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Assessing the Factors Impacting Sustainable Low-Cost Housing Development in Enugu State, Nigeria

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ABSTRACT

Housing as a fundamental need is crucial to the development of any country. One of the top three needs for men and to the existence of humans is housing. Cost is a significant problem that the majority of enterprises face on a regular basis. This study assessed the factors impacting sustainable low-cost housing development in Enugu State, Nigeria. The objectives examined; the economic factors influencing the provision of sustainable low-cost housing; propose possible mitigation measures to achieve sustainable low-cost housing provision in Enugu State. Correlation research design was adopted. Primary and secondary data were used for carrying out the research. The population was drawn from professionals of the built industry within the study area. SPSS version 20 tool was used in descriptive analysis estimate of the mean of each factor. E-view8 tool of inferential correlation and regression were used in the analysis and testing of hypothesis. The result of the analysis indicates that insufficient resources ranked 1st with mean score of 10.5 and inflation ranked 2nd with RII of 10.3 by the R^2 value of 0.702 is considered statistically significant at 0.05 level. The null hypothesis 1 was rejected because it has a t-statistics value of 0.041 respectively which are below 0.05, this means that there are significant factors that influence sustainable low-cost housing provision. Further results indicate that mitigation measures for sustainable low-cost housing include: government regulatory and policy support (84%), innovative financing methods (82%), monthly housing payment scheme for civil servants (83%), Easy access to information (84%), timely communication (80%), and community involvement and empowerment (81%). The work concludes that optimizing small spaces, selecting appropriate materials, and adapting learning practices from other regions can significantly improve low-cost housing sustainability in Enugu State. The research recommends enhancing housing policies, simplifying bank borrowing, improving financing access, implementing government-backed loans or grants for low-income families, and promoting community involvement and cultural preferences.

Keywords: Construction Cost, Sustainability, Low-Cost Housing, Government Intervention

INTRODUCTION

Housing is the provision of a physical structure for habitation, lodging, or shelter, encompassing a variety of alternatives from houses and apartments to emergency accommodations and temporary shelters, which makes it one of the most important requirements for human life. Housing guarantees that people of society have a place to live. A person's health, safety, and well-being depend on having access to secure, reasonably priced, and sustainable low-cost housing provision. A person's housing situation can affect their access to social networks, job, healthcare, education, and other resources, as well as their economic, social, and cultural chances [1]. Housing laws and programs have been developed in many nations to guarantee that everyone has access to appropriate housing and to address concerns relating to affordability, quality, and availability. In many nations, sustainable low-cost housing is seen as a social service that serves the requirements of the low- and middle-income population by providing

affordable housing [2]. Therefore, just 10% of Nigerians who want to buy a home can actually afford it, whether through personal construction or purchase, compared to 72% in the US, 78% in the UK, 60% in China, 54% in South Korea, and 92% in Singapore [3]. In Nigeria, rises in household expenditure and rent are surpassing the rate of inflation overall. The inflation rate has reached a record high of 33.4%, which has led to a large increase in building expenses overall. The market's inventory of real estate for sale and rental purposes has been relentlessly moving toward more expensive homes, exacerbating the problems. Although it is government-sponsored, low-cost housing is provided by housing associations in many developed nations, including the US, Canada, UK, Germany, Japan, and France [3]. In contrast, the government is directly involved in the provision of low-cost housing in many other developing nations, like China, Malaysia, and Nigeria, through their housing agencies [4]. One goal of housing policy around the world, especially in Nigeria, there is the need for long-term, sustainable low-cost housing availability [5]. It is crucial to provide sustainable low cost housing in any nation since it boosts the national economy. As a fundamental need, housing is key to the development of any country. Among the top three needs for men and to the existence of humans is housing. At the time of its independence in 1960, Nigeria had a population of 45,211,614, which translates to a density of 6,967,110 people per square kilometer. At this time, there were 227, 996, 080 people living there, with cities housing 57% of the population. Despite its size, the 910,802 km2 of land could not support Nigeria's expanding population [6]. In order to ensure that a growing population has access to sustainable shelter and to promote healthy and productive living, among other things, societies need to continuously provide low-cost housing. Due to this, numerous governments worldwide are making unceasing efforts to guarantee the availability of affordable housing for the general public, especially for those who would otherwise be unable to afford it. However, there is a current and expanding issue with access to sustainable low-cost housing all over the world. Due to low salaries and a lack of available housing, sustainable low-cost housing is frequently out of reach for many people [7]. Successive governments around the world have adopted various ways to meet housing demands in their nations in order to address the issue of high cost housing, particularly for the low and middle-income groups. In the Southeastern Nigeria, It is increasingly alarming how residents in Enugu State continue to struggle with unaffordable and unsustainable low cost housing provisions. This issue has led to several negative outcomes, including exorbitant sales prices, soaring mortgage costs, inadequate low-cost housing supply that undermines unit production, diminished affordability for the intended beneficiaries, poor living conditions, migration to rural areas, and population congestion, in areas like Ogwuagor, Obiagu, Abakpa, Ugbo-oghe, Ugwu-Aaron, and Ugbo-Odegwu, etc, where residents of Enugu lives in slums in the name of houses. Enugu's metro area, with a population increase from 820,000 in 2022 to 846,560 residents in 2023—a 3.24% rise—now has only 1,924 dwelling units budget, predominantly in areas such as Liberty Estate, Winners Estate, New G.R.A. and Trans-Ekulu [8]. The failure to address these housing challenges through proactive economic transformation policies, instead of reactive measures during political and economic crises, has worsen Enugu's housing problems. This study evaluate the factors that influence sustainable low cost housing provision in Enugu State, by examining the economic factors influencing the provision of sustainable low-cost housing; propose possible mitigation measures to achieve sustainable low-cost housing provision. The study initiate hypotheses to guide the research. However, the result of this study would be of significance for addressing housing crisis, promoting environmental sustainability, effective housing policies, and improved the living conditions of low income earners in Enugu State, Nigeria.

Literature Review

Concept of Project Cost Planning

For management, commanding, and controlling, cost planning is crucial. Whether it is a government development or an individual, executives must pay attention to the cost planning of buildings or services. For users making decisions in the construction company, it is important to be aware of precise, dependable, and relevant recording and calculation systems, such as price setting, cost-volume-profit analysis, break-even analysis, etc. It also has to do with effectively managing costs and expenses to maximize developer profit. To ensure that the budget can be accomplished within the allotted time frame, cost management involves planning, estimating, budgeting, and controlling expenditures [9]. However, Cost is a resource whose worth is determined by the amount of money spent on goods, structures, and services. The acquisition of materials, assets, and services is done so as to maximize developer benefits and returns both now and in the future. Both expired and unexpired costs are considered incurred costs. Costs can be divided into a variety of categories based on the goals for consideration and administrative use, which can then be managed to maximize operational performance through resource allocation and operation [10]. Therefore, operating expenses are typically those incurred throughout the course of conducting commercial operations that result in the conversion of purchased goods intended for sale into actual sales revenue. They include, among other things, maintenance and replacement costs. Cost behavior is the study of how expenses vary or do not vary with the level of activity in an organization [11]. When it comes to the supply of sustainable low-cost housing,

a construction industry needs to have proper cost estimation, cost budgeting and cost control, in order for an adequate profit to be realized. The process of calculating the expenses related to all the resources needed to complete the project is called cost estimation. Gathering, analyzing, and summarizing all of the data that is accessible for a building project is the process of estimating construction costs [12]. An estimation of the overall cost of a construction project is called a construction cost estimate. It is the estimator's duty to support the project owner in creating a budget and schedule for the project's construction. Therefore, a thorough analysis of the economic and environmental elements that will affect the estimate is required in order to prepare an accurate estimate, which is done before the job is physically realized. Project expenses are estimated prior to the completion of the topographic survey, soil survey, and socioeconomic research of the construction site. Because of this, [13] proposed that this kind of calculation include carefully reviewing the study's findings to determine a cost that is reasonable given the available time as well as the precision and thoroughness of the data provided. Furthermore, cost budgeting which is fundamental to sustainable housing provision can be seen as either an independent procedure or a component of estimating. Allocating expenses to a specific project component, such as individual tasks or modules, for a predetermined duration is known as budgeting. [14], highlighted that many low-cost housing projects in Nigeria suffer from budget overruns due to poor initial cost estimates and inadequate financial planning. Contingency reserves are set aside in budgets to handle unforeseen expenses. Critical decisions like which designer to hire—someone who can build and complete the project from start to finish, or someone who can assist with a few parts and work within a reduced budget—will be determined by the budget. How many tales ought to be included in the structure? What kind of materials ought to be utilized? The project schedule includes the activities with the allotted time and resources. In many situations, the budget and timeline are interrelated. Analyzing the cost of project activities in relation to the project schedule is crucial for effective cost management [15]. Preparing the project's cash-flow requirements in relation to the schedule is known as cost budgeting. To develop a project budget, the organization's financial limit and the project's cash flow requirements must be reconciled. Depending on available resources, the schedule can be rearranged to maximize cash flow requirements. Therefore, measuring cost variances from the baseline and correcting the gap with suitable actions, like raising the budget or narrowing the scope of work, is the process of cost control. Over the course of a project, cost control is an ongoing activity. Here, reporting in a timely and transparent manner is just as important as measuring. Cost control is crucial for organizational performance because maximizing profit is one of every company's top priorities. The purpose of good management is the effective application of resources so as to maximize profit and wealth for the shareholders because an organization's survival is also a key goal and to this extent it strives to minimize costs [16]. This becomes crucial since poor profit, low productivity, and high costs are some of the factors that cause senior management grave anxiety. However, when costs are low, profits are high, and productivity is strong, top management adopts a strategy that gives managers complete freedom to run their departments while drastically reducing its own involvement [17]. Along with the cost baseline, the cost management plan is an essential input for cost control. This plan contains details such as how project performance will be measured, what is the threshold for deviations, what actions will be done if the threshold is breached, and the list of people and roles who have the executive authority to make decisions, through earned value management. The negative schedule variance indicates that the task is falling behind, but the positive cost variance indicates that it's under budget. Cost control can offer the degree of transparency that decision makers need to act swiftly in the face of hundreds of activities in large projects.

Housing Provision in Nigeria

One of the most widely acknowledged basic human needs is housing, which also serves as a gauge for the wellbeing and quality of life of both individuals and communities [18]. It is the most common land use in developed nations and can account for as much as 30 to 35 percent of building costs on an annual average. In technical terms, housing is a stock residence, which is an assembly of homes, apartments, or other residential structures. These homes can be single-family residences, multi-unit townhouses, or apartments that can be high-rise, low-rise, detached, or semi-detached. Because of the many requirements that its residents have with regard to size, quality, location, and tenure system, the building is therefore non-standardized [19]. These categories show the fact that housing is a basic good that is required to meet the needs of people and places on an economic, social, political, and cultural level. Housing demand is the amount of housing people can afford to buy or rent without government assistance, considering their ability to pay. House need refers to the quality of housing needed for households without suitable housing or insufficient housing. However, housing requirement is the amount of housing needed for all households to have access to acceptable housing, regardless of their financial situation. It takes into account both housing demand and need, ensuring the population meets minimum standards set by local or state laws. Low-Cost Housing (LCH) provision is a sequential process that includes all of the stages required to build, furnish, and maintain the homes [19]. To create and deliver new housing units, the providing process combines resources like land, labour, financing,

and building materials are joined. [19], explains how these stages are connected to one another through discrete, short-term actions such as the initial land acquisition and assembly, the idea of building plans and designs, the building process, and the sale of finished homes. Therefore, it is a complex process that is impacted by the management system, the affordability capability of the target beneficiaries, and the contextual features of many players (public and private), all of which have an impact on the process's design, construction, distribution, and management [20]. Put another way, provision entails comprehension and thoughtful execution of all phases, from planning and building to distributing newly constructed or remodeled housing units to final consumers. The purchasing power of the household, or its capacity to support the cost of housing consumption, and the housing production price are two crucial variables that must be taken into account while providing LCH [5]. In light of these factors, government interventions are highly valued in many nations. Each nation implements a system to enable the realization of LCH provision.

Low-Cost Housing Policy

It appears that Nigeria began offering LCH in 1962, the year of the country's independence. As with many other nations, this is a deliberate government intervention aimed at giving low- and middle-class citizens access to decent housing [18]. The lack of effective policy implementation has been a recurring theme in the literature. [21], asserted that policies designed to address low-cost housing in Enugu State are often poorly enforced or inadequately funded. This results in a gap between policy intentions and actual outcomes, impacting the effectiveness of project cost management strategies. The residential structures range from low-rise to high-rise apartments to single-family homes with one to three bedrooms. Documents as presented in the NHP in [18] demonstrate that the development of low-cost housing began as a government initiative to expand the housing stock and accommodate a large number of public servants who relocated to Lagos, the then-federal capital. The term "LCH" was primarily coined in response to the World Bank's 1979 housing for the poor project. Initially, the World Bank's LCH initiative was implemented in what are now known as the southeast and northeast zones, mainly in the states of Imo, Bauchi, and other areas in the nation. Due to the need to construct homes for the laborers from the former East Central State of Nigeria, the LCH had already developed in the southeast zone prior to 1979. The prefabricated homes were situated in government-reserved housing complexes and served as core housing. Numerous housing initiatives and policies have been put into place at the federal, state, and local levels since the 1960s with the goal of ensuring that everyone in the nation has access to decent housing. Furthermore, government policies and institutional frameworks play a vital role in determining the success of low-cost housing initiatives. In Enugu State, land ownership policies, regulatory frameworks, and the effectiveness of housing development agencies are critical factors. The **Land Use Act of 1978**, which governs land allocation and ownership in Nigeria, often hinders access to land for low-income housing development due to bureaucratic bottlenecks and corruption. Moreover, the lack of coherent policies for low-cost housing provision has resulted in inconsistent government efforts.

Low-Cost Housing Provision in Enugu

The Enugu State Government has declared its intention to build 1,500 housing units for low- and middle-income people, demonstrating its commitment to giving prospective homeowners in the state somewhere to reside. [22], general manager of the Enugu State Housing Development Corporation (ENSHDC), told The Guardian that after constructing ten estates for the wealthy, the government was now concentrating on offering low-income workers, including state employees, affordable accommodation. He said that the first phase of 100 one-, two-, and three-bedroom apartment buildings at the Coal City View estate in Ugwuonyema had begun construction, supporting the state government's commitment in this area. Agu stated that the intention of government at the Coal City View Estate was to provide 750 housing units, assuring that it would be completed before the end of the administration. He added that the government had also secured approval for a N1.8 billion facility from Family Home Funds to build 500 units affordable houses at Nsukka, adding that another site had being cleared opposite Enugu State University of Science and Technology (ESUTH) for the construction of 250 units. He said: "You know because of the income of civil servants, if you don't give them a helping hand, they will not be able to build houses during their career. We agreed to provide an elongated payment plan through mortgage so that they can pay back mortgage loans within 20 or 25 years, depending on their profiling. He said: "You know because of the income of civil servants, if you don't give them a helping hand, they will not be able to build houses during their career. We agreed to provide an elongated payment plan through mortgage so that they can pay back mortgage loans within 20 or 25 years, depending on their profiling. Therefore, LCH provision will yet receive considerable attention in the Enugu State Housing Development Corporation (ENSHDC), in the near and far future. Therefore, to ensure successful LCH provision, there is the need for successful cost management strategy in that each phase of the process. This success can be effectively realized by identifying critical areas in the provision system where necessary improvements are required.

Factors that Influence Building Project Cost

Since cost management is one of the key success factors for construction projects, it should be managed and controlled throughout the project's lifecycle. This study examined cost management practices in major construction projects in southern Malaysia, and the findings showed that the following methods were the most successful: Elemental Cost Plan, Cash Flow Forecasting, and Tender Budgeting/Estimating [23]. The following were the main factors influencing the cost management of construction projects in South-Western Nigeria: ineffective cost management and leadership, inefficient resource deployment, excessive material waste on construction sites, intricate payment systems, material theft on construction sites, and variation during construction works [24]. In order to determine the factors affecting the cost management of Indian construction projects, [25], indicated the success and failure factors from a review of the literature. The results of a field survey revealed that the critical success factors obtained by the analyses were: project managers' competence; top management support; project managers' coordinating and leadership skill; monitoring and feedback from participants; coordination among project participants; and owners' competence and favorable climatic conditions. Alternatively, the factors affecting the cost performances of projects included conflict among project participants; ignorance and lack of knowledge; the presence of poor project specific attributes and nonexistence of cooperation; hostile socioeconomic and climatic conditions; reluctance to prompt decision-making; fierce rivalry during the tender phase; and little time for bid preparation. Economic Factor: A significant factor limiting the sustainable low-cost housing provisions are Economic constraints, which high construction costs, inflation, and fluctuations in the cost of building materials affect both developers and potential homeowners. Additionally, access to low cost housing development remains a challenge for both private developers and low-income individuals in Enugu State. Mortgage systems are underdeveloped, and the interest rates on housing loans are often prohibitive [26-29].

Environmental Factors: Sustainable low-cost housing requires an emphasis on environmental preservation and the efficient use of resources. In Enugu State, the impact of climate change, including increasing temperatures and irregular rainfall, creates additional challenges for housing design and construction.

Theory of Sustainability

To promote a theoretical comprehension of the conceptual framework's growth, this review is essential. This part discusses effective cost management strategies and sustained low-cost housing provision after providing a basic grasp of the principles of low-cost housing provision generally and specifically within the Enugu State context, Nigerian. In recent decades, the construction industry has paid a lot of attention to the sustainability hypothesis. [26], emphasized, the theory contends that in order to assure the best possible use of building materials, it is crucial to assess construction costs against resource availability before starting any construction project. [29,32], the Nigerian building sector exhibits low performance due to factors such as a high rate of inflation, a lack of operating capital, hurdles erected by host communities, rising construction costs, and the flagrant incompetence of self-described engineers. In Nigeria, the majority of these issues are pleading for attention from the proper authorities at both the state and federal levels. In summary, LCH is a government-initiated program designed to address the housing needs of a specific demographic class—that is, lower-middle-class and lower-class people—especially in developing nations. Research from the literature suggests that sustainable low-cost housing would continue to be in great demand for many years to come in the housing market, especially in a state like Enugu with similar contextual features. Additionally, it was shown that one of the most important success factors for a sustainable low-cost housing (LCH) provision in many developing nations, likewise Enugu State Nigeria, is for construction industries to effectively deal with cost estimation, cost budget and cost control.

Methodology

The research design used in this research was a correlational research design. A Correlational research design investigates relationships between variables without the researcher controlling or manipulating any of them. A questionnaire was used to collect information about the respondents' profile. The Pearson ranking test assessed correlation between ranked variables using Spearman's Rank Correlation. It was used to rank data, calculating differences, squared differences, and summation. The Spearman's Rank Correlation Coefficient is calculated, with values ranging from -1 to +1. Hypothesis testing is done using the Null Hypothesis (H0) or Alternative Hypothesis (H1), and a significance level is used to reject the null hypothesis. The result was further tested using t-test statistical method to determine significant differences in the result.

Findings and Discussion

Data obtained through the questionnaire were analyzed. The data from the respondents was examined and ranked in accordance with the strength of the effects, on the Tables 1-3. Table 1 shows the rank of 10 factors that influence sustainable low-cost housing provision in Enugu State. Insufficient resources ranked 1st with mean score of 10.5,

inflation, availability of land and government policies ranked 2nd 3rd and 4th respectively with RII of 10.3, 10.2, 10.1 respectively. This is in line with [25], who in his study mentioned these factors as affecting cost of housing. This was also substantiated by [26] who sees most of the identified factors as risks that affect procurement process in construction industry.

Table 1: Economic factors that influence the sustainable low-cost housing provision

S/N	Identified Economic Factors		VI----------				LI	∑FX	$\bar{X}$	RANK
		W	5	4	3	2	1			
1	Insufficient Resources	F	48	3	3	3	27	84		1st
		WF	240	12	9	6	27	294	10.5	
2	Inflation	F	45	3	3	9	24	84		2nd
		WF	225	12	9	18	24	288	10.3	
3	Availability of land	F	45	3	3	6	27	84		3rd
		WF	225	12	9	12	27	285	10.2	
4	Government policies	F	45	3	3	3	30	84		4th
		WF	225	12	9	6	30	282	10.1	
5	Communication level	F	42	3	3	9	27	84		5th
		WF	210	12	9	18	29	276	9.84	
6	Team cooperation	F	42	3	3	6	30	84		6th
		WF	210	12	9	12	30	273	9.75	
7	Onsite resource control	F	42	3	3	3	33	84		7th
		WF	210	12	9	6	33	270	9.63	
8	Organizational structure	F	39	3	3	9	30	84		8th
		WF	195	12	9	18	30	264	9.42	
9	Availability of information	F	39	3	3	6	33	84		9th
		WF	195	12	9	12	33	261	9.30	
10	Environmental effect	F	39	3	3	3	36	84		10th
		WF	195	12	9	6	36	258	9.21	
	Grand Mean								**9.56**	

Source: Researcher's field survey, 2023

VI= Very Important LI= Less Important
$\bar{X}$ = Mean ∑FX= Sum of all the mean
WF= Weighted Frequency of the response F= Frequency of the response

Table 2: Possible mitigation measures to achieve sustainable low-cost housing provision

Mitigation Measures	Acceptance	Percentage Acceptance	Rejected	Percentage Rejection	Undecided	Percentage of Undecided
Government regulatory and policy support	84	100	-	0	-	0
Innovative financing methods	82	98	-	0	2	2
Monthly housing payment scheme for civil servants.	83	99	-	0	1	1
Easy access to information	84	100	-	0	-	0
Timely communication	80	95	1	1	3	4
Community Involvement and Empowerment	81	98	-	0	2	2

Table 2 demonstrates high acceptance rates for mitigation measures for sustainable low-cost housing, including government regulatory and policy support (84%), innovative financing methods (82%), monthly housing payment scheme for civil servants (83%), Easy access to information (84%), timely communication (80%), and community involvement and empowerment (81%). The result affirmed (27) position on the role of government support in sustainable housing development and (28,29) assertion of the need for innovations in affordable housing provision.

Hypothesis

There are no significant factors that influence sustainable low-cost housing provision

Table 3: One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
There are no significant factors that influence sustainable low-cost housing provision	0.041	9	.015	15470.13010	12001.7182	16728.1301

By applying one sample test t-statistics, based on the decision rule, accept null hypothesis if the value of the t-statistics is greater than 0.05, from the result of the test above; the value of the t-statistics (0.041) is below 0.05 (critical value), this means that we reject the null hypothesis and say that there are significant factors that influence sustainable low-cost housing provision which also in agreement with previous report from (30,31).

CONCLUSION

Sustainable low cost housing provision is a crucial issue that many companies should deal with on a regular basis. Perhaps exploring beyond the materials we use, will make sustainable low cost housing available for minimum wage people and every individuals. In order to build low cost housing as economically as possible, consideration must be given to both optimizing tiny spaces and choosing the right building materials. Also, learning practices in other regions and adapting them to the local context could significantly improve low-cost housing sustainability in Enugu State.

RECOMMENDATION

The study identifies economic constraints, regulatory challenges, social dynamics, environmental issues, and technological limitations in Enugu State, Nigeria, affecting sustainable low-cost housing development. Key recommendations include improving access to financing, establishing government-backed low-interest loans or grants for low-income families, and promoting community involvement and cultural preferences.

Contribution to knowledge

The study explores sustainable low-cost housing development in Enugu State, Nigeria, highlighting local conditions, cultural dynamics, socio-economic factors, and policy recommendations for sustainable urban planning.

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