

Factors Accountable for High Cost of Building Materials for Housing Development in Nigeria: A Review Paper

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Abstract:- Housing development may be a key think about the sustainable development of a nation and a basic human need. Developing nations are continuously challenged with problems with inadequate housing. While artifact cost is subject to demand and provide, it's also laid low with many other factors. It has been established that increase within the price of building materials has multiple effects on development. this can be a review paper aimed toward identifying and assessing factors chargeable for high cost of building materials and their influences on development in Nigeria. Through literature exploration and an in-depth review, the study identified three major categories of things answerable for high costs of building materials namely; economic-related factors; building production-related factors; and stakeholder related factors. This research study recommends, among other issues, to prioritize client involvement during the planning stages because the client bears the burden of financing the project and includes a better understanding when it involves material selection. It should be ensured that the projects are completed within the budgeted costs to avoid fluctuations within the construction costs which may be a major setback within the Nigerian industry.

Keywords:- High Cost, Building Materials, Housing Development, Nigeria.

I. INTRODUCTION

The provision of housing as a basic human needs is considered as a bedrock for sustainable development of any nation. Inadequate housing is one of the major challenges affecting sustainable development o must developing nations including Nigeria (Du Plessis, 2002).

Globally, the demand for housing continues to escalate considering the rapid increase of human population (Wood, 2007). According to Ganiyu (2016), the provision of sustainable buildings has impacted far above just reducing the negative impact of building on public health. Thus it is absolutely necessary for building to be cost-effective, tends

to enhances occupant efficiency and directed towards improving community development.

Generally, cost is a key determinants factor that plays a significant roles in sustainable building and housing development (Kunzlik, 2003; Meryman, 2004). Whereas building materials accounts for up to 50% or more of the overall cost of executing building construction projects (Agapiou et al., 1998). While artefact cost is subject to demand and provide, it's also stricken by many other factors, including quality, quantity, time, place, buyer and seller.

Nevertheless, there are quite a number of other factors tht affects the value of building materials which include currency exchange, material specification, inflation pressure and availability of latest materials within the country (Elinwa, 1993). Likewise, the overall cost of building projects is highly predisposed by a lot of other factors such as improper material handling and management on-site during construction production processes, all of which impact the time and quality of the project (Elinwa, 1993)

For this reason, building construction material management has been causing serious challenges to contractors and building projects clients (Linden & Josephson, 2013). Therefor the need for effective and reliable building construction materials management to ensure efficient control of materials as well as controlling productivity and price (Kasim et al., 2005). Similarly, Solanke (2015) recommended the adoption and implementation of fabric tactics which assist towards orderliness and avoids material wastages on construction sites.

Challenges caused by high cost of building material affects the construction business activities, the professional with the industry as well as those people aspiring to own houses (Mekson, 2008). In addition, the ceaseless demand for housing and the inflation continue to affects the price of building materials in the construction industry (Eshofonie, 2008). These problem of high cost of building materials is believed to be one of the major factors affecting sustainable

housing development since building materials play a vital role in building construction processes within the industry. Similarly, Jagboro and Owoeye (2004) also argued that there are evidences of multiplier effects of high building material price of housing development generally. In the long run, these have been affecting client's confidence on professional consultants, likewise as added asset risks, the shortcoming of developers to deliver affordable housing and loss of investment within the industry.

In order to ensure development of sustainable housing on budgeted cost, with specifies time and quality, with due consideration to satisfaction clients and stakeholders' interest and above all cost effective building materials is an absolute necessity. Consequently, this paper is geared toward identifying and assessing factors chargeable for the high cost of building materials on development.

II. LITERATURE REVIEW

Building materials been the components put together to erecting a building projects or constructed structures which obviously no field of engineering is conceivable with their use. Since time immemorial, building or construction materials have been playing a significant roles in construction business activities been the major function of the construction industry (Akanni, 2006). Building materials accounts for the quality as well as cost of the housing development, this is reflected in materials used right from foundation through the building structure to the roof level and finishes consequently. It has become imperative that building materials be managed appropriately to avoid materials wastages, maintain budgeted cost and specified quality. As rightly mention by Asif et al. (2010), sustainability means the possibility to fulfil the present need without denying the future value of life mainly due to extreme usage of environmental resources, societal influences, and economic loss in a region. In order to make adequate provision of housing to meet the housing demand, the construction development ought to both affordable and sustainable thus making smart usage of sustainable building materials. The basic or foundational criterion for carrying out any development is that, the final product ought to be functional and economically cost effective, and as well readily available within the shortest possible time (Ihuah, 2015).

On the other hand the ceaseless increase in the price of building materials is anticipated to counter affects this since the value of building materials usually influences the demand greater than the supply, this causes the abandonment of some development projects before practical completion (Ihuah, 2015). Therefore, achieving sustainable buildings highly relies on choosing or selection of the stakeholders mainly for the development process, these stakeholders may include: clients/owners, managers, designers, and firms, as an example (Akadir, 2011). The steps involve towards sustainable application mainly relies on notice, knowledge as well as the actual understanding of the implications of individual action (Braganca et al., 2007). Part of these is the environmentally friendly means of

selecting suitable building materials. The building material selection process ought to be a fancy process which is highly influenced and determined by quite a number of requirements, choices and deliberations (Wastiels & Wouters, 2009).

Also the building sustainability is directly linked with the extent of construction materials selection, thus the choice of appropriate building materials has a strong influence on the overall life cycle of the building (Treloar et al., 2001). Overcoming the construction development challenges entails a wide approach to the housing provision which obviously seems not feasible or to be only affordable but equally reduce the high costs to both this and future users. These necessitate the need to explore and assess the influences of the price of building materials towards housing development, which this paper intends to realize through extensive literature review. Therefore, subsequent sub-sections present various categories and sub-categories of things answerable for the price of building materials.

III. FACTORS RESPONSIBLE FOR HIGH-COST BUILDING MATERIALS

According to Akanni et al., (2014), the high cost of building materials has caused a formidable challenge to the construction business activities and the construction industry at large. Similarly, Windapo and Cattell (2013) concurred with this assertion claiming that must of the challenges faced by building construction contractors and the issues of construction projects performance in Nigeria is primarily the increasing cost of building materials. There the instability contributes immensely towards high cost of building materials and transfers a major risk to all parties involved: suppliers, contractors, and clients. Ughamadu (1993) also asserted that local currency devaluation was a factor surging the cost of building materials up.

Many factors that contribute to the high cost of building materials were identified by Jagboro and Owoeye (2004), these include change in government policies and legislations, scarcity of raw building materials, fluctuation within the cost of fuel and power supplies, inadequate infrastructural facilities, unfortunate corruption, fluctuation within the cost of plant and labor, and seasonal changes – as being factors liable for the escalating cost of building materials. In addition quite a lot of other factors that affects the cost of building materials by other researchers are fluctuation within the cost of transportation and distribution, political interference, local taxes and charges, fluctuation of the value of raw materials, cost of finance, inflation, and fluctuation within the rate. Moreover, Oladipo and Oni (2012) analyzed some macro-economic indicators impacting the value of building materials, which include the following: the rate of local currency to other currencies globally, rate and therefore the charge per unit charged on loans. Factors liable for high costs of building materials fall under three (3) categories: economic-related factors; building production-related factors; and stakeholder related factors.

A. Economic Related Factors

➤ Exchange Rates:

The rate of exchange is that the amount that one currency is exchanged for an additional currency, employed in determining the strength of 1 currency against another (Windapo & Cattell, 2012). The ratio to which artifact costs are full of exchange rates depends on the sort and quantity of fabric being imported by a rustic at a selected time, the necessity to import the raw materials employed in the assembly of building materials locally, and on whether or not local materials (such as copper, timber, and steel) are internationally traded commodities (Windapo & Cattell, 2012). Oladapo and Oni (2012) suggested that the introduction of the interchange market has had a negative impact on the costs of building materials.

➤ Inflation:

According to Adamu (2013), inflation refers to the increase in the general economic index generally. Therefore inflation can be defined as the means of knowing how the way value of products and services rise over time (Fichtner, 2011). The other factor that delays a project will further expose the project to the danger of inflationary cost increases. Similarly, Windapo and Cattell (2012) further asserts that there's a quantity between increases in inflation before leading to an actual increase within the cost of building materials. Thanks to the character of the method and also the rate of return for work undertaken on construction projects, the results of inflation can mean loss of profit to contractors and better cost to project owners.

➤ Interest Rate:

Due to high-interest rates in addition to irregularities within the exchange market the issues of depletion of the country's exchange resources has been posing serious challenges, harshly affecting the industry with import dependence of about 60% of its raw materials (Jagboro & Owoye, 2004). However, Oladapo (1992) posited that all over the region and across countries construction firms and a lot of other profitable land projects and housing developers have become either stranded, abandoned halfway or put on hold mainly due to the scarcity of capital been affected by high-interest rates.

➤ Fluctuation within the price of building materials:

The studies of Rahman et al. (2013) revealed that fluctuation within the price of building materials was ranked as a significant factor of cost. Frimpong et al. (2003) revealed price fluctuation because the foremost severe reason for project cost escalation. Zewdu et al. (2015) conducted a study to identify the factors causing cost in Ethiopia, finding revealed that the foremost reason for cost was fluctuations within the price of building materials, a fluctuation because of the limitation within the charge per unit which successively affects artefact cost and thus the final cost level.

➤ Inadequate production of raw material:

Ogunlana, Krit and Vithool (1996) stated that the reason for the scarcity of building materials may likely be the ineffective supply of materials caused by the general

scarcity within the construction industry, poor communication amidst sites and head office, poor purchasing planning, and poor material coordination. Likewise, scarcity of construction materials may also be a result of high construction development activities, thus if cost of building materials is not predicted and integrated into the estimated cost of the project there is tendency that the cost of these materials may increase (EU Framework 1998). Ensuring the timely flow of fabrics is an indispensable responsibility of material management, as unavailability of fabric will likely lead to delays and additional expenses (Rajaprabha et al., 2016).

➤ Supply and demand for building materials:

According to Oladipo & Oni (2012), the nature of the market, the demand and supply for materials generally will determine the value or worth of building materials.

Similarly, Windapo and Cattell (2012) stated that the continuous demand for housing development coupled with the scarcity of building materials will continue to increase the tendencies for the worth or values of building materials and as well the law of supply and demand is additionally related. Again, Windapo and Cattell (2012) acknowledged that the high cost of building materials is usually linked with market condition within which they are produced or manufactured. For instance, some researchers noted building materials cost will tend to be on a high side so long as they are produced by one or two manufacturers only when compared with market condition where a quite a number of manufacturers produce building materials. A prerequisite to ensuring cost-effective building construction projects is to ensuring prompt delivery of building materials on construction site (Mohan et al., 2002). Delaying the delivery of materials on site has been considered as one of the causal factors of cost overruns of construction projects generally especially in developing countries Nigeria inclusive.

B. Building Production Related Factors

➤ Site Related factors:

Considering the nature of construction business activities, site works which involve the use of materials lead to generation of huge waste which has become a issues of serious concern to construction stakeholders. In reality waste generated on construction site affects the site activities which ultimately lead to delay and cost overruns thereby affecting the overall productivity and sustainability aspects (Nagapan et al., 2012).

It has also been established that, waste generated from building materials constitutes the greater portion of the waste generated on construction site, this is obviously related to the use of un-reusable building materials, leftovers, and debris. Regrettably, the material waste on construction site amount to 9% of the burden of materials purchased. Therefore it can be well understood that mismanagement of building materials during construction could lead to high cost of construction, in contrast efficient resource management especially effective material management on construction site could lead to significant

cost savings (Rajaprabha et al., 2016).causative factor of cost overruns in construction projects, particularly in developing countries.

Other such as Windapo & Cattell, (201) opined that the rapid increase in materials of construction is directly linked with the cost of transportation. Whereas Eshofonie (2008) noted that increase in fuel price will definitely affects the transportation costs, thus it is observe that building materials manufacturers increase the value of building materials to hide the fuel increase when distributing the finished products from factory to suppliers and end-users.

➤ *Human Factors:*

Basically, there are three major resources that are related to construction business activities, these include construction materials, machinery, and human or man power. Man power poses more challenges than construction materials and machinery. The studies of Windapo and Cattell (2012) which focused on benchmarking the respondent's perceptions against actual factors which that tends to affects future artifacts prices. Major finding from this study revealed that, labour cost perfectly correlate with the prices of building materials, and that of transportation cost. It has also been found that poor communication between management staff and labour could possibly affects the morale of the labourers, which ultimately decrease the production output and increase project cost (Eshofonie, 2008). Similarly, Nawawi et al., (2012) posited that communication management ought to be considered as a key factor for enhancing human resource management within the construction industry. There are other reseraches conducted that further explore factors that influences construction labour efficiencies. Some of these past studies, reported that scarcity of building construction materials especially delay in delivering materials on construction site is one of the factors that affects labour productivity thus significantly giving rise to the value of construction over budgeted costs. A study conducted by Adebawale and Ayodeji (2015) reported an emperical evidences on delay and insufficient wages for labour as the most significant variables affecting the efficiency of construction labour productivity which ultimately lead to rework, as well as poor overall construction performance (Ameh & Osegbo, 2011).

➤ *Design Related Factors:*

Generally, the performance of construction projects is obviously influenced by design changes (Olawale & Sun, 2010). Changes in design refers to those changes that impacts on the processes or methods to be followed in excuting work contrary to what was originally planned, budgetted, or scheduled. Moreover, based on the previous literature researchers have argued that changes in design do frequently occur within the stages of construction projects due to ample reasons from diverse sources – with significant impact. Similarly, Ameh and Osegbo (2011) posited that the non- challenge behaviour of designers to queries (clarity, complexity, and drawing errors) and

inadequacies of knowledge for production means design challenges on construction projects.

Moreover, Oyedele and Tham (2006) further stated that there is need for effective communication amongst the memembers of design team. This supposed to be simple, cerain, brief, and complete all through the aspect of the work. In the same vein, design team related matters such as team building, teamwork, team organization, and team experience are frequently acknowledged as essential factors for project performance. Hence, the dearth of serious consideration for these matters within the design phase may extend the project duration resulting in time and price overruns (Oyedele & Tham, 2006). the look change is connected to additional work, because of the absence of comprehensive briefing on the economical, functional and technical requirements of the project by the clients (Mansfield et al., 1994). Olawale & Sun, (2010) emphasized that style change orders leading to additional work can account for the maximum amount as 50% of project cost – quite substantial! Furthermore, additional work may be a significant factor contributing to cost increases and schedule delays in construction projects. Wrong methods of estimation is ascribed to a scarcity of satisfactory experience of quantity surveyors (Mansfield et al., 1994). Arguably, of these factors impinge significantly on the value of materials.

C. *Stakeholder Related Factors*

➤ *Supplier Default:*

According to Manavazhi and Adhikari (2002) factors that were found responsible for supplier default are mainly due to the control of market monopoly by suppliers by keeping the value high and restricting the output, showing little or no awareness of the wants of the purchasers. Their findings further revealed that, reson owing to high demand for some buiding mateirials causes some suppliers to double their orders thus causing problems related to importing raw materials further as increased exchange rates.

➤ *Improper Planning:*

Literature from previous studies showed that improper planning is of the core factors that influences or affects the value of building construction materials. This neccessitate the need for construction contractors to properly plan and utilize all resources in the most effective ways. Project management knowledge requirement recommend for proper planning and scheduling for effective resources utilization, thus the reverse, inadequate planning, will increase the project cost (Eshofonie, 2008), suggesting that where no effective contractor is scheduling and planning on-site, these factors are chargeable for construction project delays.

➤ *Delay in Supply of Building Materials:*

Prompt delivery of construction materials on site as at when needed is extremely important. In line with this assertion, Ramanathan et al. (2012) claimed that there are quite a number of some projects that are affected by project delay mainly due to delay in the delivery of construction materials on site Unavailability of building

materials at the specified time on-site during construction frequently ends up in production materials deterioration and wastages, time wastage, low labor productivity, and cost overruns (Solanke, 2015). Mean while, an effective materials resource management suppose to be given a special priority during construction and for this, identification of materials should be made before the time of using the materials on site. this is often a vital step in avoiding the late delivery of materials (Rahman et al., 2012).

➤ *Client Contribution to Design Changes:*

While a change during a project's design can arise for any number of reasons, Ogunlana et al. (1996) reported that amongst the project stakeholders client are responsible for these type of changes mainly due to the following reasons: Reasons may be for marketing purposes or thanks to an economic situation to fulfill customer demands. Also, adjustment or change might occur as a results of newly-emerging concepts perceived by the client for the project to attain anticipated functional requirements. Alsuliman et al. (2012), further confirmed that clients initiate most of the changes in building design which are likely to increase the delivery of projects at construction costs over budgeted cost. Arguably, changes ordered by clients will bear a consequence on the amount of construction activities and increase the development materials cost. Several other studies have also shown that style changes are primarily caused by clients (Memon et al., 2014).

IV. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

This is a review paper geared toward identifying and assessing factors liable for the high cost of building materials on development. Through literature exploration and an in-depth review, the study identified three major categories of things liable for high costs of building materials namely; economic-related factors; building production-related factors; and stakeholder related factors.

The factors that are accountable for the high cost of building materials during a production process, if effectively considered by stakeholders during the assembly process, will improve delivery of a project at construction budgeted costs satisfactory to the client. The High cost of building materials has been narrowed right down to the economic instability of this country. This encompasses a significant impact because of inflation and exchange rates that leads to a high cost of raw materials, forcing the manufacturers to extend the value of building materials when produced. to supply lasting solutions, and convey about steady artifact prices and avoid circumstances of constant price increases, the govt should assemble a artifact monitoring committee that may bring innovations in construction methods and materials research. Quarterly material research will help control the continual increases in artifact prices. the govt should support and encourage the conducting of innovative research within the development of latest local building materials for production; this may reduce the reliance on expensive imported materials.

Wastages of building materials by workers could be a site related factor answerable for escalating costs of building materials. This might be a results of the shortage of communication between the involved stakeholders and site workers and lack of fabric management. Construction stakeholders are required to include practical knowledge acquired within the industry and intelligent management skills to effectively communicate about the project with site workers. Additionally, effective material procurement management is required to avoid wastage of building materials during the building production process. Moreover, timely delivery of building materials to a site enables the effective usage of materials during construction and reduces material wastages during production processes. The value of transportation and distribution of labor is that the human-related factors answerable for a rise within the cost of building materials. These are enormous challenges within the industry and need necessary measures to cut back waste.

The government should also take drastic measures to counter the matter of transportation costs, cost of power supply, and increase within the fuel prices, to enhance simple movement and distribution of raw materials to the factory likewise as distribution of the finished products from the factory to the end-user. Therefore, it's recommended for proficiency and effective distribution of the finished products from factory to suppliers and end-users, that the Nigerian government develop long-lasting highways for the transportation of products and services which include building materials.

This research study recommends, among other issues, to prioritize client involvement during the planning stages because the client bears the burden of financing the project and features a better understanding when it involves material selection. It should be ensured that the projects are completed within the budgeted costs to avoid fluctuations within the construction costs which may be a major setback within the Nigerian housing industry.

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