



CRITICAL CONSTRUCTION RESOURCES, PROCUREMENT RISKS, AND MANAGEMENT STRATEGIES: A STUDY OF SMALL AND MEDIUM FIRMS IN ABUJA, NIGERIA.

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ABSTRACT

Small and medium-sized construction firms (SMSCFs) in Nigeria face persistent challenges in procuring essential resources due to market volatility, weak institutional support, and limited capacity. This study investigates the critical construction resources required by SMSCFs in Abuja, the risks associated with their procurement, and the strategies adopted to manage those risks. Using a mixed-methods approach, data were collected through structured questionnaires from 85 construction professionals and interviews with 12 project managers. Descriptive statistics tools such as mean and Relative Importance Index (RII) were used to analyse quantitative data, while qualitative data were thematically interpreted. Findings show that construction materials, labour, and finance are the most critical resources, while price volatility, supply chain disruptions, and unreliable vendors are the leading risks. Procurement practices are largely informal, with firms relying on requests for quotations, direct purchases, and subcontracting. Risk mitigation strategies include supplier prequalification, diversified sourcing, and contractual clauses, though the use of digital tools and structured frameworks remains low. The study concludes that procurement among SMSCFs is reactive and experience-driven, highlighting the need for institutional reforms, capacity building, and the adoption of formal risk management systems to improve procurement efficiency and project outcomes.

Key Words: *Construction procurement, Critical resources, Risk management, Small and Medium Enterprises (SMEs), Supply Chain Risks.*

INTRODUCTION

The construction industry plays a pivotal role in national development, particularly in emerging economies like Nigeria, where infrastructure demand is high, and construction activities significantly contribute to gross domestic product (GDP) and employment generation (Saka & Adegbembo, 2022; Babatunde, 2018). Within this dynamic sector, procurement of resources, including materials, labour, finance, and services, constitutes a core activity that determines the success or failure of construction projects. Efficient procurement ensures timely delivery, cost control, and quality assurance, which are

essential for maintaining competitiveness and delivering value to clients (Construction Industry Institute [CII], 2020).

Construction resource procurement is inherently complex, involving numerous stakeholders, multiple decision points, and often occurring under conditions of uncertainty. For small and medium-sized construction firms (SMSCFs), these challenges are particularly pronounced due to limitations in financial capacity, technical expertise, and managerial experience (Thomas, 2022; Almarri & Abu-Hijleh, 2016). Despite their critical role in housing and infrastructure development, indigenous SMSCFs in Nigeria often face procurement-

related risks that lead to project delays, cost overruns, poor workmanship, and, in extreme cases, project abandonment (Odediran, Adeyinka, Opatunji, & Morakinyo, 2012). These challenges are largely attributed to firms limited financial capacity, weak managerial structures, and inadequate access to capital and professional resources

A growing body of research has explored procurement methods (Smith, Merna, & Jobling, 2006) and supplier selection criteria (Cengiz, 2017). However, there has been limited empirical attention dedicated to the procurement challenges and risks encountered by SMSCFs, particularly in developing countries. Given the increasing complexity of construction projects and rising stakeholder expectations for transparency, sustainability, and value delivery, there is a pressing need to deepen our understanding of how procurement practices impact smaller firms.

This study aims to bridge this knowledge gap by examining the critical resources most frequently procured by SMSCFs and identifying the specific risk factors associated with their procurement processes. Focusing on Abuja, the Federal Capital Territory and a major construction hub in Nigeria, this research offers localised insights that can inform both industry practice and policy interventions.

LITERATURE REVIEW

Construction Procurement in small and medium-sized construction firms

Procurement in construction involves acquiring goods, services, and works required for project delivery. These include critical resources such as materials, labour, equipment, and finance (Monczka, Handfield, Giunipero, & Patterson, 2018). For SMSCF, procurement decisions are often made under constraints such as limited capital, inadequate risk management

capabilities, and fluctuating market conditions (Wang & Huang, 2014, Thomas, 2022). SMSCFs in Nigeria, especially indigenous firms, are often challenged by structural issues such as poor access to finance, inadequate capacity to manage suppliers, and bureaucratic hurdles in public procurement systems (Ibrahim & Musa-Haddary, 2010). Despite their substantial contribution to construction output, indigenous contractors struggle with project delays, cost overruns, poor workmanship, and limited competitiveness (Odediran et al., 2012). These limitations are further compounded by procurement-related risks that many of these firms are ill-equipped to manage.

Critical Construction Resources

Construction resources are principally categorised into human, material, financial, and technological types. Among these, material and human resources are most frequently procured by SMSCFs, followed by financial capital and technical services. Materials like cement, steel, aggregates, and fittings are particularly vulnerable to price volatility and supply chain disruptions, which are frequently linked to cost overruns in construction projects (Ismail et al., 2013; Linklater & Khan, 2023). Human resources, both skilled and unskilled labour, also introduce variability due to fluctuating availability, productivity, and wage rates tied to project timelines and market dynamics (Wood, 2024).

Securing financial resources remains a significant challenge. Cash flow interruptions from delayed client payments and restrictive loan terms cause liquidity constraints in SMSCFs. Meanwhile, the procurement of technical services, such as design, supervision, equipment rental, and logistics, is often plagued by inefficiencies stemming from poor vendor selection and weak

contract management practices (Xie & Bi, 2014)

Risks in Construction Procurement

Construction procurement is subject to multiple risks arising from internal, external, and environmental factors. For example, price volatility, supplier default, material shortages, labour unrest, and regulatory non-compliance (Kaur, 2023; Chen et al., 2025). In small and medium construction firms, the inability to proactively identify and manage these risks often leads to higher incidence of project failure (Chen et al., 2025).

Among these risks, price fluctuation remains highly significant, driven by exchange rates, inflation, and global commodity price movements (Kaur, 2023). Supplier unreliability, including inconsistent delivery schedules and quality issues, has been shown to derail project timelines. Moreover, labour-related risks, such as strikes or shortages of skilled tradespeople, critically impact progress in time-sensitive projects (Giri, 2025).

Additional risk arises throughout the procurement lifecycle itself, especially during tendering, bid evaluation, contract negotiation, and performance monitoring. Common vulnerabilities include misaligned incentives, ambiguous contract terms, and corruption (Giri, 2025). SMSCFs typically lack formal risk-management systems and depend on informal decision-making, which further amplifies exposure to avoidable threats (Nyambo, 2023).

Risk Management Strategies in Procurement

Risk management in procurement involves the systematic identification, assessment, mitigation, and monitoring of risks throughout the procurement lifecycle (PMI, 2017) For SMSCFs, a range of strategies are recommended:

- 1) **Supplier Prequalification:** Conducting due diligence, such as assessing financial stability, past performance, and regulatory compliance, helps minimise supplier-related risks (Holt et al., 1994).
- 2) **Diversified Sourcing:** Engaging multiple vendors reduces dependency and helps avoid supply disruptions (Osipova & Eriksson, 2011).
- 3) **Contractual Risk Allocation:** Selecting appropriate procurement methods (e.g., delivery type, payment form, partnering arrangements) clarifies roles and liabilities and improves risk management effectiveness (Osipova & Eriksson, 2011).
- 4) **Use of Digital Tools:** Adopting e-procurement platforms and real-time tracking systems supports improved transparency, supplier monitoring, and cost control (Moktadir et al., 2022).

Despite the availability of these strategies, many indigenous SMSCFs in Nigeria rarely implement formal risk management frameworks, often due to limited resources and insufficient managerial training (Ebekozen et al., 2022). As a result, their procurement systems remain vulnerable to preventable disruptions and inefficiencies.

METHODOLOGY

Research Design

This study adopts a mixed-methods research design, combining both qualitative and quantitative approaches to achieve a comprehensive understanding of critical resources and associated procurement risks in construction (Creswell & Creswell, 2017). The rationale for this design is its capacity to triangulate findings, enhance reliability, and capture both numerical patterns and contextual insights.

Study Area and Population

The research was conducted in Abuja, Nigeria, a major construction hub in the country (Adewole, 2026). The study focused on SMSCFs registered with the Federal Inland Revenue Service (FIRS), particularly those engaged in residential and commercial development. According to FIRS (2021), there are a total of one hundred and five (105) tax paying construction firms in Abuja under the classification of SMSCFs.

Data Collection and Analysis

Quantitative data were gathered via structured questionnaires distributed to professionals involved in procurement decision-making across the identified SMSCFs. The entire population is considered considering its manageable size; hence the census survey was adopted as the sampling technique for the study.

The participants for this study consist of skilled construction professionals, such as architects, structural engineers, mechanical engineers, electrical engineers, quantity surveyors, building professionals, and procurement officers, who are working either with consulting, or contracting firms as “the unit of observation” within the research frame area. The study's participants of qualified construction professionals are chosen because of their direct involvement in construction projects. As a result, they possess the necessary abilities to complete projects effectively. Project supervisors working on construction projects made up the respondents.

Qualitative data were collected through semi-structured interviews with 12 purposively selected project managers, with sample size determined by data saturation.

Quantitative data were analyzed using descriptive (means, frequencies, standard deviations and RII) and inferential statistics (correlation and regression) using SPSS. Qualitative data were subjected to thematic

analysis, following the six-phase framework outlined by Braun and Clarke (2006).

Validity and Reliability

Instrument validity was ensured through expert review and pilot testing, leading to modifications for clarity. Reliability was assessed using Cronbach's alpha, with coefficients exceeding 0.75 deemed acceptable, per Tavakol and Dennick's (2011) guidelines.

RESULTS AND DISCUSSIONS

This section presents the key findings from both the quantitative survey and qualitative interviews, structured around the core objectives of the study: identifying critical construction resources, assessing procurement processes, investigating associated risks, and evaluating risk management strategies.

Questionnaire Return

The 105 tax paying SMSCFs identified from the register of FIRS in Abuja were issued with one questionnaire to be filled by project or construction manager responsible for overseeing actual delivery of construction works.

Out of the 105 questionnaires distributed, 85 valid questionnaires were retrieved and used for analysis, representing a response rate of 80.95%. This response rate is considered adequate and suitable for statistical analysis. According to Babbie (2007), a response rate of 50% is adequate for analysis and reporting, 60% is good, while 70% and above is considered very good. Furthermore, Fincham (2008) noted that response rates approximating 60% are generally acceptable for most survey research. Therefore, the response rate achieved in this study is considered reliable and sufficient for the analysis.

Respondents' Background Information

Understanding the demographic profile of respondents is essential to contextualise the findings of the study. This section presents the background information of participants involved in both the quantitative questionnaire survey and qualitative interviews, providing insights into their professional experience, areas of expertise, and Organisational roles.

1) Background information of the questionnaire Survey

A total of 85 construction professionals participated in the structured questionnaire survey. The respondents were selected from various professional backgrounds, including architecture, building, quantity surveying, and engineering disciplines. All were directly involved in project procurement activities in their firms. The background of the respondents is presented in Table 1.

Table 1: Demographic Distribution of Questionnaire Respondents

Profession	Number of Respondents	Percentage (%)
Profession of Respondents		
Architects	16	19
Builders	23	27
Quantity Surveyors	14	16
Engineers (Civil, M&E)	32	38
Total	85	100%
Years of Work Experience		
10 -15years	16	19
15- 20 years	57	67
More than 20 years	12	14
	85	100%
Respondents Role in Organisations		
Site Manager	5	6
Project Manager	65	76
Site Engineer	15	18
Total	85	100%

These respondents occupied supervisory or managerial positions in procurement-related roles. The demographic spread ensured a balanced and multidisciplinary perspective on the resource procurement challenges encountered by SMSCFs.

Most of the participants had at least five years of professional experience, enabling them to

provide informed responses based on hands-on involvement in construction procurement.

2) Interview Participants

For the qualitative phase, 12 participants were selected for in-depth interviews. These individuals were project managers drawn from different construction professions, ensuring a broad range of insights. The breakdown is presented in Table 2.

Table 2: Demographic Distribution of Interview Participants

Profession	Number of Participants
Quantity Surveyors	2
Architects	2
Mechanical & Electrical Engineers	4
Builders	2
Civil Engineers	2
Total	12

All interviewees held project management roles within their firms and were selected based on their strategic involvement in procurement and risk management. Their average professional experience exceeded 10 years, with most having handled multiple construction projects across public and private sectors.

This rich professional background enabled interviewees to provide in-depth insights into procurement decisions, supplier management, risk mitigation, and

institutional constraints faced by indigenous SMSCFs in Abuja.

Critical Resources Frequently Procured by SMSCFs

Efficient procurement of construction resources is essential to the timely and successful execution of projects. This study identified the resources most critical to SMSCFs in Abuja, based on respondents' assessments. Table 3 presents the ranking of these resources using the Relative Importance Index (RII).

Table 3: Critical Resources Needed by Small and Medium-Scale Firms for Construction

S/N	Resource Type	Mean	SD	RII	Rank
1	Construction materials	4.27	0.81	0.854	1st
2	Labour	4.13	0.87	0.826	2nd
3	Finance	4.08	0.83	0.816	3rd
4	Equipment and tools	4.00	0.90	0.800	4th
5	Specialist subcontractors	3.91	0.96	0.782	5th
6	Plant and machinery	3.75	0.94	0.750	6th
7	Technical consultancy	3.63	0.89	0.726	7th

The results in Table 3 indicate that construction materials, labour, and finance are the top three critical resources for SMSCFs in Abuja. This highlights the operational focus of indigenous firms, where securing basic inputs remains a top priority. The prominence of finance reflects persistent liquidity challenges that constrain firms' ability to mobilise and sustain resources throughout project lifecycles.

Notably, technical consultancy and plant equipment are less emphasised, indicating a potential gap in knowledge integration and

mechanisation, two factors often associated with enhanced productivity and quality in construction (Hendrickson & Au, 2008; Jarkas & Bitar, 2012).

Procurement Procedures Adopted by SMSCFs

Procurement in construction is a multi-stage process that ensures the timely and efficient acquisition of necessary resources for project execution. Among SMSCFs in Abuja, procurement activities are guided more by practical procedures than formalized

systems. Insights from interviews with 12 project managers revealed a sequence of interrelated procurement steps commonly

adopted by these firms. These processes are summarized in Table 4.

Table 4: The necessary process to procure critical construction resources

S/N	Themes	Procurement Process	Frequency of Occurrence	Interviewees
1	Document analysis and project needs	Analysis of construction documents to establish the needs of the projects	12	P1, P2, P3, P4, P6, P8, & P10
2	Material quantification	Material take-off to determine the specific quantity of each material needed	10	P1, P3, P5, & P7
3	Compliance and quality assurance	Assessment of supply for compliance with agreed requirements	10	P2, P3, P7, P9, P5, & P12
4	Vendor selection and supplier sourcing	Sourcing and selection of reputable vendors and suppliers	10	P3, P4, & P5
5	Contract negotiation and agreement.	Negotiation of the contract and agreement on the terms of the contract	9	P1, P2, P3, P4, P9 & P11
6	Schedule planning	Preparation of procurement schedule	8	P1 & P3
7	Ordering and payment processing.	Placement of orders and making payments	8	P2, P3, P7, & P10
8	Vendor delivery	Receipt of supplies from suppliers or vendors	7	P1, P6, & P9
9	Resource control and consumption management	Internal mechanism for resource consumption control and management	6	P4 & P12

The interviews reveal a structured yet flexible procurement process that begins with document analysis and project needs assessment, followed by material quantification and vendor sourcing. These early stages ensure that procurement aligns with technical and project-specific requirements. Compliance checks and contract negotiations reflect an effort to balance quality assurance with cost and contractual obligations.

Later stages focus on schedule planning, ordering and payment, vendor delivery, and resource control, showing a continuous chain from planning to post-delivery usage. This reflects a semi-formalised approach that

combines professional judgment with basic procedural safeguards, which is consistent with previous findings on procurement practices in indigenous construction firms (Odediran et al., 2012; Ibrahim & Musa, 2010).

Notably, most firms lacked formal digital procurement systems or written procurement manuals, relying instead on professional expertise and experience-based procedures to manage procurement risks and ensure continuity.

Risk Factors Associated with Construction Resource Procurement

Procurement in construction projects particularly among SMFs, is inherently risky due to numerous internal and external uncertainties. These risks can hinder timely delivery of resources, inflate project costs, and compromise construction quality. Understanding the most prevalent and disruptive risk factors is essential for

strategic planning and improved procurement performance.

This study sought to identify and rank the major risks associated with construction resource procurement as perceived by professionals in SMSCFs in Abuja. Table 5.0 presents the findings based on Relative Importance Index (RII), mean scores, and standard deviations derived from respondent ratings

Table 5: Risk associated with procurements of construction resources

S/N	Risk Factor	Mean	SD	RII	Rank
1	Price volatility	4.05	0.93	0.81	1st
2	Supply chain disruptions	3.88	1.20	0.776	2nd
3	Vendor reliability	3.70	0.915	0.74	3rd
4	Currency fluctuation	3.56	1.165	0.712	4th
5	Contractual disputes	3.43	1.112	0.686	5th
6	Quality issues	3.39	1.042	0.678	6th
7	Inaccurate specifications	3.35	1.103	0.67	7th
8	Lack of stakeholder involvement	3.26	1.253	0.652	8th
9	Incomplete needs assessment	3.17	1.113	0.634	9th
10	Labour-related issues	2.85	1.247	0.570	10th

The analysis in Table 6 highlights price volatility as the most significant procurement risk (RII = 0.81), reflecting ongoing market instability, inflation, and fluctuating commodity prices. These are factors that are especially burdensome for resource-constrained firms. This aligns with findings by Ismail & Abdul Karim (2013), who emphasised how rapid changes in material costs destabilise project budgets and schedules.

Supply chain disruptions (RII = 0.776) emerged second, consistent with studies by Osipova & Eriksson (2011) which identify disruptions due to logistics failures, fuel shortages, or port congestion as a recurring issue in developing contexts. For indigenous firms in Nigeria, these disruptions are magnified by poor infrastructure and limited warehousing.

Vendor reliability ranked third (RII = 0.74), indicating persistent issues with inconsistent deliveries and substandard supplies. This

reinforces Osipova and Eriksson's (2011) assertion that contractor-supplier relationships, if not formalised, result in misaligned expectations and procurement inefficiencies.

Other notable risks include currency fluctuation, contractual disputes, and quality issues, all of which have strong implications for financial planning and contract management in SMSCFs. Lower-ranked risks such as labour-related issues and stakeholder non-involvement may reflect temporary or context-specific factors, but they remain important considerations during high-risk or large-scale procurement.

The findings suggest an urgent need for indigenous construction firms to adopt proactive risk management strategies such as contractual risk allocation, price fluctuation clauses, supplier prequalification, and real-time market monitoring. Without such mechanisms, firms remain vulnerable to

shocks that jeopardise project delivery and profitability.

Risk Management Procedures and Strategies

Procurement-related risks such as price volatility, supplier unreliability, and material quality issues present significant challenges to SMSCFs in Abuja. To mitigate these risks

and ensure steady resource availability, firms employ various strategies; some formal, others developed through experience. This section presents the risk management approaches adopted by these firms, as revealed by result obtained through questionnaire survey. The result is presented in Table 6.

Table 6: Approaches in managing resource procurement risks

S/N	Risk Management Approach	Mean	SD	RII	Rank
1	Supplier prequalification	3.82	0.97	0.764	1 st
2	Diversified sourcing	3.74	0.86	0.748	2 nd
3	Escalation clauses in contracts	3.64	0.89	0.728	3 rd
4	Advance payment negotiations	3.45	0.92	0.690	4 th
5	Contractual risk allocation	3.40	0.88	0.680	5 th
6	Project contingency budgeting	3.32	0.96	0.664	6 th
7	Bulk purchasing	3.25	0.89	0.650	7 th
8	Regular market analysis	3.19	0.93	0.638	8 th
9	Just-in-time procurement	2.87	1.01	0.574	9 th
10	Use of procurement software	2.65	1.07	0.530	10 th

The results indicate that supplier prequalification (RII = 0.764) is the most widely adopted risk mitigation strategy among SMSCFs in Abuja. This strategy enables firms to evaluate suppliers' financial capacity, technical competence, and compliance history before contract engagement, thereby minimizing the likelihood of delivery failures and quality issues. This finding is consistent with the view that contractor and supplier prequalification helps organizations reduce project risks associated with poor performance, delays, and contractual disputes by ensuring that only competent and financially capable firms are engaged (Holt et al., 1994; Acheamfour et al., 2020).

Diversified sourcing (RII = 0.748) ranks second, underscoring firms' efforts to avoid dependence on single suppliers and mitigate supply chain shocks. Ghadimi et al. (2018) similarly emphasised the role of supplier diversification in enhancing procurement

resilience, especially in environments prone to disruption.

Escalation clauses in contracts (RII = 0.728) emerged third, reflecting firms' attempt to manage risks associated with material price fluctuations—one of the most pressing challenges identified earlier in this study. Such clauses enable contractors to adjust prices in response to significant market changes, which aligns with recommendations by Walker and Brammer (2009) for inflation-sensitive sectors.

The findings confirm that while SMSCFs are adopting several recognised risk management strategies, these are largely reactive and operational in nature. The relatively low use of strategic tools like software systems and real-time market intelligence points to a gap in institutional capacity. Without deliberate investment in technology, contract design, and supplier development, SMSCFs remain exposed to recurring procurement risks that could threaten project performance.

CONCLUSION

This study investigated the critical construction resources required by SMSCFs in Abuja, Nigeria, the procurement processes adopted, the risks associated with procuring these resources, and the strategies used to manage such risks.

The findings identified construction materials, labour, finance, and equipment as the most critical resources required by SMSCFs. Procurement processes were largely practical and semi-formal, with firms relying heavily on requests for quotations, direct purchases, and tendering. The most prevalent risks encountered during procurement were price volatility, supply chain disruptions, and unreliable vendors, these factors significantly impact project timelines and costs.

To manage these risks, firms adopted various strategies such as supplier prequalification, diversified sourcing, escalation clauses in contracts, and negotiated payments. However, many of these strategies were informal and experience-driven, reflecting the capacity limitations of small firms in adopting more structured risk management systems.

Overall, the study highlights the need for institutional support, capacity-building, and policy reforms that enhance the procurement capabilities of indigenous construction firms. Strengthening procurement practices and formalising risk management strategies will be essential for improving performance and sustainability in Nigeria's construction sector.

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