ANALYSIS OF THE EFFECTS OF HIGH COST OF BUILDING MATERIALS ON PUBLIC HOUSING DELIVERY IN AWKA, ANAMBRA STATE

Onyejiaka, Joseph Chukwudi[1] Nwoke, Victoria Obianuju[2] Udobi, Alexander Nnamdi[3]
Department of Estate Management, Nnamdi zikiwe University, Awka

Abstract
Housing is one of the three basic needs of mankind and it is the most important for the physical survival of man after the provision of food. Adequate housing contributes to the attainment of physical and moral health of a nation and stimulates the social stability, the work efficiency and the development of individuals. This work examines the effects of high cost of building material on public housing delivery in Awka, Anambra State of Nigeria with a view to stimulating relevant agencies of government and other stakeholders into designing appropriate strategies for effective housing delivery in the state. Thus, to achieve this aim, a total of One Hundred and Ten (110) was sampled from the total population using simple random sampling method. A well-structured questionnaire and oral interview were used as the major instruments for data collection. Data collected were presented in tables and analyzed using simple percentages and mean. Correlation analysis was employed for testing the research hypotheses. The result of the hypotheses test indicated that the calculated value was higher than the critical value. Hence, the null hypothesis was rejected while the alternative was accepted. This implies that the increase in the prices of building material has significant effect on the delivery of public housing in Awka, Anambra State. It was discovered that Economic related factors, Human related factors, Stakeholder related factors and External factors are significant factors responsible for increase in the cost of building materials.

Keywords: Building materials, Public housing, Housing delivery, High cost.

Introduction

Building materials play a vital role in the construction industry as they are those materials put together in erecting buildings. Construction project is not feasible without the inclusion of building materials. Previous studies in the building industry have indicated that building materials account for between 50 to 60% of the total construction input (Adedeji, 2012). Building materials constitute the largest single input in building construction, of which housing is one part. He further revealed that the cost of building materials has been one of the factors prohibiting successful public housing delivery. Housing is a key factor in the sustainable development of a nation and one of the three basic human needs (Ganiyu, 2016). This is true as the housing sector is the bedrock of the economy of most developed nations and an important tool for stimulating growth. In most advanced countries like the United States of America, Britain and Canada, the sector contributes between 30 to 70% percent of their Gross Domestic Product (GDP). While decent housing is important to every individual and nation, housing crisis remains one of the global problems and a grave and rising challenge facing both urban and rural residents and public and private sectors, particularly in most developing countries. Developing nations are continuously challenged with issues of inadequate housing (du Plessis, 2002). Housing demand continues to grow in recent periods worldwide and is projected to continue escalating (Wood, 2007).

Housing availability is characterized by its method of production as well as life cycle which enhances the economic stability of the inhabitants by taking into consideration – at every stage of construction – the use of land and material resources (Solanke, 2015). Thus, for the delivery of a sound and affordable house, it is crucial to consider the implications of cost of material from the housing design stage to construction stage in order to ensure adequate building materials utilisation. Resolving the

housing delivery problem entails a holistic approach towards building houses that are not only affordable but equally sustainable (available) to both the present and future users. Hence there is a need to investigate the effects of cost of building materials on housing delivery.

Statement of the problem

Since the creation of Anambra State in 1991, the housing situation in the state could be described as deplorable. Shortage of housing in the three major towns of Awka, Onitsha, and Nnewi appears uncontrollable with increasing rural-urban drift and as more civil servants are moving to Awka the state capital (Emoh and Ugonabo, 2013). There is scarcity of government funded residential houses. This scarcity of housing has pushed the cost of rented buildings very high as an average 3 bedroom flat lets for between N200,000.00 – N300,000.00 per annum and a duplex lets for between N500,00.00 – N1,200,000.00 per annum in the three major towns of Onitsha, Awka and Nnewi.

Obviously these rents are not affordable to the majority of the civil servants resulting in emergence of squatter settlements as alternative accommodation. Extensive illegal and unregulated building patterns predominate the urban towns in the state especially in Onitsha. Buildings are put up without regard to existing building and health codes or zoning and subdivision regulations thus creating slum and squatter conditions in which many residents in the state now live. This ugly situation still persists today and not much has been done by the government to increase the housing stock in relation to demand for residential and office accommodation in the state especially Awka the State Capital. Cost of building houses is increasing every day and it is becoming difficult for an average civil servant to build their own houses unless government embarks on massive construction of low cost housing estate in Awka, Onitsha and Nnewi that have increasing urban population and commercial activities.

Public Housing Delivery

At state level, there is Anambra State Housing Development Corporation (ASHDC). ASHDC is one of the fully commercialized agencies of the Anambra State Government charged with the responsibility of implementing the State Government's housing policy

The aim of this research is to analyse the effects of high cost of building materials on public housing delivery in Awka, Anambra State, with a view to provide information on public home ownership.

Research Hypothesis

Null Hypothesis (H0): High cost of building materials does not affect public housing delivery in Awka, Anambra State.

Literature Review

The Building Construction Industry

The Building construction industry contributes significantly in terms of scale and share in the development process for both developed and developing countries. The construction products provide the necessary public infrastructure and private physical structures for many productive activities such as services, commerce, utilities and other industries. The industry is not only important for its finished product, but it also employs a large number of people (directly and indirectly) and therefore has an effect on the economy of a country/region during the actual construction process. The National Bureau of Statistics (NBS) put Nigeria's post-re-basing contributions of the construction sector to Gross Domestic Product at N5.7 billion in three years. NBS, in its summary report of 2010, 2011 and 2012 fiscal years on the Construction industry and disclosed that in 2010, the sector contributed N1.570 billion, a value which leaped by 21.30 per cent to reach N1.905 billion in 2011.The industry's contributions closed at N2.188 billion in 2012, bringing the total contribution of the sector to GDP to N5.7 billion and 2017 report shows that the sector recorded a 13 percent growth. Construction activities captured in the report include construction of buildings, roads, railways as well as civil engineering projects. Others are construction of utility projects, demolitions as well as site preparations, among others. The NBS added that part of the increased contributions of the sector to the nation's GDP, was its ability to capture all economic activities in the sector.

for all classes of people. However, the State Government appoints Board of Directors of the corporation which usually consists of seasoned and accomplished professionals in the Housing business and other related sectors of the society.

In an interview with the Head of Department, Estate Services (ASHDC), he lamented that the high cost of building materials has prevented the corporation from achieving its goal of providing readily available housing units. He however said that the corporation employ the use of Sites and Services scheme in all its housing units. Sites and Services schemes entails the provision of plots of land, either on ownership or land lease tenure, along with a bare minimum of essential infrastructure needed for habitation. Though this can be counted as a step towards the delivery of public housing in Awka and subsequently Anambra State, it should be noted that this does not consider all the classes of people. Housing estates under ASHDC including Udoka Housing Estate, Hilltop Neighbourhood, Ngozika Housing Estate, Obinwanne Housing Estate and so many others range in prices from as low as 6,000,000 million to 13,000,000 million Naira, ensuring that only high income earners and the influential can afford to own a home.

Building Materials in Nigeria

Building materials play a vital role in the construction industry as they are those materials put together in erecting buildings; construction project is not feasible without the inclusion of building materials (Akanniet al., 2014). That is, building materials play an undeniable significant role in the housing industry as it is the most substantial input in project development. According to Adedeji (2012), about 60% of total housing expenditure is spent on building materials. Notably, Karana, Hekkert and Kandachar (2010) indicated that appropriate use of the building materials, in respect of the expertise involved in the building construction process, determines the strength, functionality and quality of the building. Building materials play a crucial role in enhancing sustainability of buildings and contributing to economic wealth of the nation. However, Donyavi and Flanagan (2011) observed that in order to reduce construction costs, and to improve productivity, quality and timely project delivery, material management effectiveness must be a main concern. The prices of building materials increase on a daily basis, due to instability of the Naira to the Dollar and general inflationary trends. Table 1, shows the difference in the prices of major building materials from August 2017 to August 2018.

Table 1: Building material prices for 2018 and 2017

Building Material	Year 2018 Prices (₦)	Year 2017 Prices	Percentage Increase (%)
Sharp sand	34,000	35,000	-2.9
Cement	2,650	2,550	3.9
3 inches bag of nails	8,000	6,000	33.3
Water 1000kg	5,000	4,800	4.2
Timber	1,100	900	22.2
6' solid block	160	120	33.3
9' solid block	160	135	18.5
5' solid block	145-150	115	30
12mm Reinforcement	2,000	1,800	11.1
10mm reinforcement	1,800	1,500	20
8mm reinforcement	1,600	1,400	14.3
16mm reinforcement	2,500	2,000	25
Binding wire Roll	8,000	6,500	23.1
25mm steel rods	4,550	4,000	12.5
8mm steel rods	750	700	7.1
PVC pipes	1,650	980	68.4
30×30 pack of ceramic tiles	1,500	1,300	15.4

Factors Responsible for increases in the Cost of Building Materials in Anambra state

The factors responsible for increases in the cost of building materials have been categorized as Economic related factors, Human related Factors, Stakeholders related factors and External factors.

Economic related factors

i. Exchange rates

The exchange rate is the price of a nation's currency in terms of another currency used in determining the strength of one currency against another. Thus, an exchange rate has two components, the domestic currency and a foreign currency. Nigeria produces its own strategic materials and has the ability to survive without importation but yet relies on imported equipment. Therefore, increases in materials cost within the industry are a cause for concern. The skyrocketing exchange rate of the dollar to the naira (1 dollar=362 naira as at 1st August 2018) is killing the building materials sector in Nigeria and depreciation in naira value is working against the building materials importers.

ii. Inflation

Inflation is a sustained increase in the price level of goods and services in an economy over a period of time. Consequently inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy. Clearly, any other factor that delays a project will further expose the project to the risk of inflationary cost increases.

iii. Interest rate

The high interest rate of banks and the unpredictability in the foreign exchange market result in serious depletion of a nation's foreign exchange resources, harshly affecting the industry with import dependence of about 60% of its raw materials (Jagboro & Owoeye, 2004). However, Oladapo (1992) opined that across the nation, many construction and profitable real estate projects and housing have either been put on hold or abandoned half way because of the scarcity of capital or because of the sky rocketing cost of borrowing. Aside from the increase in the cost of borrowing, high interest rate also causes reduction in spending as people are more inclined to save. Central Bank of Nigeria interest rate as at April, 2018 was 14%.

iv. Fluctuation in the cost of building materials

The studies of Rahman et al. (2013) revealed that fluctuation in cost of building materials was ranked as a significant factor of cost overrun. Incessant fluctuation of building materials is the most severe cause of project cost escalation. Zewdu et al. (2015) conducted a study to identify the factors causing cost overrun in Ethiopia. Findings revealed that the main cause of cost overrun was fluctuations in cost of building materials, a fluctuation attributable to the limitation in exchange rate which in turn affects building material cost and the general cost level. In addition to exchange rate, others such as inflation, hoarding by suppliers and government policies also cause fluctuation in the cost of building materials.

v. Inadequate production of raw materials

Ogunlana, Krit and Vithool (1996) argue that the reason for shortage of materials could be the ineffective supply of materials occasioned by general shortages in the industry, poor communication amidst sites and head office, poor purchasing planning and poor material coordination. Shortages of some construction materials may arise where the level of development activity is unusually high. If this had not been anticipated and integrated into the original cost estimate, the prices of these materials will increase (EU Framework, 1998). This can also occur where the sector relies heavily on importation than exploiting locally sourced ones.

vi. Supply and demand of building materials

Supply and demand of materials will determine the price of building materials. Windapo et al. (2012) stated that the demand for more housing and delay in supplying the building materials (or lack of materials) will add to the trends in the price of building materials where the law of supply and demand can be related. They further admitted that building materials cost increases are dependent on the market conditions under

which they are manufactured. For example, the researchers noted that material cost will increase if only one or two companies are manufacturing building materials as compared to those for which many manufacturers compete for the same market. This is true as certain brands enjoy monopoly in the building materials sector and their demands are usually higher than others. A precondition for cost-effective construction is the availability of construction materials at the required time and location on site. Delay in the supply of materials on site is one causative factor of cost overruns in construction projects, particularly in developing countries.

Human factors

There are three typical resources associated with construction: material, machinery and manpower (3Ms). Manpower is the source of more threats than construction materials and machinery (Hanna et al., 2005). In the study of Windapo and Cattell (2012), as they sought to benchmark respondents' perceptions against actual factors that may affect future building material prices in South Africa, it was revealed that labour cost had the highest correlation with building material prices, followed by transport cost. Notably, poor communication between management and labour can reduce morale of the labourers further decreasing production while increasing project cost. Mustapha and Rashid (2012) pointed out effective communication management as a key factor for improving the management of human resources in construction. This exposes the need of an efficient and effective project manager whose role involves liaising between labour and management.

Stakeholder related factors

i. Supplier default

The main factor responsible for supplier default come from the fact that some suppliers control a monopoly of the market by keeping the price high and restricting the output, showing little or no awareness of the needs of the customers. The researchers stressed that because of the high demand of some building materials, some suppliers wait for a high accumulation of orders, thereby generating problems associated with importing raw materials as well as increased exchange rates. The results of the study by Elinwa and Silas (1993) revealed that fraudulent practices and kickbacks was the second significant factor responsible for an increase in construction cost as perceived by construction professionals interviewed

ii. Improper planning

Improper planning is one of the most important factors affecting the cost of building materials. Contractors should utilize all resources in effective ways. Proper scheduling is essential in project resource utilization, as the reverse, inadequate planning, will increase the project cost (Eshofonie, 2008), suggesting that where there is no effective contractor scheduling and planning on site, these factors will be responsible for construction project delays (Assaf & Al-Hejji, 2006).

External factors

i. Force majeure

Force majeure otherwise known as 'Acts of God' is a term that covers a range of events, including revolution, war, riot, earthquake, landslide, fire, political and economic instability and other such risks (Nega 2008). Where it occurs, it will result in significant increase in the cost of building materials especially when reconstruction comes to mind.

ii. Weather conditions

While building materials are a significant component of any building project, climate change directly or indirectly will also have an effect on the use of building materials before or during building construction. Climate changes contribute a vast challenge to global warming emission of CO2 by buildings under construction and in use (Windapo et al, 2013). As actual site conditions for a construction project are not usually determined until construction begins, some changes may occur due to hostile weather conditions or changes in sub-soil conditions (EU Framework, 1998).

iii. Government policies

According to Mansfield, Ugwu, and Doran (1994) and Obadan (2001), the building materials sector is one the government policies established. Government policies on importation, taxation, interest rate, relief to local producers, budget etc. impact on how building

materials affect housing delivery. According to Mansfield et al. (1994), governments may also invoke their powers to initiate or halt projects on political, social and environmental grounds. It is important to note that no construction work happens in a single space; rather it is subject to a group of powers from regulatory control to political intervention. Among other external factors responsible for increase in cost of building materials is the lack of proxy substitutes for some building materials. Construction project consideration

Cost, quality and time are the three major factors significantly essential in any construction project. Nonetheless, the primary goal of the construction project manager is accomplishing successful completion of the construction project within the predefined time, budgeted cost and expected quality checks (Nwachukwu 2016). Kerzner (2013) emphasized that the process of project management is labelled successful when the project objectives are achieved within time, cost and desired technological level.

Effects of Building Materials Cost on Housing Delivery

Fluctuation in cost of construction

According to Windapo and Cattell (2013), substantial growth in the construction industry is subject to price stability in materials costs as these have increased at faster rates than the expected. Client and project contractors have been facing serious issues to maintain steady cost projection on construction projects (Akanni et al 2014). Also, poor estimation of original project cost and underestimating the construction cost by quantity surveyors are the basic reasons of cost escalation in construction industry. The researcher further stated that the prices change so quickly that the initial budget figures become completely unrealistic. Akanni et al. (2014), in their study of the implications of the rising cost of building materials in Nigeria, determined fluctuation in construction costs as the most significant effect of increase in the cost building materials. This is in agreement with Windapo and Cattell (2013) who found out that on the key issue affecting the development of the construction industry in Nigeria that increase in costs of building materials was a significant factor affecting development of the construction industry.

Increase in project abandonment.

Project abandonment is the unplanned suspension of the work progress especially at the execution stage such as the refusal or failure to complete a contract after practical completion time (Nwachukwu, 2016). Numerous construction projects are temporarily or even permanently abandoned, and according to Nwachukwu (2016) the predominance of many uncompleted and abandoned projects resulted from finance related crises and material related factors. Inflation and high cost of building materials are major factors that lead to uncompleted and sub-standard buildings and this has a significant effect on the industry for delivery of housing. Whereas Aluko (2008) stated the effects of abandoned project on environment and identified such effects as the problems of flooding, traffic congestion, air and water pollution, drug addiction and health hazards in the neighbourhood. Also an upward review of contract sum leads to conflicts between contractors and clients, likely leading to cases of abandonment where investments are tied down, since such project will not be put to use at the expected time.

Low volume of construction product

Output of the construction industry in South Africa is quite low when compared with the construction industry in many developed countries. Ganiyu (2016:27) stated that the South African construction industry is faced with a number of threats, primarily affecting its performance in sustainable housing delivery. Similarly, according to a study by Windapo et al (2004), in Nigeria millions of middle and low-income families are being priced out of the market for home ownership due to the excessive increase in the cost of building materials and the consequential acute shortages of housing. The observations from these studies were due to the increase in the cost of building materials. It has been confirmed that Nigeria has more than 17 million housing deficit as at 2004.

Poor quality of workmanship

According to Lam, Chan, Wong and Wong (2007) output of quality buildings and structures is one of the attributes

of a developed construction industry. The quality of workmanship in construction work is assessed according to the requirement of the relevant standard, and marks are awarded if the workmanship complies with this standard The researchers further claimed that there were records of conflicts between clients and building contractors over review in contract sums, so to avoid conflicts and still be in the business, some contractors fell back upon substandard or insufficient materials for construction projects, an action which contributed to cases of building collapse. Undeniably, workmanship plays an important role in project quality. Akanni et al (2014) further revealed low quality workmanship and (CIDB, 2011). The study of Oladipo and Oni (2012) reporting the trend in the cost of building materials has envisaged great danger for the construction industry and the nation's economy.

inhibited innovations in construction methods as further repercussions of building materials cost increases. Hence, the studies revealed that increases in the cost of building materials contribute to low and unreliable rates of profitability of contractors as attempts to balance up by enticing contractors to employ low quality workmanship, prohibiting new innovations in the construction methods.

Presentation and Analysis of Data Distribution and Collection of Questionnaires

Table 2: Questionnaire Distribution

Option	Number	Percentage
Questionnaire Retrieved	95	87.5
Sample size	105	100

Demographics of Respondents Table 3: Sex Distribution of Respondents

Option	Number	Percentage
Male	75	83.3
Female	15	16.7
Total	**90**	**100**

In Table 3 above, out of 90 (100%) respondents, 75 (83.3%) were male while 15 (16.7%) were female.

Table 4: Age Group of Respondents

Age Group	Number	Percentage
26-30	25	27.8
31-40	55	61.1
41-50	0	0
51-60	10	11.1
61- Above	0	0
Total	**90**	**100**

In Table 4 above, shows the Age Group level and percentage of the respondents. The Analysis showed that the major percentage of respondents is within the ages of 31-40.

Table 5: Qualification Level of Respondents

Qualification	Number	Percentage (%)
Diploma	10	11.1
Bachelor's Degree	30	33.3
Master's Degree	40	44.4
Doctorate Degree	10	11.1
Others	0	0
Total	**90**	**100**

In Table 5 above, shows the Qualification level and percentage of the respondents. The Analysis showed that the qualification with the major percentage is Master's Degree.

Discussion and Analysis of Research Questions and Questionnaires

Factors Responsible For The Increase In The Cost Of Building Materials

Table 6: Economic related factors

Economic related factors	**No.**	SA %	Agree %	U %	D %	SA %	Mean value

Inflation	90	66.7	33.3	0.0		0.0	5.2
Exchange rate of Naira	90	38.9	61.1	0.0		1.4	4.9
Interest rate	90	44.4	33.3	22.2		0.0	4.7
Market condition	90	44.4	44.4	11.1		0.0	4.8

Table 6 presents the perceptions of survey respondents in the order of severity of economic related factors affecting the cost of building materials. Respondents were requested to indicate the extent to which each of the identified factors affected the cost of building materials, following a five (5) point Likert scale: 5=Strongly agree, 4=Agree, 3=Undecided, 2=Disagree and 1=Strongly disagree. In Table 5, Inflation, with a mean value of 5.2, was identified as the most significant economic related factor affecting the cost of building materials, as 66.7% of respondents strongly agreed that this factor strongly affects the cost of building materials.

Table 7: Human factors

In Table 7, the factors have mean values above 3.0, therefore they are accepted as human factors that cause increase in the cost of building material.

Human factors	No.	SA %	A %	U %	D %	SD %	Mean value
Cost of power supply	90	11.1	88.9	0.0	0.0	0.0	4.6
Delay in payment of construction labourers	90	0.0	66.6	22.2		11.1	3.8
Cost of plant	90	22.2	77.8	0.0	0.0	0.0	4.7

Table 8: Design factors

Design factors	No.	SA %	A %	U %	D %	SD %	Mean value
Design changes	90	22.2	66.7	0.0	0.0	0.0	4.2
Additional work due to changes in design	90	11.1	44.4	33.3	0.0	11.1	3.8
Estimation errors by Quantity surveyor	90	22.2	77.8	0.0	0.0	0.0	4.7

From Table 8, the respondents agreed that errors in estimation by the Quantity Surveyor is has the important effect on building material, with 4.7% in mean value.

Table 9: Stakeholders related factors

Stakeholders related factors	No.	SA %	A %	U %	D %	SD %	Mean value
Monopoly of raw materials	90	5.6	94.4	0.0	0.0	0.0	4.5
Fraudulent activities	90	27.8	27.8	33.3	11.1	0.0	4.1
Improper planning	90	0.0	66.7	22.2	11.1	0.0	4.7

From Table 9, it can be deduced that improper planning under stakeholder's related factors has the most impact on the high cost of building materials.

Table 10: External factors

External factors	No.	SA %	A %	U %	D %	SD %	Mean value
Force majeure (natural occurrence)	90	33.3	55.6	11.1	0.0	0.0	4.7
Weather conditions	90	22.2	33.3	33.3	11.1		4.1
Change in governmental policies and regulation	90	33.3	55.6	0.0	0.0	11.1	44.4
Level of advanced	90	44.4	44.4	11.1	0.0	0.0	4.8

technology							
Government legislations	90	33.3	66.7	0.0	0.0	0.0	4.8

Effects of Increase in the Cost of Building Materials on Public Housing Delivery

Table 11:

Effects of increase in the cost of building materials on public housing delivery	**SA** %	**A** %	**U** **%**	**D** **%**	SD %	**SA** %	Mean value
Fluctuation in cost of construction	90	22.2	77.8				4.7
Increase in project abandonment	90	22.2	66.7	11.1			4.6
Shortage in the delivery of adequate housing to the populace	90	11.1	77.8	11.1			4.4
Building collapse due to the use of less quality materials	90	22.2	61.1	5.6	11.1		4.4
Increase in final cost of building product, final cost higher than budgeted	90	22.2	55.6	11.1		11.1	4.2

Test of Hypothesis

Null Hypothesis (H0): High cost of building material does not affect public housing delivery in Awka, Anambra State.

Using Correlation Analysis

Table 12:

Mean Response	**Mean Weight**	**Factors responsible for the increase in the cost of building materials (X)**	**Effects of increase in the cost of building materials on public housing delivery (Y)**	**XY**	**X^2**	**Y^2**
SA	5	12	40	480	144	2601
A	4	43	27	1161	1849	256
UD	3	15	14	210	225	196
D	2	10	6	60	100	36
SD	1	10	3	30	100	9
Total		**90**	**90**	**1941**	**2418**	**3098**

Test statistics formula

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x2 - (\sum x)2][n\sum y2 - (\sum y)2]}}$$

$$r = \frac{5(1941) - (90)(90)}{[\sqrt{5(2418) - (90)2}][5(3098) - (90)2}$$

$$r = \frac{9705 - 8100}{\sqrt{(12090 - 8100)(15490 - 8100)}}$$

$$r = \frac{1605}{\sqrt{(3990)(7390)}}$$

$$r = \frac{1605}{\sqrt{29486100}}$$

$$r = \frac{1605}{\sqrt{5430.11}}$$

$$r = 0.2956$$

Therefore the correlation between High cost of building materials and Public housing delivery is 0.2956, which means that relationship is positive.

To test the hypotheses
Null Hypothesis (H0): High cost of building material does not affect public housing delivery in Awka, Anambra State

T calculated = 1.73
Degree of freedom = 5-1 = 4
Level of significance = 5= 0.05
The critical value (ttab) = 0.811
The calculated value (tcal) was indicated to be greater than the table value (ttab) i.e. 1.73 > 0.811, thus we reject the null hypothesis and conclude that increase in the cost of building materials effect public housing delivery in Awka, Anambra State.

Summary of the test statistic
Table 13: Summary of Hypotheses Test

Test	Value of Test statistics	Level of significance	Critical value	Decision
Correlation Analysis	1.73	0.05	0.811	Reject H_o, there is a significant relationship

Findings and Conclusion
Summary of Findings
i. The research revealed that that the increase in the prices of building materials affects the delivery of public housing in Awka, Anambra state.
ii. It was discovered that, Economic related factors, Human related factors, Stakeholder related factors and External factors are significant factors responsible for increase in the cost of building materials.
iii. Also the effects of these factors on the delivery of public Housing were examined.
iv. The available housing layout provided by the state was found to be outside the reach of most of its citizens.
v. Finally, the test of hypothesis attested to the fact that there exist significant relationship between increase in building material prices and public housing delivery.

Conclusion and Recommendations
Increase in the cost of building materials has been narrowed down to economic instability of the study area. This has a significant impact on the manufacturer of building materials, due to high cost of raw materials, forcing the manufacturers to increase cost of building materials when produced. In order to provide lasting solutions and bring about steady building material prices and avoid circumstances of constant price increases, the government of Anambra State should set up a building material monitoring committee that will bring innovations in construction methods and materials research. Quarterly material research will help curb the continuous increases in building material price.

References

Adamu, P.A., (2013). The Inflation and Economic Growth Nexus InEcowas Countries: An Empirical Investigation. West African financial and Economic review.

Abdul-Rahman, H., Wang, C. & Yap, J.B.H. (2015). Impacts of design changes on construction project performance: Insights from a literature review. In 14th Management in Construction Research Association (MiCRA 2015) Annual Conference and General Meeting.

Adedeji, Y.M.D. (2012). Sustainable housing provision: preference for the use of interlocking masonry in housing delivery in Nigeria. *Architecture Research*, 2(5):81-86.

Adebowale, O.J., (2014). Framework for effective management of the construction workforce

towards enhancement of labour efficiency during the building production process in South Africa (Doctoral dissertation, Cape Peninsula University of Technology).

Adekoya, S. O. (2003). Housing development in Nigeria, which way forward. The Professional Builders.

Agapiou, A., Clausen, L.E., Flanagan, R., Norman, G. &Notman, D. (1998). The role of logistics in the materials flow control process. Construction Management & Economics, 16(2):131-137.

Akanni, P.O., Oke, A.E. and Omotilewa, O.J., (2014). Implications of Rising Cost of Building Materials in Lagos State Nigeria. *SAGE* Open, 4(4), p.2158244014561213.

Anosike, P. (2009). Nigerian groans under high cost of building material. *The Daily Sun*.

Chitkara, K. K. (2006). *Construction Project Management, Planning, Scheduling and Controlling*. New Delhi: Tata McGraw-Hill Publishing Company Limited.

Chinedu, C.C. (2016). Fundamentals of Project Materials.

Du Plessis, C. (2002). Agenda 21 for sustainable construction in developing countries. CSIR Report BOU E, 204.

Froeschle, L.M. (1999). Environmental assessment and specification of green building materials. Construction Specifier, 52:53-57.

Ganiyu, B.O. (2016). Strategy to enhance sustainability in affordable housing construction in South Africa (Doctoral dissertation, Cape Peninsula University of Technology).

Idoro, G. I., &Jolaiya, O. (2010). Evaluating material storage strategies and their relationship with construction project performance. Proceedings of CIB International Conference on Building Education and Research, University of Cape Town.

Ihuah, P.W., Kakulu, I.I. & Eaton, D. (2014). A review of Critical Project Management Success Factors (CPMSF) for sustainable social housing in Nigeria. *International Journal of Sustainable Built Environment.*

Jagboro, G.O. & Owoeye, C.O. (2004). A model for predicting the prices of building materials using the exchange rate in Nigeria. *The Malaysian Surveyor*, 5(6):9-14.

Kasimu, M.A. (2012). Significant factors that cause cost overruns in building construction project in Nigeria. *Interdisciplinary journal of contemporary research in business*, 3(11):775780

Nega, F. (2008). Causes and effects of cost overrun on public building construction projects in Ethiopia. Unpublished doctoral dissertation,Addis Ababa University, Ethiopia.

Ogunlana, S.O., Promkuntong, K. &Jearkjirm, V. (1996). Construction delays in a fastgrowing economy: comparing Thailand with other economies. *International journal of project Management*, 14(1):37-45

Oladipo, F.O. & Oni, O.J. (2012). Review of Selected Macroeconomic Factors Impacting Building Material Prices in Developing Countries–A Case of Nigeria. Ethiopian *Journal of Environmental Studies and Management*, 5(2):131-137.

Rajaprabha, R., Velumani, P. &Jayanthi, B. (2016). Factors Affecting the Cost of Building Material in Construction Projects. *International Journal of Science and Engineering Research*

Windapo, A.O. &Cattell, K. (2013). The South African construction industry: perceptions of key challenges facing its performance, development and growth. *Journal of Construction in Developing Countries*.