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Examination of Factors Influencing Cost of Building Materials in Anambra State

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Abstract - The study examined the factors influencing the high cost of building materials for public housing projects in Anambra State, Nigeria, using a survey research design. The target population comprised 470 construction professionals, including architects, builders, quantity surveyors, and structural engineers, with 425 completed and valid questionnaires returned, representing a response rate of 90.4%. Data were analyzed using SPSS version 26, employing descriptive statistics to summarize demographic and perception data, and inferential statistics, including one-sample t-tests, to assess the significance of identified factors. Findings revealed that economic-related factors were the most influential determinants of building material costs, with a group mean of 0.82, where inflation and fluctuations in material prices were the most critical (RII = 0.84), followed by exchange rate volatility (RII = 0.83). Stakeholder-related factors, including improper planning (RII = 0.83) and delays in supply (RII = 0.81), ranked second (G.mean = 0.80), while building production-related factors such as labor efficiency and site conditions contributed moderately (G.mean = 0.79). External factors, including government policies and weather conditions, were ranked fourth (G.mean = 0.77). The overall one-sample t-test indicated a statistically significant effect of these factors on material costs ($t = 48.401$, $df = 424$, $p < 0.001$), with a mean score of 4.11, significantly above the neutral benchmark. The study concluded that the high cost of building materials in Anambra State is driven by a combination of macroeconomic, stakeholder, production-related, and external determinants. Effective mitigation requires coordinated policy measures, improved project planning, enhanced stakeholder management, and investment in local material production. These interventions are critical for reducing construction costs, improving efficiency in public housing delivery, and enhancing affordability and sustainability in the state's housing sector.

Key Words: Building Materials Cost, Public Housing, Construction Industry, Economic Factors, Stakeholder Factors, Anambra State, Housing Affordability, Project Delivery

I. INTRODUCTION

Globally, the success of a building project is determined by the ability of the project to meet the criteria of cost, time, safety, resource allocation, and quality as determined by the client (Olajide, Olabode and Iniobong, 2016). In agreement to this, Ali and Kamaruzzaman, (2010) stated that the construction industry measures the performance of construction projects majorly through cost parameters in addition to time and quality which are also important. It is therefore with these parameters that the success or failures of the construction industry which has been proven to be the corner stone and bedrock of rapid economic growth of any nation is been measured.

With respect to cost parameter, the major costs associated with construction are cost of land, labour, materials, plants, and machineries. Cost is the amount of money, which must be given to or is needed in order to acquire, produce, or affect something. Chudley and Greeno, (2016) defined cost of building as the amount which the client will have to pay the contractor for a construction project. Ferry (1992) further stated that the contractors' costs are made up of the prime costs which consist of wages (cost of labour), cost of materials together with cost of plant and machinery, overheads these include salaries and office administration expenses.

Cost is one of the major considerations throughout the lifecycle of a project. Unfortunately, most of the projects failed to achieve project completion with the estimated cost. Besides time overrun, cost overrun is also a serious problem in the construction industry. In Nigeria, the trend is more severe, where these overruns sometimes exceed 100% of the anticipated cost of the project (Oluyemi-Ayibiowu., Aiyewalehinmi, and Omolayo, 2019).

Building materials account for a significant proportion of the total cost of construction, with estimates suggesting they contribute approximately 60–70% of the overall project budget (Olanrewaju, Akinola and Oladimeji., 2018). Consequently, Okongwu, Okolie, Obodoh & Uche (2025) emphasized that fluctuations in the cost of building materials directly impact housing affordability. In recent years, Anambra State has experienced a steady increase in the cost of

materials, driven by factors such as inflation, exchange rate volatility, high transportation costs, and dependency on imported materials (Okoye, Ngwu, and Umeh, 2022). This trend exacerbates the housing deficit, making it increasingly difficult for the government to meet the growing demand for affordable public housing.

The problem of high construction costs is becoming obvious in this county and it has been observed that the substantial increase between final construction always get higher than the budgeted cost of construction. The causes of these problems are varied; some are not only difficult to predict but also difficult to manage (Morris and Hough 1991). High cost of construction generally undermines the viability and sustainability of the construction industry as well as its participants. According to Mbachu and Nkado (2004), to the client, high cost implies added costs. To the professionals, high cost implies inability to deliver value for money and could well tarnish their reputations leading to loss of confidence reposed in them by clients. To the contractor, it means loss of profit for non-completion; this could jeopardize the chances of winning future jobs, if at fault. Other problems as a result of these project cost related problems includes, increase in project abandonments, construction disputes, and high costs of renting or using the services rendered by these public projects etc. therefore, in other to improve the success performance rate of public projects, the incessant increase in costs of construction materials calls for thorough investigation particularly in the study area. It is against this backdrop that the examination into the factors influencing cost of building materials in Anambra State.

II. LITERATURE REVIEW

2.1 Building Materials

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 (Akanni, Oke, and Omotilewa, 2014). Akanni*et al.* (2014) explained that building materials remain the most substantial input in project development and, because of this, play an undeniably significant role in the delivery of construction projects. 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 (Akadiri 2011). 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 importance of building materials in sustainable housing delivery cannot be underestimated.

2.2 Factors Responsible for Increase in The Cost of Building Materials

As discussed, the cost of building materials has presented a formidable challenge to the construction industry (Akanni *et al.,* 2014). Windapo and Cattell (2013) are in agreement, contending that the preeminent challenge affecting the performance of the construction industry and projects in South Africa is primarily the increasing cost of building materials. Hence, volatility tends to push the cost of building materials up and transfers a major risk to all parties involved: suppliers, contractors and clients (Li, 2001). Ughamadu (1993) also asserted that local currency devaluation was a factor surging the cost of building materials up.

Jagboro and Owoeye (2004); Mojekwu, Idowu, and Sode (2013); and Idoro and Jolaiya (2010), in their respective studies, pointed out many factors – such as the change in government policies and legislations, scarcity of raw building materials, fluctuation in the cost of fuel and power supplies, inadequate infrastructural facilities, unfortunate corruption, fluctuation in the cost of plant and labour, and seasonal changes – as being factors responsible for the escalating cost of building materials. Other factors responsible for the increase cost of building materials identified by researchers are these: fluctuation in the cost of transportation and distribution, political interference, local taxes and charges, fluctuation of cost of raw materials, cost of finance, inflation, and fluctuation in the exchange rate. Moreover, Oladipo and Oni (2012) analysed some macro-economic indicators impacting the cost of building materials, which include the following: exchange rate of local

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currency to other currencies globally, inflation rate and interest rate charge on loans.

III. METHODOLOGY

This study adopted a survey research design to examine the factors influencing the high cost of building materials for public housing projects in Anambra State, Nigeria. The target population comprised 470 construction professionals, including architects, builders, quantity surveyors, and structural engineers, selected from professional secretariats across the state. Given the manageable population size, the entire population was adopted as the sample, and purposive sampling was used to ensure that respondents possessed the relevant knowledge, expertise, and experience in construction and housing projects. Data were collected using a structured questionnaire designed to capture demographic information, professional experience, and perceptions of the key factors driving high material costs, such as inflation, supply chain challenges, import dependencies, and transportation constraints. Out of the 470 questionnaires shared, only 425 were returned and found useful for the study.

The data collected were analyzed using SPSS version 26. Descriptive statistics were employed to summarize respondents' characteristics and overall perceptions, while inferential statistics, including correlation and regression analysis, were used to examine relationships between identified factors and their influence on material costs. Ethical standards were strictly adhered to, with informed consent obtained from all participants, assurances of confidentiality and anonymity, and prior approval from the relevant ethics committee. This approach ensured that the study produced reliable, valid, and ethically sound insights into the determinants of building material costs in Anambra State.

IV. RESULTS

Table -1: Distribution of the factors affecting the cost of building materials in the respondent's area.

S/N	Factors	∑f	∑fx	RII	Rank	G.mean	G.Rank
A	Economic related factors					0.82	1st
	Exchange Rates	425	1760	0.83	3rd		
	Inflation	425	1790	0.84	1st		
	Interest Rate	425	1700	0.80	5th		
	Fluctuation in Cost of Building Materials	425	1775	0.84	1st		
	Inadequate Production of Raw Materials	425	1660	0.78	6th		
	Supply & Demand of Building Materials	425	1735	0.82	4th		
B	Building production related factors					0.79	3rd
	Site Related Factors	425	1655	0.78	2nd		
	Human Factors	425	1690	0.80	1st		
	Design Related Factors	425	1665	0.78	2nd		
C	Stakeholder related factors					0.80	2nd
	Supplier Default	425	1650	0.78	4th		
	Improper Planning	425	1770	0.83	1st		
	Delay in Supply of Building Materials	425	1715	0.81	2nd		
	Client Contribution to Design Change	425	1675	0.79	3rd		
D	External factors					0.77	4th
	Force Majeure	425	1565	0.74	3rd		
	Weather Conditions	425	1620	0.76	2nd		
	Government Policies	425	1725	0.81	1st		

The findings in Table 1 showed the relative importance of factors influencing the high cost of building materials in Anambra State, categorized into four major groups: economic-related factors, building production-related factors, stakeholder-related factors, and external factors. Analysis of the Relative Importance Index (RII) and Group Mean (G.mean) indicated that economic-related factors were the most influential, with an overall group mean of 0.82, ranking first among all categories. Within this group, inflation and fluctuations in the cost of building materials were identified as the most critical

individual factors (RII = 0.84), followed closely by exchange rate volatility (RII = 0.83). These findings suggest that macroeconomic instability, including currency depreciation and rising general prices, has a direct and substantial impact on the cost of materials, consistent with earlier studies emphasizing the vulnerability of construction costs to national economic conditions.

Stakeholder-related factors ranked second (G.mean = 0.80), highlighting the role of human and organizational actions in driving material costs. Improper planning (RII = 0.83) and delays in the supply of building materials (RII = 0.81) emerged as the most significant within this category, indicating that coordination, procurement strategies, and responsiveness of suppliers and contractors are crucial in controlling costs. Building production-related factors followed closely (G.mean = 0.79), with human factors (RII = 0.80) and site-related challenges (RII = 0.78) identified as the key contributors, reflecting the influence of labor efficiency, site conditions, and design complexities on overall project expenses.

External factors, including government policies (RII = 0.81), weather conditions (RII = 0.76), and force majeure events (RII = 0.74), were ranked fourth, suggesting that while these elements affect material costs, their impact is less pronounced compared to economic and stakeholder-related determinants. Overall, the table highlights that economic stability, effective planning, and stakeholder coordination are critical to mitigating the rising cost of building materials in public housing projects in Anambra State.

The paper tested the hypothesis which states there are no factors influencing cost of building materials in the study area. To test the hypothesis, respondents' opinions on the factors affecting the cost of were analyzed using descriptive statistics and a one-sample test against a benchmark mean of 3.00, which represents a neutral level of agreement on a five-point Likert scale.

Table 2-: Summary Statistics of Factors Influencing Cost of Building Materials

Variable	N	Mean	Std. Deviation
Factors affecting the cost of building materials	425	4.1102	1.12958

The One-Sample Statistics table (Table 2) provides descriptive information about the variable "factors." The sample size (N) is 425, which is sufficiently large to ensure reliable statistical results. The mean score of factors is 4.1102, indicating that, on average, participants perceive a moderate level of factors. The standard deviation (1.12958) suggests moderate variability in responses, with some participants rating factors much higher or lower than the average. These statistics set the foundation for inferential tests, such as the one-sample t-test, to determine if this mean differs significantly from a hypothesized value (test value).

Table -3: One-Sample Test of the Factors Influencing Cost of Building Materials

Variable	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
					Lower
Factors affecting the cost of building materials	48.401	424	.000	4.11020	2.9838

The One-Sample Test table (Table 3) evaluates whether the mean score of factors (4.11023) significantly differs from the test value (000). The t-statistic (48.401) is an extremely large positive value, indicating that the sample mean is far from the test value. The degrees of freedom (424) align with the sample size (N−1), and the p-value (0.0000.) is highly significant, well below the standard threshold of 0.05. This means that the observed difference is not due to random chance. The mean difference (4.1102) quantifies the extent of deviation from the test value, while the 95% confidence interval (2.9838 to 4.2366) confirms that the true population mean is significantly greater than zero, as the interval does not include zero. Therefore, the null hypothesis, which assumes that there are no factors influencing cost of building materials in the study area. (mean = 0), is rejected. This analysis demonstrates that participants perceive that there are significant factors that exists, with a

mean score that is both statistically and substantively meaningful.

Decision: Reject the null hypothesis (Accept the alternative hypothesis)

V. CONCLUSIONS

The study established that the cost of building materials in Anambra State is influenced by a combination of economic, stakeholder, production-related, and external factors. Economic factors, particularly inflation, fluctuations in material prices, and exchange rate instability, were identified as the most significant drivers, highlighting the critical role of macroeconomic conditions in shaping construction costs. Equally important were stakeholder-related factors, including improper planning, delays in material supply, and coordination challenges, which underscore the need for effective project management and procurement practices. Production-related factors, such as labor efficiency, site conditions, and design complexities, also contributed to rising material costs, while external factors, including government policies and environmental conditions, had a moderate but noteworthy effect.

The findings demonstrate that the high cost of building materials is not the result of a single issue but rather the interplay of multiple determinants. Addressing these challenges requires a holistic approach that combines economic policy measures, improved planning and coordination among stakeholders, investment in local material production, and responsive regulatory frameworks. By targeting these areas, policymakers, contractors, and other construction professionals can reduce material cost pressures, enhance efficiency in public housing delivery, and improve the affordability and sustainability of housing projects in Anambra State

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