State

Source: Department of Surveying and Geo-Informatics, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria (2025)**.**

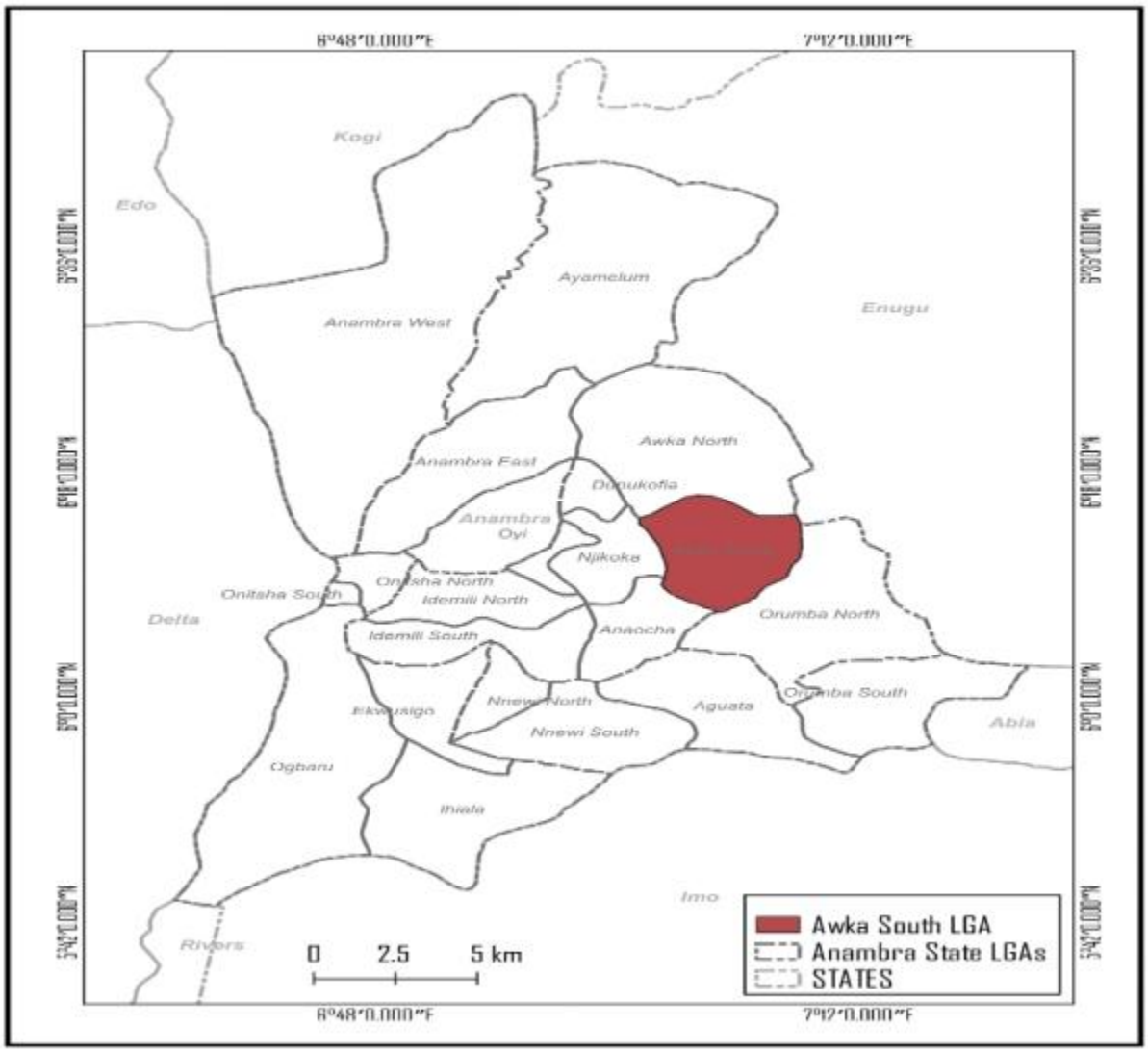


Figure 3.2: Map of Anambra Showing Awka South LGA

Source: Department of Surveying and Geo-Informatics, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria (2025).

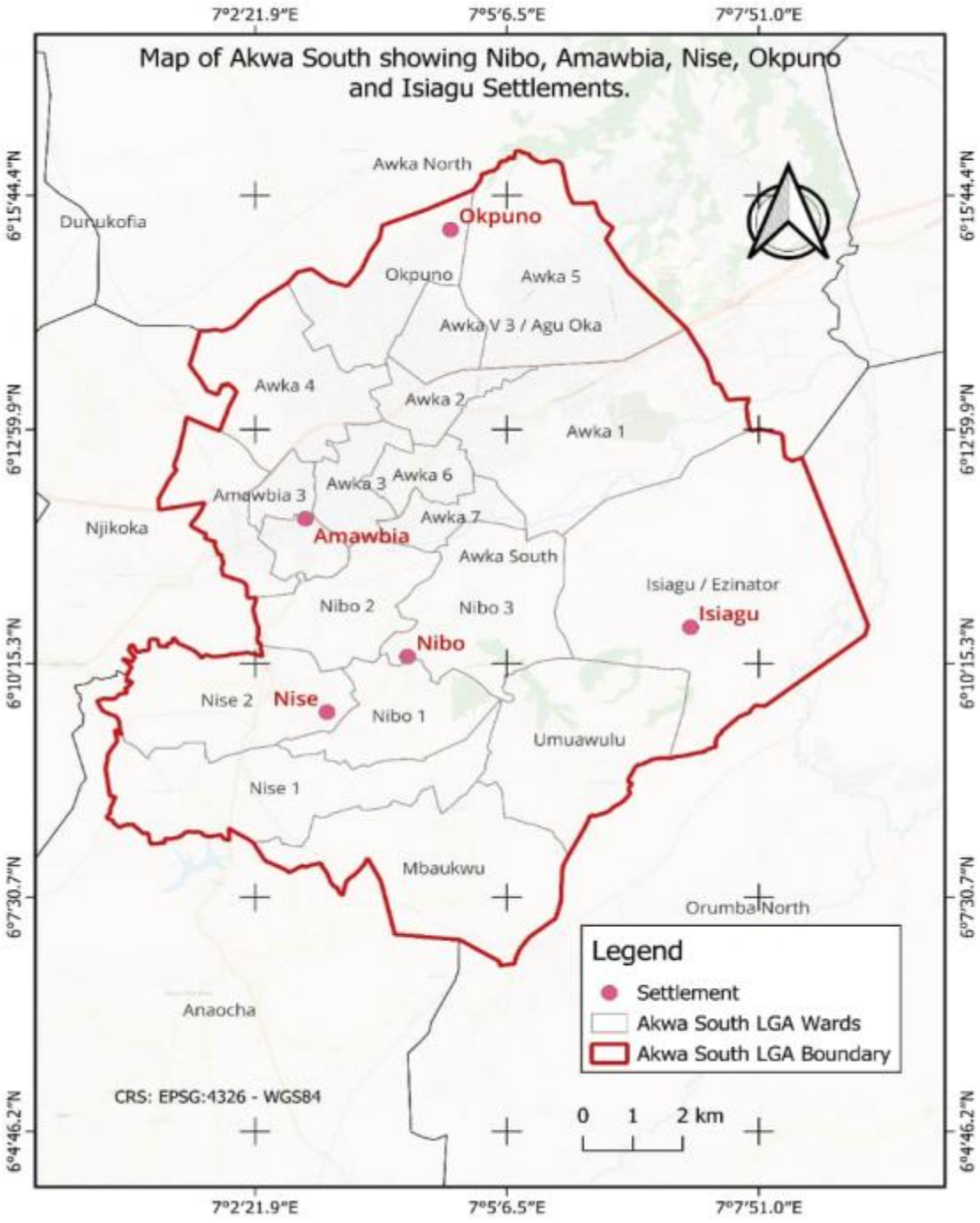


Fig 3.3. Map of Awka South Showing the Study Areas

Source: Department of Geography, University of Jos (2026)

3.3 Population of the Study

Population is all the items or individuals whose ideas or characteristics are being studied (Okolie, 2018). The population of interest for this study was Household Heads, Government

Officials and Urban Planners, Environmental Health Officers, Estate Developers and registered Building Professionals within the 5 selected suburban communities of Amawbia, Nibo, Okpuno, Isiagu, and Nise in Awka South in Anambra State who was assumed to have adequate knowledge of housing environment sanitation infrastructure and environmental problems in their household setting. As the study was going to be conducted in 2026, the population figures for 2024 was projected to 2025 and through this 145,704 household heads, Government Officials and Urban Planners, Environmental Health Officers, Estate Developers and Building Professionals was gotten and this became the population for this study and the projection was necessary to reflect the current population situation in the study area, and to boost the precision of sampling estimates. See table 3.1:

3.3.1 Projection of Awka South L.G.A. Population

Using the 2024 National Population Commission for Awka South L.G.A which is 366,715, Taro Yamane's formular as cited in Ogunoh (2014) was used thus:

$P_{2025} = 366{,}715(1+0.0228)^1$

$P_{2025} = 366{,}815 \times 1.0228$

$P_{2025} = 375{,}081.86$

$P_{2025} = 375{,}082.$

Thus, the projected population of Awka South L.G.A. for 2025 is 375,082.

3.3.2 Projection of the Study Communities

The same formula was applied to the selected communities as shown in the Table below

Table 3.1: Projected Population of the Selected Communities

Community	2024 population	Projection formula	2025 projected population
Isiagu	11,964	11,964 × 1.0228	12,237
Nibo	49,451	49,451 × 1.0228	50,579
Nise	30,745	30,745 × 1.0228	31,446
Amawbia	40,382	40,382 × 1.0228	41,302
Okpuno	9,816	9,816 × 1.0228	10,040
Total	142,358		145,704

The projected total population of the five selected communities is therefore 145,704.

Source: NPC (2024)

3.4. Sample Size Determination

To determine an objective and representative sample size across the study areas, a uniform 2% sampling intensity was applied to the total estimated household framework of the communities. Based on the 2025 projected population distributed across five targeted suburban communities; Isiagu, Nibo, Nise, Amawbia and Okpuno. The total regional household was established at 29,140.8 (which is consistent with the national average household size of five persons documented in Nigerian census and demographic surveys (National Population Commission, 2006). Calculating 2% of the household base within each cluster yielded an aggregate sample size of 582 which was adopted for this study. The adoption of a 2% sampling intensity was justified on the basis that it aligns with standard sampling principles, ensuring statistical adequacy while remaining operationally feasible for the study's scope and resources. (Cochran, 1977)., World Bank (1974) documented a household survey in Sudan using an overall 2% sampling fraction. Also, from the National Bureau of Statistics, Nigerian household surveys explicitly recognize sampling fractions as part of the household-selection procedure.

3.5 Sample Size and Sampling Techniques

The sample size for the study was 582 respondents drawn from the five selected suburban communities of Amawbia, Nibo, Okpuno, Isiagu and Nise in Awka South Local Government Area. The respondents comprised household heads/residents and relevant stakeholders, including government officials, urban planners, environmental health officers, estate developers and building professionals.

A multistage sampling technique was adopted for the study. The sampling was carried out in distinct stages. At the first stage, purposive sampling was used to select the five suburban communities of Amawbia, Nibo, Okpuno, Isiagu and Nise because of their rapid residential development and relevance to the assessment of housing quality. At the second stage, the projected population of each selected community was used to estimate the number of households by dividing the population by five, based on the adopted average household size. At the third stage, a 2% sampling rate was applied to the estimated number of households in each community to determine the sample allocated to each community. Finally, households

and relevant respondents were selected within the sampled communities using stratified sampling, with respondents grouped according to the relevant categories of household residents and key housing-related professionals and officials.

Table 3.1: Composition of the Sampled Distribution

Community	2025 projected population	Estimated household's (population/5)	Sampling rate formula	Sample Size
Isiagu	12,337	2,467.4	2467.4x2%	49
Nibo	50,579	10,115.8	10,115.8x2%	202
Nise	31,446	6,289.2	6,289.2x2%	126
Amawbia	41,302	8,260.4	8,260.4x2%	165
Okpuno	10,040	2,008.0	2,008x2%	40
Total	145,704	29,140.8	-	582

Source: Researcher Field work (2026)

3.6. Instrument of Data Collection

The data for this study was collected using structured questionnaire, field observation and interview. It consisted of items developed in line with the research questions and insight gained from related literature reviewed. The questionnaire has two sections - "A" and "B". Section A contained items on the demographic data of the respondents based on gender, educational qualifications, occupation and length of Stay of Respondents, while Section B is divided into s clusters of B_1 – B_3, and covered issues in the research questions. The instrument was structured on a 5-point scale of SA, A, UN, D and SD with nominal scales of 5, 4, 3, 2 and 1 respectively.

3.7 Validity of the Instrument

The face and content validity of the instrument was established using the opinions of three experts. Draft copies of the questionnaire including the the research topic, purpose of the study, research questions and hypotheses was given to the three experts (lecturers) from the Department of Environmental Management, Faculty of Environmental Sciences, NnamdiAzikiwe University, Awka. They were equested to constructively examine the instrument in terms of appropriateness, wording, suitability and items construct. The experts' inputs was used in modifying the items to the standard which was approved by the supervisor.

3.8 Reliability of the Instrument

The reliability of the instrument was established using a pilot test of twenty house heads, health workers, estate developers, builders and town planners in some selected communities from Awka North, which is outside the study area but have similar features to the studied area. Data collected was analysis using Cronbach's alpha and a value of 0.8 which was obtained and accepted, indicating adequate internal consistency and ensuring that the instrument is both reliable and suitable for generating trustworthy results.

3.9. Method of Data Analysis

Descriptive and inferential were employed. Descriptive statistics including frequencies table and charts were used to provide a clear summary of the data, making it easier to identify patterns and trends in housing quality across the selected suburban communities of Awka South Local Government Area. Mean and standard deviation was used to answer the research questions.

A criterion mean of 3.00 was adopted as the benchmark for interpreting the mean scores. This value represents the midpoint of the five-point Likert scale employed in the study (Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, Strongly Disagree = 1). Consequently, any mean score of 3.00 and above was regarded as agreed, while mean scores below 3.00 were regarded as disagreed.

To test the null hypothesis, chi square was used to test the null hypothesis at 0.05 level of significance. Where the p-value was less than 0.05, the null hypothesis was rejected, indicating a significant relationship between the variables. The computer application used for data processing and analysis was SPSS version 25, which facilitated efficient data computation and interpretation.

Qualitative data from field observations and interviews were analysed using thematic analysis (following Braun and Clarke's six-phase approach). This involved familiarisation with the data through repeated reading of interview transcripts and observation notes, generation of initial codes, searching for and reviewing candidate themes, defining and naming the final themes, and producing a coherent narrative report. The thematic findings were integrated with the quantitative results to provide a richer, complementary understanding of housing quality.

3.9 Ethical Considerations

Ethical principles were observed throughout the study. Before data collection, the purpose of the study was explained to the respondents, and informed consent was obtained before participation. Participation was voluntary, and respondents were informed of their right to withdraw at any time. Confidentiality and anonymity were maintained, and the information collected was used strictly for academic purposes. The researcher also ensured that respondents were not exposed to any harm, coercion or discomfort during the study.

4.0 Data Presentation and Analysis

4.1.1 Distribution of Questionnaire

Community	2025 projected population	Estimated household's (population/5)	Sampling rate formula	Questionnaires shared (N=582)	Questionnaire collected
Isiagu	12,337	2,467.4	2467.4x2%	49	46
Nibo	50,579	10,115.8	10,115.8x2%	202	196
Nise	31,446	6,289.2	6,289.2x2%	126	122
Amawbia	41,302	8,260.4	8,260.4x2%	165	159
Okpuno	10,040	2,008.0	2,008x2%	40	37
Total	145,704	29,140.8	-	582	560

A total of 582 questionnaires were shared across the five communities, with Nibo receiving the highest share (202) due to its larger projected population, followed by Amawbia (165), Nise (126), Isiagu (49), and Okpuno (40). Of these, 560 questionnaires were retrieved, representing a 96.2% response rate, which is adequate for analysis. Nibo also recorded the highest number of collected questionnaires (196), while Okpuno recorded the lowest (37).

4.1.1. Demography of Respondents

Table 4.1.2 Gender Distribution of Respondents.

Gender	Frequency	Percentage (%)
Male	317	56.6
Female	243	43.4
Total	560	100.0

Male respondents constituted 56.6% (317) of the sample, while females made up 43.4% (243). This indicates that males were more represented in the survey, though female participation was still substantial.

Table 4.1.3 Age Distribution of Respondents

Age group	Frequency	Percentage (%)
18 to 30 years	129	23.1
31 to 40 years	207	36.9
41 to 50 years	150	26.8
51 years and above	74	13.2
Total	560	100.0

The majority of respondents were aged 31 to 40 years (36.9%), followed by those aged 41 to 50 years (26.8%) and 18 to 30 years (23.1%). Respondents aged 51 years and above were the least represented (13.2%). This shows that the survey was dominated by economically active adults.

Research Question 1: What is the physical state of housing units in sub-urban areas of Awka South LGA, Anambra State?

Table 4.2: Respondents mean and standard deviation ratings on the physical state of housing units in sub-urban areas of Awka South LGA, Anambra State

S/N	Item statement	X	SD	Ranks	Remarks
1	The walls of my house are strong and in good condition.	3.48	1.0	2nd	Agree
2	The roof of my house is intact and does not leak when it rains.	3.52	1.03	1st	Agree
3	The floor of my house is smooth and not cracked.	3.41	1.08	3rd	Agree
4	The ceiling of my house is in good condition.	3.35	1.11	4th	Agree
5	The doors and windows in my house are well fitted and functional.	3.29	1.14	5th	Agree
6	The paint on the walls of my house is fresh and not peeling.	2.94	0.94	7th	Disagree
7	The plumbing fittings in my house are in good working condition.	2.87	0.98	8th	Disagree
8	The electrical fittings in my house are safe and working properly.	3.21	1.07	6th	Agree
	Cluster Mean	**3.2**			**Agree**

Table 4.2 presents the mean and standard deviation ratings of respondents on the physical state of housing units in sub-urban areas of Awka South LGA, Anambra State. High mean scores for the roof of the house being intact and not leaking when it rains ($\bar{X}$ = 3.52) and the

walls of the house being strong and in good condition ($\bar{X}$ = 3.48) indicate that respondents perceive the major structural components of their houses as being in good condition. The floor of the house being smooth and not cracked ($\bar{X}$ = 3.41), the ceiling being in good condition ($\bar{X}$ = 3.35), the doors and windows being well fitted and functional ($\bar{X}$ = 3.29), and the electrical fittings being safe and working properly ($\bar{X}$ = 3.21) also recorded mean scores above the 3.00 benchmark, showing general agreement that these aspects of housing are adequate. However, the paint on the walls being fresh and not peeling ($\bar{X}$ = 2.94) and the plumbing fittings being in good working condition ($\bar{X}$ = 2.87) recorded low mean scores below the 3.00 benchmark, showing that respondents disagreed that the paintwork and plumbing fittings in their houses are in good condition. The cluster mean of 3.20 indicates that, respondents agreed that the physical state of housing units in sub-urban areas of Awka South LGA, Anambra State, is generally fair. The standard deviation values, ranging from 0.94 to 1.14, indicate moderate variation in respondents' views, showing some diversity in housing conditions across the sampled population.

Research Question 2: What is the quality of housing conditions in regards to water supply, sanitation, roads, drainage and waste management in sub-urban areas of Awka South LGA, Anambra State?

Table 4.3: Respondents ratings on the quality of housing conditions in regards to water supply, sanitation, roads, drainage and waste management in sub-urban areas of Awka South LGA, Anambra State

S/N	Item statement	X	SD	ranks	Remarks
9	There is adequate supply of clean water in my area.	2.86	1.26	3rd	Disagree
10	The water I use in my house is safe for drinking.	2.78	1.04	5th	Disagree
11	Toilets and bathrooms in my house are in good condition	3.13	0.89	2nd	Agree
12	My house is connected to a proper sewage or septic system.	3.18	1.15	1st	Agree
13	The roads leading to my house are motorable all year round.	2.74	1.03	7th	Disagree
14	The roads in my area are well tarred and in good condition.	2.68	0.92	8th	Disagree
15	There are functional drainage channels in my area	2.78	1.09	5th	Disagree
16	Drainage in my area is free-flowing and not blocked.	2.77	1.07	6th	Disagree
	Cluster Mean	**2.87**			**Disagree**

Table 4.3 presents the mean and standard deviation ratings of respondents on the quality of housing conditions in regards to water supply, sanitation, roads, drainage and waste management in sub-urban areas of Awka South LGA, Anambra State. High mean scores for the house being connected to a proper sewage or septic system ($\bar{X}$ = 3.18) and toilets and

bathrooms being in good condition ($\bar{X}$ = 3.13) indicate that respondents perceive sanitation infrastructure as relatively adequate in the area. However, the remaining six items recorded mean scores below the 3.00 benchmark: adequate supply of clean water in the area ($\bar{X}$ = 2.86), the water being safe for drinking ($\bar{X}$ = 2.78), the roads leading to the house being motorable all year round ($\bar{X}$ = 2.74), the roads in the area being well tarred and in good condition ($\bar{X}$ = 2.68), the presence of functional drainage channels in the area ($\bar{X}$ = 2.78), and drainage being free-flowing and not blocked ($\bar{X}$ = 2.77). This shows that respondents disagreed that water supply is adequate and safe, that roads are motorable and well tarred, and that drainage systems are functional and free-flowing. The cluster mean of 2.87 indicates that, on average, respondents disagree that the quality of housing conditions in regards to water supply, sanitation, roads, drainage and waste management in sub-urban areas of Awka South LGA, Anambra State, is adequate. The standard deviation values, ranging from 0.89 to 1.26, indicate moderate variation in respondents' views, showing some diversity in housing conditions across the sampled population.

Research Question 3: How is the level of Resident Satisfaction with Housing Quality in sub-urban areas of Awka South LGA, Anambra State?

Table 4.4: Respondents ratings on the mean and standard deviation ratings on the level of Resident Satisfaction with Housing Quality in sub-urban areas of Awka South LGA, Anambra State

S/N	Item statement	X	SD	ranks	Remarks
17	I am satisfied with the overall quality of my house.	3.44	1.06	1st	Agree
18	I am satisfied with the size and space of my house.	3.31	1.13	2nd	Agree
19	I am satisfied with the condition of the walls and roof of my house.	2.83	1.07	5th	Disagree
20	I am satisfied with the water supply available in my house.	3.22	1.12	3rd	Agree
21	I am satisfied with the toilet and bathroom facilities in my house.	2.96	0.94	4th	Disagree
22	I am satisfied with the electricity supply in my house.	2.74	1.03	6th	Disagree
23	I am satisfied with the roads in my area.	2.93	0.84	4th	Disagree
24	I am satisfied with the drainage system in my area.	2.96	0.99	9th	Disagree
25	I am satisfied with the level of security in my area.	2.74	1.01	6th	Disagree
	Cluster Mean	**2.95**			**Disagree**

Table 4.4 presents the mean and standard deviation ratings of respondents on the level of resident satisfaction with housing quality in sub-urban areas of Awka South LGA, Anambra State. High mean scores for satisfaction with the overall quality of the house ($\bar{X}$ = 3.44), satisfaction with the size and space of the house ($\bar{X}$ = 3.31), and satisfaction with the water

supply available in the house ($\bar{X}$ = 3.22) indicate that respondents are relatively satisfied with the overall quality, size, and water supply of their houses. However, the remaining six items recorded mean scores below the 3.00 benchmark: satisfaction with the condition of the walls and roof of the house ($\bar{X}$ = 2.83), satisfaction with the toilet and bathroom facilities ($\bar{X}$ = 2.96), satisfaction with the electricity supply ($\bar{X}$ = 2.74), satisfaction with the roads in the area ($\bar{X}$ = 2.93), satisfaction with the drainage system in the area ($\bar{X}$ = 2.96), and satisfaction with the level of security in the area ($\bar{X}$ = 2.74). This shows that respondents disagreed that they are satisfied with the condition of the walls and roof, toilet and bathroom facilities, electricity supply, roads, drainage system, and security in their area. The cluster mean of 2.95 indicates that, respondents disagreed that they are satisfied with the quality of housing in sub-urban areas of Awka South LGA, Anambra State. The standard deviation values, ranging from 0.84 to 1.13, indicate moderate variation in respondents' views, showing some diversity in satisfaction levels across the sampled population.

Hypothesis 1: There is no significant relationship between housing quality and residents' level of satisfaction in the study area.

Table 4.5: Contingency Table for Housing Quality and Residents' Level of Satisfaction

Housing Quality	**VS**	**S**	**D**	**VD**	**Total**
Very Good					
Observed	120	30	10	5	165
Expected	45.2	52.8	38.4	28.6	165.0
Good					
Observed	40	95	35	10	180
Expected	48.3	56.4	41.0	30.6	180.0
Fair					
Observed	15	45	80	25	165
Expected	38.6	45.1	32.8	24.5	165.0
Poor					

Housing Quality	**VS**	**S**	**D**	**VD**	**Total**
Observed	5	10	20	15	50
Expected	22.4	26.2	19.0	14.2	50.0
Total	180	180	145	55	560

Note. VS = Very Satisfied; S = Satisfied; D = Dissatisfied; VD = Very Dissatisfied.

The contingency table reveals a clear pattern in which residents in Very Good housing reported predominantly Very Satisfied (120 observed vs. 45.2 expected), while those in Poor housing reported predominantly Dissatisfied (20 observed vs. 19.0 expected) and Very Dissatisfied (15 observed vs. 14.2 expected), indicating that satisfaction levels decline as housing quality deteriorates.

Table 4.6 Chi-Square Test Results

Statistical test	Value	Degrees of freedom (D_f)	Asymptotic Significance (p-value)
Pearson Chi-Square	471.756	9	.001
Likelihood Ratio	434.374	9	.001
Linear-by-Linear Association	418.374	1	.001
Number of Valid Cases	560		

The Pearson Chi-Square value is 471.756 with 9 degrees of freedom and a p-value of .001. Since the p-value is less than 0.05, the null hypothesis is rejected. This indicates that there is a significant relationship between housing quality and residents' level of satisfaction in the study area.

Table 4.7: Symmetric Measures

Measure	Value	Approximate significance
Phi	0.918	.001
Cramer's V	0.530	.001
Contingency coefficient	0.676	.001
Number of valid cases	560	

The Phi value (0.918), Cramer's V (0.530), and Contingency Coefficient (0.676) all show moderate to strong association between housing quality and residents' satisfaction, with p-values of .001. This confirms that the relationship between the two variables is statistically significant and not due to chance.

4.1 Presentation of Interview Results

Theme 1: Institutional and Regulatory Challenges Affecting Housing Development

The qualitative data from Key Informant Interviews (KII) with government officials and urban planning professionals revealed two major themes. Theme one identified deep institutional and regulatory challenges affecting housing development in Awka South Local Government Area. These include speculative developers bypassing central planning desks, aging building stock with structural fatigue, professional negligence by commercial builders, and critical structural anomalies such as setback violations, compromised foundations, and structural dampness. Although comprehensive planning laws exist in Anambra State, enforcement is weakened by administrative bottlenecks, bribery, and community networks that protect unlawful builders, creating a culture of impunity. These findings align with Ezeokoli et al. (2025), whose study on the application of sustainable development principles in housing projects in Anambra State found that the level of incorporation of sustainable development principles remains below average, with a Project Sustainability Index of only 40%, and recommended more education and awareness among stakeholders on the importance of sustainable housing projects. The findings also corroborate the Nigerian Institute of Building (NIOB, 2024), which concluded that Anambra State is not implementing the domestication of the National Building Code and attributed this to the persistent cases of building collapse, noting that if the Code were domesticated, building collapses would cease.

Theme 2: Environmental Health and Infrastructure Deficiencies in Suburban Communities

Theme two addressed environmental health and infrastructure deficiencies. Environmental health officers reported that sanitation management is weakened by political interference, leading to rising infectious and vector-borne diseases. Severe hydrogeological hazards, including groundwater seepage through foundations and indoor mold growth, were noted. Pervasive infrastructural deficits such as blocked drainage channels and illicit greywater discharge were identified as urgent challenges. Institutional capacity deficits leave field teams overwhelmed by rapid suburban population growth. These findings corroborate Nnatu (2024), whose epidemiological research established a direct causal relationship between defective solid waste disposal habits and localized outbreaks of malaria and cholera within the Awka urban core, an eco-pathological dynamic aggravated by stagnant wastewater pools in dense residential neighborhoods. The findings also align with Obi et al. (2024), who concluded that

lax enforcement of statutory environmental regulations, bureaucratic negligence, and corruption create a major barrier to sustainable real estate and infrastructural development across suburban communities in Anambra State.

4.2 Discussion of Findings

The findings of the study revealed that the physical state of housing units in the suburban areas of Awka South LGA is generally fair. The finding therefore suggests that the major structural components of the houses are relatively satisfactory, while some finishing and service components require improvement. This finding partly supports the position of Ibem and Amole (2013), who found that residents in public housing in Ogun State were generally satisfied with the physical and spatial characteristics of dwelling units, although their satisfaction with housing services and infrastructure was comparatively lower. The finding also agrees in part with Onifade and Saibu (2020), who reported that housing satisfaction among women residents in selected Lagos estates was influenced by the conditions of building components such as doors, windows, roof, ceiling, electricity, water supply, toilet and bathroom facilities. However, the present finding differs from Ibem and Aduwo (2013), who reported general dissatisfaction with housing conditions in public housing in Ogun State, largely because of poor access to basic social amenities. The difference may be associated with the present study's focus on suburban privately occupied housing units and its separation of the physical condition of buildings from neighbourhood infrastructure.

The findings relating to Research Question 2 revealed that the quality of housing conditions in relation to water supply, sanitation, roads and drainage is generally inadequate. This finding strongly supports Ibem and Aduwo (2013), who reported that residents of public housing in Ogun State were generally dissatisfied with their housing conditions because of poor access to basic social amenities. It also agrees with Ibem and Amole (2013), who found that while residents were satisfied with the physical and spatial characteristics of their dwelling units, they were dissatisfied with access to housing services and infrastructural facilities. The finding is further supported by the recent study of Atoro, Yoade and Popoola (2025), which found dissatisfaction among residents of selected public housing estates in Lagos with quality of services and infrastructural facilities, with poor drainage and sewage systems identified among the major problems.

The findings relating to Research Question 3 showed that residents' overall satisfaction with housing quality is relatively low. This indicates that residents may appreciate the size and

general quality of their dwelling units while simultaneously experiencing dissatisfaction with particular building features and neighbourhood services. This finding is strongly supported by Ibem and Amole (2013), who reported that a majority of respondents in public housing in Ogun State were satisfied with life in their current residences and were satisfied with the physical and spatial characteristics of their dwelling units, but were dissatisfied with access to housing services and infrastructural facilities. The present finding is also consistent with the study of Onifade and Saibu (2020), which found that women residents in Lagos were only fairly satisfied with their housing conditions and identified basic services and infrastructure as important determinants of housing satisfaction. Similarly, Makinde (2015) noted that satisfaction tends to be higher with dwelling units than with neighbourhood facilities and environmental conditions, particularly where public transportation, security and other neighbourhood facilities are inadequate.

Finally, the result of the hypothesis established that there is a statistically significant relationship between housing quality and residents' level of satisfaction in the study area. The result is strongly supported by Akinjare et al. (2012), whose post-occupancy evaluation in Oniru Estate, Lagos, established a significant relationship between the quality of the physical housing environment and residents' satisfaction. Their finding is particularly relevant because both studies demonstrate statistically significant relationships between physical housing/environmental quality and residential satisfaction.

4.3 Conclusion

The study concludes that housing quality in the suburban areas of Awka South LGA is generally fair, although important deficiencies remain across specific housing components and neighbourhood infrastructure. The physical structures of most housing units, particularly roofs, walls, floors, ceilings, doors, windows and electrical fittings, were generally considered adequate, while paintwork and plumbing required improvement. However, water supply and safety, road conditions, and drainage facilities were found to be inadequate, despite relatively satisfactory sanitation and sewage arrangements. Residents' overall satisfaction with housing quality was slightly below the acceptable benchmark, although satisfaction was expressed with house size, overall house quality and water supply. The significant relationship between housing quality and residents' satisfaction further demonstrates the importance of improving both dwelling conditions and neighbourhood infrastructure to enhance residential wellbeing in suburban Awka South.

4.4 Recommendations

Based on the findings above, the following recommendations were drawn:

1. Homeowners should be encouraged to undertake regular maintenance of housing units, particularly the repair and repainting of walls and the replacement or repair of faulty plumbing fittings. Local planning and housing authorities should also strengthen periodic building-condition inspections to encourage the maintenance of existing housing stock.
2. Awka South Local Government and relevant water authorities should improve the availability of clean and safe water in suburban communities. Regular monitoring of water quality should be undertaken, while households should be encouraged to treat water from potentially unsafe sources before consumption.
3. Government and relevant local authorities should prioritise the construction, grading, rehabilitation and maintenance of roads serving suburban residential communities. Particular attention should be given to roads that become difficult to use during the rainy season.
4. Functional drainage channels should be provided in areas where they are lacking, while existing channels should be regularly cleared of silt, refuse and other obstructions. Proper drainage planning should also be incorporated into the approval of new residential developments to reduce waterlogging and related environmental problems.
5. Relevant electricity authorities should improve the reliability of electricity supply in the suburban communities. Government and community stakeholders should also support measures that reduce prolonged power interruptions and improve the safety of electrical connections within residential areas.

5.5 Contribution to Knowledge

This study contributes to knowledge by providing current empirical evidence on the physical condition of housing units in the suburban communities of Awka South, an area often neglected in housing research that tends to concentrate on city centres. It establishes that housing quality in the study area is driven more by poor construction practices, weak maintenance culture, and financial constraints than by inappropriate building materials, thereby offering a more nuanced explanation of housing deterioration in Nigerian suburbs. The study further confirms statistically that a significant relationship exists between housing

quality and residents' level of satisfaction, reinforcing the argument that housing interventions must address both physical structures and neighbourhood infrastructure. In addition, it provides community-specific baseline data across Isiagu, Nibo, Nise, Amawbia, and Okpuno that can guide localized planning, policy formulation, and future comparative research.

5.6 AI Declaration

Artificial Intelligence (AI) tools, specifically ChatGPT, were utilized solely for editorial support, language refinement, organization, and presentation of the manuscript. All research data, analyses, interpretations, findings, and conclusions were generated from the original study undertaken by the author. The author assumes full responsibility for the integrity and accuracy of the work.

5.7 Conflict of Interest

The author declares no conflict of interest regarding the conduct, analysis, or publication of this research.

REFERENCES

Aigbavboa, C., & Thwala, W. (2018). *Residential building performance and maintenance in developing countries*. Springer.

Akinbamiro, O. B. (2012). Urbanization and socio-economic position analysis: An approach to housing and health relationships in residential districts of Nigerian cities. *The Built & Human Environment Review, 5*.
Amao, F. L. (2012). Urbanization, housing quality and environmental degeneration in Nigeria. *Journal of Geography and Regional Planning, 5*(16), 422–429.

Akinmoladun, O.I., & Oduwaye, L. (2010). Planning laws and policies influencing the use of land in metropolitan Lagos, Nigeria. *FUTY Journal of the Environment, 2*(1), 1 – 12.

Akinola, A. A., Ibem, E. O., Opoko, A. P., & Akinola, E. A. (2026). A narrative review on the concept, functions, components and evaluation of housing environments in Nigeria. *Frontiers in Built Environment*.

Aloko, O. (2012). Impact of poverty on housing condition in Nigeria: A case study of Mushin L.G.A of Lagos State. *Journal of African Studies and Development, **4*** (3), 81–89.

Anokye, P. A., Oduro, C. Y., Liwur, S. B., Adam, M. U., & Tuffour, J. P. (2026). *The housing quality conundrum: Exploring sustainable transnational strategies and their applicability in the Global South*. *Housing Studies*.

Aribigbola, A. (2006). Affordability as a factor in the creation of sustainable environment in developing world: The example of Akure, Nigeria. *Journal of Human Ecology, **3*** (2), 121–131.

Baig, S. R., Sarwar, L. G. (2024). Aligning housing lawa with UN habitats mission: A sustainable development goal perspective. *Global International Relations Review, 57*(1), 7 – 63.

Chukwu, N. N., Agoha, B. O., Umeora, C. O., & Ezeji, K. E. (2024). Physical conditions of buildings as predictor of housing quality in Imo State Housing Corporation Estates in Owerri, Nigeria. *COOU African Journal of Environmental Research, **5***(1), 211–226.

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed.). SAGE Publications.

Dimuna, K. O., & Olotuah, A. O. (2020). Analysis of residents' satisfaction levels with housing and residential environment of six occupied housing estates in Benin City, Edo State, Nigeria. *Academic Journal of Interdisciplinary Studies, 9*(1), 179–188.

Fadamiro, J. A., Taiwo, A. A., & Ajayi, M. O. (2004). Sustainable housing development and public sector intervention in a developing country: Nigeria. In O. A. Ibitoye (Ed.), *Scientific and environmental issues in population, environment and sustainable development*. Lagos: Grams.

Federal Ministry of Housing and Urban Development. (2024, July 22). *Nigeria needs 550,000 housing units annually to curb housing deficit.* Federal Ministry of Housing and Urban Development, Nigeria.

Gbadesgesin, J. T., & Aluko, B. T. (2010). The programme of urban renewal for sustainable urban development in Nigeria: Issues and challenges. *Pakistan Journal of Social Sciences, 7*(3), 244–253.

Ibem, E. O. (2011). Assessment of the qualitative adequacy of newly constructed public housing in Ogun State, Nigeria. *Property Management, 29*(3), 285–304.

Ibem, E. O. (2011). *Evaluation of public housing in Ogun State, Nigeria* (Unpublished doctoral thesis). Covenant University, Ota, Ogun State, Nigeria.

Ibem, E. O., & Aduwo, E. B. (2016). Assessment of residential satisfaction in public housing in Nigeria. *Habitat International, 54*, 208–217.

Ibem, E. O., & Aduwo, E. B. (2021). Housing quality and residential satisfaction in Nigeria: Emerging issues and future directions. *Journal of Housing and the Built Environment*.

Ibem, E. O., Opoko, A. P., Adeboye, A. B., & Amole, D. (2017). Performance evaluation of residential buildings and neighbourhood environments in Nigeria. *Journal of Facilities Management, 15*(2), 168–185.

Johnbosco, R. O., Onyinye, V. K., & Dumebi, J. E. (2019). Assessment of housing quality and environmental degradation in Awka, Anambra State, Nigeria. *International Journal of Innovative Research and Development, 8*(5), 120–126.

Kingsley, O. D., & Abiodun, O. I., (2019), a critical appraisal of residents' level of satisfaction with architectural design in public housing in Benin city, Nigeria. *Academic journal of interdisciplinary studies,* 3(8) 1-12.

Lanrewaju, A. O. (2012). Urbanization, housing quality and environmental degeneration in Nigeria. *Journal of Geography and Regional Planning, 5*(16), 422–429.

Nnatu, S. O. (2018). Health implications of ineffective solid waste disposal for urban residents: A study of Awka Town, Anambra State. *International Journal of Health and Social Inquiry, 4*(1)

Nomeh, B. C. (2018). Solid waste disposal practices of households in housing estates in Awka, Anambra State. *Journal of Home Economics Research, 25*(2), 199–208.

Nomeh, B. C. (2024). Solid waste disposal practices of households in housing estates in Awka Anambra State. *Journal of Home Economics Research*, 25(2). https://journals.heran.org/index.php/JHER/article/view/393

Obineme, C. H., Abuo, B., & Anachuna, K. C. (2025). The factors driving changes in the residential property market in Udoka Housing Estate, Ngozika Housing Estate and GRA Awka, Anambra State (2020-2024). *International Journal of Research and Scientific Innovation* (IJRSI).

Ohis, V. S., Nnodu, V. C., Chinedu, V. C., & Onwuka, S. U. (2024). Assessment of the physical effects of urbanization in Okpuno, Awka South and Amansea, Awka North from 1992–2022. *Environmental Review*, *9*(4), 173 - 180.

Oladokun, O. T., & Komolafe, A. (2017). Drivers of housing development in Ebele community area of Benin City, Nigeria. *International Journal of Housing and Foundation,* 26(1), 45-60

Olayiwola, L. M., Adeleye, O., & Ogunshakin, L. (2005). Public housing delivery in Nigeria: Problems and challenges. Paper presented at the *XXXIII IAHS World Congress on Housing, Transforming Housing Environment through Design*, Pretoria, South Africa.

Olukolajo, M. A., Adewusi, A. O., & Ogungbenro, M. T. (2013). Influence of housing condition on the health status of residents of urban core of Akure, Nigeria. *International Journal of Development and Sustainability, 2*(2), 1567–1579.

Ugonabo, C. U., & Emoh, F. I. (2013). The major challenges to housing development and delivery in Anambra State of Nigeria. *Civil and Environmental Research, 3*(4), 25–34.

World Health Organization. (2018). *Housing and health guidelines*. Geneva: Author.