

INFLUENCE OF RISK TRANSFER ON PERFORMANCE OF ROAD CONSTRUCTION PROJECTS BY KENYA URBAN ROADS AUTHORITY IN NAIROBI CITY COUNTY, KENYA

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Abstract: The Kenya Urban Roads Authority acknowledges the critical role of risk management in ensuring the successful completion of road construction projects. This is achieved through proactive risk identification, contingency planning, and continuous monitoring. The authority is committed to minimizing the impact of risks and uncertainties, thereby delivering high-quality road infrastructure that fulfills the community's needs. Research indicates that approximately half of construction projects experience delays, while around 63% of information systems projects encounter significant budget overruns, with the range extending from 40% to 200%. Despite these challenges, it is noted that most road projects eventually meet the specified requirements. However, they frequently fall short of adhering to their deadlines and budgetary limitations, with around 80% of ongoing road construction projects remaining incomplete. Therefore, this study sought to influence of risk transfer on performance of road construction projects by Kenya Urban Roads Authority in Nairobi City County, Kenya. The study was conducted using a cross-sectional research design. The research sample included project managers, engineers, supervisors, surveyors, environmentalists, risk managers, construction company employees, and government/KURA officials from eight road construction projects in Nairobi County accomplished between 2015 and 2021. A sum of 200 individuals made up this population. Out of this population, 134 participants were chosen at random for the sample. Surveys were employed to gather pertinent data for the research, and a reliability assessment of the research tools was conducted with a coefficient value exceeding 0.7. In order to confirm the questionnaires' validity and reliability, a pilot study was carried out with 10% of the participants. Descriptive statistics (mean, standard deviation) and inferential analysis (multiple regression) were utilized to analyze the collected data, along with diagnostic tests like correlation, normality, and multicollinearity assessments to verify data integrity. The findings were visually displayed using a mix of tables, graphs, and pie charts. The research discovered that the performance of road construction projects in Nairobi County, Kenya was significantly improved by risk transfer. The research findings suggest that risk transfer enables project managers to shield projects from severe losses, maintain project cash flow, and concentrate on the organization's key strengths. The research suggests that project managers should perform a comprehensive risk assessment and analysis in order to guarantee effective risk transfer.

Keywords: Risk transfer, Project Performance.

1. INTRODUCTION

Efficient project management, as noted by Dai and Wells (2019), plays a crucial role in minimizing unnecessary expenditures and ensuring the effective allocation of resources, thereby resulting in cost savings for the organization. Ulmusawir, Serra, Zwikael, and Ali (2022) highlight that through the optimization of processes and timely task completion,

a well-executed project can significantly enhance overall productivity within the organization. The successful and timely completion of a project within budget can also boost the organization's reputation and credibility among stakeholders, clients, and customers. Consequently, the implementation of efficient project management practices can align with stakeholder expectations, ensuring their needs are met and ultimately leading to higher levels of stakeholder satisfaction.

Rabechini and Monteiro (2021) assert that project risk management stands as a critical element in ensuring the success of any project within an organization. Effectively identifying, evaluating, and mitigating potential risks enables project managers to enhance the likelihood of meeting project objectives and delivering results within the set time frame and budget. Jun, Qiuzhen, and Qingguo (2023) further highlight the significant correlation between project risk management and organizational performance. When organizations manage project risks effectively, they are better positioned to achieve their strategic goals. By taking a proactive approach to address potential risks, organizations can minimize adverse impacts on project outcomes and overall performance, thereby improving their ability to deliver successful projects and meet strategic objectives through prioritizing risk management.

Musyoka (2012) argues that all organizations encounter risks, and it is the responsibility of management to determine the acceptable level of risks to enhance stakeholder value. The uncertainties associated with risks can either add value or diminish it. To effectively identify, evaluate, and address risks, the adoption of risk management practices becomes imperative. Kumar (2014) stresses the significance of developing risk management tools and techniques to ensure successful project delivery within specified timeframes, budget constraints, and customer expectations. However, the failure of many project managers to implement these practices often leads to project failures. Carbone and Tippet (2015) underscore the critical importance of effectively managing project risks for successful project outcomes.

Project performance relies on various factors such as time, cost, customer satisfaction, safety, and client modifications (Musyoka, 2012). The occurrence of project delays and cost overruns is a global phenomenon (Gitau, 2016), often stemming from unexpected events and uncertainties with detrimental consequences. Hence, the thorough analysis and management of risks are essential components of project management that necessitate careful consideration by project managers to realize the project's goals.

Lee, Lam, and Lee (2015) found that in Canada, a failure to identify risks at the project's outset led to issues like baseline measurement challenges, increased cost overruns, and project complexity. In Nigeria, Augustine, Ajayi, Ade, and Edwin (2013) demonstrated that adopting risk management practices can reduce time and cost overruns while enhancing the quality of construction projects.

Alinaitwe, Apolot, and Tindiwensi (2013) established a clear relationship between the incapacity to develop a formal and well-structured approach for collectively managing risk, both in the stages of project planning and in addressing delays in construction projects in Uganda. Macharia (2016) discovered that in Kirinyaga County, the adoption of strategies such as risk avoidance, reduction, sharing, and retention significantly influenced the successful completion of construction projects. Finally, Mbada (2016) contends that the consequences of private and public road construction projects failing to comply with standards related to cost, quality, and timeliness result in resource wastage and subpar performance.

According to a report by the Government of Kenya (GoK) in 2012 and the World Bank (2013), the construction of Thika Superhighway, initially slated for completion in 2011, was ultimately finished a year later due to various factors. The project's completion date was rescheduled twice, leading to delays and a Kshs.7 billion escalation in the project's cost from the original budget. Key contributors to this delay included economic inflation, significant political discord within the ruling coalition, limited community engagement, El-Niño rains in 2011 and 2012, and local subcontractors lacking technological proficiency.

An additional project plagued by inadequate financial allocation and outdated technology was the Greenfield terminal construction at Jomo Kenyatta International Airport, which failed to meet its completion deadline (GoK, 2013). The project's official commencement date was postponed multiple times, resulting in substantial delays and an overall detrimental impact on the government. Consequently, the government faced potential losses of Ksh.98,324,900 due to inconvenience adjustments (The Quantity Surveyor and Construction Claims, 2011).

PMI (2013) defines risks as events that have an adverse impact on a project's core objectives, specifically time, cost, and quality. The construction industry is particularly vulnerable to significant risks due to its unique construction activities compared to other sectors. These activities are characterized by lengthy projects, complex processes, high financial stakes,

adverse environmental conditions, and fluctuating organizational frameworks. Furthermore, the construction sector is notorious for its poor track record in adopting and executing effective risk management practices, leading to numerous projects failing to achieve their cost and schedule targets, thereby negatively affecting various stakeholders, including the public, contractors, clients, and others (Tesfaye et al., 2016). Risk management involves the identification, comprehension, and assessment of potential adverse outcomes that could impact a project (Muriana & Vizzini, 2017). Risk management methodologies encompass risk control, prevention, transfer, and retention (Nyoni, 2018). The OECD (2016) states that organizations have multiple risk strategies at their disposal, including risk transfer, retention, reduction, and avoidance. PMI (2017) posits four primary risks in a project: transfer, avoidance, acceptance, and mitigation.

Risk transfer is an essential aspect of risk management, as highlighted by Carvalho and Rabechini (2015). The allocation of risks to various stakeholders, such as clients, contractors, subcontractors, designers, and other involved parties, is contingent upon the characteristics of the specific risk, as noted by Cagliano, Grimaldi and Rafele (2015). While this strategy may result in increased costs, additional workload, and higher risk premiums, it is important to acknowledge that the risk is merely shifted to the most appropriate entity for its management, rather than eliminated, as emphasized by PMI (2004). Risk transfer mechanisms encompass measures like insurance policies, contracts with indemnity clauses, performance bonds, and warranties.

Project performance denotes the evaluation and measurement of a project's alignment with its objectives and goals, encompassing an assessment of various project facets such as budget adherence, scheduling efficiency, quality maintenance, and scope adherence, to determine the project's progress and delivery of anticipated outcomes, as discussed by Sudhakar (2018). According to Ika and Pinto (2022), project performance evaluation entails scrutinizing the efficiency and effectiveness of project processes, pinpointing areas for enhancement to ensure the project's successful conclusion within predefined constraints. Ultimately, the evaluation of project performance plays a pivotal role in meeting stakeholder expectations and realizing the project's intended results.

Borman and Motowidlo (2017) contend that the successful completion of a project can furnish an organization with a competitive advantage in the market by showcasing its capability to efficiently deliver high-quality outcomes, thereby setting the stage for future growth and prosperity through effective project execution and stakeholder value delivery. Moreover, Subramanian, Jiang, and Klein (2022) assert that project performance indicators serve as metrics for gauging a project's progress and achievement, offering valuable insights into its efficiency, effectiveness, and overall performance. Through the vigilant monitoring and analysis of these indicators, project managers can make well-informed decisions, pinpoint areas necessitating improvement, and ensure the project remains on course to attain its objectives.

The Kenya Urban Roads Authority (KURA) operates as a State Corporation falling under the Ministry of Transport and Infrastructure, having been established in accordance with the Kenya Roads Act of 2007. Primarily tasked with the oversight, enhancement, repair, and upkeep of national urban trunk roads, KURA's core responsibilities encompass the construction, enhancement, rehabilitation, and maintenance of roads within its jurisdiction. Additionally, KURA supervises the management of urban road reserves and regulates developments along roadsides. Moreover, the authority plays a crucial role in executing urban road policies, monitoring and evaluating road usage, and devising plans for road development and maintenance. Furthermore, KURA collaborates with other road authorities on planning and operational aspects concerning roads while preparing comprehensive road works programs for all urban roads.

As per the National Construction Authority (NCA) (2018), the construction sector in Kenya plays a crucial role in its socio-economic advancement, being intertwined with various segments of the economy that contribute to the country's Gross Domestic Product (GDP). Within Kenya's Vision 2030 framework, construction is acknowledged as a driving force propelling the nation towards global competitiveness and prosperity, ultimately enhancing the quality of life by 2030. The fiscal year 2017/2018 witnessed the successful completion of five significant road construction endeavors by the Kenya Urban Roads Authority (KURA), including the City Cabanas interchange, Langata Road rehabilitation and upgrading, Bitumen standard enhancement of Syokimau-Katani Link Road Phase I, improvements to First Avenue Eastleigh and General Waruinge Roads, and the development of Access to Embakasi Industrial Park (Infinity). This research will focus on the eight recently finalized road construction, rehabilitation, and upgrading projects within Nairobi City County spanning the period from 2015 to 2021.

2. STATEMENT OF THE PROBLEM

Road constructions play a fundamental role in the progress of a nation as they serve as key drivers of economic growth and a crucial element in achieving Vision 2030. Ensuring the timely completion of projects within budget constraints and meeting the established quality standards is essential (Nagaraju & Reddy, 2016). The Kenyan government has been actively involved in the development of road infrastructure, especially in Nairobi County. Studies indicate that a significant portion of construction projects face delays of about 50% and encounter budget overruns ranging from 40% to 200% (Olatunji, 2011). Despite most road projects eventually meeting the required standards, they frequently fall short of meeting deadlines and financial targets, with approximately 80% of ongoing projects in Nairobi County being far from completion (KURA, 2019).

Numerous studies have been conducted globally, regionally, and locally on the practices of risk management and their influence on the successful execution of projects. For instance, Carvalho and Rabechini (2015) highlighted the financial and productivity benefits that Information Technology projects gain from effectively managing risks. Adeleke, Nasidi, and Bamgbade (2016) established a positive relationship between the adoption of efficient risk management practices and project success.

In Kenya, research by Kinyua, Ogolla, and Mburu (2015) revealed that many ICT companies in Kirinyaga County have embraced project risk management techniques, leading to improved success rates in project implementation and decision-making processes. Another study by Macharia (2017) found that the primary factor influencing the performance of construction projects in Murang'a County is the use of risk avoidance strategies, while risk transfer had the least impact. Additionally, the application of risk management approaches was crucial for the successful implementation of secondary school projects. Peter (2019) uncovered a significant link between project performance and risk management in Nairobi County.

Despite the existing studies on the influence of risk management practices on project performance, there are still research gaps. Many studies focused on different countries, while those conducted in Kenya were predominantly in sectors unrelated to road construction projects. Peter's research did not specifically address construction road projects undertaken by KURA in Nairobi City County, resulting in a notable gap. This study seeks to address this gap by evaluating the impact of risk management practices on the performance of road construction projects carried out by KURA in Nairobi City County, Kenya, focusing on completion within specified cost, time, scope, and quality as performance indicators.

3. LITERATURE REVIEW

Theoretical Literature Review

Uncertain Theory

Liu (2010) initially introduced the concept of uncertain theory within the framework of measure theory. This theory is centered on the constrained comprehension and recognition of risk events, their consequences, and the likelihood of their occurrence. The notion of risk duality emerges from the twofold impact of uncertainty on business objectives, encompassing both advantageous and detrimental facets. According to Liu (2010), the uncertain theory was proposed as a response to the extensive realm of uncertainty. This concept was later evolved into uncertain logic by Liu and Li (2010), who posited that the value of truth is defined as an unknown determinant of the precision of a project. Furthermore, Liu (2010) advocated for uncertain entailment, a method that can be employed to calculate the value of truth for an uncertain formula, considering the truth value of other formulas that are not certain. The concept of uncertainty is not novel in project management. Techniques like PERT, developed in the 1950s, acknowledged the likelihood of tasks having variable durations. The practical applications of this theory were broadened in the 1960s to encompass probabilistic branching, such as the Graphical Evaluation and Review Technique. Qualitative methodologies, like the Analysis of Potential Problems, were introduced to assist project managers in anticipating uncertainty by averting risks and planning for contingencies. These strategies have proven particularly beneficial in scheduling tasks for intricate and uncertain projects. The Critical Path Method (CPM) is a renowned technique within this domain.

Nevertheless, foreseeable uncertainties are identified as potential factors that can impact project management, necessitating closely controlled risk management. Uncertainty risk is the principal determinant of the project and stakeholder management strategy. Consequently, anticipated uncertainty demands meticulous attention to risk management, the recognition of

probable risks that could affect the project, the implementation of mitigation measures to prevent adverse occurrences, and the formulation of multiple contingent plans to address such events. Monitoring progress involves tracking both completed and ongoing activities. The project manager must possess problem-solving skills and consolidate completed tasks to sustain project momentum. Risks, incidents, and project outcomes must be continuously monitored and communicated with stakeholders. This theory elucidates the significance of risk prevention and its influence on project performance. The prevention of risks is predicated on an uncertain scenario that, if mishandled, can lead to substandard project performance.

Empirical Literature Review

Imran, Khaliq, Hye, and Ekareesakul (2019) explored the impact of risk transfer on the effectiveness of construction firm projects in Pakistan. The research examines data collected from 61 construction firms through the use of partial least square structural equation modeling technique. The research found that project success is influenced in a positive way by design risk, financial risk, technical risk, and labor risk. On the other hand, the current study did not find a connection between the project's success and external risk variables. Furthermore, the current advice suggests that government agencies and construction firms should factor in risk assessments when determining project execution strategies. Nevertheless, the focus remained on construction companies from Pakistan.

Gitonga and Nyang'au (2023) explored the risk transfer strategy and performance of air safety projects in the Civil Aviation Industry in Nairobi County, Kenya. The study utilized a descriptive research design, focusing on 277 KCAA employees from the ANS department based in different areas of Nairobi County. The 164 sample population was calculated using Slovin's formula from the original target population of 277. The process involved gathering primary data through the distribution of questionnaires, followed by summarizing and analyzing the information using descriptive and inferential statistics. The correlation and regression statistics showed that risk transfer has a significant positive effect on the performance of air safety projects in the civil aviation sector. However, the study focused only on projects in the Civil Aviation Industry in Nairobi County, Kenya.

Macharia and Kirui (2018) examined how the performance of construction projects in public secondary schools in Murang'a County, Kenya is impacted by the risk transfer strategy. The research utilized a descriptive research design and employed judgmental or purposive sampling technique to choose public secondary schools in Murang'a County for the study. The research utilized original data collected through the distribution of surveys. Next, the information was condensed and examined using descriptive and inferential statistics. Descriptive statistics use frequency tables, standard deviation, mean, and mode, while inferential statistics involve regression analysis for quantitative data analysis. The risk transfer strategy was determined to only slightly impact the performance of construction projects. Nevertheless, the research concentrated on building projects in government high schools in Murang'a County, Kenya.

Odhiambo and Senelwa (2021) studied how the project risk transfer strategy impacts the project sustainability of NGO healthcare projects in South Nyanza, Kenya. The focus of the research was on the project managers of healthcare projects run by an NGO in South Nyanza. The current study utilized a census survey design to gather data from all 93 project managers leading NGO projects in South Nyanza. Based on the results, the risk transfer strategy positively impacts the project's sustainability. This means that maintaining all variables constant, a single increment in risk transfer tactics results in a notable rise in project sustainability within companies. Nonetheless, the research concentrated on the long-term viability of NGO healthcare initiatives in South Nyanza, Kenya.

4. RESEARCH METHODOLOGY

The study was conducted using a cross-sectional research design. The research sample included project managers, engineers, supervisors, surveyors, environmentalists, risk managers, construction company employees, and government/KURA officials from eight road construction projects in Nairobi County accomplished between 2015 and 2021. A sum of 200 individuals made up this population. Out of this population, 134 participants were chosen at random for the sample. Surveys were employed to gather pertinent data for the research, and a reliability assessment of the research tools was conducted with a coefficient value exceeding 0.7. In order to confirm the questionnaires' validity and reliability, a pilot study was carried out with 10% of the participants. Descriptive statistics (mean, standard deviation) and inferential analysis (multiple regression) were utilized to analyze the collected data, along with diagnostic tests like correlation, normality, and multicollinearity assessments to verify data integrity. The findings were visually displayed using a mix of tables, graphs, and pie charts.

5. FINDINGS

The descriptive statistics results on risk transfer are presented in Table 1.

Table 1: Risk Transfer

Statement	M	SD
Our organization insures project items such as construction equipment	3.96	1.04
Our organization ensures that there's enforceable contracts contract in place with indemnity clauses before site mobilization	4.54	0.46
Our organization outsources workforce to reduce the rates of delay in project completion time	3.29	1.71
An environmental impact assessment (EIA) is always conducted on a project prior to its construction for quality purposes	3.81	1.79
There is always a performance bond for every project to be execute	3.47	1.53
All purchases must be accompanied by warranty documents	4.63	0.37
Aggregate Score	3.99	1.01

The results in Table 1 show that the respondents agreed that risk transfer had an effect on the performance of road construction projects in Nairobi City County, Kenya as indicated by the aggregate mean score of 3.99 with 1.01 as standard deviation. These results align with those observed in a research study conducted by Kolo (2015), which indicated that Nigerian construction companies implemented risk transfer strategies. These strategies encompassed the acquisition of risk premiums and insurance policies. Such measures were found to influence the cost, quality, and timeliness of project performance.

The statements that were strongly agreed by the respondents were that all purchases must be accompanied by warranty documents ($M=4.63$, $SD=0.63$) and that their organization ensures that there's enforceable contracts contract in place with indemnity clauses before site mobilization ($M=4.54$, $SD=0.46$). These results concur with the observations of Carvalho and Rabechini (2015), who emphasize the significance of risk transfer within the realm of risk management. The transfer of risks to various stakeholders, including clients, contractors, subcontractors, designers, and other entities, is contingent upon the specific characteristics of the risk in question.

The statements that were agreed by the respondents were that their organization insures project items such as construction equipment ($M=3.96$, $SD=1.04$) and that an environmental impact assessment (EIA) is always conducted on a project prior to its construction for quality purposes ($M=3.81$, $SD=1.79$). These results align with the PMI (2004) report, suggesting that such a shift may result in heightened costs, supplementary workload, and elevated risk premiums. Nonetheless, it is important to acknowledge that the risk is transferred to the party best equipped to manage it, rather than eliminated.

The respondents indicated to a moderate extent on the statements that the there is always a performance bond for every project to be execute ($M=3.47$, $SD=1.53$) and that their organization outsources workforce to reduce the rates of delay in project completion time ($M=3.29$, $SD=1.71$). The results contradict those of Nsiah and Bonnah (2014), who posited that the primary determinant of the performance of Ghanaian banks was the implementation of risk transfer strategies, encompassing insurance policies, contract signings, and the payment of high-risk premiums. This research was exclusively focused on the banking sector of Ghana.

Inferential Statistics Results

Table 2: Correlation Analysis

		Risk transfer	project performance
Risk transfer	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	128	
Project Performance	Pearson Correlation	.773	1
		.000	
		128	128

Based on the results presented in Table 2, the correlation coefficient, denoted by Pearson's r , for the relationship between Risk Transfer and Project Performance was calculated to be 0.773. This value indicates a significant correlation, with a coefficient closer to 1, thereby suggesting a strong positive relationship. Furthermore, the coefficient was found to be less than 0.05, signifying a significant correlation. These findings indicate that risk transfer was found to be strongly correlated with project performance.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error Estimate
1	.872 ^a	.757	.741	1.275

Based on the findings presented in Table 3, it is evident that the risk transfer component accounts for 74.1% of the project performance, as quantified by the adjusted R-squared value. Consequently, this implies that factors not examined in the scope of this research contribute to an additional 25.9% of the project performance.

Table 4: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	231.514	1	231.514	475.543	0.002
	Residual	61.342	126	0.487		
	Total	292.856	127			

As shown in Table 4, the statistical mean value at the 5% level of significance was found to be 231.514, which was, in turn, less than the statistical F value of 475.543. This discrepancy suggests that the overall model was indeed significant. Furthermore, the significance value of 0.002 underscores the robustness of the regression model in accurately predicting the influence of the independent variable on the dependent variable.

Table 5: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.719	.145		4.959	.000
	Risk transfer	.814	.245	1.185	3.322	.001

Table 5 presents the findings, indicating that maintaining risk transfer at its current level would result in a project performance score of 0.719, equivalent to 71.9%. Furthermore, an enhancement in risk transfer mechanisms is projected to elevate project performance by an additional 0.814, corresponding to 81.4%. This leads to the following regression equation; Project performance = 0.719 + 0.814 (risk transfer)

The research findings indicate that the process of risk transfer was associated with a beta value of 3.322 ($p=0.001$), suggesting a positive and statistically significant impact on the performance of road construction projects within Nairobi County, Kenya. These results align with those of Aduma and Kimutai (2018), who established a clear relationship between the performance of the National Health Insurance Fund (NHIF) in Kirinyaga County, Kenya, and the implementation of risk transfer strategies. This includes the utilization of insurance policies, outsourcing, contractual agreements with third parties, and the high cost of risk premiums, all of which were identified as significant factors influencing the performance of the Fund's projects.

6. CONCLUSIONS

The research concludes that the practice of risk transfer enables project managers to safeguard projects against significant financial setbacks, stabilize the flow of project funds, and concentrate on the core competencies of the organization. By engaging in risk transfer, organizations experience a reduction in liability, thereby relieving themselves of the sole responsibility for bearing the costs associated with any potential losses. This strategy is advantageous for businesses as it empowers them to mitigate the risk of financial loss and decrease their overall liability. When a corporation opts to transfer its risk to an insurance provider, it commits to a fixed premium payment in return for the assurance that the insurance company will indemnify the corporation in the event of any losses. This arrangement not only lightens the financial load on the company but also offers a sense of security, knowing that potential losses are adequately covered.

7. RECOMMENDATIONS

The study suggests that for the successful transfer of risks, it is imperative for project managers to undertake a comprehensive risk assessment and analysis. This process is crucial for identifying which risks ought to be shared or transferred, and which should be retained or mitigated. Furthermore, it is essential to select partners or providers who possess the requisite skills, experience, reputation, and financial stability. Negotiating clear terms and conditions is also vital, as these should delineate the roles and responsibilities of each party, as well as establish mechanisms for monitoring, reporting, and resolving any issues that may arise. Regular communication and coordination with partners or providers are also critical to ensure alignment, transparency, and accountability. Additionally, it is advisable to periodically review and update the risk transfer arrangements to accommodate any changes in the external environment, objectives, or performance metrics.

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