



EFFECTS OF BUILDING MATERIALS ON HOUSING DEVELOPMENT A CASE STUDY OF MAIDUGURI METROPOLIS.

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Abstract

Over the years there has been an increase in the rising cost of building materials and which in-turn discourage individuals to embark in housing development. This research paper was designed in order to look into the effects of building materials cost on housing development in Maiduguri metropolis area of Borno State. Data on the prices of building materials were obtained by the researcher through market survey between the year 2019 and 2020. One hundred and Twenty Five (125) respondents were selected randomly. One hundred and twenty questionnaire were dully returned and were used for the analysis. The data were presented using chi-square statistics and theoretical analysis were used to analyse data that are not numerical in nature. The analysis revealed that the implication on building material cost could result in the downward effect on the Gross Domestic Product (GDP) in the nation's economy. The result also shows that rising cost of building materials was generated due to the exchange rate of the Nigerian Naira. It is recommended that the use of local building materials should be encourage by individuals, housing developers as well as contractors in order to produce houses at subsidize rate. Government at all levels should endeavour to play their own role in the control of prices of building materials in order to avoid further inflation in the country.

Keywords: *Building, Materials, Housing, Development. Building Materials, Housing, Development*

Introduction

Many researchers in the construction industry have indicated that between 50 to 60 per cent of the total construction input goes into building materials. As a result, there is an urgent need to address the high cost of these products which is said to have slowed down the growth of the building and construction sector in Nigeria. Building materials constitute the largest single input in housing construction. While Adedeji (2010) observed that about sixty (60) per cent of the total housing expenditure goes for the

purchase of building materials, Arayela (2005) averred that the cost of building materials constitute about 65 percent of the construction cost.

Ogunsemi (2010) opined that building materials form the main factors that restricts the supply of housing and ascertained that they account for between 50-60 percent of the cost of buildings. Thus, Adedeji (2002) rightly observed that one main barrier to the realization of effective housing in Nigeria as revealed in successive government efforts has been the cost of housing in the country. He argued that in the early periods, shelter in Nigeria was easily affordable as building materials were sourced from the immediate environment at affordable costs. Technology also was readily available with commensurate simple techniques. But contact with the outside world through interregional and international training of professionals in foreign countries as occasioned by colonization, brought changes to tastes and hence outlook to house forms. These changes rendered the undeveloped local building materials inadequate while there was an increased demand for exotic ones. Accordingly, Arayela (2002) posited that the modern building industry lays much emphasis on sophisticated building materials and techniques that are expensive and energy consuming. Though, housing delivery efforts have evidently been inhibited by prohibitive costs of building materials, this problem cannot be reasonably and reliably overcome by merely resorting to the use of locally available materials without due considerations to the applicable initiative, the cost of processing and sustainability of the local materials. One of the most important components of a sustainable building is the material efficiency. Correct selection of building materials can be performed by taking into account their complete life span and by choosing products with the minimal environmental impacts. For instance, González and Navarro (2006) estimated that the selection of building materials with low environmental impacts can reduce carbon dioxide (CO₂) emissions by up to 30%. The use of renewable and recycled sources is widely encouraged as the life-cycle of a building and its elements can be closed (Chwieduk, 2003). The major factor that greatly affect the selection of building materials are their costs and social requirements such as thermal comfort, good mechanical properties (strength and durability), aesthetic characteristics and an ability to construct quickly. Ideally, the combination of all environmental, economic and social factors can give a clear description of a material, and thus helps in a decision making process regarding the cost of the materials suitable for buildings (Abeyundara, et, al.,2009) . Nigerians would continue to pay more for accommodation in major cities until the cost of building materials is subsidized through probably through tax reduction. The instability in the price of building materials was posited as a direct result of high taxes which in turn impacts on the cost of accommodation in major cities across the country. It is against this background, that

this research work was undertaken in order to assess the effects of Building Materials on Housing Development Case Study of Maiduguri Metropolis.

Literature Review

Building materials have been playing an important role in the construction industry—they are those materials put together in erecting or constructing structures, no field of engineering is conceivable without their use (Akanni, 2006; Udosen & Akanni, 2010). Building materials contribute immensely to the quality and cost of housing, from what is used in the foundation to the materials for roofing and finishes, while the building materials industry is an important contributor to the national economy of any nation as its output governs both the rate and the quality of construction work. According to Mansfield, Ugwu, and Doran (1994) and Obadan (2001), government policies set the economic environment in which all sectors operate including the building materials sector. Dlakwa and Culpin (1990) and Adekoya (2003) identified government fiscal policies as one of the factors affecting the cost of building materials in the Nigerian construction industry. However, findings of other researchers, Jagboro and Owoeye (2004); Mojekwu, Idowu, and Sode (2013); and Idoro and Jolaiya (2010), concluded that factors such as the change in government policies and legislations, scarcity of building raw materials, fluctuation in the cost of fuel and power supply, inadequate infrastructural facilities, corruption, fluctuation in the cost of plant and labor, seasonal changes, fluctuation in the cost of transportation and distribution, political interference, local taxes and charges, fluctuation on cost of raw materials, fluctuation in the interest rates and the cost of finance, the inflation, and fluctuation in the exchange rate of Naira were many of the recipes for the rising cost of building materials in Nigeria. Building materials had been playing an important role in the construction industry. They were all naturally occurring in the ancient times, for example, stone, wood, straws, clay, lime, and brick (Akanni, 2006; Taylor, 2013). As the building techniques were improving, simple composite materials, combined by means of mixing and/or heat treatment, were developed. A typical example is concrete, which was developed by the Roman Empire (Everett & Barritt, 1994). Due to advances in science and technology at the beginning of the 20th century, materials with better performance and durability were introduced, for example, reinforced concrete, steel, plastics, and metal (Taylor, 2013). Ibn-Homaid (2002) and the report of UNCHS (1993) found that building materials remain the most significant input in project development and play a very important role in the delivery of construction projects. Buttressing this view, Jagboro and Owoeye (2004) and Idoro and Jolaiya (2010) find that building materials alone account for 50% to 60% of project cost and control about 80% of its schedule. One of the major constraints in the Nigerian construction industry

today has been the rapid inflation in the cost of the building materials. Windapo, Ogunsanmi, and Iyagba (2004) observed that the situations arising from the rapid increase in the cost of building materials may degenerate to acute shortages of housing with the millions of middle- and low-income families being priced out of the market for home ownership all across Nigeria. According to Arayela (2002), many completed housing estates had remained unoccupied because of the high rental and sale prices attached to them as against the meager income of the average Nigerian workers. He also added that if government can revitalise our industrial base, the cost of building materials will come down and many more people would be able to build houses. He therefore urged the Federal Government to provide tax relief for local manufacturers and importers of building materials in order to reduce the high cost of accommodation in major cities. While Adedeji (2010) observed that about sixty (60) per cent of the total housing expenditure goes for the purchase of building materials, Arayela (2005) averred that the cost of building materials constitute about 65 percent of the construction cost.

Research Methodology

This research work involves the use of primary and secondary sources of data. A market survey was conducted directly by the researcher in which an interview was carried out with sellers of building materials within Maiduguri metropolis in order to obtain the prices of materials between the year 2019 and 2020 respectively. One hundred and Twenty Five (125) questionnaire were designed and distributed to the respondents which were selected randomly. One hundred and twenty questionnaire were dully returned and were used for the analysis. Secondary source of data on building materials were obtained from internet source, journal etc. The data were presented using chi-square statistics and theoretical analysis were used to analyse data that are not numerical in nature.

Results and Discussion

Trends in the Average price of Building Materials in Maiduguri Metropolis Between 2019-2020.

The table 1 below shows that there has been an upward increase in the cost of building materials over the years, even though it has been observed that there are price fluctuations depending on the economic situation, market forces such as demand and supply as well as the availability of materials and the period of construction. In the period under review, all the materials surveyed experienced an increase in their prices except ceiling material involving that of Brazil and Holland has experienced decreased in their prices. For instance the price of cement has increased by 49.0% between 2019

and 2020, while Plaster of Paris (POP) has also increased by 100.1% in the same period. It has also been considered that a Load of Gravel has propelled by 37.5%, Plastic Ceiling Board by 37%, Steel Door by 35.3%, Wash Hand Basin, W.C & Accessories by 38%, Tiles (30 x 30) by 43.8% as well as Tiles (60 x 60) by 36.8%. The same trend also goes for Iron Bar (10mm), Iron Bar (12mm), Iron Bar (16mm), Bag of Nails, PVC Pipe 4 inch whose prices has increased by 50%, 36.4%, 34.2%, 50% and 66.7% respectively in the same period under consideration.

Table 1

S/N	Types of Materials	Prices of Items in Naira over the Years		Absolute Increase	Increase in Percentage
		2019	2020		
1	Cement	2,500	3,800	1,250	49
2	Plaster of Paris (POP)	3,900	8,200	4,300	100.1
3	Load of Gravel	80,000	110,000	30,000	37.5
4	Load of Sharp Sand	13,000	15,000	2,000	15.4
5	Bundle of Roofing Zinc	16,800	21,500	4,700	27.10
6	Plastic Ceiling Board	13,500	18,500	5,000	37
7	Ceiling (Brazil)	3,000	2,650	-350	0
8	Ceiling (Poland)	2,500	2000	-500	0
9	Flush Door	15,500	18,000	2,500	16.1
10	Steel Door	17,000	23,000	6,000	35.3
11	Wash Hand Basin, W.C & Accessories	24,000	33,000	9,000	38
12	Tiles (30 x 30)	1,600	2,300	700	43.8
13	Tiles (40 x 40)	1,500	1,700	200	13.3
14	Tiles (60 x 60)	1,900	2,600	700	36.8
15	Paint	4,900	5,500	600	12.2
16	Plank (1x12x12)	1,700	2,000	300	17.6
17	Plank (2x2x12)	340	360	20	5.9
18	Plank (2x3x12)	430	450	20	4.7
19	Plank (2x4x12)	560	600	40	7.1
20	¾ Plywood	2,500	3,200	700	28
21	Iron Bar (10mm)	1,400	2,100	700	50
22	Iron Bar (12mm)	2,200	3,000	800	36.4
23	Iron Bar (16mm)	3,800	5,100	1,300	34.2
24	Bag of Nail (3 inch)	5,000	7,500	2,500	50

25	Bag of Nail (4 inch)	5,000	7,500	2,500	50
26	Bag of Nail (5 inch)	5,000	7,500	2,500	50
27	Packet of Zinc Nail	2000	2600	600	30
28	Galvanized Pipe 3/4				
29	PVC Pipe (4 Inch)	1,800	3,000	1,200	66.7
30	Timber	1,700	1.800	100	5.9

Source: Field Survey (2019)

Table 2

Respondents		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Builders	17	14.2	14.2	14.2
	Architects	25	20.8	20.8	35
	Engineers	20	16.7	16.7	51.7
	Quantity Surveyors	10	8.3	8.3	60
	Estate Surveyors	15	12.5	12.5	72.5
	Contractors	15	12.5	12.5	85
	Building Material Sellers	18	15	15	100
	Total	120	100.0	100.0	

Source: Field Survey (2019)

The above table shows that 14.2% of the respondents were Builders in the construction industry, 20.8% were Architects and 16.7% represent Engineers while 8.3%, 12.5% and 12.5% were Quantity Surveyors, Estate Surveyors, and Contractors respectively as well as 15% representing Sellers of Building materials.

Table 3

Opinion on the Causes of Rising Cost of Building Materials		Freq.	Pert.	Valid Pert.	Cum. Pert.
Valid	Cost of Transportation & Distribution	14	11.67	11.67	11.67
	Taxes and Charges	17	14.17	14.17	25.84

Change in Government Policies & Legislation	12	10.00	10.00	35.84
Fluctuation in the Exchange Rate of Naira	34	28.33	28.33	64.17
Increase in the Cost of Pump Price & Power Supply	20	16.67	16.67	80.84
Increase in the Cost of Crude Oil	23	19.17	19.17	100
Total	120	100	100	

Source: Field Survey (2019)

Table 3 above shows that 11.67% of the respondents opined that causes of rising cost of building materials was as a result of the increase in the cost of transportation and distribution while 14.17% of the respondents attributed the increase to taxes and charges. Subsequently 10.00% of the respondents referred the causes of rising cost of building materials to change in Government policies and legislation while 28.33% of the respondents revealed that the increase was as a result of fluctuation in the Exchange Rate of Naira. Furthermore 16.67% and 19.17% of the respondents opined that causes of rising cost of building materials was as a result of the increase in the cost of Pump price and Power supply as well as increase in the cost of Crude oil respectively.

Table 4. Chi-square Test Statistics on Causes of Rising Cost of Building Materials

Opinion of Causes of Rising Cost of Building Materials		
Chi-Square(a)	83.690	34.586
df	3	3
Asymp. Sig.	.000	.000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 65.3.

Source: Field Survey (2019)

Table 3 above shows that 28.33% respondents have opined that Causes of the Rising Cost of Building Materials was due to Fluctuation in the Exchange Rate of Naira is much higher than those that revealed 19.17% of the respondents was due to Increase in the Cost of Crude Oil. While 16.67% was attributed to Increase in the Cost of Pump Price & Power Supply. In addition, 14.17% of the respondents revealed that rising cost was as a result of the increase in Taxes and Charges while 11.67% and 10.00% of the respondents opined the rising cost was as a result to increase in the Cost of Transportation & Distribution and Change in Government Policies & Legislation

respectively. The chi-square test result in the table above shows an asymptotic significance probability of 0.000 which is less than the level of significance ($X = 0.05$). This shows that the proportions of respondents for the mentioned opinions are significantly different.

Conclusion

It has been observed and evaluated during the year under review that between 2019 and 2020, the rising cost of building materials has followed an inflationary trend as indicated in Table 1 above and thereby resulting to production of low output in housing development. The research also attributed that fluctuations in the Exchange Rate of Naira, Increase in the Cost of Crude Oil, Increase in the Cost of Pump Price and Power Supply as well as Taxes and Charges has been considered as the most valuable factors responsible for the rising cost of building materials. Subsequently, it could be drawn from the conclusion that the effect of the rising cost of building materials could result to downward negative performance on the Gross Domestic Product (GDP) in the nation's economy if not controlled which will consequently affect Government in the realization of their policies and objectives.

Recommendations

1. It is recommended that Government should formulate a standing policy that will discourage the use of imported building materials thereby encouraging the use of local building materials and also engage professionals in research and fabrications.
2. Government should formulate a policy in order to reduce the cost of production and transportation of goods and services.
3. Government should also provide a tax relief and charges if it becomes necessary to local and importers of building materials so as to reduce the high cost of rental charges in urban areas.

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