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Public Acceptability of Burnt Brick for Mass Housing Projects in Ilorin, Nigeria

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Abstract

Mass housing programmes have not yielded much in Nigeria due to high cost of provision arising from utilization of conventional building materials; thus, people have continued to live in substandard, overcrowded and dilapidated houses which have socio-psychological effects on the well-being of residents. This paper therefore, conducted an opinion survey based on the experience of developed countries of the world such as America and Brazil by assessing People's perception on the utilisation of Burnt brick for Mass housing projects. The study uses Ilorin, the seat of one of the Federal Universities in Nigeria where Housing problem is pronounced as a case study. Multistage random sampling was used in selecting 216 respondents from the three senatorial districts in the city, while questionnaire forms the basic instrument for data collection. The data collected were analyzed using Frequency counts, Percentage and Chi-square.

The paper found out that 81.2% of the respondents have knowledge of the material, out of which 73.3% are willing to utilise it. However, reasons for willingness to utilise the material include quality (53.3%), cost effectiveness (52.1%), availability (58.5%), income (13.6%) and recommendation (4.4%), while chi-square test of perception shows that, People's perception on the utilisation of the material does not differ at 0.05 level of significance. The paper concludes based on the findings above, that in order to achieve sustainable housing provision in Nigeria, the material should be incorporated into housing policies and programs which should not be at the exclusive preserve of Federal Government and at the exclusion of State and Local governments.

***Key** words: Mass housing projects, Conventional building material, Burnt brick, incorporation, Sustainable housing provision.*

Introduction

In spite of the well established technology advancement and wide application range of burnt brick in the building industry, it has not really found favour in housing programmes taken up in Nigeria either in the public or in the private sector level (Isaac and Manasseh, 2008); the constraints are mainly due to acceptability of the material in view of the bias and stigma attached to it, otherwise considered to be the material which is for use by only the poor man. Other constraints are: lack of institutional arrangement for market availability of the material as is normally available for sandcrete blocks through block industries and suppliers, lack of support through Codal provisions either in the National Building Codes or through the Public Works Department (PWD) codes and lack of references of material in most of the schedule of rates in the country as an alternative to sandcrete blocks and over-emphasizing use of materials like sandcrete blocks.

In many countries, the need for locally manufactured building materials can hardly be overemphasized because there is an imbalance between the demands for housing and expensive conventional building materials coupled with the depletion of traditional building materials. Thus, to address the situation, attention has been focused on low-cost alternative building materials and earth has been used as a construction material on every continent and in every age. It is one of the oldest building materials on the planet and it is thought that the first freestanding human dwellings may have been built of mud or wattle-and-daub. For example, about 10,000 years ago, the residents of Jericho were using oval, hand formed, sun dried bricks (adobes) and today, it is estimated that between a third and a half of the world's population lives in earthen dwellings. (Arayela, 2005)

Earth construction can take many forms including adobe, sod, rammed earth, straw-clay, and wattle-and-daub thus, in Nigeria, efforts should be made to reduce the cost of housing. Construction cost can be reduced through the use of Burnt brick, an indigenous building material (Dosumu, 2002 and Odunjo, 2006). Since public mass housing programmes in Nigeria have not yielded much due to high cost of houses, there is the need to achieve self-sufficiency in building materials which will ultimately lead to the improvement of housing and well-being of citizens. This paper therefore, assesses the perception of people on the utilisation of Burnt brick for Mass housing projects in Nigeria using Ilorin as a case study. Hindrances to the utilisation of the material were identified and suggestions were made towards solving the problem.

Literature Review

The phenomenal rise in the number and size of cities in Nigeria has, over the last few years resulted in several problems and urban crisis (Agbola, 2001 and Olotuah, 2005). Among the problems are acute shortage and high cost of dwelling units that have resulted in overcrowding and slum developments as well as, inadequacies in terms of quality and quantity of life - support systems such as water, electricity, medical facilities and infrastructure. Thus, urbanisation brings complex urban problems that serve as push factors for prospective developers into the peri-urban areas.

Urbanisation is not a new phenomenon in Nigeria as it dates back to the pre-colonial period. Available indices show that, in the country, urbanisation has continued unabated without commensurate physical planning on housing provision and economic development, which inevitably resulted into urban poverty (Salau and Onibokun, 1990).

The most critical evidence of urban poverty however, is the problem of housing (Arayela, 2000; Omojinmi, 2000 and Adedeji, 2007). Rapid deterioration of urban housing and living conditions are often, the most visible and obvious consequences of urbanisation in the developing countries (Lewis, 1981). This is traceable to the fact that, urbanisation leads to explosive population growth, occasioned by phenomenal leap in the quantitative housing needs of the populace. These housing needs are not matched by effective demand, since majority of the populace do not have the wherewithal for adequate housing. Thus, a large number of urban residents are indeed poor and constrained to limited, insufficient, crowded, cold and dirty shelter (Gailbrath, 1968). Ogunpola and Ojo (1975) argued that housing is a good indicator of poverty.

Studies have shown the deplorable condition of housing in Nigeria (Jagun, 1983 and Olotuah, 2000). Jagun (1983) observed that, 75% of the dwelling units in Nigeria are substandard and sited in slums. Olotuah (2000) showed that the quantitative housing needs of Nigerians have never been met and that the problem was aggravating over time. He further argued that the estimated combined inputs of the private and public sectors in Nigeria since the Third National Development Plan of 1975, required producing at least 100, 000 dwelling units annually, but the provision of housing has been a far cry from this, which explains the gross deficiency in housing (Olotuah, 2005).

The problem of housing in the urban centers is due to lack of finance which is basic to any development. Of all the problems of development in the country, the problem of finance is very critical and decisive (Ozurumba, 2011). The best programmes of any government no matter how grand and viable in scope and content had always remained a day dream because, there is insufficient capital to concretize it. Despite various pronouncements, regulations, deregulations and all financial implementation policies of the country, the problem of accessing fund for an effective housing delivery system had remained perpetually unsolved.

Methodology of Research

The Study Area

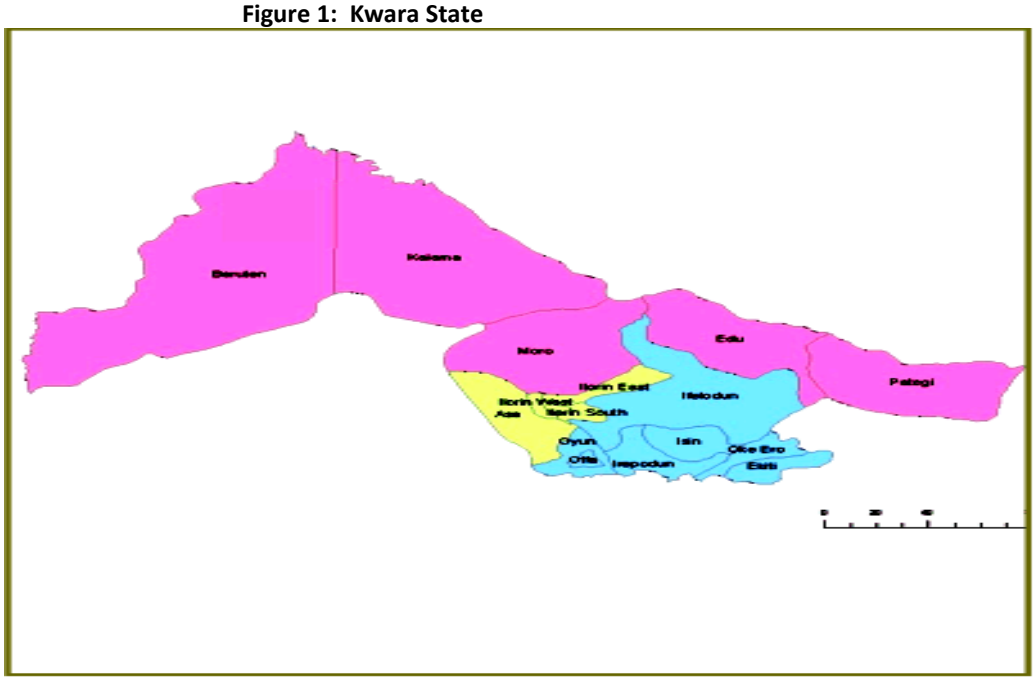
Ilorin is the capital of Kwara state, one of the thirty-six states in the country and located in the north central region (Figure 1). It has a growing population of over 2 million spread across the three senatorial districts and located on longitude 8 ^{o} 24' north of the Greenwich meridian and latitude 4 10'E north of the equator (Figure 2). It has an area of about 100KM2 (Kwara State Diary, 1997).

The city is situated at a strategic point between the densely populated southwestern and the sparsely populated middle belt of Nigeria, as well as in the traditional zone between the deciduous woodland of the south and dry savanna of north of Nigeria (Jimoh, 2003). Ilorin was founded by a Yoruba man in 1450. It later became a provincial military headquarter of the ancient Oyo empire and northern Nigeria protectorate when Shehu Alimi (descendant of Shehu Usman Dan-Fodio dynasty) took control of the city through the spread of Islamic religion.

Ilorin has a tropical savanna climate with dry winter. Thus, it is covered by grassland and forests and experiences a fairly high temperature. The mean annual temperature is about 31-25 degree, it also experiences moderate annual rainfall of about 1,156mm. The climate of Ilorin is characterized by both wet and dry seasons. The temperature of Ilorin ranges from 33oC to 34^{0}C from November to January; while from February to April, the value ranges between 34^{0}C and 53^{0}C (Ilorin Atlas, 1982). The mean monthly temperature is very high varying from 25^{0}C to 28.9^{0}C. The diurnal range of temperature is also high in the area.

The rainfall in Ilorin city exhibits greater variability both temporarily and spatially (Ajadi, 1996). The total annual rainfall in the area is about 1,200mm (Olaniran, 2002). The diurnal range of moderate rain in the area shows clear night time rainfall (Olaniran, 1988). Relative humidity at Ilorin in the wet season is between 75 to 80%, while in the dry season, it is about 65% (Tinuoye, 1990). The day time is sunny. The sun shines brightly for about 6.5 to 7.7 hours daily from November to May (Olaniran, 1982).

Figure 1: Kwara State



Source: Surveyor General Office, Kwara State (2014)

Figure 2: Ilorin in the context of Kwara State

Source: Nokia @ 2012 yahoo.org

Method of Data collection

Multistage random sampling was used for the study and two major types of data were utilized. Primary data were collected through questionnaire and field observation. The questionnaires were administered on the users, house owners and potential house owners in order to obtain information on the level of awareness of the building material, the underlying factors of utilization as well as the perception of people on the utilisation of the material. In order to test the perception of people on the utilisation of the material, a hypothesis was put forward which states that:

H_1= People's perception differ on the utilization of Burnt brick for Mass housing project in Ilorin.

H_o = People's perception does not differ on the utilization of Burnt brick for Mass housing project in Ilorin.

Both open and close ended questions were used. However, the city is composed of three local government areas namely: Ilorin south, Ilorin west and Ilorin east. In each local government area, four wards comprising the three residential zones of high, medium and low densities were randomly selected, making a total of 12 wards selected for the study. 18 questionnaires were randomly administered in each residential density thereby, making a total of 216 questionnaires administered to the residents. Data was processed using the Statistical Package for the Social Science, while the data obtained were analysed with frequency counts, percentages and chi – square used to test the perception of people on the utilisation of the building material.

Findings and Discussions

Out of 216 questionnaires administered to the residents a total of 200 questionnaires were retrieved back representing 93% and this is considered to be valid for assessing the situation under study

A. Socio-economic characteristics of Respondents

2% of the respondents were below 18 years of age, 41% were between 18 and 45 years, while 46 - 60 years of age accounted for 35.5 %, with 60 years and above being 21.5%. However, 45.5% of the respondents were male, while 54.5% were female. 41.0% of the respondents were Christians, 57.5% were Muslims, while those who practiced traditional religion were 1.5%.

Further analysis shows that 9.5% of the respondents were single, while 61.5% were married. Divorced and widow/widowers were 12.5% and 16.5% respectively. 6% of the respondents were not educated, 14.5% had primary education, while secondary school certificate holders accounted for 16%, OND/NCE were 25%, while 1st/ HND/ Postgraduate degree were 38.5%. 4% of the respondents were unemployed, 2% were Apprentice, while Artisan and civil servant were 17.5% and 26% respectively. Building professionals constituted 5.5%., businessmen/women accounted for 29%, while the retiree were 16%. 19% of the respondents earn below #10,000 monthly, 32.5% earned between #10,000 and #20,000. while 29.5% of the respondents earned between #20,001 and #40,000. Also, 10% earned #40,001- #60,000, while 9% earned above #60,000 monthly

B. Perception of People on utilisation of Burnt brick for Housing

184 (81.2%) of the respondents have knowledge of the material, while 32 (14.8%) are not knowledgeable about it. The implication is that, Burnt bricks is generally known by majority of people in the society, while those that do not know it may be young in age and probably, have not seen houses constructed with burnt brick before, since conventional building materials are the materials in vogue.

Out of the respondents that have knowledge of the material, 143 (73.3%) respondents are willing to adopt the material, while 52 (26.7%) do not wish to utilise it for building construction. However, 98 respondents (53.3%) are willing to utilise based on quality. In other words, the quality of the material determines its usage. 18 (9.8%) respondents will utilise based on cost effectiveness, 35 (19.0%) on availability, 25 (13.6%) income and 8 (4.4%) respondents based on recommendation as shown in Table 1.

Table 1: Underlying factors of utilisation of Burnt brick in Nigeria

S/N	Criteria for utilization	Frequency (N)	Percentage (%)
1.	High quality	98	53.3
2.	Cost effectiveness	113	52.1
3.	Availability	126	58.5
4.	Level of income	25	13.6
5.	Recommendation	8	4.4
	Total	**184**	**100.0**

Source: Authors' field survey (2015).

Plate 1: Gate house made with Burnt brick

Source: Authors' field survey (2015)

Plate 2: Houses constructed with Burnt brick

Source: Authors' field survey (2015)

Plate 3: Modern UK Estate constructed with Burnt brick

Source: Authors' field survey (2015)

Plate 4: Berlin Housing Estate, Germany

Source: Authors' field survey (2015)

When the hypothesis was subjected to chi-square test, analysis shows that, People's perception does not differ on the utilization of the material for mass housing project for the reduction of housing cost in the city. The calculated value was 17.4, while the Tabled value was 32.7 at 0.05 level of significance. Since the Table value of 32.7 is higher than the calculated value of 17.4 at 0.05 alpha level, thus, H_i is rejected and H_o is accepted.

Table 2: Chi-square test of the Perception of the Residents of Ilorin on the utilisation of Burnt bricks for Mass housing projects

Attributes	X^2 value	Degree of freedom	Level of significance
Chi-square test	17.4	21	0.689
Likelihood ratio	21.2	21	0.445
No of valid cases	185		

Source: Authors' field survey (2015)

Therefore, people's perception on the utilisation of Burnt brick does not differ. This implies that, people have the same perception on the utilisation of the material and are ready to adopt the material for housing construction. The problems adduced to the usage of the material according to Okunola (1998) however, are:

1. **Acceptability:** The general observation in Nigeria is that the use of the material is yet to be fully accepted and adopted especially in the urban areas. Acceptability measures the ease at which Nigerians accept houses constructed with burnt brick regardless of the status. There is the psychological feeling that a building made with the material is a "poor man's building" whereas, in Brazil, cities wear a red look because of the predominance of burnt brick used in construction.

2. Reluctance of Professionals: The lack of such standards as published by the Standards Organization of Nigeria are used as an excuse by the professionals to continue with the existing conventional materials because, this is easy and convenient as well as, enhance high professional fee that is charged on a project compared with when the building material is used in construction. In this respect, it is suggested that, standards should be formulated for the use of the material by the various international and African agencies on housing matters. Also, there should be agreement on specifications, testing and construction methods as well as the need to identify raw materials and lastly, a suitable technology for mass production of the material should be developed.

3. Lack of Innovation: Two factors are combined to make the process of innovation slower than in other production sectors. First, the bulk of the industry operates through small scale sector which has little capacity in terms of capital or skill to invest in innovation. The second factor contributing to lack of innovation has been the several lack of orientation of Building Institutes to devote their limited resources to the development of technologies responding to the specific needs of the basic building materials industry operating in small scale sector. The labour force in the small scale sectors is obtained by the use of friends, neighbours, relatives and in – law (micro – scale enterprise) when compared with, large scale mechanized and sometimes automated plants producing cement.

4 Lack of Masonry: Experienced mansion are not available for the laying of the material as most labour are not trained towards making use of it and therefore, this factor can pose serious problem.

3.0 Conclusion

This paper has shown that people have knowledge of Burnt brick building material in Nigeria and are willing to utilise it for mass housing projects. This is because the material has high quality, readily available and is cost effective; therefore, it could be used to achieve sustainable housing for all in terms of quality and quantity.

In order to increase housing stock in Nigeria, there is the need to incorporate the material into the formulation and implementation of housing policies and programs. This should be done at all levels of government that is, Federal, State and Local governments. Thus, there is a need now, for the Federal government to reach out and effectively involve the people and governments at grassroots levels in the formulation of housing policies.

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