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UNEARTHING THE LINK BETWEEN SOCIO-ECONOMIC STATUS AND WALLING MATERIAL SELECTION FOR AFFORDABLE HOUSING IN SOUTHWEST NIGERIA

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ABSTRACT

The walling material component constitutes a substantial part of the building envelope with consequent implication on overall housing cost. This study examined the impact of socio-economic status (SES) of respondents on walling material selection preferences for affordable housing in southwest Nigeria. Data was collected in a cross-sectional field survey through administration of structured questionnaires on randomly selected respondents in four Local Government Areas (LGAs) of three States in Southwest Nigeria. Data obtained was analyzed using descriptive and inferential statistics with results presented in tables and figures. The result showed a high aspiration for homeownership amongst respondents. The result also showed that lesser cost implication of walling materials does not translate to acceptance and use. Most importantly, the results showed high significant relationship between SES and choice of walling material for affordable housing. The study recommends that selection of walling should be responsive to the SES of households to make housing affordable. Study is also useful for guiding formulation of affordable housing policy in Nigeria that is responsive to the SES of households in the study area.

Key words: Affordable housing, Housing policy, Nigeria, Socio-economic status, Walling material selection.

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1. INTRODUCTION

Since time immemorial, adequate housing has played a very significant role in human development. It is equated with food and clothing as one of the primary basic needs of humans. Aside from providing shelter for people to reside, decent and affordable housing is also crucial to important issues such as health and general well-being of individuals (Mueller and Tighe, 2007; Hardoy and Satterthwaite, 1989), crime reduction (Horner, 2009), employment generation particularly for unskilled labour (Erguden, 2001), best indicator of a person's standard of living and of his or her place in society (UN-HABITAT, 1993) and social and economic good (Oyalowo, Nubi and Lawanson, 2018). To underscore its importance to human survival, the right to housing is recognized by several international human rights instruments. For instance, Article 25 of the Universal Declaration of Human Rights and Article 11(1) of the International Covenant on Economic, Social and Cultural Rights (ICESCR) recognize the right to housing as part of the right to an adequate standard of living. In 1988, the United Nations General Assembly adopted the Global Strategy for Shelter (GSS) to the Year 2000 aimed at developing housing policy framework and formulation of implementation strategies towards enabling housing concepts. The evolving framework on enabling housing concept was further articulated in the Habitat Agenda of the Second United Nations Conference on Human Settlements (Habitat II), which held in Istanbul, Turkey in 1996. In 2001, the UN-Habitat reaffirmed the 1996 Istanbul Agreement and Habitat Agenda and established the UN Human Settlement Programme to promote the right to housing. It promoted access to housing as a basic human right that must not be denied any individual. In September 2015, the UN summit of Heads of Government formally launched the Sustainable Development Goals (SDGs), which further recognized the importance of adequate human settlements in its Goal 11 aimed at "Making cities and human settlements inclusive, safe, resilient and sustainable". As a result of the importance of housing to human existence and survival, its provision for the majority of the populace should be of utmost importance to government of every nation. However, it has been observed that housing demand surpasses housing supply in Nigeria.

The background to this article was based on previous scholarly works, which identified issues related to housing problems (Ibem, Ayo-Vaughan, Oluwunmi and Alagbe, 2018; Ezeigwe, 2015; Owoeye and Adedeji, 2015; and Zami and Lee, 2011) leading to increase in cost of housing (Adam and Agib, 2001) with consequent rise in people living in deplorable housing conditions (Kihato, 2013). Rapid urbanization is at the root of increase in housing demand (CAHF, 2010). The housing deficit in Nigeria like in many other African countries is traceable to rapid population growth and rural-urban migration (Adeleye and Anofjie, 2011). With respect to rapid population growth, UN (2012) projected world's population to grow from 3.6 billion in 2011 to 6.33 billion in 2050. It further noted that 94 percent of the increase in world's urban population would occur in developing countries. Studies revealed that the bulk of the population growth in developing countries would be taking place in Africa. For instance, Bah et al (2018) noted an unprecedented population growth in Africa countries in the past decades. The study reported that Africa experienced an average annual population growth of 2.53 percent between 1950 and 2015. The report concluded that the urbanization rate in Africa is the highest in the world. This was based on the premise that 60 percent of

Africa's population lives in rural areas, while there was an alarming high rate of rural-urban migration averaging 3.5 percent between 2000 and 2015. With nation specific, Nigeria is the most populous country in Africa with an unparalleled urbanization rate of 4.8 percent since 2000 (Bah et al., 2018). Nigeria's annual population growth rate is way beyond world population growth rate of 1.23%, thus asserting more stress in meeting the housing demand of the populace. Oni-Jimoh and Liyanage (2018) reported "urban population in Nigeria to have grown from 6.9 million, 15.4% of the total population of 45 million in 1960 to 99.9 million, which is 48.9% of the total population of 195.8 million today". Consequently, housing deficit in Nigeria is estimated to have been at least 17 million since 2010. Bah et al (2018) extrapolated the figure to have risen to at least 20 million "given the annual demand of 700,000 units and an annual supply of less than 100,000." There have been various documented housing strategies by the Nigerian government targeted at increasing housing supply particularly to the vulnerable low income and mid income groups but most have recorded low success levels. Therefore, the surge in demand for housing amongst urban dwellers is effectively driving up housing prices and pushing quality housing out of reach for the majority of those who are in need, especially poor and middle-income households.

This situation has forced about 50 percent of urban dwellers in most cities of the developing world to live in slums and squatter settlements. The development, expansion and proliferation of slums and informal settlements has exacerbated and remained persistent as a result of vast majority of the urban population operating within the informal economy, outside of existing regulatory frameworks (Bah et al., 2018). The proliferation of informal housing is exacerbated further by difficulty in access to housing development elements such as land, building materials and credit facilities (Erguden, 2001). In addition to huge housing deficit in cities of most developing countries, housing provision for low-income and mid-income groups have been largely provided by individual efforts, "with the poor playing a leading role as the construction project manager, laborer, and finance provider" (Bah et al., 2018). The UN-Habitat (1993) noted that despite several public and private sectors intervention in housing policies and programmes, effective solutions to housing problems in Nigeria are yet to be found. Failure of previous interventions was adduced to assumption that improvement in general economic conditions of the nation will translate to an improvement in the housing delivery sector. The report submitted that the "wait and see" attitude of the Nigerian government towards housing delivery issue has led to more failure than successes. Furthermore, high cost of building materials as a result of high cost of local production and high exchange rate of imported materials as escalated the cost of housing delivery.

While several studies have looked at various strategies of mitigating the housing delivery challenges particularly of the vulnerable income groups, there are very few studies that focused on the impact of socio-economic status of households on walling material selection for affordable housing. Therefore, the main aim of this study is to provide an analytical insight on relationship between socio-economic status (SES) of households and its impact on walling material selection for housing construction in three purposively selected States in Southwest Nigeria. Specifically, the study examined whether there is a significant relationship between income status of households and their selection of walling material for affordable housing construction.

2. LITERATURE REVIEW

2.1. Concept of affordable housing

Affordable housing (AH) is defined in multiple ways. However, the most important definition acceptable internationally is the one that defined housing affordability as a "measure of

expenditure on housing to income of the household” (Gopalan and Venkataraman, 2015). Similarly, Ram and Needham (2016) defined affordable housing as housing of a reasonable quality that is affordable to people on modest or low incomes. Winston and Montserrat (2007) described affordable housing as that which is affordable to specified eligible households whose income is not adequate for them to access appropriate housing in the market. Since housing as being identified as an indicator of societal wellbeing and an assessment parameter for country’s quality of life (Salleh and Badarulzaman, 2012), the concept of affordable housing should be of paramount concern particularly to nations that have majority of their urban populace living in poverty. Vanguard Online News (June25, 2018) quoted a 2018 report by Brookings Institution that Nigeria now has the highest number of extremely poor people overtaking India that erstwhile held the position. The report indicated that in every minute, six people slip into extreme poverty in Nigeria. This has dire implication on the housing situation in the country where it is reported that Nigeria requires at least 20 million housing units to meet the housing deficit at 700, 000 units per annum with only about 100,000 units produced annually (Bah et al., 2018). Urban poverty was identified as a major factor associated with poor housing conditions for urban residents (Akinyode and Martins, 2017). Key issues identified in literature germane to provision of affordable housing include: alternative housing markets such as the co-operative sector (Oyalowo et al., 2018), improve access to land and mortgage with favorable interest rates through review of housing finance and housing policy by governments of affected nations.

Experiences in literature on how nations with similar population and urbanization characteristics with Nigeria have tackled the issues of housing deficit through affordable housing delivery strategies are discussed forthwith. Gopalan and Venkataraman (2015) conducted a study on affordable housing in India with focus on policy and practice. India shares similar socio-economic statistics with Nigeria with respect to urbanization and population growth. The study identified three factors that are at the root of demand for affordable housing in India. First is a progressive urbanization with a growing urban population, which increased from 109 million in 1971 to 377 million in 2011, and is projected to grow to 600 million by 2030. Consequently, it was observed that the increased number of people migrating to the urban areas directly correlates with higher demands for land and housing leading to congested transportation network, and stress on basic amenities such as water and power. Secondly, there is an upsurge in the number of the middle class group as a result of rising incomes leading to “a spike in demand for affordable housing”. Thirdly, on the economic side, the study noted that the real estate sector is a major component of the India sector contributing “6.3% of the GDP in 2013-14, at an estimated 3.7 *lakh crores* and employed about 7.6 million people” (CREDAI, 2013 in Gopalan and Venkataraman, 2015). The study concludes that since housing constitutes the largest component of the financial and housing construction sector, a focus on affordable housing will lead to better quality of life and provide a significant boost to the GDP of the country.

Shi, Chen and Wang (2016) studied affordable housing policy in China with focus on new developments and new challenges. The study identified that housing affordability poses a big challenge in urban China. The paper investigated the impact of the success of the radical shift of the Chinese government from the post-reform housing policy in favour of direct massive construction plan of 36 million units of public housing between 2011 and 2015. It was reported that the combination of the 2006 “harmonious society” development ideology and the 2013 new urbanization strategy served as a “propelling engine to promote accommodating millions of low-income migrants in cities permanently under the new urbanization strategy”. The success was attributed to the social housing policy of the Chinese government targeted at: achieving a balance between different policy priorities in the housing policy design, primary priority of the housing policy should be housing affordability, reducing the local state’s fiscal

dependence on land revenue and establishing an effective and efficient housing finance system.

As established previously, increased number of people migrating to the urban areas directly correlates with higher demands for land and housing. Therefore, it is essential that nations seek to develop housing policies that will enable majority of households to have access to affordable housing. While affordable housing programs are aimed at improving access to housing at affordable prices particularly for the low-income households, the extent to which the schemes have enabled access to housing by the low-income is still insignificant. This is partly because majority of housing supply in Africa and Nigeria in particular is done through the informal sector while a minor proportion is through formal market supplies. This view is corroborated by the World Bank (2016) who established that the informal sector in Nigeria supply about 900,000 housing units annually as against the formal sector of 100,000 units. Since housing supply in developing nations and Nigeria in particular is achieved mostly through informal sector participation, it is expedient to appraise the strategies adopted by this sector in order to mitigate the housing deficit challenges in the face of growing population and rapid urbanization. One of such factors that have significant impact on the cost of housing affordability is the choice of building materials.

2.2. SES and its impact on affordable housing

At the crust of every building project is the choice of building materials or means used in the selection process (Flórez, Castro-Lacouture, Sefair and Medaglia, 2009). Building materials selection has environmental as well as social and economic aspects (Evcı and Ciravoglu (2015). Similarly, Cunningham (2013) submitted that “the materials specified and the proposed construction details will have an important bearing on the cost of the project”. Udawattha and Halwatura (2017) noted that the wall and roof material constitutes a significant portion of the building envelope. Thus, this study opined that a rational choice of walling material based on the SES of household would significantly impact housing affordability. The impact of SES has been investigated over a wide range of societal issues such as health (Matthews et al., 2011), affordable housing (Anderson et al., 2003), education (Frempong et al., 2012) and housing policy (Dunn et al., 2006). However, there is dearth of study on impact of SES on walling material selection for affordable housing.

However, Lockwood, Coffee, Rossini, Niyonsenga and McGreal (2018) noted a well-established nexus between socio-economic status (SES) and societal wellbeing. They observed that SES is a determinant of location of residential property. The study was conducted in Adelaide, the capital city of South Australia. The study adopted a relative location factor (RLF) so as to capture the “compositional and contextual elements that link residential property value to SES”. The study concludes that “the locational component of real property value and traditional SES indices are linked through a definition of wealth and therefore has a valid claim as a proxy for spatial SES”.

Evcı and Ciravoglu (2017) conducted a survey on the impact of SES of users on the selection of building materials in their designs. Result revealed that out of 168 architects that participated in the survey, 69% (116) attached great importance, 23% (38) moderate, while only 9% (14) attached little importance. Thou, architects were the units of study in this survey, it can be deduced that majority of the architects understand that the SES of households has a significant impact on housing affordability and therefore put this factor into consideration while specifying building materials. The study concluded that social, economic and environmental criteria play a major role in the selection of building materials.

Morenikeji, Umaru, Pai, Jiya and Idowu (2017) studied the spatial variation in housing quality across 36 states and the Federal Capital Territory in Nigeria. Principal component analysis was used to determine the components responsible for housing quality. The variables responsible for housing quality determinant were broadly classified into three components namely high quality housing, poor housing quality and slumming. Deductions from the study are that dense population and higher economic and administrative activities characterized States that have high housing quality. Most importantly, the SES of the inhabitants was a major factor in the high housing quality in those States. The study observed that the higher the SES of the residents, the higher the housing quality. This suggests that the higher the SES of residents, the higher the probability of selecting more durable materials that is also a function of higher cost. Conversely, low quality housing was associated with poverty level and high cost of building materials. This suggests that low SES of residents will directly translate to selection of cheap and less durable building materials.

The focus of this study will be on the impact of SES on the selection of walling materials for affordable housing. While there are different types of walling materials that can be used for affordable housing, cost of material, durability and aesthetics were identified by Adewale, Babalola, Jegede, Afolabi, Oyenuga and Obi (2018) and socio-cultural implication (Alagbe and Opoko, 2013) as critical factors considered by households in the selection of walling materials. The commonly used walling materials in Nigeria are mud, sandcrete hollow blocks, compressed stabilized laterite blocks (in various forms such as laterite interlocking blocks, laterite cement blocks) and burnt bricks (Udawattha and Halwatura, 2017; Iwuagwu and Iwuagwu, 2015; Raheem, Momoh and Soyngbe, 2012; and Aguwa, 2010). This study provided empirical data on the relationship between income of residents and its implication on selection of these walling materials for housing construction in Nigeria.

3. RESEARCH METHOD

The data for this study was obtained from a cross-sectional field survey of respondents in four Local Government Areas (LGAs) of three States in Southwest Nigeria. The LGAs and the States were purposively selected to represent their level of urbanization and by extension socio-economic status (SES) distribution. Agege LGA in Lagos State was selected as it represents an urbanized community, Ado-Odo/Ota LGA in Ogun State is semi-urban while Ibadan SW and Ogbomoso North LGAs in Oyo State represent a transition between rural and very rural communities respectively. Data was obtained through the distribution of 720 structured questionnaires to randomly selected respondents with 180 distributed in each LGA. The retrieved questionnaire used for the purpose of this study is 551 (76.5%). The study provides a descriptive summary of SES of respondents, which include their location, level of educational attainment, monthly income, aspiration for home ownership, and their knowledge of the different walling materials in terms of their physical properties, cost implication and preferred walling materials.

3.1. Characteristics of participants

The characteristics of respondents across the surveyed LGAs are shown in Table 1. There were more valid questionnaires retrieved in Ibadan SW LGA representing 145 (26.3%) of the total questionnaires retrieved though there was no significant difference in response rate across other locations. The education attainment of respondents was classified into four categories. The result showed that most respondents, 185 (33.6%) have education attainment up to tertiary level; 125 (22.7%) had post-tertiary education while very few, 52 (9.4%) had basic primary education. Since majority of the participants are well educated, it suggests therefore that they are knowledgeable enough to make informed decision on the subject matter. Socio-

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economic status (SES) in Nigeria is divided mainly into three strata: the low-income, mid-income and the high-income class. The classification was based on national minimum wage benchmark of eighteen thousand naira (N18,000K). Table 1 showed that 224 (40.7%) representing majority of respondents are in the mid-income group earning between N36,000 and N109,000. The respondents in the low-income group are substantial as representing 193 (35.0%) while 103 (18.7%) of the respondents belong to the high-income group.

Table 1 Characteristic of Respondents

Characteristic of respondents	Frequency N = 551	Percentage %	Cumulative Percentage
Location			
Ogbomoso	135	24.5	24.5
Ibadan	145	26.3	50.8
Adodo	132	24.0	74.8
Agege	139	25.2	100.0
Educational Level Primary			
Secondary	52	9.4	11.2
Tertiary	102	18.5	33.2
Post-tertiary	185	33.6	73.1
Monthly Income Status			
Low income	125	22.7	100.0
Mid-income	193	35.0	37.1
High-income	224	40.7	80.2
Missing	103	18.7	100.0
	31	5.6	

A significant number of respondents 31 (5.6%) did not indicate their income, which perhaps suggests that they are not proud of their monthly (low) income, thus they are not willing to reveal it publicly. majority of respondents fall in the mid-income group, which is a reflection of their education status. It can be deduced that the higher the educational attainment of an individual, the higher the prospect to earn more income.

3.2. Respondents' aspiration for home ownership

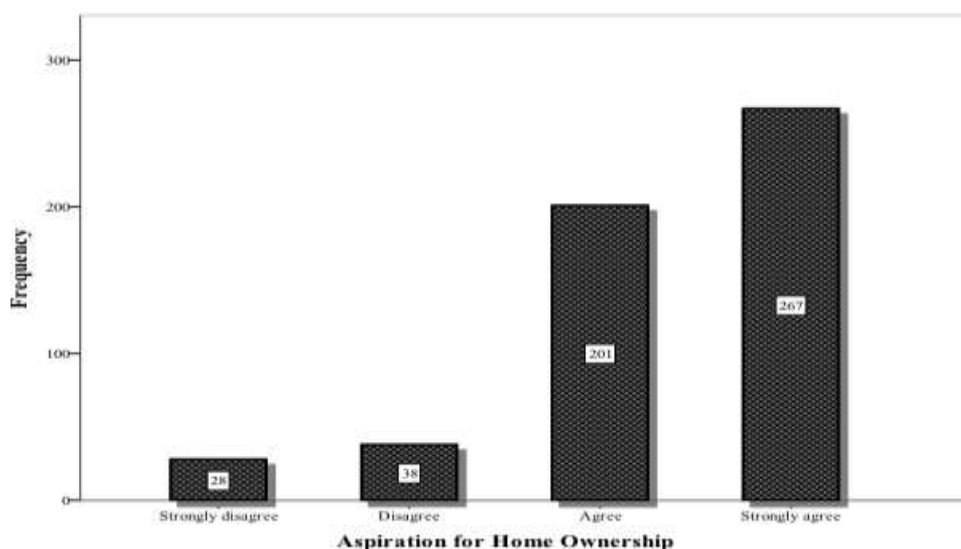


Figure 1 Respondents' Aspiration for Home Ownership

The study obtained the level of importance that respondents attached to homeownership. The data in Fig. 1 showed that 267 (48.5%) and 201 (36.5%) of respondents strongly agree and agree respectively that home ownership is a legacy, while a total of 66 (12.0%) do not consider home ownership a lifetime aspiration. This result corroborates the finding by UN-HABITAT (1993) that housing is the best indicator of a person’s standard of living and of his or her place in society. It also shows that majority of Nigerians in southwest Nigeria see home ownership as a lifelong aspiration and will work assiduously to own one.

3.3. Critical factors in selection of walling materials

Furthermore, the study explored critical factors in selection of walling materials for affordable housing construction in Nigeria in terms of their physical properties (Table 2), cost implication (Table 3), and their preferred choice for housing construction (Table 4). A five-point likert scale was used for this purpose and the mean score was used to rank the walling materials. The commonly used walling materials for affordable housing construction in Nigeria are sandcrete blocks, burnt bricks, compressed stabilized laterite bricks (CSLBs) and burnt bricks and were thus the ones sampled in this study. Table 1 shows the knowledge of respondents about the physical properties of the walling materials with respect to their application in housing construction in the following order; sandcrete blocks, burnt bricks, CSLBs and mud, with mean score of 2.86, 2.58, 2.41 and 2.37 respectively. The deduction from this result is that majority of the respondents have appreciable knowledge about the different walling materials but seems to have more knowledge about the physical properties of sandcrete blocks. The result revealed that mud was least in terms of physical properties. It implies that respondents perceive it as a non-durable material and perhaps not desirable for affordable construction.

Table 2 Knowledge of physical properties of walling materials

Walling material	Total N = 551			
	Frequency N	Missing	Mean	Ranking
Burnt Bricks	524 (95.1%)	27 (4.9%)	2.58	2 nd
Mud	523 (94.9%)	28 (5.1%)	2.37	4 th
CSLB	522 (94.7%)	29 (5.3%)	2.41	3 rd
Sandcrete Block	525 (95.3%)	26 (4.7%)	2.86	1 st

Table 3 showed the knowledge of respondents on the cost implication of choosing the walling materials for housing construction. Mud wall was adjudged the material with the lowest cost implication with mean score of 3.55. The ranking for the other materials with respect to their cost implication is burnt bricks, sandcrete blocks and CSLBs with means score of 2.59, 2.18 and 1.79 respectively. Therefore, respondents opined that selecting mud as walling material has the cheapest cost implication while CSLBs have the highest cost implication.

Table 3 Cost implication of walling materials

Walling material	Total N = 551			
	Frequency N	Missing	Mean	Ranking
Burnt Bricks	519 (94.2%)	32 (5.8%)	2.59	2 nd
Mud	529 (96.0%)	22 (4.0%)	3.55	1 st
CSLB	520 (94.4%)	31 (5.6%)	1.79	4 th
Sandcrete Block	527 (95.6%)	24 (4.4%)	2.18	3 rd

Conversely, while mud as a walling material has the cheapest cost implication, Table 4 showed that respondents selected sandcrete blocks as their most preferred walling material. The least preferred walling material is mud. The second and third most preferred walling materials are burnt bricks and CSLBs respectively. Though sandcrete blocks was adjudged to have high cost implication in Table 3 above, probably because of all the treatments (plastering, painting, tiling) it requires before it becomes acceptably finished, it is still mostly preferred by respondents. This could be as a result that sandcrete block is the most popular walling material in the Nigerian building construction industry. Its ready availability and widespread usage are evidence of its knowledge and acceptance.

Table 4 Preferred Walling Materials

Walling material	Total N = 551			
	Frequency N	Missing	Mean	Ranking
Burnt Bricks	524 (95.1%)	27 (4.9%)	2.58	2 nd
Mud	523 (94.9%)	28 (5.1%)	2.37	4 th
CSLB	522 (94.7%)	29 (5.3%)	2.41	3 rd
Sandcrete Block	525 (95.3%)	26 (4.7%)	2.86	1 st

4. HYPOTHESIS TESTING

Inferential statistics was used to test the hypothesis of whether there is a significant relationship between socio-economic status (SES) and selection of walling material for affordable housing. The hypothesis is stated in the null and alternative hypothesis below:

H₀₁: There is no significant relationship between SES and choice of walling material for affordable housing.

H₁: There is a significant relationship between SES and choice of walling material for affordable housing.

A chi square test of independence was performed to examine the relationship between income and walling material selection. The data showed that there is a significant relationship between the income of respondents and selection of different walling materials. The significant relationship as shown in Table 5 is in the following order: mudwall, X² (2, N = 519) = 536.23, p < .001; burnt bricks, X² (2, N = 519) = 181.75, p < .001; CSLB, X² (2, N = 519) = 278.99, p < .001; sandcrete block, X² (2, N = 519) = 536.23, p < .001. Therefore, the null hypothesis (H₀) is rejected and the alternate hypothesis (H₁) that there is a significant relationship between SES and choice of walling material for affordable housing is accepted.

Table 5 Cross tabulation of relationship between income and selection of walling materials

	N	Mean	Std. Deviation	Pearson Chi-Square	df	Asymp. Sig.
Burntbricks	519	6.97	22.41	181.75	2	.000
Mudwall	519	7.36	23.91	536.23	2	.000
CSLB	519	6.18	20.46	278.99	2	.000
Sandcrete	519	5.45	18.75	324.43	2	.000

5. CONCLUSION

The study aimed at determining whether there is a significant relationship between SES and choice of walling materials in selected local government areas in three States in southwest Nigeria. The study identified a high aspiration for home ownership amongst the respondents. Sandcrete blocks was identified as the most preferred walling materials followed by burnt bricks, CSLBs and mud. The preference of sandcrete block is contrary to the cost implications

of the walling materials, which shows that mud is the cheapest, followed by burnt bricks, sandcrete blocks and CSLBs. It suggests that while respondents have a high aspiration for home ownership, a cheaper cost implication does not translate to preference for selection of walling materials. Thus, other factors not investigated in this study could be responsible for the choices that households make with respect to walling material selection. The study ultimately finds a significant relationship between SES and choice of walling material for affordable housing in southwest Nigeria. Generalization of the results of the study is limited because it only focused on a selected random sample in southwest Nigeria.

The study recommended the following:

- Since the walling material component of a building envelope is substantial with effects on overall cost, building professionals and households must take cognizance of SES while specifying walling materials.
- Formulation of housing policy in Nigeria must be responsive to the SES of households towards making housing affordable particularly for the low-income earners.
- Awareness campaigns through prototype construction of buildings using the cheaper walling materials should be intensified with a bid to increase acceptance and use.

Further study to be carried out on the subject in other regions of the country for better understanding of the phenomenon.

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