

Evaluating the Architectural Challenges Affecting Public Housing Delivery in Port Harcourt, Nigeria

*Dimkpa, K¹; and Abraham, P¹

Department of Architecture, Faculty of Environmental Science, Rivers State University, Port Harcourt, Nigeria.

Correspondence: chidimma.azike@ust.edu.ng, kelechukwu.dimkpa@ust.edu.ng

LICFES 2025-022 – FP3

Abstract

This study investigated the architectural challenges affecting public housing delivery and their impact on residents' satisfaction in Port Harcourt, Nigeria. The research aimed to examine the relationships between socio-demographic variables, building attributes, residential environment attributes, and the family life cycle stage with housing satisfaction. Employing a mixed-methods approach, the study utilized a descriptive and correlational quantitative design with a sample of 120 residents from selected public housing estates, and a qualitative case study design involving semi-structured interviews with 16 residents and government stakeholders. Quantitative data were analyzed using descriptive and inferential statistics (correlation and regression), while qualitative data underwent thematic content analysis. Findings revealed that marital status, age, income level, number of occupants, building attributes, and residential environment significantly correlated with housing satisfaction. Specifically, better-rated building and environmental attributes were associated with higher satisfaction, while policy and allocation processes were major sources of dissatisfaction. The study concludes that enhancing building design, improving residential environments, ensuring equitable housing policies, and considering socio-demographic variations are crucial for improving public housing delivery and resident satisfaction in Port Harcourt. Recommendations include policy reforms focusing on resident involvement in design and allocation, and improved maintenance mechanisms.

Keywords: Public Housing, Housing Satisfaction, Architectural Challenges, Socio-demographics, Residential Environment, Nigeria.

Introduction

Public housing delivery remains a significant challenge in many developing countries, including Nigeria. In urban centers such as Port Harcourt, the rapid increase in population and urban migration has led to a persistent housing deficit, resulting in overcrowded settlements and substandard living conditions (Ibem *et al.*, 2015). As the economic hub of the oil-rich Niger Delta region, Port Harcourt has witnessed considerable infrastructural development. However, the expansion of public housing to meet the needs of the growing population has been inadequate, exacerbated by architectural and socio-economic challenges (Dimuna *et al.*, 2019). This study seeks to investigate the architectural challenges impeding public housing delivery in Port Harcourt, with a particular focus on socio-demographic factors, building attributes, residential environment, and family life cycle stages.

Existing research on public housing delivery in Nigeria has often focused on economic and policy aspects while overlooking the architectural factors that significantly influence housing satisfaction. For instance, Jiburum *et al.* (2021) argue that inadequate architectural planning and poor maintenance culture are among the core reasons for the deteriorating state of public housing.

However, the relationship between architectural elements and housing satisfaction has received limited attention. Similarly, research by Dimuna *et al.* (2019) highlight the importance of socio-demographic variables in housing choice, yet the specific link between these variables and housing satisfaction within public housing projects in Port Harcourt remains underexplored.

The relevance of this study is rooted in addressing the current gap in the literature concerning architectural determinants of housing satisfaction. Public housing in Port Harcourt often suffers from poor architectural design, inadequate space utilization, and substandard building materials, which compromise habitability and sustainability (Ibem *et al.* 2015). By examining architectural challenges from a holistic perspective, this research aims to provide evidence-based recommendations for enhancing housing quality and occupant satisfaction.

One of the critical issues to address is the role of socio-demographic variables, including age, income, education, and occupation, in shaping residents' perceptions of housing satisfaction. As previous studies have predominantly addressed these factors independently of architectural considerations, this research intends to bridge that gap by examining how these socio-demographic variables interact with building attributes to influence overall satisfaction (Grimes *et al.*, 2024). The findings are expected to offer insights into how public housing can be more inclusively designed to meet the diverse needs of urban residents.

Furthermore, this study will investigate how residents rate specific attributes of their buildings and residential environments. Past research often highlights factors such as structural stability, ventilation, and aesthetics without considering how these attributes are perceived by the occupants (Jiburum *et al.*, 2021). Understanding the subjective evaluation of building features can inform more resident-centered architectural planning, particularly in public housing schemes designed to accommodate diverse populations.

The primary objective of this study is to examine the architectural challenges affecting public housing delivery in Port Harcourt, Nigeria. Specifically, the study aims to examine the relationship between socio-demographic variables (age, income, education, occupation) and housing satisfaction among residents of public housing in Port Harcourt; identify the relationship between the rating of building attributes (such as structural quality, ventilation, aesthetics, and space utilization) and housing satisfaction in public housing schemes; determine the relationship between the rating of residential environment attributes (such as accessibility, safety, and community facilities) and housing satisfaction among public housing residents; and ascertain the relationship between the stage in the family life cycle (e.g., young couples, families with children, elderly households) and housing satisfaction within public housing developments.

Materials and Methods

This study employed a mixed-methods approach, integrating quantitative and qualitative designs, to explore the factors influencing residential satisfaction in government housing estates in Port Harcourt, River State. The quantitative component used a descriptive correlational design to examine the relationships between housing variables and satisfaction levels. A structured questionnaire, based on a 5-point Likert scale (Strongly Agree = 5 to Strongly Disagree = 1), was administered to measure residents' perceptions and experiences. The qualitative component adopted a case study design, using Key Informant Interviews (KIIs) and In-Depth Interviews (IDIs) to obtain detailed, context-specific insights.

The target population comprised residents of low-, medium-, and high-income government housing estates in the city. From the identified 875 housing units across estates such as Aggrey Housing Estate, Ndoki Housing Estate, Marine Base, Lagos Street Government Quarters, Khana

Street Housing Estate, Benin-Uyo Street Housing Estate, Elekahia Housing Estate, and Abuloma Housing Estates Phases I and II, three estates were purposively selected for an in-depth study: Marine Base Residential Layout (low-income), Aggrey Housing Estate (medium-income), and Elekahia Housing Estate (high-income). Random sampling within each estate yielded 40 residents at each site (120 respondents). For the qualitative phase, four residents from each estate and four government agency representatives were purposively selected, bringing the total sample size to 136 participants. This sampling ensured socioeconomic diversity and enriched the data.

Quantitative data were collected using structured questionnaires to assess housing conditions, affordability, structural features, environmental quality, and service delivery. Qualitative data were obtained from semi-structured, face-to-face interviews, which were recorded and transcribed with participants' consent. Architectural design software was used to simulate residential satisfaction in relation to measurable building features, such as window size, orientation, ventilation, and structural integrity. These simulations were used to compare and validate subjective responses against objective design parameters.

Results and Discussion

Data analysis involved the use of descriptive statistics (mean, frequency, and standard deviation) and inferential statistics (correlation and regression analysis) to interpret quantitative data, processed using SPSS software.

$$Y_{ij\dots n} = \hat{Y} + a_i + b_j + c_k + d_l\dots + e_{ij\dots n} \dots\dots\dots(1)$$

The study examines the factors influencing housing satisfaction, with the dependent variable being the housing satisfaction score of an individual categorized by various predictors: Stage in the Family Life Cycle (A), Price (B), Residential Environment (C), and Demographic Variables (D). The grand mean (\hat{Y}) represents the overall housing satisfaction, while the effects of each category within these predictors (a_i , b_j , c_k , d_l) are assessed to understand their impact on housing satisfaction. The error term (e_{ijn}) accounts for individual variation. Statistical analysis was conducted using SPSS to evaluate the relationships between these predictors and the dependent variable. Qualitative data were analyzed using Thematic Content Analysis (TCA), where interview transcripts were coded to identify recurring themes. The simulation results were compared with respondents' feedback to validate the predictive models.

The demographic data reveals key factors influencing housing satisfaction among public housing residents in Port Harcourt. Males (55.3%) slightly outnumber females (44.7%), and most residents are married (66.7%), with a significant portion of respondents between the ages of 31-40 (42.1%). Educational qualifications vary, with the majority holding an OND (27.2%) or a Bachelor's degree (37.7%), while income levels predominantly fall within the moderate range (61.4%). Occupation data highlights that retirees (35.1%) and state civil servants (30.7%) are prominent, suggesting that the housing needs of these groups, including stability and community access, will impact their satisfaction. Additionally, most respondents are in Stage 2 of the family life cycle (47.4%), with families having children, indicating that housing satisfaction may be influenced by family space and amenities.

The analysis of housing attributes such as house type and condition also sheds light on satisfaction levels. Most respondents live in flats (50.9%) or bungalows (25.4%), with a large majority reporting good house conditions, such as perfect tiles (68.5%). The number of rooms and household type further contribute to varying satisfaction levels, as those with larger households and more rooms may prioritize space, safety, and access to amenities. These findings emphasize the importance of addressing the socio-demographic factors in future public housing policies,

particularly the housing needs of families, retirees, and civil servants. By considering income, family structure, and occupation, housing developers and policymakers can better tailor public housing projects to improve satisfaction among residents.

Table 1: Residents' Satisfaction with Housing Conditions and Accessibility Factors

S/N	Factors	Mean	Standard Deviation	Remark
1	The distribution of the house is efficient	2.79	1.258	Not sure
2	The kitchen is comfortable	3.33	0.661	Not sure
3	The size of the house is adequate	3.18	0.686	Not sure
4	The bathroom is very comfortable	3.35	0.665	Not sure
5	The level of light and ventilation is efficient	3.67	0.712	Satisfied
6	The degree of insulation is efficient	2.8	1.032	Not sure
7	House maintenance expenses are minimal	3.26	0.969	Not sure
8	Adequate number of necessary amenities	1.61	1.019	Very Dissatisfied
9	The house provides natural lighting	2.9	0.912	Not sure
10	Ease of moving around inside the home	3.54	0.884	Satisfied
11	Access to churches and worship centers	4.5	0.655	Satisfied
12	Distance to shops is minimal	4.46	0.754	Satisfied
13	Primary health care is easily accessible	3.53	0.743	Satisfied
14	There is safety from crime	3.04	1.088	Not sure
15	Ease of moving around the neighborhood	3.42	0.608	Not sure
16	Distance to supermarkets is minimal	4.63	0.767	Satisfied
17	Access to bars/restaurants/cafeterias	3.49	1.007	Not sure
18	Frequency of meeting neighbors	4.71	0.62	Satisfied
19	Distance to the local outpatient department	3.32	0.554	Not sure
20	Mobility in the Neighborhood	2.69	0.979	Not sure
21	Government policy on housing provision	1.82	0.865	Very Dissatisfied
22	Fairness of policy to household heads	2.07	0.773	Dissatisfied
23	The allocation process gave equal access	2.91	0.782	Not Sure
24	The allocation process was easy	2.46	0.731	Dissatisfied
25	Requirements for allocation are clearly stated	3.84	0.508	Satisfied
26	The allocation process had too many hurdles	3.71	0.993	Satisfied
27	House designed/built without involvement	4.53	0.778	Satisfied
28	Free/fair choice of housing unit	2.76	0.8	Not Sure
29	Alternative housing unit preference	3	1.262	Not Sure
30	Alternative floor preference	2.96	1.219	Dissatisfied

The study on residents' satisfaction with public housing in Port Harcourt, Nigeria, reveals a complex interplay between building attributes, residential environment attributes, and socio-demographic factors. Building attributes, such as house efficiency, insulation, and natural lighting, received relatively low ratings, reflecting residents' dissatisfaction with structural and environmental quality, while kitchen and bathroom comfort were rated more positively. In contrast, residential environment attributes showed favorable ratings for proximity to amenities like shops and places of worship but highlighted concerns about safety and mobility. Socio-demographic analysis indicated that higher-income residents reported greater satisfaction with healthcare access, while retirees expressed dissatisfaction with neighborhood mobility. Family life cycle stages also influenced satisfaction, with young families being more positive compared to elderly households. Notably, residents expressed strong dissatisfaction with the housing policy, especially regarding fairness and transparency in the allocation process. These findings suggest that policy improvements should focus on enhancing building design, safety, mobility, and the equity of the housing allocation process, while also considering the diverse needs of different demographic groups.

Findings from the Housing Resident's Perspectives

Table 2: Respondents' Satisfaction Level with Building Attributes

Interview Question: *"How satisfied are you with the building properties and attributes?"*

S/N	Respondent ID	Summary of Response
1	MB01	Expressed high satisfaction with external features such as parking and landscaping, noting these exceeded expectations.
2	MB02	Satisfied with room size, estate planning, and infrastructure such as power and drainage systems.
3	MB03	Pleased with the estate's location, safety of external works, availability of playgrounds, parking, and landscaping.
4	MB04	Satisfied with house pricing, but disappointed with the house design which did not meet expectations.
5	EK01	Happy with the design as it met the initial specifications; satisfied with service and product quality.
6	EK02	Fulfilled expectations regarding the design and estate aesthetics.
7	EK03	Impressed by the house finishes and external infrastructure.
8	EK04	Only satisfied with aspects external to the housing unit.
9	AR01	Satisfied with cost-sharing of shared services like security and cleaning.
10	AR02	Appreciated estate planning and layout but highlighted concerns about narrow driveways in the flats section.
11	AR03	Praised the estate's aesthetics, road quality, and security services.
12	AR04	Satisfied with shared facility costs and external amenities.

Source: Researcher's Interview Session (2021)

Findings from Table 2 reveal that the majority of housing residents expressed general satisfaction with various building attributes, particularly external features such as parking, landscaping, estate aesthetics, security services, and shared amenities. Respondents MB01, MB03, EK03, and AR03 emphasized the quality and appeal of outdoor infrastructure, while MB02, EK01, and AR02 appreciated planning, room sizes, and service delivery. A few participants, including MB04 and AR02, raised concerns regarding internal design and functionality—highlighting dissatisfaction

with house design and driveway dimensions. Notably, cost-effectiveness in shared services (security and cleaning) was positively noted by respondents AR01 and AR04. Overall, the responses indicate a strong preference and satisfaction with external and communal features, though some deficiencies in internal design and spatial planning remain.

Table 3: Respondents' Satisfaction Level with Building Amenities

Interview Question: *"Does the building contain the expected amenities? How satisfied are you with the installed amenities?"*

S/N	Respondent ID	Summary of Response
1	MB01	Expressed high satisfaction with external features such as parking and landscaping, noting these exceeded expectations.
2	MB02	Satisfied with room size, estate planning, and infrastructure such as power and drainage systems.
3	MB03	Pleased with the estate's location, safety of external works, availability of playgrounds, parking, and landscaping.
4	MB04	Satisfied with house pricing, but disappointed with the house design which did not meet expectations.
5	EK01	Happy with the design as it met the initial specifications; satisfied with service and product quality.
6	EK02	Fulfilled expectations regarding the design and estate aesthetics.
7	EK03	Impressed by the house finishes and external infrastructure.
8	EK04	Only satisfied with aspects external to the housing unit.
9	AR01	Satisfied with cost-sharing of shared services like security and cleaning.
10	AR02	Appreciated estate planning and layout but highlighted concerns about narrow driveways in the flats section.
11	AR03	Praised the estate's aesthetics, road quality, and security services.
12	AR04	Satisfied with shared facility costs and external amenities.

Source: Researcher's Interview Session (2021)

The analysis of Table 3 shows that most respondents were generally satisfied with the building amenities, particularly those related to external and shared facilities. Key amenities such as parking, landscaping, estate aesthetics, road quality, security, and power infrastructure were consistently praised by respondents like MB01, MB03, EK03, and AR03, indicating that these features either met or exceeded expectations. Several participants, including MB02, EK01, and AR01, expressed contentment with estate planning, service quality, and shared service arrangements like security and cleaning. However, a few respondents, notably MB04 and AR02, highlighted areas of dissatisfaction, especially regarding the internal design of the houses and the narrowness of driveways in the flats. EK04 also noted satisfaction only with external aspects, suggesting that internal amenities may not have fully met resident expectations. Overall, while satisfaction with external and communal amenities was high, improvements in internal building features could enhance overall resident contentment.

Table 4: Respondents' Views on Problems with Building Attributes and Maintenance Response
Interview Question: *"What problems exist with the current building attributes, and how does the maintenance agency respond?"*

S/N	Respondent ID	Summary of Response
1	MB01	Poor plumbing and substandard amenities; noted slow service response.
2	MB02	Complaints were not adequately addressed.
3	MB03	Poor amenities, plumbing, and delayed after-sales service.
4	MB04	Dissatisfaction with slow complaint responses.
5	EK01	Disappointed with construction and lack of promised features; some satisfaction with personnel attention.
6	EK02	Criticized construction quality and craftsmanship.
7	EK03	Poor finishes and lack of promised facilities.
8	EK04	Poor maintenance response; resident opted to self-repair.
9	AR01	Prompt attention but low-quality maintenance service.
10	AR02	Cited poor workmanship and missing kitchen store.
11	AR03	Noted omission of promised amenities.
12	AR04	Highlighted failure to provide facilities like the swimming pool.

Source: Researcher's Interview Session (2021)

Table 4 reveals widespread dissatisfaction among residents regarding building attributes and the responsiveness of maintenance services. Common issues cited include poor plumbing, substandard finishes, and the omission of promised amenities, as reported by respondents such as MB01, MB03, EK02, and AR03. Several participants, including MB02, MB04, and EK04, expressed frustration over delayed or ineffective maintenance responses, with some, like EK04, resorting to self-repairs due to the lack of timely service. Criticisms also extended to construction quality and missing features, as noted by EK01, EK03, and AR02. While AR01 acknowledged prompt attention, the maintenance quality was still considered subpar. Overall, the findings indicate systemic problems with both the initial construction quality and post-occupancy support, suggesting a need for improved service delivery, better adherence to contractual specifications, and more efficient maintenance operations.

Table 4: Interview Overview with Institutional Stakeholders

S/N	Interview Code	Duration	Designation
1	PMI	15 minutes	Federal Mortgage Bank Representative
2	PPP	15 minutes	Representative, Rivers State Bureau for Public Private Partnership
3	RHPDA	15 minutes	Representative, Rivers State Housing and Property Development Authority
4	RSMUDPP	15 minutes	Representative, Rivers State Ministry of Urban Development and Physical Planning

Source: Researcher's Interview Session (2021)

Table 4 presents a summary of interviews conducted with key institutional stakeholders involved in housing development and policy implementation. Each session lasted approximately 15 minutes and featured representatives from four significant bodies: the Federal Mortgage Bank, Rivers State Bureau for Public Private Partnership, Rivers State Housing and Property Development Authority, and the Rivers State Ministry of Urban Development and Physical Planning. These stakeholders provided critical institutional perspectives on housing policy, development strategies, public-private collaborations, and regulatory frameworks. The selection of these entities underscores the importance of multi-agency coordination in addressing housing challenges and highlights the institutional roles in shaping and maintaining residential infrastructure and service delivery within the state.

Table 5: Institutional Views on Building Attributes and Resident Satisfaction

Interview Question: *"What are the challenges and feedback regarding building attributes from residents?"*

S/N	Respondent	Summary of Response
1	PMI	Acknowledged residents' complaints, including high costs, insufficient amenities, and poor maintenance, but emphasized ongoing efforts to improve.
2	PPP	Agency acknowledged performance but noted need for better maintenance service delivery.
3	RHPDA	Stated that complaints are addressed during management meetings but emphasized a bureaucratic process that may delay responses.
4	RSMUDPP	Recognized that government provision alone cannot meet rising demand; acknowledged challenges in increasing social housing units.

Source: Researcher's Interview Session (2021)

Table 5 highlights the institutional stakeholders' recognition of resident dissatisfaction with building attributes, focusing on issues such as high housing costs, inadequate amenities, and poor maintenance services. The Federal Mortgage Bank (PMI) acknowledged these concerns but pointed to ongoing improvements aimed at addressing them. The Public Private Partnership (PPP) office recognized the need for enhanced maintenance delivery despite generally satisfactory performance. The Rivers State Housing and Property Development Authority (RHPDA) reported that while resident complaints are considered in management meetings, bureaucratic delays often hinder timely responses. Meanwhile, the Rivers State Ministry of Urban Development and Physical Planning (RSMUDPP) stressed the limitations of relying solely on government provision, citing difficulties in meeting the growing demand for social housing. Collectively, these responses reflect institutional awareness of systemic challenges and suggest a need for improved efficiency, collaboration, and investment in housing service delivery.

Conclusion

The findings of this study extend beyond a mere assessment of housing satisfaction in Port Harcourt's public housing schemes. They offer critical insights that resonate across the fields of architecture, urban planning, sociology, and public policy. Broadly, this research underscores the intricate interplay between the physical design of housing, the characteristics of the residential environment, and the socio-demographic profiles of residents in shaping overall well-being and satisfaction. It highlights that housing is not simply shelter but a complex socio-spatial

phenomenon where individual needs and societal factors converge. This understanding is crucial for fostering sustainable and equitable urban development, not only in Nigeria but in similar contexts globally where public housing aims to address the needs of diverse populations. Specifically, this study makes several key contributions. Firstly, it empirically demonstrates the significant influence of specific socio-demographic variables – marital status, age, income, and household size – on housing satisfaction within the Nigerian context. This nuanced understanding challenges generalized approaches to public housing provision and calls for more targeted strategies that consider the diverse needs of different demographic groups. For instance, the finding that larger households report lower satisfaction underscores the need for adequate space planning in public housing designs. Secondly, the research quantifies the substantial impact of the residential environment's attributes, such as safety and accessibility, on residents' satisfaction, even more so than individual building attributes. This emphasizes the critical role of urban planning and infrastructure development in creating livable and satisfying public housing communities. Thirdly, by integrating qualitative data from residents and institutional stakeholders, the study provides a rich, contextual understanding of the challenges related to building quality, maintenance, and policy implementation. The identified discrepancies between residents' experiences and institutional perspectives highlight critical areas for policy reform and improved service delivery. Finally, the study's methodological rigor, employing a mixed-methods approach and incorporating simulation data, offers a robust framework for future research in housing satisfaction and architectural performance evaluation in similar urban contexts. This approach provides a more holistic and validated understanding of the factors influencing residential well-being, contributing to a more evidence-based approach to public housing design and policy.

Reference

- Ibem, E. O., Opoko, P. A., & Aduwo, E. B. (2015). Satisfaction with neighbourhood environments in public housing: Evidence from Ogun State, Nigeria. *Social Indicators Research*, 122(1), 227-250. <https://doi.org/10.1007/s11205-015-1188-y>
- Dimuna, K. O., & Olotuah, A. O. (2019). A critical appraisal of residents' level of satisfaction with architectural designs in public housing estates in Benin City, Nigeria. *Academic Journal of Interdisciplinary Studies*, 8(3), 15-24. <https://doi.org/10.36941/ajis-2020-0047>
- Jiburum, U., Nwachukwu, M. U., Mba, H. C., Okonkwo, C. N., & Okeke, D. C. (2021). Determinants of public housing affordability for large income diversity groups in a new-town capital city: A case study of Abuja, Nigeria. *SAGE Open*, 11(3). <https://doi.org/10.1177/21582440211045079>
- Grimes, A., Smith, C., & O'Sullivan, K. (2024). Housing tenure and subjective wellbeing: The importance of public housing. *Applied Research in Quality of Life*. <https://doi.org/10.1007/s11482-024-10369-y>
- Ajom, S. K., Mfon, I. E., Moses, N. E., & Eteng, S. U. (2022). Residential housing satisfaction in public housing estates in Calabar, Cross River State, Nigeria. *Journal of Social Sciences and Management Studies*, 1(2), 63–68. <https://doi.org/10.56556/jssms.v1i2.139>

