



Effect of Building Materials Cost on Housing Delivery in Port Harcourt

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ABSTRACT

The study was aimed at investigating the effect of rising cost of building materials on construction industry in Port Harcourt. The study has three specific objectives and three research questions. The two variables of study are cost of building materials and housing delivery. Housing delivery depended on the cost of building materials. The area studied was Port Harcourt. The study was survey study mean that it sourced its data from primary sources through the use of structured questionnaire. The population of study was made up of 1125 participants (respondents), while the accessible sample size was 316 derived through the use of al-Sedairy method. A total of 316 questionnaires were distributed to respondents. The distribution was based on the population of each representatives, of the total number retrieved according to the respondents designate was 175 representing 55.38percent. The researcher adopter the use of simple mean and standard deviation to the extent to which the respondents responded a mean value of 3.90-4.90 was regarded as very high meaning that the respondents strongly agreed to the question as a cause of increase in price of building materials. The analyses showed that inflation, government policy, dual taxation, lack of capacity to produce were the key factors responsible for the incessant increase in prices. The study concluded that persistent increase in price will truncate government plan in providing shelter for the people. The study recommended that government should create enabling environment to encourage private sector participation in the production of building materials in other to make supply competitive.

Keywords: inflation. Dual taxation, government policy, rising price, building materials

1.1 INTRODUCTION

Existing literature affirmed that cost of building materials account for over 50% of the total cost of construction in the build industry in Nigeria. According to Ogunsemi (2010), the unprecedented rises in the cost of building material constrain the supply of housing in Nigeria. In the same vein Adedeji(2012) assert that escalating cost of building material should be should be accorded priority in the process estimating cost of building. According to Nega (2008), the ever increasing cost of building material had a negative impact on the quality of building, accounted for the incessant delay in the completion of building project. Consequently, housing and housing delivery is erratic and falling short of global standard. Nega(2008) also noted that contracted construction work between contractor and project sponsor often result into dispute arising from disparity between estimated and actual cost of construction. It is against this background that it becomes imperative to identify the causes of high cost of building materials and its impact on delivery of quality and affordable housing in Port Harcourt.

There is no gain saying that high cost of building materials slows down the rate of housing delivery and its timeliness in housing delivery. To minimize the cost of building, building professionals have proposed

methods of building, for instance, the use of non-conventional method of building in order to minimize cost of building and housing more affordable. Before accepting new method there is the need to consider some key factors such as sustainability of the alternative materials, appropriate initiative and cost of processing. The theory of sustainability has called for major attention in the construction industry over recent decades. The theory assert that before embarking on any construction project it is important to weigh construction cost against resource availability from the design stage to construction stage in order to ensure optimal utilization of building materials.

It is against this back drop the present study becomes imperative as a means to finding lasting solution to overcome a major problem in the building industry.

1.2 Statement of the Problem

The major veritable factor responsible for the mass exodus of people from one place to another is economic factor. People must survive and make ends meet, cities offer such opportunities, therefore, there is mass drift to the cities. Some of the antecedences from such movement are increase in demand for shelter, health care, job opportunities, schools and recreational facilities and so on. However, the observed trend is that supply of such facilities always fall short of its demand (ihuah,2015). Given this situation, builders in the building industry want to cease the opportunities to cash in enormous profits. There is high demand for building materials and building construction space far above what the market is capable of supplying. Consequently, cost of building and materials escalate. The situation is helpless especially in a private sector led economy in which the government lacks the capacity to the difference. The resultant outcome is general rise in prices of all commodities including that of building materials. For government to effectively regulate price of building material the cartel in production and supply must be broken, through the production or supply of the difference between what the market can supply and what the consumers are demanding. The problem is what is the participation capacity of the government? Available evidenced as posited by Ihuah,(2015) was that govern hardly participate in the production of building materials, worse still is the fact that there is no regulatory agent mandated to regulate rise of the price of building materials in any of the thirty six state in Nigeria especially Port Harcourt, this constrain limit the supply of residential houses in Port Harcourt Maguta, (2015) observed that the exceptionally high cost in the price of building materials severely reduce the number of residential building built per year by both private individuals and government.

As the threat to proper and low cost housing continue to deepen and the impasse is far from being resolved. What then are the possible options to checkmate the incessant rise in the prices of building materials? There is no gain saying that the frequent rise in the prices of building material in the above context necessitated the need to investigate its effect on residential housing estate development and other properties in Port Harcourt metropolis. Urmar(2017) observed that the building industry in Nigeria is characterized by low performance resulting from, high inflation rate, low working capital, barriers set by host communities, increasing cost of construction and the fragrant display of incompetency by self-acclaimed engineers. Most of these problems are yarning for attention from appropriate authorities at both state and federal levels in Nigeria. Most of them are currently ignored by those whose duty is to attend to them. The consequence of not tackling the problem has result into the ever increasing cost of building especially in Port Harcourt.

1.3Aims and objectives of the study

The study is aimed at examining the effect of rising cost of building materials on housing in Port Harcourt city. The specific objectives of the study are:

- (1) To identify the factors responsible for the rising cost of building materials in Port Harcourt city.
- (2) To examine how the factors affect cost of building in Port Harcourt city.

1.4 Research questions

- (1) What factors are responsible for the rising cost of building materials in Port Harcourt?
- (2) To what extent do these factors affect cost of construction in Port Harcourt?

1.5 Scope of the study

The study is limited in content scope to examining the effect of rising cost of building materials on housing in Port Harcourt city. The study is geographically limited to Port Harcourt city in Rivers state. The unit scope is limited to causes of rising cost of building materials.

1.6 Significance of the study

The study will offer us the opportunity to give an expository discussion on the factors that are responsible for the rising cost of building materials in Port Harcourt city. The outcome will give us an insight as to the extent each of the identified factor affect cost of building materials in Port Harcourt city. The outcome of this study will be of invaluable importance to prospective property developers. It will guide the government in fashioning out workable policy to either cushion the effect of such rise on property developer or invest in the production of some building materials.

Finally, future researcher will use the outcome as literature material for further studies.

2.0 Literature Review

Conceptual Review

2.1 The concept of building material

Building material are materials used for constructing building. It comprises of sand chippings/ stone, wood, nails, clay, ladder, plywood, doors, reinforcement, cement, sharp sand, blocks, soft sand etc. building and construction are the ore upon which infrastructural development of any nation rest. How much we build is a function of building material available and the quantity of it available. Moreover, the durability and quality of a building also depend on material and its quality. However, the quality and quantity of material used are functions of cost of building materials (Njoku,2007). Cost of building materials refers to the money cost of each building materials or cost of acquiring the materials and labor cost.

One obvious problem militating against the ability of the building industry in Nigeria from delivering quality and affordable housings and buildings is costs of building materials (Mekson, 2008). People find it difficult building houses because of cost of materials. The problem has become enigma in the building industry. In the past one or two proactive measure has been taken to address the escalating and uncontrollable rise in the cost of building materials. It was for these reasons the Nigeria Building and road research institute (NBRRI) was established in 1978. The institute was mandated to workout alternative source(s) of building materials that will be cost effective and serve as a perfect substitute to the escalating cost of building materials (Saba, 2018). It is important to note that NBRRI mandate was on how to develop quality and suitable building materials using mineral deposits and agro- industrial waste found in Nigeria at little or no cost.

The reason why so much concern has been expressed by building professional why so much concern have been expressed concerning the ever increasing cost of building materials especially in Port Harcourt metropolis. Far be it from exaggeration, there are number of abandoned building projects. According to Aluko, 2000) the high cost of building material has caused more than proportionate increase in rent passed on to would be tenants in the case of rentable building.

Aluko asserted that on average cost of building material increases at the rate of 133.33% annually in Nigeria far back 2000, presently the price has risen to 620% using selling price per bag of cement in 1990(#500) and #3600 in 2021 as indicators. Similarly, Achuenu and Ujene (2006) observed that price of building material is not uniform across Nigeria. They observed that cost of building material is relatively higher in both south East and South-South of Nigeria despite the huge mineral resources present in the region. They attributed this to nonexistence of manufacturing companies in the region to cover the mineral resources to finished goods. The development poses great threat people aspiring to own their own houses (Anosike,2009)

2.2 Factors affect cost of building materials

Building material is an invaluable input in the development of projects and in the delivery of construction projects, Jagboro and Owoeye (2004), while Idoro and Jolaiya (2010)observed that cost of building

material account for between 50% to 65% of any project cost and control over 70% of the project schedule. According to Ogunsanmi, Iyagba and Windapo(2004) if government to make proactive steps in addressing the increasing cost of building materials, the situation may result into acute shortage of housing for both low and middle income earners if not checked can degenerate into the low and middle income families being priced out of home ownership.

2.2.1 Reasons for the escalating cost of building materials In Rivers state

The cost of building material is affected by a number of factors such as: the demand and supply of the materials; the quality; quantity; time; place, and buyers and sellers during construction production; other factors are exchange rate of the naira to other major currencies; improper material handling at the construction site. The totality of this factor is responsible for increasing cost of building material.

2.2.2 Consequences of increased cost of building materials on building industry in Port Harcourt

Little or no literature exist on the effect of increased cost of building material on property development. It is against this background it becomes imperative to outline the effects of increasing cost of building materials on property ownership, and development. Hence the study to provide information on the effect of rising cost of building materials on property development Port Harcourt metropolis, the effects are:

(1) It will lead to increasing or fluctuating cost of building construction

Fluctuation in Cost of Construction

The incessant increase in the cost of building materials makes it difficult in maintaining stable cost estimate, which affects both the building sponsor(s) and project contractors. The implication of fluctuation in construction cost is overruns in cost. Most times contractors quote prices that are completely unrealistic due to fluctuation in price Ahmed, Faroogui and Azhar (2008). Project cost overrun often results into abandon project or project incompleteness (Jagboro and Owoeye, 2004).

(2) **Quality of workmanship is affected**

A number of building professional and scholars affirmed that the output of quality building and structures are good evidences that construction industry is developed Lan, Chan, Wrong (2007). According to construction industry developing boarding (2011) the quality of workmanship is assessed according to the lay down requirement of relevant standard in the construction industry.

According to Oladipo and Oni (2012) observed that continuous increase in the cost of building material account for the increasing cases of building collapse reported in some states, contractor resort to the use of substandard materials in a bid to avoid argument and loss of the job from the owner of the building.

(3) **Volume of Construction output affect**

Two major studies affirmed that Nigeria record low level of construction output compare to number of developed countries Fagbenie, Adeyemi and Adesanya(2004). Windapo et al (2012) blamed it on rapid increase in cost of building materials which has led to a number of middle and low income earners being priced out of the market for homes. In the same vein Anosike (2009) asserted that Nigeria has more than 17million housing deficit far back 2004,

(3) **Effect on the rate of employment**

Rate of employment is affected. The construction industry's workforce is extremely diverse and includes different types of individuals working within construction such as unskilled workers, skilled workers, craft, managerial roles, and administrative workers. According to research, maintaining and attracting the right people within the construction industry is a priority due to the scarcity of both skilled people and experienced managers. Ayodele and Alabi (2011) found that inflation in the costs of building material is killing the construction

RESEARCH METHODS

3.0 Method of data analyses

The study aimed at identifying and analyzing the implication of increase in the cost of building materials on building. The study will rely on the use of primary data sourced through structured questionnaire. However, prices of building materials for the period was sourced through

Table 3.1 showing changes in price level of building materials for the period 2021-2022.

3.1 Population of study

The respondents to this study will be drawn from the following groups Architects, builders, quantity surveyors, Engineers, contractors. See table 3.1 below

Table 3.1 showing the distribution of the population for the study

S/N	Respondents designate	Population
1	Architects	180
2	Builders	200
3	Quantity surveyors	165
4	Engineers	120
5	Contractors	210
6	Building material suppliers	250
	Total	1,125

Source: researchers field work,2022

3.2 Sample size Determination

We use Al-Sedairy (1994) formula for sample size determination defined as Sample size

$$n = n_1 / [1 + (n_1 / N)],$$

Where $n_1 = S^2/V^2$,

N= total estimated population;

V=standard error of the sample distribution=0.05

S= maximum standard deviation in population at a confidence level of 95%,

$$S^2 = (p) \times (1-p)$$

Note that p is the probability of success while 1-p is probability of failure

Therefore the estimated sample size for each of the estimate population will be S^2/V^2

Table 3.2 showing the distribution of population and sample size

S/N	Respondents designate	Population	Sample size
1	Architects	180	64
2	Builders	200	67
3	Quantity surveyors	165	62
4	Engineers	120	55
5	Contractors	210	68
6	Building material suppliers	250	71
	Total	1125	316

4.0 DATA PRESENTATION AND ANALYSES

4.1 data collection and processing (distribution and retrieval of distribution of questionnaires

Table 4.1 below shows the Analysis of the respondents' responses to the questions in the questionnaire made by property developers and building material dealers

Respondent	Total number of questionnaire distributed	Total number of questionnaire retrieved	Total number of questionnaire not retrieved	Percentage not retrieved
Property developers	64	33	31	51.56%
Building material dealers	67	37	30	55.22
Quantity surveyors	62	40	22	64.52
Engineers	55	29	26	52.73
Contractors	68	36	32	52.94
Total	316	175	141	55.38

Source: field survey 2022.

Table 4.1 above shows the distribution and collection of the questionnaire from the respondents. The respondents are the stake holders in the building industry in Nigeria. The table shows that of the 316 questionnaire distributed 175 representing 55.38% were successfully retrieved from the respondents. The table also shows that quantity surveyors gave the highest response rate. Of the 62 questionnaire issued to them 40 or 64.52 percent were retrieved.

Table 4.2 shows the opinion of the respondents to price trend in the building industry

Item	Frequency	Percentage
Fair	25	14.29
High	70	40
Very high	80	45.71
Total	175	100

Source: output of field survey 2022

Table 4.2 shows the order of response to the question on price trend of building materials. The table shows that of the 175 respondents 25 or 14.71% of the respondents admit that the prices are fair, while 70 representing 40% of the total respondents admitted that the prices are high. Finally 80 respondents representing 45.71% said that the prices are very high. We therefore conclude that the continuous rise in the cost of building material, has compelled individual developers to increase the unit cost of residential houses demanded by the people with respect to better shelter and home ownership

4.2 Primary analysis of data

Table 4.3 below shows the respondents' responses to the question of cause of continuous rise in the cost of building materials. The table shows that the 35 persons blamed it on the current inflationary rate trending in the country. Similarly the table shows that 40 or 22% blamed it on over dependency on imported goods. 40 respondents representing 22.86% of the total number of respondents blamed the increase in the cost of building materials on dual (double) taxation imposed by tax authorities. 23 respondents representing 13.14% of the total respondents blamed it wrong government policy. Similarly 21 respondents or 12% of the respondents attributed the rising cost of building materials to lack of capacity to produce the materials locally.

4.3 Respondents opinion on the causes of continuous rise in the cost of building materials

Items	Frequency	Percentage
The current inflationary trend in the country	35	20
Over dependency on imported goods and services	22	18.29
Dual taxation	40	22.86
Wrong government policy	23	13.14
Lack of capacity to produce the materials locally	21	12
High import duties	34	19.43
Total	175	100

Source: field survey 2022

Factors hindering property development in Port Harcourt

Table 4.4 showing the extent to which the respondents admit to the causes of incessant rise in prices

S/N	ITEM	SA	A	UD	DA	SDA	Mean	Std. Dev
1	Increased cost of building materials affect property development in Port Harcourt	86	74	0	7	8	4.27	0.5432
2	Factors such as cost of land, building materials, lack of access to mortgage loan all affect property development in Port Harcourt.	92	64	1	6	8	4.22	0.4362
3	The use of locally produced building materials added to subsidy on imported material can positively lead to fall in building cost.	80	75	15	3	2	4.302	0.3417
4	High import duty is the reason for the rising cost of building material.	78	85	3	5	4	4.309	0.4361
5	Lack of price regulation is the reason for the rising cost of building materials	65	58	25	17	10	3.863	0.3255
6	Building material prices varies from one place to another in Port Harcourt and more costlier in Port Harcourt city	72	88	5	10	0	4.269	0.4623
7	Rise in the prices of other commodities affect cost of building materials	76	77	10	8	4	4.217	0.2456

Source: SPSS version 18

Table 4.4 above shows the outcome of the respondent responses to the questions, causes of frequent increases in the cost of building materials in Port Harcourt. Descriptive statistics measures of mean and standard deviation were used to analysis the participant responses. Note that mean value range of between 3.8- 4.5 shows very high agreement in opinion, meaning that nearly all respondent admitted that the factor could cause rise in the price of building material.

Correspondingly, standard deviation value of $x < 1$ shows low disagreement meaning that the respondents also admitted the factors as the causes of rises in the cost of building materials in Port Harcourt.

3.4 Price index

One sure way to remove the effect of the incessant change in price on building material is to calculate the price index.

Price index according to Theil (1965) is an index number that expresses measure of change in the average retail prices of number of commodities compared to the level of prices of the same commodities often purchased by a group of people in an area using arbitrary chosen base year period. It is against this back drop that it is consider appropriate to use price data for building material that span from 2005 to 2021, obtained from the building merchant. To make the items selected all inclusive, building materials best described as basic and common materials frequently used in building construction were selected (see table 4.7 below). This study adopted the use of Laspeyres price index formula, the choice was informed by the fact that it is one of the key method for deflating price changes Theil(1965). Laspeyres involve.

Laspeyres involve taking the ratio of the cost of purchasing a specific group of commodities at current prices to the cost of that same group of based-period price and multiply by 100

$$\text{Price index} = P_n / p_o \times 100$$

While, the rates of inflation of selected materials will be computed using the formula below

$$R = 100(p_n / p_o - 1)$$

Where P_0 = first value of index , p_n = the last value of the index, n = numbers of years, and r = rate of inflation

4.5 Building material price index for some selected building materials in Port Harcourt for the period 2010-2017

S/N	Material	Unit	2010	2011	2012	2013	2014	2015	2016	2017
1	Cement	Bag	100	163.89	172	186	192	200	230	250
2	Granite	3.81m ³	100	142	156	178	197	210	220	230
3	Sharp sand	3.81m ³	100	142	156	230	265	300	310	320
4	Soft sand	3.81m ³	100	139	149	158	174	180	205	230
5	225 sandcrete hollow block	-	100	136	138	142	153	156	166	175
6	150 sandcrete hollow	-	100	83	120	145	156	138	165	176
7	Galvanized iron roofing sheet	Bundle	100	143	147	178	210	220	250	265

Source: computed price index for building material. Prices sourced from building material dealers in Port Harcourt.

Table 4.4 above showed, that prices of building material maintained a steady and up movement with the period under review. We observed that materials such as cement, granite, galvanized iron roof sheets recorded 100% increases in prices. Meaning that the material value were affected by the rising cost without corresponding increase in the amount of building material in the above describe situation as inflationary trend, meaning that the persistent price rise was induced by inflation. By implication, the type of rising cost affecting cost of building material was induced by inflation.

DISCUSSION OF FINDINGS

The result obtained supported the observed trend in the building material industry and market. This study produced results that that greatly support the result of the previous study on the causes of rising prices in the building material industry. The mean scores in table 4.4, affirmed the work of Owoeye and Jagboro(2004); Idoro and Jolaiya (2011 and Oladipo and Oni (2012). The factor discussed produced a multiplier effect and are responsible for the continuous rise in the prices of the materials. A close observation of the results revealed that the rising cost of the materials are responsible for rise in other prices.

We also observed that rising cost of building materials is also responsible the increasing cases of abandoned projects or inability to complete building projects, volume of construction output in the state. This finding empirically verify the result obtained by Dikwa and Culpin (1990); Mojekwu et al (2013) that rising prices of building material will trigger off rise in prices of other goods and services such as transportation cost.

We noted that earlier that the rising cost of material also accounted for the inability of builder to deliver the project within the estimated or projected budget and on time, the rising cost make it difficult to achieve quality project sometimes may result into conflict between project owner or sponsor or contractor and clients which usually result from continuous upward review of the project cost. The rising cost of material will always result into reduction in the volume of construction output. The reduction will endanger the ability of the government to fulfill its housing policy which will result into shortage in the government supply of housing. Consequently, construction workers stand losing their jobs and by extension result into fall of the nation's gross domestic product (GDP).

CONCLUSION

The study dwelled on the effect of rising cost of building material on the built industry in Rivers state. A number of factors were identified as responsible for the increasing cost of building materials in state. The

factors were carefully analyzed, noting the implication of this factors on the building industry in the state. The study demonstrated an upward trend in price increase over time the period of study.

The finding made in the study are affirmation of existing work on effect of rising cost of building materials on construction, which include the work of Aluko(2008), Amaratunga, Baldry, Sarshar and Newton(2002).

The study also concluded that: inflation, government policies; dual taxation and lack of capacity were the factors responsible for the incessant rise in the prices of building materials. These factors to a large extent are responsible for reduction in number of houses delivered by government and property developers.

The major inference drawn was that the persistent rise in price will kill whatever vision the government has toward ensuring adequate shelter for all.

RECOMMENDATIONS

Based on the above findings the study made the following recommendations:

- (1) Government should create enabling environment that will encourage private sector participation in producing some of the materials domestically.
- (2) Given the persistent rise in general prices and its antecedences on production, trade government should ensure that inflation is reduced to a one digit value inflationary rate.
- (3) Dual taxation policies should be eliminated in other to stabilize cost of building materials.
- (4) Import substitution policy should be encouraged in other to reduce over dependency on import.

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Appendix A

Type of building material	Quantity	Cost price per bag and trailer load
Cement		
Dangote(50kg)	600 bags or 1 trailer	2,950/2,100,000
Elephant supaset (50kg)	600 bags or I trailer	2,550/1,530,000
Elephant(50kg)	600 bags or I trailer	2,600/1,560,000
Eagle (50kg)	600 bags or trailer	2,500/1,500,000
BUA(50kg)	600 bags or trailer	2,600/ 1,560,000
IBETO Regular (50kg)	600 bags or trailer	2,600/1,560,000
LARFARGE		
TUFFCRETE(50kg)	600 bags or trailer	1,800/1,080,000
UNICEM(50kg)	600 bags or trailer	2,450/1,470,000
GRANITE		
¾ INCH, CLEAN	20Tonnel (1trip)	80,000-90,000
	30 Tonnel (1trip)	150,000
1/2INCH, CLEAN	20 tonne(1Trip)	80,000-90,000
	30 tonnel (1trip)	150,000
¼ INCH CLEAN	20 Tonnel(1 trip)	70,000-75000
	30 Tonnel (1trip)	150,000
1 INCH CLEAN	20 Tonnel(1 trip)	85,000-95,000
	30 Tonnel (1 trip)	180,000
GRANITE	20 Tonnel(1trip)	60,000
	30 Tonnel(1 Trip)	100,000
GRAVEL(1- ¼) INCH	7 Tonnel(1 Trip)	42,000
CLEA.	15Tonnel(1 Trip)	65,000