Educational Administration: Theory and Practice
2024, 30(6), 136 - 142
ISSN: 2148-2403
https://kuey.net/

Research Article

Exploring The Nexus Of Income And Building Maintenance For Sustainable Housing Solution In Ogun State, Nigeria

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Citation: Ayomipo Akintunde Fadeyi et al. (2024) Exploring The Nexus Of Income And Building Maintenance For Sustainable Housing Solution In Ogun State, Nigeria *Educational Administration: Theory And Practice*, *30* (6), 136 - 142
Doi: 10.53555/kuey.v30i6.5123

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ABSTRACT

Housing maintenance and repairs play a vital role in ensuring liveable conditions and adequate quality of housing for homeowners in Ogun State, Nigeria. The allocation of resources for these tasks is significantly influenced by several factors including age, monthly income, levels of education and the choice of building materials used in housing production and so on. This study delves into the complex interplay between income levels, building material selection and resource distribution for housing maintenance and repairs in Ogun State. Through an examination of various socio-economic factors such as income disparity and building material attributes, the research aims to unveil the underlying mechanisms that govern housing maintenance practices in the region. Employing quantitative research methods and analysing survey data, the study seeks to identify patterns and trends in resource allocation strategies among homeowners with varying income levels. The findings of this research are expected to offer valuable insights for policymakers, urban planners and housing advocates, facilitating the development of targeted interventions to improve housing conditions and promote sustainable urban growth in Ogun State.

Keywords: Building material, Housing maintenance, Income inequality, Socioeconomic factors, Sustainable development goal, Sustainable housing

Introduction

Housing maintenance and repairs play a vital role in guaranteeing adequate quality of housing for the homeowners of Ogun State, Nigeria. Although there has been an increase in global economic prosperity, the problem of income inequality persists, as a significant number of individuals continue to earn relatively low incomes (Hood & Waters, 2017). This economic environment significantly impacts how households make decisions about how to manage and distribute their financial resources, especially concerning the maintenance and repair of their homes (Batuo et al., 2022).
It is worth noting that a mutual connection can be observed between the quality of housing and the monthly income of individuals according to (Nchor, 2023) and (Kim et al., 2021). Substandard housing, characterized by issues like roof leaks or faulty plumbing, has the potential to detrimentally influence the health and general welfare of homeowners, thereby impeding their capacity to earn income (Flood et al., 2021). To illustrate, persistent health problems arising from inadequate living conditions could result in higher medical costs and reduced efficiency, thereby compounding financial difficulties (Simcock et al., 2021); (CHONG et al., 2021).

In the context of Ogun State, the allocation of income towards housing maintenance and repairs is significantly influenced by social and cultural factors (Haque et al., 2021);(ODAUDU, 2023). Within low-income households, where financial resources are constrained, cultural norms often prioritise expenditures on ceremonies or events rather than housing upkeep as observed by (Oladehinde et al., 2024). This preference may result in limited funds being directed towards housing maintenance according to (Hosany & Hamilton, 2023). Furthermore, (Corlett et al., 2019) argue that the societal expectation to uphold a specific standard of

living can exert pressure on individuals, leading to altered spending patterns that may divert resources away from housing maintenance.
Government interventions and policies can significantly influence the allocation of resources for housing maintenance and repairs (Mazele & Amoah, 2022). Initiatives such as subsidized housing programs or low-interest loans for renovations aim to alleviate the financial burden on low-income households (Abera, 2022). However, the effectiveness of these interventions relies heavily on accessibility and implementation, which may vary within Ogun State (Ajijola et al., 2023); (Otu et al., 2021).

Conducting this study is imperative due to the complex interplay between housing quality, income levels, cultural norms, and governmental policies. It is essential for informing policymakers on how households allocate financial resources, advocating for interventions tailored to the needs of low-income families, and improving public health outcomes by emphasizing the link between housing conditions and well-being. Additionally, understanding the influence of cultural norms and societal expectations on spending patterns will facilitate the design of culturally sensitive interventions. Moreover, assessing the effectiveness of existing government initiatives will guide future policy formulation and implementation, ultimately contributing to inclusive economic development and enhanced housing quality for all residents of Ogun State.

Methodology

The study used a quantitative methodology, surveying with a questionnaire to gather information from a sample size consisting of 102 homeowners with membership in randomly selected community development associations. The study will use descriptive and SPSS analytic tools to analyse the relationships between the socioeconomic characteristics of homeowners in Ogun state and building material attributes to examine maintenance and sustainable housing solutions. The study centred on households located within the peri-urban area of Iyana-Iyesi, Ogun State, Nigeria, where housing conditions exhibit significant variations. Closed-ended questions were used to enable respondents to provide qualitative insights regarding the socioeconomic characteristics of homeowners in the study area while, a Likert scale of 1 to 5 (1 = Very significant, 2 = significant, 3= indifferent, 4 = Not very significant and 5 = insignificant) was used to measure the significance of 13 building materials attributes in the process of selecting building materials for housing production, thereby facilitating easy data analysis.

The quantitative data obtained from the survey underwent analysis using statistical software, descriptive statistics, correlation analysis and regression modelling techniques. The aim is to investigate the connections between monthly income, building material attributes and maintenance habits to detect recurring patterns, trends and relationships using the Chi-Square Formula.

Chi-Square Formula

The Chi-Square is denoted by $\chi 2$. The chi-square formula is:

$$\chi 2 = \sum(Oi - Ei)2/Ei$$

where
Oi = observed value (actual value)
Ei = expected value.

In this study, the chi-square test statistic, also known as the P-value or probability value, is employed to determine the likelihood of obtaining a result that is equal to or more extreme than the other observed data points. The P-value of 0.005 will signify the probability of the specific event occurring. It will serve as an alternative to the rejection point, indicating the minimum level of significance at which the null hypothesis would be rejected. A smaller P-value indicates stronger evidence supporting the alternative hypothesis, considering the observed and expected frequencies.

This detailed research methodology delineates the strategy for executing a survey questionnaire to explore the interaction between monthly income, building materials, and upkeep methods in sustainable housing solutions. By conducting thorough data collection, analysis and distribution, the research enhances the comprehension of the intricate connections among these variables and pinpoint approaches to promote durable and equitable housing conditions in developing nations.

Findings

A Pearson Chi-Square analysis of the relationship between monthly income (Mi) and building material attributes (BMA), showed that there is a strong relationship between [Maintenance] (Mt) and (Health/Safety Risk] (HSR) each with nominal values of 0.003 and 0.002 of 0.005 respectively (see Table 3.1). The selection

of health and safety of building material attributes suggests a certain level of awareness and understanding of sustainability in building materials and housing production and its benefits. This is indicative of the higher level of education the majority of the respondents possess in the study area (see Table 3.2). The higher level of education also could be responsible for the nominal value of the relationship between maintenance and building materials (0.003). This is also suggestive of a relatively good grasp of building maintenance and its long-term benefits (Fulcher et al., 2022).

The frequency table (Table 3.1) also shows the choices of other building material attributes as viewed by the respondents. It depicts varying levels of significance in facilitating maintenance and sustainable housing conditions. The study analysis shows the variables with high significance to maintenance to include Quality/Superiority] (QSM), Strength of material (SoM), Sustainability (StB), Cost (CoT), Health/Safety Risk (HSR), Maintenance (MtC), Resistance to fire (RtF), with frequency percentages of 53.9; 49.0; 49.0; 44.1; 42.2; 40.2; and 35.3 respectively. This selection of building material attributes in Figure 3.1 is suggestive of the age and mature levels of experience of the respondents. It shows the age group with the highest frequency to be 41 – 55 years. Studies suggest that the middle-aged group (41 – 55 years) are expected to have acquired adequate life experiences to shape their choices and preferences accordingly (Hawkley et al., 2022); (Liu et al., 2021); (Buczak-Stec et al., 2023).

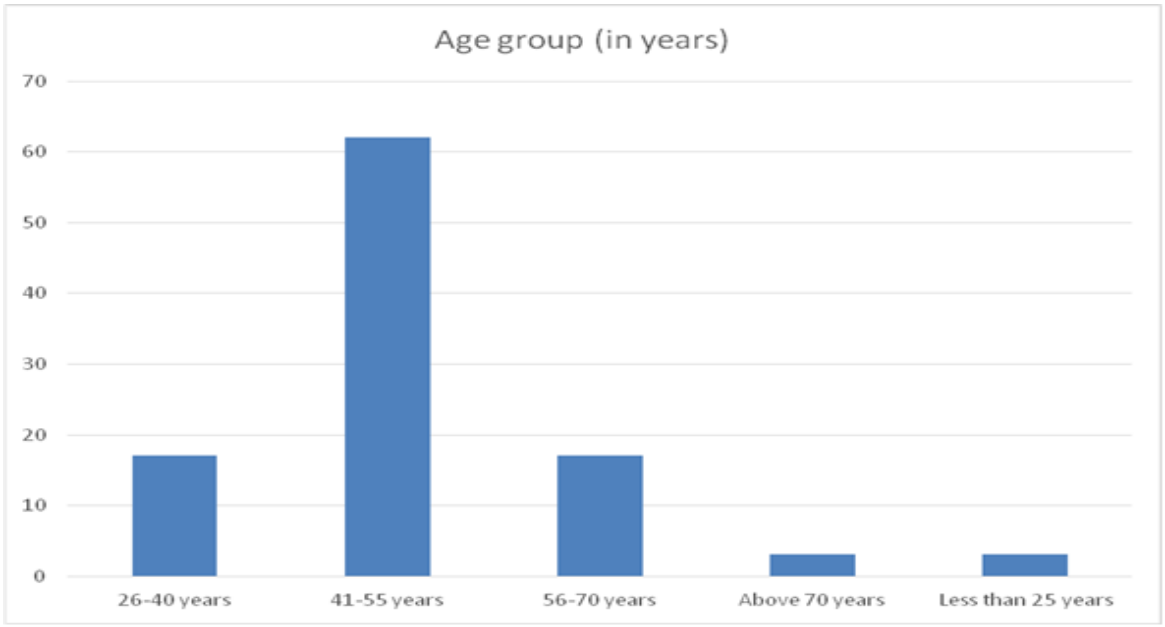

Figure 3.1 Bar Chart showing the age group of respondents

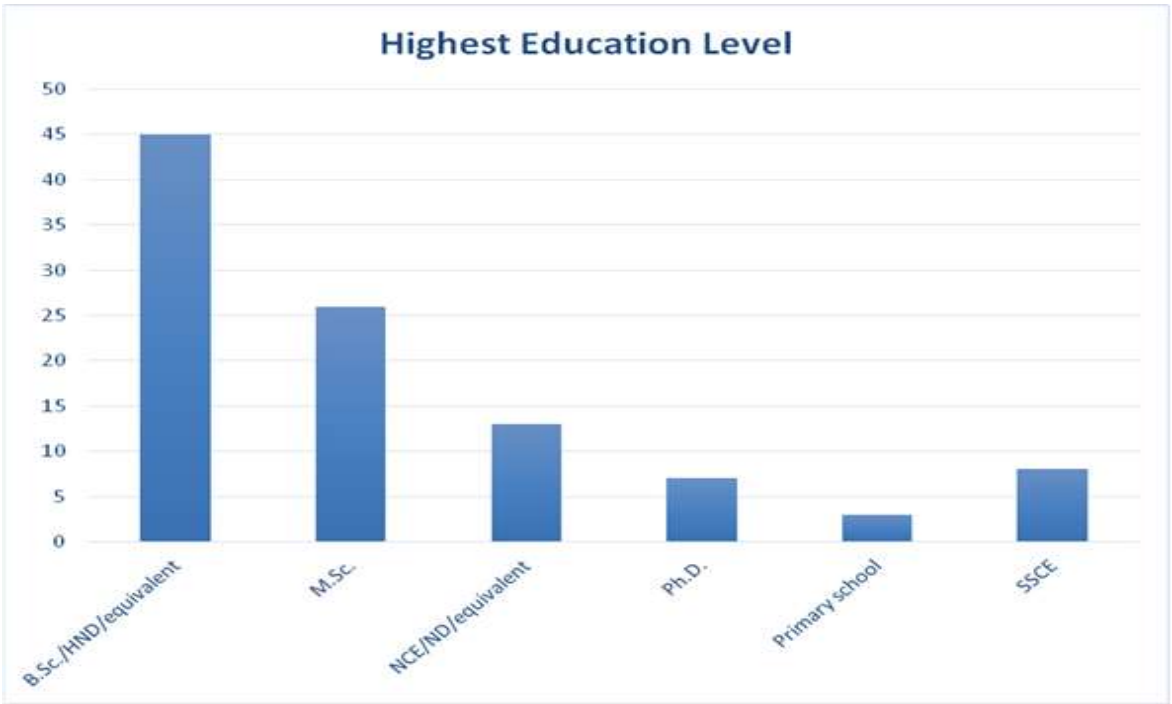

Figure 3.2 Bar Chart Showing the Highest Level of Education of Respondents

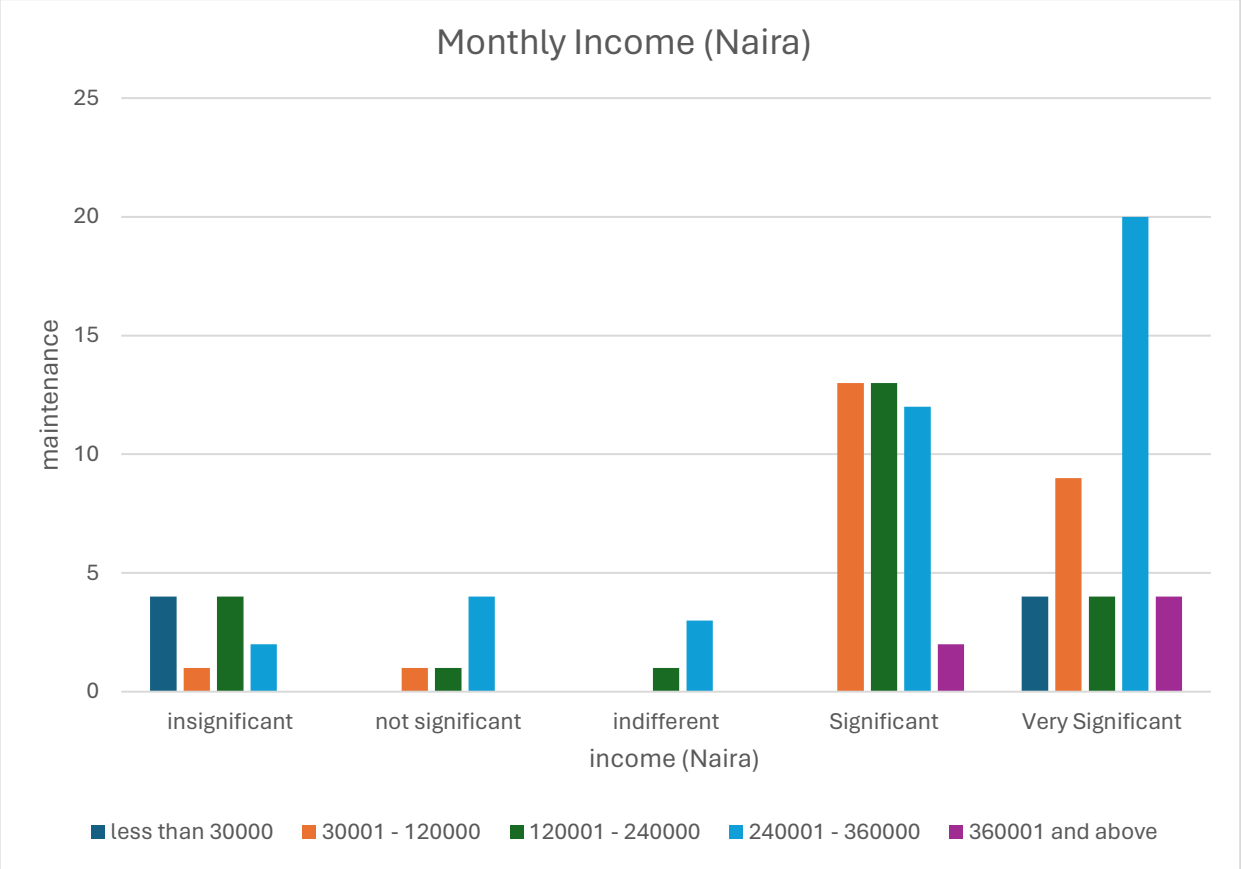

Figure 3.3 Bar Chart Showing the Monthly Income Range of Respondents

The income frequency of homeowners in the study area indicates that those earning a monthly income of ₦240,000 and above are of the view that income should have a significant impact on resource allocation towards maintenance, bearing in mind the higher education levels of the same group (see figure 3.3.). Due to the current economic realities, lower-income earners may not prioritise house maintenance.

Table 3.1 Frequency table of building material attributes.

Questions	Level	Frequency	Percent (%)	Chi Value (at > or < 0.005)
Indicate the significance of this attribute when selecting building materials for housing production **[Strength of material] (SMt)**	**Very significant**	**50**	**49.0**	0.029
	significant	29	28.4	
	indifferent	4	3.9	
	not very significant	8	7.8	
	insignificant	11	10.8	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **[Availability] (AvT)**	Very significant	39	38.2	0.025
	significant	**40**	**39.2**	
	indifferent	4	3.9	
	not very significant	10	9.8	
	insignificant	9	8.8	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Sustainability (StB)**	**Very significant**	**50**	**49.0**	0.202
	significant	32	31.4	
	indifferent	3	2.9	
	not very significant	7	6.9	
	insignificant	10	9.8	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Workability (WoK)**	Very significant	33	32.4	0.019
	significant	**46**	**45.1**	
	indifferent	5	4.9	
	not very significant	7	6.9	
	insignificant	11	10.8	

Questions	Level	Frequency	Percent (%)	Chi Value (at > or < 0.005)
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Ease of transportation (EoT)**	Very significant	26	25.5	0.038
	significant	**43**	**42.2**	
	indifferent	6	5.9	
	not very significant	13	12.7	
	insignificant	14	13.7	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **[Cost] (CoT)**	**Very significant**	**45**	**44.1**	0.633
	significant	33	32.4	
	indifferent	4	3.9	
	not very significant	7	6.9	
	insignificant	13	12.7	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Aesthetics/Visual appeal (AeT)/(VaP)**	Very significant	37	36.3	0.006
	significant	**40**	**39.2**	
	indifferent	6	5.9	
	not very significant	9	8.8	
	insignificant	10	9.8	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Resistance to fire (RtF)**	**Very significant**	**36**	**35.3**	0.014
	significant	34	33.3	
	indifferent	13	12.7	
	not very significant	11	10.8	
	insignificant	8	7.8	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Resistance to sound (RtS)**	Very significant	18	17.6	0.025
	significant	**42**	**41.2**	
	indifferent	15	14.7	
	not very significant	17	16.7	
	insignificant	10	9.8	
	Total	102	100	
Indicate the significance of this attribute when selecting building materials for housing production **Ease of Cleaning (EoC)**	Very significant	32	31.4	0.007
	significant	**42**	**41.2**	
	indifferent	9	8.8	
	not very significant	7	6.9	
	insignificant	12	11.8	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Health/Safety Risk (HSR)**	**Very significant**	**43**	**42.2**	**0.002**
	significant	38	37.3	
	indifferent	4	3.9	
	not very significant	7	6.9	
	insignificant	10	9.8	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Maintenance (MtC)**	**Very significant**	**41**	**40.2**	**0.003**
	significant	40	39.2	
	indifferent	4	3.9	
	not very significant	6	5.9	
	insignificant	11	10.8	
	Total	102	100.0	
Indicate the significance of this attribute when selecting building materials for housing production **Quality/Superiority (QSM)**	**Very significant**	**35**	**53.9**	0.007
	significant	23	22.5	
	indifferent	6	5.9	
	not very significant	8	7.8	
	insignificant	10	9.8	
	Total	102	100.0	

The significant variables included Workability (WoK), Ease of transportation (EoT) Resistance to sound (RtS), Ease of Cleaning (EoC), Availability (AvT), Aesthetics/Visual appeal (AeT)/(VaP) with frequency percentages of 45.1; 42.2; 41; 41.2; 39.2 and 39.2 respectively. While these results tally with the age and higher level of

education inference, the discussions are further validated by the frequency of data findings that place premium value on the practicality, functionality and sustainability of the building materials attributes.

The study findings suggest a pattern of high levels of education playing a crucial role in sustainable building material choices. The strategic nature of the survey responses demonstrates the need to focus on education as a strategic tool for achieving sustainable development goals (SDG) 9 and 11 in the global construction sector (Fei et al., 2021).

Conclusion

In conclusion, the study highlighted the connection between the allocation of resources for housing maintenance income and education levels as highly complex. Those with low incomes encounter considerable difficulties in affording essential repairs, resulting in worsening living conditions and potential socio-economic repercussions. Resolving this matter necessitates a comprehensive strategy that encompasses specific government interventions, initiatives to empower communities and economic policies designed to decrease income inequality. By tackling the underlying causes of disparities in housing maintenance, Ogun State can work towards guaranteeing secure and liveable living conditions for every resident, regardless of their income.

On a global scale, the study demonstrates the need to focus on education as a strategic tool for achieving SDGs 9 and 11 in the construction sector. Furthermore, a need to intensify advocacy efforts on the benefits of sustainable houses in homeowners' and community development associations leading to healthier occupants and a more sustainable environment.

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