E-ISSN: 1116 - 2759 P-ISSN: 3027- INTERNATIONAL JOURNAL – EDIR
MPRI-EDIR | INTERNATIONAL JOURNAL OF EARTH DESIGN AND INNOVATION RESEARCH
VOL. 07 NO. 4 – JANUARY, 2025

INFLUENCE OF RISK ON ROAD PROJECTS COST AND DURATION IN ABUJA, NIGERIA

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DOI: https://doi.org/10.70382/mejedir.v7i4.030

Abstract

Project risks have a significant effect on time, cost, scope, or work quality. Studies were thus conducted to assess the effect of risk on project cost, time, and work quality. Though, these studies only viewed building projects in Nigeria, and no attempt was made to cover road projects. Therefore, this study seek to evaluate the influence of risk on road projects cost and duration in Abuja, Nigeria. A purposive sample of 100 construction industries involved in selected projects within F.C.T, Abuja were chosen. Data analysis include mean score for ordering the variables. Findings indicated that [redacted] use of subpar materials, poor quality of work, budget overruns, bad project management, and supply chain disruptions are branded as the most critical influence of risk on road projects cost. Whereas, additional cost to contract sum, prolonged completion date, delay in expected revenue/usage, give rise to fluctuation claims, decrease in the quality of the final product, project abandonment, loss of workers' productivity, and protracted health and safety issues

Keywords: Construction industry, Cost, Duration, Project risk, Road projects.

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occasioned by road construction were identified as the most critical influence of risk on road projects duration. The findings accentuate the prominence of comprehensive planning, stable funding, and effective project management to allay road project risks. Thus, it was recommended that construction industries should invest in the use of advanced project management tools to achieve greater project efficiency. Also, project stakeholders should ensure stable funding before the commencement of projects. This can be achieved through government support, public-private partnerships, and financial institutions.

Introduction

As construction projects increases in complexity, the magnitude of risk involved become inevitable (Tipili & Ilyasu, 2014). Project risk includes the possibility of loss or gain, or variation from a desired or planned outcome, as a consequence of the uncertainty associated with ensuing a particular course of action (Bypaneni & Tran, 2018). Kamal et al. (2019) describe risk in construction as exposure of construction activities to financial loss, due to unforeseen events or foreseeing events for which uncertainty was not properly accommodated. Project risk thus has two elements: the likelihood or probability of something happening, and the consequences or impacts if it does. Among the most common project risks encountered are design and quantification errors, design changes, unforeseen physical conditions or artificial obstructions, unforeseen price rises in labour, materials or plant, theft or damage to the works, or materials and equipment on site, weather conditions, including floods or excessive hot weather, delay or inability to obtain materials or equipment required, inability to get the amount or quality of labour required or labour strikes, errors in pricing by the contractor (Al-Hazim & Salem, 2015; Ammar et al., 2022; Fashina et al., 2021). Consequently, Aderbag et al. (2018) averred that such risks have a

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significant effect on at least one of the project objective, such as time, cost, scope, or work quality.

For this reason, some studies recognized the impact of risk on project cost, duration, and work quality. For instance, Tipili & Ilyasu, (2014) carried out an evaluation of the impact of risk on project cost overrun; they identified the risk factors inherent in different building procurement methods and assessed their impact on project cost. However, this study was limited to risk factors in relation to building procurement methods and the impact on cost. Obodoh et al. (2019) assessed the construction professional's perception of risk impact on cost of building projects and concluded that completion delay is the risk variable that has the highest probability of occurrence and this risk has the second highest impact on construction cost. Adedokun et al. (2019) also assessed risk in the light of the impact it has on contractors' pricing in building projects and concluded that inadequate cash flow had a significant impact on contractors pricing of building projects. Akinola, (2023) examined the risk response techniques employed for major projects and they concluded that the construction industry concentrates almost exclusively on reduction of financial risk.

Accordingly, these studies were limited to building projects in Nigeria and no attempt was made to cover road projects. Road projects are crucial for every nation’s economy development as it facilitate connecting societies, boosting trade, attracting investment, and providing access to essential services (Ammar et al., 2022). In Nigeria, several road projects are vulnerable to project-specific risks that affect cost and time performance (Akinola, 2023). Though, Hossain et al. (2019) backed the need for all-inclusive planning, and effective project management to allay project risks. Hence, in order to support effective road project planning and management that mitigate road project risks, it will be helpful to assess the influence of risk on road projects cost and duration.

Literature Review

Aderbag et al. (2018) defines project risk as an uncertain event or condition that, if it occurs, has a positive or a negative effect on cost, time, or quality. Road projects are particularly prone to cost overrun, with actual cost of road projects being 20% higher than estimated (Alinaitwe et al., 2013; Annamalaisami & Kuppuswamy, 2019). This can be caused by rising costs from inflation and inadequate analysis of information and by costing methods (Bhangale, 2016). Design and project specific factors such as vagueness in scope, design complexity and project size also affect the cost estimate of a project (Alinaitwe et al., 2013). Johnson & Babu, (2018) identified four factors that give rise to cost overrun. The factors include external risk due to modifications in the scope of a project and changes in the legal, economic and technological environments. Moreover, delays in construction raise the costs of project significantly; they cause additional interest expenses and debt accumulation and erode financial viability of the project sponsors and other financiers (Amoatey & Ankrah, 2017). In a survey of the West Bank in Palestine, Mahamid (2013) indicated that the most severe factors affecting time delay in road construction projects from the owners' perspective are: poor communication between construction parties, poor resource management, delays in commencement, insufficient inspectors, and rework. Though, Hossain et al. (2019); Ammar et al. (2022) advocated the need to include contingency provisions in the budget submission to take care of cost and time overrun. However, the level of project risk contingency in estimates has a major impact on their financial outcomes for clients thereby affecting the duration of the project. If the contingency is too high, it might encourage poor cost management, cause the project to be uneconomic and aborted, or lock up fund that is not available for other projects. On the other hand, if the contingency allocation is too low, then it may be too rigid and set an

unrealistic financial environment, resulting in unsatisfactory performance outcomes.

Accordingly, Elhusseiny et al. (2021) emphasized on the essence of risk analysis, which attempts to capture all corresponding impact of risk on project objectives if the risks do occur. This will help construction organizations to improve their project's performance effectively by focusing on high-priority risks. Therefore, understanding the influence of risk on road projects cost and duration in Abuja, Nigeria will lay the foundation for establishing priorities for risk response planning.

Research Methodology

Research Strategy

Based on the literatures reviewed, 12 influence of risk on road projects cost and 13 influence of risk on road projects duration were identified. These was used to construct a structured questionnaire for the study. The questionnaire was divided into two sections. Section A highlights the background information of the respondents, while Section B consists of close-ended questions that focus on matters relating to the research objectives which are: i. Determine the influence of risk on road projects cost in Abuja, Nigeria. ii. Examine the influence of risk on road projects duration in Abuja, Nigeria.

Sample structures

Since this study involved the opinion of construction industries, purposive sampling method was employed in reaching out to the respondents. This affirmed the reliability of data gathered. Consequently, a sample of 100 construction industries involved in selected road projects within F.C.T, Abuja was targeted in the survey. Though, there are several methods of administering a questionnaire survey, direct conveyance of the questionnaire was chosen.

Table 1 shows that most respondents (50.0%) have HND/Bachelor's degree qualification. 45.0% of the respondents have Master’s degree certificates,

while, 5 respondents equivalent to 5.0% have PhD degrees. This shows that all the respondents have the needed knowledge to fill the questionnaires.

Table 1. Educational qualification of respondents

Highest educational qualification	Frequency	percentage
HND/Bachelor's Degree	50	50.0
Master's Degree	45	45.0
PhD	5	5.0
Total	**100**	**100%**

Source: Fieldwork, 2025

Table 2 shows that 10 respondents corresponding to 10.0% have 1-5 years of experience, while, 49 respondents equivalent to 49.0% have 6-10 years of experience. Also, 41 respondents which is equal to 41.0% have over ten years' experience in the industry. Generally, this shows the reliability of the data.

Table 2. Years of working experience in the construction industry

Years of Experience	Frequency	Percentage
1-5 years	10	10.0
6-10 years	49	49.0
Above10 years	41	41.0
Total	**100**	**100%**

Source: Fieldwork, 2025

Data Analysis and Discussion

This section presents and weigh up the mean score results of the identified influence of risk on road projects cost and duration in Abuja, Nigeria. The performance of each variable was evaluated based on the importance weighting and productivity of each variable.

As shown in Table 3, the analysis of influence of risk on road projects cost revealed that use of subpar materials (Mean Score = 4.24) was ranked first,

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poor quality of work (Mean Score = 4.14) was ranked second, while, budget overrun (Mean Score = 4.10) was ranked third. Also, bad project management (Mean sore = 4.08) was ranked fourth, supply chain disruptions (Mean score = 4.04) was ranked fifth, contract disputes (Mean score = 4.02) was ranked sixth, delays, legal issues and inattentiveness to health and safety concerns (Mean score = 4.00) were ranked seventh. Moreover, decrease in workers' remunerations (Mean score = 3.98) was ranked tenth, technical challenges (Mean score = 3.94) was ranked eleventh, and lastly contentious claims (Mean score = 3.88) was ranked twelveth.

Table 3. Influence of risk on road projects cost

Influence of risk on road projects cost	Mean	Rank
Use of subpar materials	4.24	1st
Poor quality of work	4.14	2nd
Budget overruns	4.10	3rd
Bad project management	4.08	4th
Supply chain disruptions	4.04	5th
Contract disputes	4.02	6th
Delays	4.00	7th
Legal issues	4.00	7th
Inattentiveness to health and safety concerns	4.00	7th
Decrease in workers' remunerations	3.98	10th
Technical challenges	3.94	11th
Contentious claims	3.88	12th
Average	**4.04**	

Based on the average Mean (4.04), five influence of risk on road projects cost (Use of subpar materials, poor quality of work, budget overruns, bad project management, and supply chain disruptions) indicates how much more they are critical to the respondents. These risks are critical as they directly impact the feasibility and sustainability of road construction projects (Al-Hazim & Salem, 2015; Ammar et al., 2022). These findings underscore the financial strain that risk factors can impose on road construction projects, necessitating robust risk management strategies to control costs.

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Consequently, the data in Table 4 indicated that additional cost to contract sum (Mean Score = 4.40) was ranked first, prolonged completion date (Mean Score = 4.37) was ranked second, delay in expected revenue/usage (Mean score = 4.31) was ranked third, give rise to fluctuation claims (Mean score = 4.27) was ranked fourth, decrease in the quality of the final product (Mean score = 4.25) was ranked fifth, project abandonment (Mean score = 4.24) was ranked sixth, loss of workers' productivity (Mean score = 4.22) was ranked seventh, protracted health and safety issues occasioned by road construction (Mean score = 4.20) was ranked eighth, negative impact on the project stakeholders and loss of credibility on the project management team (Mean score = 4.10) was ranked ninth, negative impact on the local economy (Mean score = 4.06) was ranked eleventh, loss of workers' morale (Mean score = 4.04) was ranked twelveth, and lastly, loss of goodwill with the community (Mean score =3.94) was ranked thirteenth.

Table 4. Influence of risk on road projects duration

Influence of risk on road projects duration	Mean	Rank
Additional cost to contract sum	4.40	1st
Prolonged completion date	4.37	2nd
Delay in expected revenue/usage	4.31	3rd
Give rise to fluctuation claims	4.27	4th
Decrease in the quality of the final product	4.25	5th
Project abandonment	4.24	6th
Loss of workers' productivity	4.22	7th
Protracted health and safety issues occasioned by road construction	4.20	8th
Negative impact on the project stakeholders	4.10	9th
Loss of credibility on the project management team	4.10	9th
Negative impact on the local economy	4.06	11th
Loss of workers' morale	4.04	12th
Loss of goodwill with the community	3.94	13th
Average	**4.19**	

Based on the average mean score (4.19), the most pronounced influence of risk on the duration of road projects are additional cost to contract sum (4.40), prolonged completion date (4.37), delay in expected revenue/usage (4.31), give rise to fluctuation claims (4.27), decrease in the quality of the final

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product (4.25), project abandonment (4.24), loss of workers' productivity (4.22), and protracted health and safety issues occasioned by road construction (4.20). These findings highlight how risk factors can extend the time required to complete road construction projects. Thus, rescheduling becomes necessary, which further thwart project timelines and management.

Conclusion

The study concludes that risk are prominent in road projects cost and duration. These risks lead to use of subpar materials, poor quality of work, budget overruns, bad project management, supply chain disruptions, additional cost to contract sum, prolonged completion date, delay in expected revenue/usage, give rise to fluctuation claims, decrease in the quality of the final product, project abandonment, loss of workers' productivity, and protracted health and safety issues occasioned by road construction. These findings emphasize the importance of comprehensive planning, stable funding, and effective project management to mitigate road project risks. By addressing these key areas, construction projects can achieve greater project efficiency, meet project timelines, and cost control. Based on the foregoing, the following recommendations are made:

1. Construction industries should invest in the use of advanced project management tools to foresee and dull potential risks.
2. Project stakeholders should secure stable and adequate funding before the commencement of projects. This can be achieved through government support, public-private partnerships, and financial institutions dedicated to infrastructure development.
3. Partnerships with educational institutions and vocational training centers can enhance the skill levels of construction workers.

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