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ANALYSIS OF RISK MANAGEMENT IN PROCUREMENT OPTIONS AVAILABLE TO CONSTRUCTION INDUSTRIES IN ENUGU METROPOLIS

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ABSTRACT

The ongoing housing shortage in Nigeria, particularly in the South East region, calls for a thorough assessment of government initiatives aimed at enhancing housing affordability. This study investigates the effectiveness of the National Housing Fund (NHF) Scheme in facilitating access to affordable housing in South East Nigeria. A survey research design was employed, incorporating both primary and secondary data sources. Primary data were gathered through structured questionnaires distributed to employees of the Federal Mortgage Bank of Nigeria (FMBN), registered NHF contributors, and NHF loan beneficiaries across the five states within the South East geopolitical zone. A total of 400 questionnaires were disseminated using a multistage sampling method, resulting in 352 valid responses that were subsequently analyzed. Secondary data were sourced from institutional reports and policy documents. Data analysis utilized descriptive and inferential statistical methods, including mean score rankings and chi-square tests. The results indicate that although the NHF scheme has made contributions to housing provision in the region, its overall effectiveness is compromised by issues such as low public awareness, complex loan procedures, and restricted disbursement capabilities. The study advocates for specific policy reforms, including improved stakeholder engagement, the digitalization of loan processes, and enhanced inter-agency collaboration to bolster the scheme's effectiveness. These enhancements are essential for fulfilling the NHF's objective of providing affordable and inclusive housing in South East Nigeria.

Keywords: Risk, Risk Management, Procurement Options, Construction Industries, Enugu Metropolis

1.0 INTRODUCTION

1.1 Background to the Study

The construction industry globally serves as the bedrock for nations' sustained infrastructure development, economic growth and survival (Eze, Sojolahan, Adegboyega and Saidu, 2019). Nigeria, as a fast-developing country, is one of the most strategic in Africa due to its population, hydrocarbon resources and commitment to democracy. Despite a harsh business environment, the construction sector contributed 9.5% to GDP (NBS, 2022), amounting to N12.9 trillion.

The industry has faced challenges due to low demand, low productivity, and subpar performance (Adeyemi, 2005). Key constraints include lack of skilled labor, high managerial costs, material shortages, and regional instability. The market is dominated by foreign firms like Julius Berger, Arab Contractors, RCC, and CCECC, leaving local companies fewer opportunities.

No construction project is risk free. Risk can be managed, minimized, shared, transferred or accepted—but not ignored. Poor risk management leads to increased costs, delays, and compromised quality. All stakeholders must prioritize risk management. Construction projects face risks at every phase. Many firms poorly manage risks, causing schedule and budget failures. Traditional quantitative methods fail to capture subjective risk aspects, prompting interest in modeling to improve communication and planning (Tar and Carr, 1999).

Risk communication is often inconsistent and informal. Even when risks are identified, poor communication leads to misunderstanding and poor response. A unified process model is lacking. Procurement, a key aspect of project delivery, must balance cost, time, and quality.

1.2 Statement of the Problem

In Enugu State, construction contractors face persistent risks such as changes in work scope, delayed payments, labour disputes, and unforeseen site conditions—often resulting in conflicts, project abandonment, client dissatisfaction, and wasted resources. Although studies acknowledge risks in construction, there is limited understanding of their specific impact on procurement options. Despite frequent cost overruns and delays, little attention has been paid to identifying procurement methods that mitigate these risks. This study addresses this gap by examining risk management in relation to procurement strategies, aiming to improve project delivery in terms of time, cost, quality, and safety.

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1.3 Aim and Objectives of the Study

The aim of this study is to analyze Risk Management in Procurement Options available to construction industries in Enugu Metropolis, with a view to identifying specific strategies and frameworks that can help these industries avoid or mitigate procurement risks.

To achieve the aim of this study, the following objectives will be pursued:

a. To identify procurement options in use for delivery of construction projects in Enugu metropolis.

b. To identify and appraise risks associated with different procurement options in Enugu metropolis.

1.4 Research Questions

The study seeks to answer the following questions:

I. What procurement options are currently in use for the delivery of construction projects in Enugu metropolis?

II. What are the risks associated with different procurement options in Enugu metropolis, and how do they compare?

This study will focus on the analysis of the risk factors that are specifically experienced when accessing procurement options for building construction projects in Nigeria. This research work will consider Enugu metropolis as the study area comprising; Enugu South, Enugu North and Enugu East local government areas. As such, it would involve an examination of the stakeholders in construction industries comprising, consultants, contractors and suppliers.

2.0 LITERATURE REVIEW

2.1 Risk

Risk refers to the possibility of either gaining or losing something valuable, such as physical health, emotional stability, or financial resources, affected by anticipated or unexpected actions. Risk is characterized as a deliberate engagement with uncertainty (Cline, 2015), which is unpredictable and uncontrollable. Risk is an uncertain event or condition that, if it occurs, impacts at least one objective. It is often evaluated as the likelihood of an event multiplied by its cost or benefit—also known as 'Expectation Value' or 'Risk Factor'. The PMBOK® Guide (2008) defines project risk as “an uncertain event or condition that, if it occurs, has a positive or negative effect on at least

one project objective." Pproject risks can lead to delays, cost increases, or failure. Risk is commonly categorized as external or internal (Tah and Carr, 2000). Internal risks affect all projects, while international ones face additional external risks like political and regulatory changes (Wang, Dulaimi, and Aguria, 2004). Risk is quantified by probability and impact, and includes outcome, likelihood, significance, causal scenario, and affected population (Kumamoto and Henley, 2006).

2.2 Management

Management refers to the administration of an organization, encompassing the processes of setting strategies, coordinating efforts, and utilizing resources—financial, human, technological, and natural—to achieve goals (Lethon, 2016). It also involves overseeing the organization, including strategic planning, managing resources, deploying assets, and evaluating outcomes (Morris, 2014). Management is not limited to supervisors but involves all members who engage in some form of management or reporting (Terry, 2014). It can be defined as the planning, directing, controlling, and coordinating of efforts toward shared objectives to maximize benefits. Baridam (2012) emphasizes accomplishing tasks through and with people, focusing on planning and directing efforts. Traditional management functions include planning, organizing, decision-making, staffing, leading, motivating, and controlling, forming a continuous cycle. Management is the art or science of achieving objectives through the efforts of individuals, with a focus on supervision to ensure responsibilities are met and enhance productivity (Ramos, 2014). It also involves creating a collaborative environment where individuals work toward common goals (Koontz & Weihrich, 2009). Key aspects include planning, organizing, staffing, leading, and controlling, with the goal of generating surplus and improving productivity across all organizational levels. Ultimately, management enhances problem-solving, administration, human resource management, and leadership.

2.3 Risk Management

Risk management in construction projects involves identifying, analyzing, and addressing risks to ensure project objectives are met (PMI, 2008). It plays a crucial role in navigating uncertainties and contributing to project success by enhancing opportunities while mitigating adverse events.

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Goh and Abdul-Rahman (2013) view risk management as a decision-making process that minimizes risks, improving the chances of success.

Goh and Abdul-Rahman (2013) describes project risk management as both an art and science, aimed at achieving project goals. Traditional approaches focus on risks from physical or legal factors like natural disasters or accidents, aiming to safeguard assets, reputation, and profits (Bing et al., 2009). Risk management is a core knowledge area in project management (PMI, 2008) and a systematic process to identify, analyze, and address risks.

Effective risk management is integral to an organization's strategy, guiding projects to long-term benefits. It enhances accountability, performance, and operational efficiency. According to ISO 31000, it involves identifying, evaluating, and controlling risks. Risk management varies in effectiveness across organizations, and its importance grows due to construction's complexity and external challenges.

2.4 Procurement

The procurement process in construction involves the structured methods, procedures, and standards utilized by clients to acquire construction-related assets such as buildings, roads, and infrastructure (Masterman, 2002). This process requires the collaboration of various stakeholders to design, manage, and implement projects that meet specific client needs. It is the framework for organizing professionals to achieve project goals. It also incorporates modern procurement systems that feature innovative and accelerated strategies, affecting responsibility distribution, activity sequencing, and organizational structures.

Ramus (2006) explains that procurement in construction is the process of acquiring buildings or infrastructure, which includes coordinating various stakeholders to meet client objectives. Procurement methods in construction vary, ranging from traditional systems to expedited strategies such as Design and Build, Management Contracting, and Build-Operate-Transfer. These methods influence the management and delivery of construction projects. Ashworth and Hogg (2007) classify procurement methods into traditional and non-traditional categories. Traditional methods include Design-Bid-Build (DBB), where design and construction are separate phases. Non-traditional methods integrate design and construction, streamlining the process for clients seeking faster project delivery.

The choice of procurement method significantly impacts project outcomes. Ashworth and Hogg (2007) note that procurement methods encompass the entire process from need identification to contract completion. The 'Traditional' method is the most widely used in Nigeria, though non-conventional methods are gaining popularity due to their ability to meet clients' evolving needs. These include Design and Build, Project Management, and Labour-Only contracts Traditional procurement method dominates the Nigerian construction industry, but other methods like Management Contracting and Design and Build are gaining traction.

Several factors influence the selection of procurement methods. It is argued that the Traditional method is unsuitable for fast-tracking projects due to its sequential design and construction phases. However, it is suggested that separating the phases provides clarity and structure, which is essential for certain projects.

Overall, the procurement process in construction is multifaceted and varies depending on project size, complexity, and client needs. While traditional methods remain prevalent, non-traditional approaches, particularly Design and Build and Public-Private Partnerships (PPP), are increasingly sought for their efficiency in meeting modern demands (Ashworth and Hogg (2007).

2.5 Processes of Risk Management

The risk management process involves implementing management policies and procedures to identify, assess, treat, monitor, and communicate risks. It serves as a framework for managing risks within a project, including identification, assessment, analysis, and response. Nwachukwu (2016) identified four key components: risk identification, risk assessment, risk control, and risk recovery. In construction projects, this systematic process aims to increase favorable outcomes and minimize adverse risks to achieve project objectives (Nwachukwu, 2016. Goh and Abdul-Rahman (2013) describe it as a decision-making process to mitigate risks. The construction risk management process includes three stages: risk identification, risk analysis and evaluation, and risk response.

Risk identification involves recognizing and documenting potential risks in a construction project Nwachukwu, 2016). It is crucial for the overall effectiveness of risk management, as risks must be identified before they can be analyzed or managed. Tools such as brainstorming, Delphi method, and SWOT analysis aid this process. Though complete risk coverage is impossible, proactive identification addresses the most critical risks.

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Risk analysis/assessment is the process of evaluating and prioritizing identified risks. It bridges the gap between identification and management by analyzing the probability and impact of risks. Risk analysis uses both qualitative and quantitative methods, with the choice depending on factors like project scale and available data (Goh & Abdul-Rahman, 2013).

Risk response involves selecting strategies to address identified risks. These strategies—avoidance, reduction, transfer, or retention—depend on the nature of the risk. Effective response requires choosing strategies that minimize impacts and are feasible in terms of cost, timeline, and stakeholder agreement (Goh & Abdul-Rahman, 2013).

Risk control focuses on mitigating identified risks through cause-related and effect-related measures. Risk monitoring ensures that risk management strategies remain effective throughout the project, adjusting them as needed. It includes ongoing assessments and oversight to ensure that the project's risk profile remains aligned with desired conditions (PMI, 2004).

2.6 Empirical Review

Berenger and Nazeem (2018) conducted a study aimed at identifying the key factors of risk management within the construction industry. They identified essential risk management factors (RMFs) that are crucial for enhancing the value of risk management in the construction sector. Their findings highlighted ongoing confusion and disagreement regarding which factors should be included in risk management practices in construction. Nevertheless, they noted that the RMFs related to the organizational environment, objective definition, resource requirements, risk measurement, risk identification, risk assessment, risk response and action planning, communication, monitoring, review, and continuous improvement are prevalent in existing literature. Recognizing RMFs that are easily comprehensible and implementable will aid in improving the current state of risk management and expanding the knowledge base.

Babatunde, Opawole, and Ujaddugbe (2010) conducted a study assessing project procurement methods in Nigeria. They gathered data through meticulously designed questionnaires distributed to professionals within the Lagos metropolitan area. The analysis of the collected data employed both descriptive and inferential statistical techniques. The findings indicate that variations of the traditional contract procurement method are predominantly utilized in project execution across Nigeria. When selecting a procurement method, the study highlights that timely project completion

is the primary consideration for the traditional method, whereas quality assurance is the foremost factor for non-conventional methods.

Pawel (2017) explored the concept of risk management within the construction sector. They emphasized that effective risk management does not equate to merely avoiding risks, which may appear to be the most economical choice. The fundamental issue with this approach is its lack of economic rationale; inherently profitable ventures are, by nature, associated with risks, while options devoid of risk tend to lack economic interest and fail to yield substantial benefits. Consequently, effective risk management should aim to strike a "golden mean" in managing risks related to the project. This involves safeguarding against negative risks through thorough identification and classification, leading to a comprehensive analysis. Simultaneously, management should focus on maximizing the benefits of decisions by employing various mathematical and analytical tools. A meticulous analysis that considers all relevant factors, including stakeholder perspectives, will enable effective risk management, ultimately translating into tangible advantages for the project. Identifying project risks primarily involves determining the types of risks that may impact the project, outlining their specific characteristics, and estimating the likelihood of their occurrence.

Ekwelem, Okolie, Emoh, and Ezeokoli (2021) evaluated the effects of risk management techniques on the costs of building projects in South-East Nigeria. The researchers employed a well-structured questionnaire and conducted interviews to support the survey findings. As part of this survey research, questionnaires focused on risk management were randomly distributed to key stakeholders in the built environment, including clients, contractors, and consultants in South-East Nigeria. A total of 322 questionnaires were distributed, with 284 completed and returned, resulting in a response rate of 88%. The data were analyzed using the Relative Importance Index and ranked accordingly. The study revealed that the leading impacts of risk management techniques on building project costs in South-East Nigeria include project cost management (3.81), the ability of the project team to maintain focus on critical outcomes (3.79), and the contribution to project success by identifying internal and external risks (3.77). The study concluded that to enhance the likelihood of success and mitigate potential risks associated with construction projects in Nigeria, it is essential for construction firms to incorporate risk management into their decision-making processes. Schieg (2016) conducted research on risk management within construction project management, identifying six key steps in the risk management process. According to Schieg

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(2016), the implementation of a risk management system in construction projects should align with the project's progression and encompass all areas, functions, and processes involved. Special emphasis is placed on personnel-related risks, as specialized employees are crucial for the market success of firms that offer highly skilled services.

3.0 RESEARCH METHODOLOGY

The research adopted a quantitative approach with a descriptive survey design, aiming to accurately depict the respondents' perspectives. The design uses quantitative data from questionnaires or interviews and includes data from surveys, case studies, and observations to draw conclusions and recommendations. A well-structured questionnaire, based on a pilot survey, was used to gather data from clients, contractors, consultants, project managers, Estate Surveyors, and Valuers.

The targeted population consists of professionals serving as consultants on construction projects, including Architects, Builders, and Quantity Surveyors. The number of registered professionals in Enugu State is as follows: 40 Architects, 50 Quantity Surveyors, and 46 Builders, all sourced from the respective professional bodies.

Data were primarily gathered from questionnaires, interviews, and observations, while secondary data were collected from published sources such as textbooks, journals, and the internet.

3.1 Method of Data Analysis

Data were analyzed using descriptive statistics such as frequency tables, percentages, and weighted mean scores based on a five-point Likert scale: 5 = Strongly Agree (SA), 4 = Agree (A), 3 = Unsure (US), 2 = Disagree (D), and 1 = Strongly Disagree (SDA). The percentage response is calculated by:

$$\% \text{ response} = (X / Y) \times 100$$

Where X is the number of respondents for an option, and Y is the total number of responses.

The average mean is computed as:

Average Mean = (5 + 4 + 3 + 2 + 1) / 5 = 3.0

A mean score of 3.0 and above is considered positive, while below 3.0 is negative. The weighted mean is calculated using:

Weighted Mean = ∑ fX / N

Where f is the frequency of responses, X is the score given, and N is the sum of responses.

4.0 RESULT AND INTERPRETATION

Table 4.1: Distribution and Return of Questionnaires

Categories	Frequency	Percentage (%)
Questionnaires distributed	138	100.00
Questionnaires received	136	98.55

A total of 138 questionnaires were distributed to respondents within the construction industry in Enugu State. Of these, 136 questionnaires were successfully retrieved, representing 98.55% of the distributed questionnaires. The population of the study was summarized into three professional groups: Architects (40), Quantity Surveyors (50), and Builders (46), summing up to 136 respondents.

Table 4.2: Procurement Options Currently in Use

	Procurement Options	SA (5)	A (4)	U (3)	DA (2)	SDA (1)	Total	Mean Score	Rank
1	Bill of firm quantities	40	50	20	16	10	136	3.88	1
2	Bill of approximate quantities	30	40	25	25	16	136	3.50	3
3	Drawings and specification	35	45	25	20	11	136	3.65	2
4	Schedule of rates	20	30	40	25	21	136	3.13	4
5	Cost reimbursement	15	25	40	35	21	136	2.88	5

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Bill of Firm Quantities (3.88) is the most commonly used procurement option in Enugu, according to the respondents. It is considered highly effective, as a majority of respondents strongly agree (40 SA) or agree (50 A) with its use. This indicates it is perceived as reliable in project delivery. **Drawings and Specification (3.65)** ranks second, reflecting a strong preference for using detailed drawings and specifications to manage construction projects. **Bill of Approximate Quantities (3.50)** ranks third, suggesting it is also widely used, though slightly less favorable compared to firm quantities. **Schedule of Rates (3.13)** and **Cost Reimbursement (2.88)** are ranked lower, with fewer respondents strongly agreeing with their use, indicating that these methods may not be as preferred or as effective in the context of Enugu's construction industry.

Table 4.3: Risks Associated with Procurement Options

	Risks	**SA (5)**	**A (4)**	**U (3)**	**DA (2)**	**SDA (1)**	**Total**	**Mean Score**	**Rank**
1	Separation of design and construction leads to inaccurate cost estimates	50	40	20	16	10	136	3.88	1
2	Prolonged timelines due to sequential processes	40	50	20	16	10	136	3.82	2
3	Miscommunication leads to conflict	30	50	25	16	15	136	3.63	3
4	Contractor control compromises quality	20	30	40	30	16	136	3.22	4
5	Managing multiple contractors creates scheduling problems	15	25	40	35	21	136	2.88	5

Separation of Design and Construction (3.88) ranks as the highest risk. Respondents strongly agree that this separation leads to inaccurate cost estimates, which can significantly affect the accuracy of budgets and project planning. **Prolonged Timelines (3.82)** follows closely, with respondents agreeing that sequential processes in procurement lead to delays, indicating a need for better project scheduling and integration. **Miscommunication Leading to Conflict (3.63)** also ranks high, signaling the importance of clear communication between project stakeholders to avoid

disputes and misunderstandings. **Contractor Control Compromising Quality (3.22)** highlights concerns that contractor-driven processes might sacrifice quality, particularly in design and build procurement models. **Managing Multiple Contractors (2.88)** is seen as a relatively lower risk, but still a concern, especially for projects involving complex coordination across multiple contractors.

5.0 CONCLUSION

This study aimed to examine the procurement methods used in construction projects within Enugu metropolis, evaluate the associated risks, and assess the effectiveness of current risk management practices. The findings indicate that the selection of procurement methods significantly influences project success, with "Develop and Construct" emerging as the most favorable for complex projects, despite its coordination risks. On the other hand, methods like "Bill of Firm Quantities" and "Cost Reimbursement" often faced challenges related to budget overruns and quality control. These insights emphasize the need to match procurement strategies to the specific characteristics of each project to minimize risks and ensure better project outcomes. Ultimately, the findings confirm that procurement risks significantly affect the procurement options available in Enugu's construction industry.

6.0 RECOMMENDATIONS

The recommendations from this study emphasize the need for a strategic approach to procurement and risk management in construction projects. Project managers should tailor procurement strategies to align with the specific characteristics of each project, such as its complexity, time constraints, and budget. For example, for complex projects, methods like "Develop and Construct" can be advantageous if supported by effective communication practices to ensure proper coordination.Furthermore, procurement and risk management frameworks should be developed based on the unique priorities of different professional clusters. Regular project audits should also be conducted to assess whether procurement and risk management practices are aligned with the priorities of the three identified clusters, facilitating necessary adjustments. Finally, creating a feedback loop from completed projects will allow for continuous improvement of procurement and risk management strategies. This feedback mechanism can guide future projects, ensuring that practices are refined and optimized over time for better outcomes.

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