Identifying and Mitigating the Impact of Insecurity on Construction Project Delivery: A Case Study of Kebbi State

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ABSTRACT

The construction sector is crucial for economic growth, yet its efficiency is increasingly jeopardized by insecurity, especially in developing regions. This study examines the effects of insecurity on construction project delivery in Kebbi State, Nigeria, aiming to identify key security challenges and propose effective mitigation strategies. A mixed-method approach was utilized, combining quantitative data from 100 structured questionnaires administered to construction professionals and qualitative insights from 15 semi-structured interviews with stakeholders such as contractors, project managers, and community leaders. The analysis included descriptive statistics, the Relative Importance Index (RII), and regression analysis for quantitative data, while thematic analysis was used for qualitative data. Results indicate that insecurity significantly hampers construction performance, with project delays (Mean = 4.45) and cost overruns (Mean = 4.32) being the most critical impacts. Other significant effects include workforce shortages, decreased productivity, and material theft. The RII results highlight that banditry (0.89), kidnapping (0.85), and theft/vandalism (0.80) are the primary security threats in the area. Regression analysis reveals a strong negative correlation between insecurity and project performance ($\beta = -0.68$, $p < 0.05$), indicating that higher insecurity levels lead to worse project outcomes. Qualitative findings support these results, emphasizing frequent disruptions, increased security costs, worker anxiety, and inadequate government responses. The study concludes that insecurity is a major factor influencing construction project success in Kebbi State, affecting operational efficiency, financial stability, and workforce morale. Recommendations include enhanced security measures, improved government intervention, community engagement, comprehensive risk management, and stronger collaboration among stakeholders.

Keywords: Insecurity, Construction Projects, Cost Overruns, Relative Importance Index, Nigeria

INTRODUCTION

Construction projects are complex and resource-intensive, making them particularly susceptible to disruptions caused by insecurity (Waqas et al., 2019). This vulnerability is heightened in regions with high levels of civil unrest, organized crime, or political instability, where project delays and cost overruns become common due to threats such as kidnapping, banditry, and terrorism (Adedokun et al., 2023; Ebekozien et al., 2024). Such security challenges severely impede project timelines and overall performance, creating significant uncertainties regarding project outcomes and financial viability (Ebekozien et al., 2024).

In Kebbi State, located in northwestern Nigeria, escalating insecurity due to cross-border crimes and armed banditry disrupts construction projects, leading to delays, increased costs, reduced workforce availability, and discouragement of local and foreign investments (Shameli-Sendi et al., 2016). The nature of construction work, which relies heavily on human labor and involves valuable equipment, makes it particularly vulnerable to security threats. Consequently, project managers often resort to unplanned contingency measures, which adversely affects overall project performance (Ragu-Nathan et al., 2008; D'Arcy et al., 2014).

Recent studies emphasize that insecurity imposes both direct and indirect costs on construction activities. Direct impacts include material theft, vandalism, and financial losses due to project delays, whereas indirect impacts involve reduced labor productivity, increased stress among workers, and diminished investor confidence (Ezenwobodo & Samuel, 2022; Ahmad et al., 2012). Furthermore, insecurity forces construction firms to allocate resources to security management rather than focusing on core project objectives, thereby exacerbating cost overruns and compromising project quality.

Statement of the Problem

Despite recognizing the significance of insecurity on construction projects, there is a lack of localized research specifically investigating its effects in Kebbi State. While national studies highlight general trends, they often overlook the unique socio-cultural, geographic, and security dynamics of the northwestern region. Consequently, project managers and policymakers lack evidence-based strategies to effectively mitigate insecurity-related risks, leading to frequent delays, cost escalations, and reduced productivity that undermine the sector's contribution to regional development and national growth.

Aim and Objectives of the Study

The primary aim of this study is to identify and mitigate the impact of insecurity on construction projects delivery in Kebbi State. The specific objectives are;

1. Identifying the key security risks affecting construction projects in Kebbi State.
2. Evaluating the impact of these risks on project timelines, costs, and workforce productivity.
3. Developing strategies for mitigating insecurity-related risks in construction projects.

Research Questions

This study seeks to answer the following questions:

1. What are the predominant forms of insecurity affecting construction projects in Kebbi State?
2. How does insecurity influence the cost, duration, and quality of construction projects?
3. What strategies can be developed to mitigate security-related risks in construction projects?

Significance of the Study

This research is significant for several reasons. Firstly, it provides evidence-based insights into the nature and extent of insecurity in Kebbi State's construction sector, which can inform policymakers and security agencies. Secondly, the findings offer practical strategies for project managers to mitigate insecurity risks, optimize resource allocation, and improve project outcomes. Finally, the study contributes to the academic literature on construction risk management, particularly in regions affected by insecurity, serving as a reference for future research in similar socio-political contexts (Ahmad et al., 2012; Webb et al., 2014; Shameli-Sendi et al., 2016).

Scope of the Study

This study focuses on construction projects in Kebbi State, particularly those most affected by insecurity, including roadworks, commercial buildings, and public infrastructure projects. A mixed-method approach was adopted, combining quantitative data from questionnaires administered to construction professionals with qualitative data from interviews with key stakeholders, including project managers, contractors, and community leaders.

LITERATURE REVIEW

Concept of Insecurity in Construction Context

Insecurity within the construction sector refers to the exposure of project environments to threats such as violence, crime, and instability that disrupt project execution. In developing countries like Nigeria, insecurity

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has become a critical external risk factor influencing construction performance. Unlike traditional project risks (e.g., cost estimation errors or material shortages), insecurity introduces **unpredictable disruptions** that directly affect project continuity, workforce safety, and resource availability.

The construction industry is inherently risk-prone due to its dependence on labour, equipment, and site-based operations. Studies show that construction projects in Nigeria are already challenged by poor planning, inadequate risk management, and weak stakeholder coordination, which are further exacerbated by insecurity (Unegbu et al., 2023). Insecurity therefore represents an **external macro-risk** that interacts with existing internal project vulnerabilities.

Construction-Specific Forms of Insecurity

Insecurity in construction projects manifests in forms that are directly linked to site operations and project logistics. In northern Nigeria, particularly regions like Kebbi State, the most prevalent forms include:

- **Banditry and Armed Attacks** – These disrupt site operations, force temporary shutdowns, and damage infrastructure.
- **Kidnapping of Construction Personnel** – This leads to labour shortages and increased insurance/security costs.
- **Theft and Vandalism of Materials and Equipment** – Construction sites are highly vulnerable due to the presence of valuable materials.
- **Communal Conflicts and Land Disputes** – These affect site access and project continuity.

These threats are consistent with broader findings that construction environments are highly exposed to **external socio-political risks**, especially in conflict-prone regions (Oyekunle, 2024). Unlike manufacturing or office-based industries, construction activities are geographically fixed and therefore cannot easily relocate away from insecure environments.

Impact of Insecurity on Construction Project Delivery

Project delivery in construction is typically measured using three key performance indicators: **time, cost, and quality**. Insecurity affects all three dimensions significantly.

Time Performance (Project Delays)

Delays are one of the most common consequences of disruptions in construction. Empirical studies in Nigeria show that delays frequently result in **extended project durations and schedule overruns**, often due to external factors beyond contractor control (Mansfield et al., 2002). Insecurity contributes to these delays through:

- Site closures due to attacks
- Restricted movement of labour and materials
- Interruption of supply chains

Cost Performance (Cost Overruns)

Insecurity increases project costs both directly and indirectly. Direct costs include:

- Hiring security personnel
- Replacing stolen materials
- Paying ransom or compensation

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Indirect costs arise from delays and inefficiencies. Research shows that cost-related factors such as resource instability and operational disruptions significantly affect financial performance in Nigerian construction projects (Nnadi & Najjobyo, 2025).

Productivity and Workforce Performance

Construction productivity is heavily dependent on labour availability and efficiency. In insecure environments:

- Workers may refuse deployment
- Skilled labour becomes scarce
- Psychological stress reduces efficiency

Risk management studies highlight that workforce-related risks are a major determinant of project performance in Nigeria (Oyekunle, 2024).

Material Loss and Resource Disruption

Material theft and vandalism are major issues in construction sites, particularly in unsecured environments. These lead to:

- Increased procurement costs
- Project delays
- Disruption of workflow

Material-related disruptions have been shown to significantly influence project timelines and efficiency in Nigeria (Timothy, 2025).

Risk Management Perspective in Construction

The study is anchored in **Risk Management Theory**, which emphasizes the identification, assessment, and mitigation of risks throughout the project lifecycle. In construction, risks are categorized as:

- **Internal risks** (planning, finance, management)
- **External risks** (economic, environmental, and security-related)

Insecurity falls under external risks but has **system-wide implications**, affecting cost, time, quality, and stakeholder confidence. Effective risk management practices—such as risk identification, monitoring, and mitigation—have been shown to significantly improve project performance in Nigeria (Oyekunle, 2024).

Furthermore, studies on project management constraints in Nigeria emphasize that poor institutional frameworks and weak policy enforcement amplify the effects of external risks such as insecurity (Akintola et al., 2024).

Regional Context: Northern Nigeria and Kebbi State

Northern Nigeria has experienced increasing insecurity due to:

- Armed banditry
- Cross-border crimes
- Weak security infrastructure

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These conditions make construction projects in states like Kebbi particularly vulnerable. The region's socio-economic structure, including rural project locations and limited government presence, further increases exposure to insecurity risks. Unlike southern urban centres, where infrastructure and security systems are relatively stronger, construction projects in northern Nigeria face:

- Limited access to security services
- Poor road networks (affecting response time)
- High dependency on local community cooperation

This highlights the importance of **context-specific mitigation strategies**, such as community engagement and localized security arrangements.

METHODOLOGY

Research Design

The study employs a mixed-method research design, combining quantitative and qualitative approaches: **Quantitative Approach:** Structured questionnaires were administered to construction professionals, including project managers, engineers, contractors, and site supervisors. This approach enabled the measurement of insecurity impacts using numerical scales (Likert scale 1–5) and statistical analysis.

Qualitative Approach: Semi-structured interviews were conducted with stakeholders, including contractors, community leaders, and local security personnel. This approach provided deeper insights into lived experiences, contextual factors, and mitigation strategies not captured through surveys.

The convergent parallel design was adopted, allowing for concurrent collection of quantitative and qualitative data, which were integrated during analysis to provide a comprehensive understanding of insecurity's impact.

Study Area

The focus of the study is Kebbi State, located in northwestern Nigeria, which has experienced increasing security challenges such as armed banditry, kidnapping, communal clashes, and theft, particularly in areas with ongoing construction projects. The study targeted urban and semi-urban locations with active roadworks, commercial buildings, and public infrastructure projects, where insecurity has tangible impacts on construction activities.

Population of the Study

The study population includes:

- **Construction Professionals:** Engineers, quantity surveyors, contractors, project managers, and site supervisors operating in Kebbi State.
- **Key Stakeholders:** Community leaders, security personnel, and project sponsors knowledgeable about local insecurity and project execution.

Sampling Technique and Sample Size

A purposive sampling technique was employed to select respondents who have direct experience with

construction projects affected by insecurity. This technique ensures that participants are knowledgeable and can provide reliable information.

- **Quantitative Sample:** 100 respondents completed structured questionnaires.
- **Qualitative Sample:** 15 stakeholders participated in semi-structured interviews.

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This sample size aligns with similar studies in construction risk management, providing adequate data for both statistical and thematic analyses.

Purposive Sampling Limitations and Generalizability Implication

Although purposive sampling helped identify respondents who were knowledgeable and had direct experience of insecurity in construction projects, it comes with limitations regarding representativeness and generalizability. Because purposive sampling is a non-probability technique, it does not allow for statistical generalization to the wider population, and the selection process may be affected by researcher judgment. Therefore, the study's findings are largely specific to Kebbi State and should be applied to other regions with caution.

However, the alignment of the results with evidence from similar studies conducted in northern Nigeria and other conflict-prone parts of Africa indicates some level of analytical generalizability. This suggests that while the findings may not be universally applicable, they offer useful insights into construction project delivery under insecurity and may be transferable to settings with comparable socio-political conditions.

Research Instruments

Questionnaire: The questionnaire consisted of three sections:

- **Section A:** Demographics—Age, gender, role, years of experience.
- **Section B:** Insecurity Factors—Likert-scale items measuring exposure to insecurity, types of threats, and frequency.
- **Section C:** Project Impact—Likert-scale items assessing project delays, cost overruns, workforce productivity, material loss, and mitigation measures. The questionnaire was validated through a pilot study with 10 respondents, achieving a Cronbach's alpha of 0.86, indicating high internal consistency.

Semi-Structured Interview Guide: The interview guide included open-ended questions on:

- Experiences of insecurity on construction projects
- Perceived causes and patterns of insecurity
- Effectiveness of current mitigation strategies and suggestions for improving project resilience

Interviews were recorded (with consent) and transcribed for thematic analysis.

Ethical Considerations

Permissions were obtained from relevant authorities and organizations. Questionnaires were distributed in person and via email where applicable. Face-to-face interviews were conducted with stakeholders in secure locations, lasting 30–45 minutes. Quantitative data were coded and analyzed using SPSS, while qualitative data were transcribed and organized in NVivo.

Data Analysis

Quantitative Analysis:

- **Descriptive Statistics:** Employed to find frequencies, percentages, mean scores, and standard deviations.
- **Relative Importance Index (RII):** Used to rank the severity of insecurity impacts as perceived by respondents.
- **Regression Analysis:** Assessed the relationship between insecurity and project performance.

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Hypotheses Testing:

- Null hypothesis (H0): Insecurity has no significant effect on project performance.
- Alternative hypothesis (H1): Insecurity significantly affects project performance.

Qualitative Analysis:

- **Thematic Analysis:** Transcripts were coded, and recurring patterns were grouped into themes.
- **Triangulation:** Qualitative insights were integrated with quantitative findings to validate results and provide context.

Validity and Reliability:

Instruments were validated by academic experts, and pilot testing ensured content relevance. Cronbach's alpha was greater than 0.8, indicating strong internal consistency for the survey instrument. Triangulation was employed in combining quantitative and qualitative data, which enhances reliability and reduces bias.

RESULTS AND DISCUSSION

Introduction

This section presents the analysis of data collected from respondents and discusses the findings in detail. The results are analyzed using descriptive statistics (mean scores), the Relative Importance Index (RII), and regression analysis, interpreted in line with the research objectives and existing literature. Qualitative results are also discussed.

Demographic Characteristics of Respondents

The respondents included engineers, quantity surveyors, contractors, and site supervisors with varying years of experience. Most had over five years of experience, indicating that the data obtained is reliable and based on practical industry knowledge.

Analysis of the Impact of Insecurity on Construction Projects

Table 4.1: Mean Score Analysis of Impact of Insecurity		
Impact Factor	Mean Score	Rank
Project delays	4.45	1
Cost overruns	4.32	2
Workforce shortage	4.1	3
Reduced productivity	4.05	4
Material theft/loss	3.98	5
Field Survey, 2026		

The results indicate that project delays (Mean = 4.45) are the most significant impact of insecurity on construction projects in Kebbi State. This suggests that insecurity frequently disrupts work schedules, causing temporary site shutdowns and limiting access to project locations. Cost overruns (Mean = 4.32) rank second, reflecting the financial burden imposed by insecurity, which arises from hiring security personnel, replacing stolen materials, and compensating for project delays.

Workforce shortage (Mean = 4.10) indicates that insecurity discourages skilled workers from accepting or continuing jobs in high-risk areas. Reduced productivity (Mean = 4.05) suggests that even when workers remain on-site, their efficiency is compromised due to fear and psychological stress. Finally, material theft/loss (Mean = 3.98) remains a critical issue, contributing to financial losses and disrupting workflow continuity. Overall, the

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high mean scores indicate that insecurity has a significant and widespread impact on construction project performance.

Major Forms of Insecurity

Table 4.2: Relative Importance Index (RII) of Insecurity Factors		
Insecurity Factor	RII	Rank
Banditry	0.89	1
Kidnapping	0.85	2
Theft/Vandalism	0.8	3
Field Survey, 2026		

Results show that banditry (RII = 0.89) is the most significant form of insecurity affecting construction projects in Kebbi State. Kidnapping (RII = 0.85) ranks second, highlighting the risk faced by construction workers. Theft and vandalism (RII = 0.80) remain significant threats, leading to material loss and additional costs. The high RII values indicate that all identified insecurity factors are highly significant, confirming that insecurity is a major challenge in the study area.

Regression Results

Table 4.3: Regression Results			
Variable	Coefficient (β)	t-value	p-value
Constant	1.25	2.1	0.038
Insecurity (INS)	-0.68	-5.42	0.000
Field Survey, 2026			

$R^2 = 0.62$

The regression analysis reveals that insecurity has a statistically significant negative effect on construction project performance ($\beta = -0.68$, $p < 0.05$). This implies that an increase in insecurity leads to a corresponding decrease in project performance. Specifically, a one-unit increase in insecurity results is a 0.68 unit reduction in project performance, holding other variables constant. The coefficient of determination ($R^2 = 0.62$) further indicates that 62% of the variation in project performance can be explained by insecurity. This provides strong empirical evidence that insecurity is a key determinant of project outcomes in Kebbi State. It is important to note that the regression coefficient represents a **linear relationship** and does not imply causation beyond the model context.

Qualitative Interview Results

In addition to quantitative data obtained through questionnaires, qualitative data were collected through semi-structured interviews with selected stakeholders, including project managers, contractors, site engineers, and local community representatives. This approach provided deeper insights into how insecurity affects construction projects beyond numerical analysis.

Key Themes from Interviews

- **Disruption of Construction Activities:** Most respondents emphasized that insecurity frequently leads to temporary or complete shutdowns of project sites. “There are times when we have to suspend work for weeks due to security threats in the area,” noted a project manager.

- **Increased Project Cost Due to Security Measures:** Interviewees highlighted the financial burden of insecurity, particularly regarding security arrangements. “We spend a lot on hiring local vigilantes and sometimes even security escorts for materials,” stated a contractor.

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- **Fear and Workforce Challenges:** A recurring issue was the reluctance of workers to operate in high-risk areas. "Some skilled workers refuse to come to site once they hear about attacks nearby," reported a site engineer.

- **Community Relations as a Security Strategy:** Some respondents emphasized the importance of engaging local communities as a means of protection. "When the community supports the project, security improves because they help monitor activities," noted a contractor.

- **Ineffectiveness of Government Security Response:** Many stakeholders expressed dissatisfaction with the level of government intervention. "Government security presence is not enough to guarantee safety on sites," remarked a project supervisor.

Integration of Quantitative and Qualitative Findings

Table 4.4 Integration of Quantitative and Qualitative Findings	
Quantitative Finding	Qualitative Insight
Project delays ranked 1st	Site shutdowns and work suspension confirmed
Cost overruns ranked 2nd	Extra spending on security explained
Workforce shortage	Fear and refusal to work identified
Field Survey, 2026	

The qualitative data reveal that insecurity is not only a measurable risk but also a lived experience for stakeholders. It affects decision-making, planning, and execution of construction projects. The findings suggest that insecurity introduces uncertainty and unpredictability, compelling contractors to engage in reactive planning and creating psychological burdens for workers.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study investigated the impact of insecurity on construction projects in Kebbi State, Nigeria, using a mixed-method approach that combined quantitative surveys with qualitative interviews. Findings reveal that insecurity significantly affects construction projects in various dimensions:

- **Operational Impact:** Project delays were identified as the most critical consequence of insecurity, with frequent banditry and theft disrupting site operations.

- **Financial Impact:** Cost overruns were observed as a major challenge, largely due to expenses on security personnel, insurance premiums, and project downtime.

- **Human Resource Impact:** Workforce shortages and reduced productivity were highlighted, as workers are often reluctant to operate in high-risk areas.

- **Investor Confidence:** The prevalence of insecurity discourages investments and contractor engagement in vulnerable regions, further affecting sector growth.

Overall, the study concludes that insecurity is a major determinant of construction project performance in Kebbi State. The integration of both quantitative and qualitative data underscores that addressing insecurity requires a multi-faceted approach involving government, communities, and private sector stakeholders.

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RECOMMENDATIONS

Based on the findings, the following strategies are proposed to mitigate the impact of insecurity on construction projects:

i. **Enhanced Security Measures:** Construction firms should invest in advanced security solutions, including surveillance systems and trained private security personnel for high-risk sites.

ii. **Government Intervention:** Strengthen security presence around construction zones through coordination with local authorities and rapid response policies.

iii. **Community Engagement:** Foster collaboration with local leaders to enhance project safety and gain support for security initiatives.

iv. **Risk Management Planning:** Incorporate comprehensive security risk assessments during project planning and establish contingency plans for potential disruptions.

v. **Insurance Policies:** Adopt comprehensive insurance covering workers, equipment, and materials to mitigate financial losses from insecurity-related incidents.

vi. **Workforce Training and Awareness:** Conduct safety training sessions for workers to enhance preparedness for potential security incidents.

vii. **Stakeholder Collaboration:** Encourage collaboration between contractors, investors, and government agencies to share security intelligence and best practices.

viii. **Policy and Legislative Support:** Advocate for regional policies aimed at reducing insecurity, including rehabilitation programs for offenders and conflict mediation.

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