International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Influence of Risk Response Strategies on Construction Project Performance: Evidence from Embu County, Kenya

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Abstract

Risk response strategies have become very crucial in the performance and success of any construction project. Construction is a very key sector in Kenya. The sector accounts for about 7% of the Gross Domestic Product (GDP) of Kenya and employs about 1.5 million workers annually. Performance of the sector in Embu County and the country as a whole has been very poor with more than 70% of the constructions undertakings being delayed in one way or the other thus the need to examine the risk control strategies practiced in construction undertakings. The study mainly aimed at analyzing the impact of risk control strategies on the performance of construction projects within Embu County in Kenya. The research design used was Descriptive. The study sample included 288 construction staff from 204 construction sites. A questionnaire was employed as a tool for data collection. Analysis of data was done by means and standard deviation. Meanwhile the analysis done on the relation between the projects' outcomes and the predictor variables involved multiple regression analysis. Correlation analysis' findings indicated that risk response showed a statistically significant and a positive correlation to construction projects' performance($r=0.767$, $p=0.001<0.05$). Regression analysis further showed risk response had a strong, significant and positive impact in predicting performance of construction projects ($\beta = 0.212$ $p=0.001 < 0.05$). The study provides a geographically specific knowledge and situates the findings on a unique context of Embu County – Kenya - thereby filling the gap between international theories of risk management and local realities of a project in the sub-Saharan Africa.

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Keywords: Strategy, Strategic Risk Management, Management, Strategic Response, Project Performance

INTRODUCTION

Risk control strategies have now become a hot topic of discussion with different viewpoints (Olechowski et al., 2016). On the other hand, Project performance has consistently attracted attention in the construction sector with the emphasis shifting towards approaches that include cost, time, and quality (Ingle & Mahesh, 2022; Khadim et al., 2023).

A Report on analysis of construction projects across the globe by McKinsey showed that construction projects suffer cost increases of up to 80% and delay in completion that can extend to 20 months, thus pointing at the continuous performance challenges in the construction industry (McKinsey Global Institute, 2017). Wanyonyi (2015) notes that lack of a measuring method for evaluating and managing project risk can lead to cost and schedule overruns.

Project managers need to use strategies for risk management because they reduce project failures, efficiently allocate resources, facilitate better decision-making, increase stakeholder communication, and keep costs and timelines under control. Project managers may enhance productivity, lower uncertainty, boost the likelihood of success, and exert more influence over the future by effectively managing risks (Risk Management Toolkit, n.d.) Risk control strategies are useful in averting probable risks that likely influence the project's performance in an adverse manner (Wanyonyi, 2015)

Risk response and planning strategies (RRPS) have been viewed from different points in different parts of the world. In Australia, RRPS has been seen as a means of providing robust methodology for enhancing risk management processes in complex projects. Qazi et al. (2016) conducted research to address strategic risk management primarily through the lens of managing project complexity and interdependencies between risks. Objective: The objective of this research study was to investigate strategic risk management in the South Australian construction industry. Methods: Thirteen "South Australian construction companies" were selected using the snowball sample method. The research methodology followed a literature review, conceptual model development and empirical research approach. Results: The results showed that strategic risks in construction projects were highly correlated and were influenced by the project characteristics such as the project complexity and the organisation and environmental context. It was also established that the current "Risk Management Strategies" (RMS)

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used in the construction industry did not manage risks in a systematic way. The construction companies treated risks as occurrence of independent events and this might have hindered the effective implementation of the risk management frameworks of the companies. Conclusion: It is concluded that if the Risk Management Systems (RMS) were to be effectively implemented, they could provide a toolbox of appropriate tools and techniques that could assist in improving the risk management on construction projects and particularly complex projects.

Risk strategic management in the construction industry in Sub-Saharan Africa has been determined to be a very significant tool for preventing delay and extension in construction projects. Machu and Nkado (2021) carried out a study to investigate the challenges that construe the construction industry with particular reference to strategic risk management in Sub-Saharan Africa. The study population were the construction industry professionals. The researcher targeted three hundred construction industry professionals using the “stratified sampling” method. The researcher used questionnaires and interviews so as to use the mixed method research approach. “Regression analysis” was utilized in the study to see how the variables related to one another and “thematic analysis” analysed the themes that emerged from the qualitative aspect. There was evidence that 70 % of construction projects in Africa are delayed, proving the failure in risk management.

Risk Management Strategies (RMS) and Risk Response

Individual RMS in construction focus on spotting, measuring, reducing and keeping an eye on risks linked to each project activity. This makes these strategies necessary since construction fields are always changing and may be affected by weather, price changes, and issues with stakeholders, changes in the design and rules. One of them is the “Risk Response & Planning Strategies” (RRPS)

In construction, individual RRPS means being active about spotting risks and deciding on the right ways to deal with them. This means picking response methods that include avoiding, minimizing, transferring or accepting the risk depending on how it is and how serious it is. RRPS helps to identify measures for threats and chances, along with supporting certain options with the project’s objectives. Contractors might make extra plans, update timelines or buy insurance depending on the type of risks associated with a project (Project Management Institute [PMI], 2021).

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Performance of Construction projects

The construction industry is the sector that highly contributes to the GDP of Kenya contributing Construction about 7%. However evidence reveal that RRPS Embu County's construction projects are weak and that more risks were identified during the construction phase and require intervention (KNBS, 2023; NCA, 2023).. Nonetheless 60% of the construction projects in Embu were either delayed or abandoned due to risk poor management (NCA, 2023).

Problem statement

Project delays and failure is a universal phenomenon that has taken the construction industry by storm. As highlighted by the National Construction Authority, the "Kenya National Bureau of Statistics" (KNBS) reveals that about 41% of construction projects fail due to project delay and cost escalation as a result of risk management failure in the construction sector. A recent survey conducted by Building Contractors Association shows that the performance of the construction sector in Embu County and at the National level is being marred by project failure on account of delay in completion and high inflation leading to abandoned and halted projects. In this regard, Mwangi (2022) holds that Kenya has a low compliance rate of construction projects and that Embu County has a compliance rate of forty-five percent, which is lower than the national average of sixty-five percent. The inability by stakeholders to anticipate and accordingly put adequate measures to avert risks that occur at the outset of a construction project right up to its completion end up affecting negatively the efficiency and effectiveness of the project and hence affecting its performance as highlighted by Akinsola & Potts (2015).

Literature shows that the earlier studies carried out in the Kenyan construction industry with respect to risk strategies and performance were done at the national level, but none has been carried out in Embu County. This study by Otaalo et al., (2019) initiated the research on "Risk Management Strategies" (RMS) and their impact on the performance of road building projects in Kenya. The investigation determined that in road building construction activities risk management practices are enhanced positively and significantly by the risk identification activities carried out within the construction process. It was also established that the risk management practices enhanced in road building construction activities carried out within the road construction industry were significantly and positively influenced by risk analysis. The study focused on the risk identification only leaving other activities like risk responses and risk planning. This study was carried out in Kakamega County only.

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Risk Management as a tool to enhance performance of projects has become universal in the construction industry. However, the current state of risk management in Kenya in particular Embu County is not well known. Therefore in order to determine the practical risk management methodologies and practices that can be adopted in Embu County to strengthen projects performance, a number of key strategic questions need to be addressed. It was revealed that in Embu County, the majority of the construction projects have encountered more risks which affect a significant number of projects in terms of cost and quality. Above all, there is lack of an effective Risk Management System (RMS) that can manage risks in the construction projects in the region efficiently and effectively.

Risk management is considered very key in terms of projects performance and there is a lack of understanding of the impact of risk management to projects performance in this region as no study has been done specifically in Embu County. Therefore, study tries to fill this knowledge gap by examining how Risk response and planning influences the performance of construction projects within Embu County.

Research objective

i. To analyze the influence of risk response strategies on performance of construction projects in Embu County.

LITERATURE REVIEW

Theoretical Literature

The study draws upon two key theories:

Systems Theory

Introduced by Bertalanffy (1936), the theory treats a project as complex interrelated components that, eventually, come together to form a whole. According to the theory, all parts of a system are connected and a change in one part affects the other. It thus assumes that the system must be viewed as a whole. This theory can also be termed over broad and abstract, hence not easy to apply within certain situations or scenarios (Schneider & Bauer, (2007). Systems theory applies to a very wide range as it focuses much on the relationships and interactions among different components. In construction projects, a risk in one component can easily have repercussions throughout the entire system. Construction projects, with all other risks, are no exception. Systems theory

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highlights the need to look at the project from all perspectives-with all such risks and their interrelations involved-because risks cannot be looked at in isolation (Walker, 2015)

An all-inclusive risk management strategy as will be discussed address the system on a holistic basis, taking into consideration how any risks established in one area may trigger consequences in another area. It would, therefore, support the conduct of the study by underlining comprehensive RMS that take into account the whole project ecosystem of Embu County.

Agency Theory

First introduced in 1976 by Jensen & Meckling, the theory explores the relationship between the principals-for instance, the project owners-and the agents-for instance, the contractors along with possible conflicts raised due to differing objectives (Jensen & Meckling, 1976). In such a case, they contradict each other and result in inefficiencies because of conflicting interest arising between them. This theory hence has its basis in considering parties to be in their self-interest, which, in turn leads to them facing agency costs due to goal misalignment. The criticism about the theory is that the theory overly simplifies interdependent relationships and lacks the reflective implications of factors like trust and cooperation. This theory is pertinent in this study as it underscores the positioning of risk response in aligning the interests of stakeholders with reduced project risks, agency problem, as well as enhancing construction projects' performance (Eisenhardt, 1989)

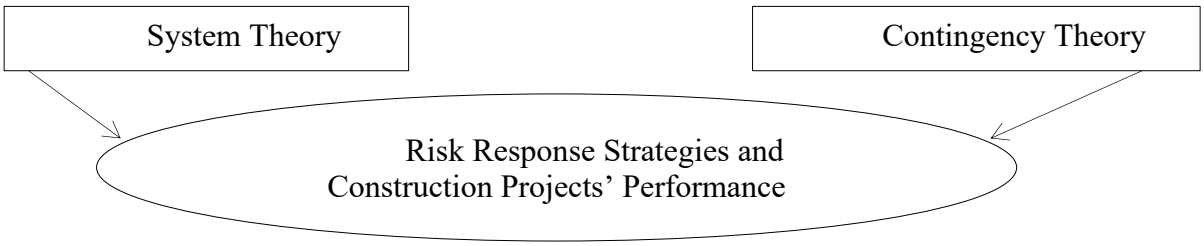


Figure 1: Theoretical Framework
Source: Researcher (2026)

Empirical Literature

Risk Response and Construction Projects' Performance

Risk response planning involves identifying ways of dealing with identified risks in order to arrive at effective methods. Some of the ways of handling risks are RRPS. Some

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of the special methods which may be applied in reduction of risk in Embu County building projects are operation of safety measures to control the risk, purchase of insurance to share the risk, and saving money to risk. Sustaining these methods and ensuring that RRPS are adequately backed requires resource management for risk management which means that risk management involves the provision of financial, human and technological resources.

Kumar et al (2021) examined ways to handle risks in large infrastructure projects in a study called “A Project Management Perspective” with a focus on finding the main risk factors involved in building infrastructure and checking how properly project managers are handling such risks. This study is a research effort undertaken in India with the objective of enhancing the risk handling capacity of infrastructure projects in India. For this study, a questionnaire was aided collection of the primary data from engineers, contractors, consultants and project managers engaged in construction of infrastructure projects in India. The sample for the study consists of 100 respondent engineers, contractors, consultants and project managers selected through purposive sampling method. A Risk Assessment Questionnaire (RAQ) that comprised of various risk factors affecting the infrastructure projects under consideration has been used. The study makes use of descriptive analysis and Risk Index (RI) for prioritization and listing of risk factors in terms of their frequency and severity and for validating the effectiveness of risk handling methods and strategies rated by the respondents. The study identified delays in land acquisition (RII = 0.86); environmental and ecological clearance (RII = 0.81) and cost overrun (RII = 0.79) as major concerns for infrastructure projects. The most effective risk handling methods and measures identified by the respondents were risk anticipation and mitigation, consultation with stakeholders and provision of contingency fund. It is concluded by the authors that early risk handling of risks and compliance to regulations facilitates achieving higher efficiency and effectiveness in the implementation of infrastructure projects. The study contributes significantly to the risk management of mega infrastructure projects but had some limitations when applied to the Kenyan Construction Sector. This study concentrated on national mega infrastructure projects hence excluded similar projects implemented at county level by various counties in Kenya. Similarly though it pointed out areas of risk and suggested ways of managing them, it did not carry out an in-depth impact assessment on the effect of these management measures on the key project parameters of time, cost and quality. The exercise focused on the regulatory and financial risks and less so on the community and socio- political risks which were a major concern in the decentralized structure of Embu

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County. So, even though Kumar et al. (2021) gave useful advice on handing infrastructure project risks, we still need a country-specific study to show how using unique strategies impacts the actual performance of local construction projects.

The study looks into residential construction alone which is a section of the entire built structures in the Embu County. Consequently, the study findings cannot be deemed universal to all types of structures such as infrastructure projects, commercial developments and mixed use developments. The management of risk in construction projects was not looked into in relation to efficient management of time, cost and clients' needs which are some of the criteria of measuring the success of projects.

Karunakaran et al (2020) assessed how the risk response measures act as moderator on association between project's delay and performance. This, therefore, implied that the paper sought to analyze ways in which risk response measures - preventive, predictive, corrective and organizational - shape the project performance and which effect these have when measuring the moderating effect on the association between delay factors and project performance. The reveal that Risk Response Measures (RRMs) moderate the effect of delays factors on performance. Though four types of risk response measures were cited in this study, they are preventive measures, predictive measures, corrective measures and organizational measures. This limited reference may be due to the fact that other measures like risk monitoring which was covered in this study might not be part of the reference cited by the empirical studies mentioned above.

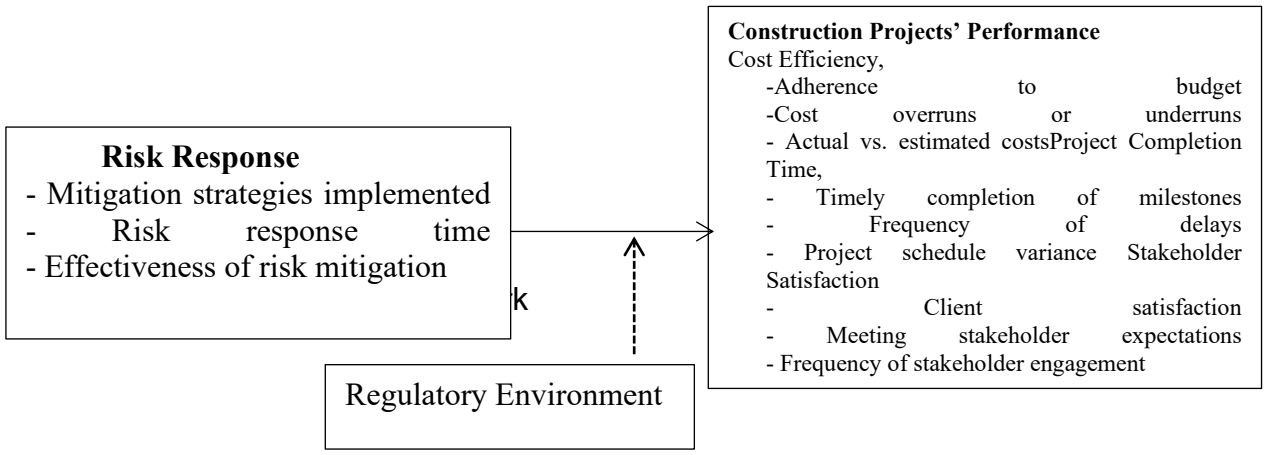
The study by Ghaeb and Mahjoob, (2023) investigated the significance of risk response in Reliability Maintainability and Probability (RMP) with respect to construction projects. This paper explains how the risk response in RMP enhances the project performance by reducing losses and increasing gains. This study takes the systematic review approach on 38 research papers published between 1997 and 2020 in various countries, including Australia, China, Canada, Egypt, SA, Turkey, and USA. The research work categorized risk response strategies and methodologies presented in the literature with thematic analysis. Findings indicated that risk response is critical to project success and should be integrated into the process of risk management. In conclusion risk response had a substantial role in the reduction of negative impacts of risks on performance in construction projects. It, recommends future research to undertake deeper evaluations of the various types of risk responses across different stakeholders and project types. Despite the richness of diversity, this works do not show a strong specific inquiry into how local contexts play in shaping risk response strategies

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Conceptual Framework

The conceptual framework illustrates the relationship among variables. The (predictor) is Risk Response Strategies while the the outcome variable was Project Performance, whose indicators were Cost Efficiency, Project Completion Time, and Stakeholder Satisfaction. Other variables like Project Size and type of construction were excluded as they were controlled by looking at the project time delays and budget overruns in terms of percentages against the expectations, and not just in terms of days.

INDEPENEDENT VARIABLES **DEPENDENT VARIABLE**



Source: Author (2026)

Research Gap

The critical section of the literature identifies gaps within the conducted research. For instance, the available literature explains the effects of project outcomes concerning risk management, but there is minimal research specifically available for construction projects in Embu County.

Ayemba et al. (2024) further analyzed the key role of risk management when it comes to residential construction defects in Queensland, Australia By focusing only on residential building; the study is not very applicable to all types of buildings found in Embu County, such a huge infrastructure projects, commercial buildings, and mixed-use site. Also, the research did not focus greatly on linking risk management actions to improvements in cost efficiency, speed, and fulfilling customers' expectations the key elements that measure a project's success. Other studies (Ghaeb and Mahjoob, 2023;

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Kumar et al, 2021) have focussed on risk management strategies but have neglected the Kenyan context. Despite the available numerous literatures on managing risks in construction, there is still a huge research gap in Embu County, Kenya. Most studies focus on urban settings neglecting rural settings. This study sought to fill the provide insight into risk management strategies' influence on construction projects in Embu County, with the potential to improve better practices and contribute to the academic discourse thus filling the gap.

RESEARCH METHODOLOGY

The study uses a mixed-method approach by using a "semi structured" questionnaire with both "open" and "closed ended" questions to give full elaboration on the impact of RMS on construction projects. Such approaches enhance the understanding of phenomena under study (Creswell & Plano Clark, 2018).

Research Design

The study adopted a "descriptive design" as it enables the systematic description of characteristics of the population or the phenomenon being investigated (Kothari, 2004).

Target Population

The study targeted key stakeholders in construction projects within Embu County, which included project managers, consultants (both architects and engineers), contractors, developers and site workers and supervisors in the construction projects. These were selected because they are the players who are actively involved in RMS implementation and can provide meaningful insights into challenges and successes to be derived in managing risks. According to NCA Embu county site inspection report for the financial year 2023-2024, active projects were 200, with approximately 1,020 players - projects managers, developers, site construction workers and professionals across the 200 projects.

Table 1: Target Population

Category	Target Population	Percentage
Developers	153	15.00
Project Managers	102	10.00
Consultants	306	30.00
Contractors	255	25.00
Site Supervisors	204	20.00

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Total	**1,020**	**100.00**

Source: NCA Embu county site inspection report F/Y 2023-2024

Sample Size and Sampling Procedures and Techniques

The study used stratified random sampling technique The sample was distributed in to 4 regions forming the 4 strata. According to NCA, Embu County is divided in to 4 main regions, i.e. Embu North, Embu South, Embu West, and Mbeere North. Each of these regions will form strata in which elements of the samples will be drawn in randomly and proportionately to eventually make come up with the total desired sample of 288

A sample of 288 respondents was selected from the target population. The sample includes project developers, contractors, project consultants, foremen, and safety officers. Sample determination was by use of Taro Yamane's formula of as shown below

$n= N/ (1+N (e)^2)$

Where n = "Sample size",

N = "estimated population size"

e = standard error of estimate.

$n= 1,020/ (1+1,020 (0.05)^2) =287.32$, Say 288 respondents

A corresponding percentage of population composition was also used to draw the corresponding samples of the various stakeholders.

Table 2: Sample Size Table

Category	Sample	Percentage
Developers	43	15
Project Managers	29	10
Consultants	86	30
Contractor	72	25
Site Supervisors	58	20
Total	**288**	**100**

Source: NCA Embu county site inspection report F/Y 2023-2024

Data collection Instruments

A "questionnaire" was used to obtain data. The constructs were derived from literature review. The "risk management practice" scale developed by Zwikael and Sadeh (2007) was adopted to measure the RMS applied in projects for the purpose of risk identification, risk monitoring and risk control. The factors for measuring the construction

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project performance are derived from the Pinto and Slevin (1987) project performance scale which includes cost, time, quality, client satisfaction and business impact. Standard questionnaires with Likert scales were constructed for measuring the performance of the indicators. “Multiple regression” analysis was employed to analyze the “RRPS – Performance” relationship. Toor and Ogunlana (2010) supported the use of multi indicator for measuring projects performance..

Validity of the Questionnaire

When assessing criterion, construct and content validity of the study, the experts were asked to mention the concept validity of the objective statement of the study, research questions and variables. They were also asked to mention the construct validity of the criteria mentioned and whether the content validity of the study was fully covered. Some comments were also solicited from the experts. They stated that the contents of the questionnaire should cover all the issues related to the study and that the constructs in the questionnaire should be measured appropriately. The pilot respondents were also requested to indicate the extent of their understanding of the questions in the questionnaire. They were also requested to let the researcher know whether they thought they measured what the researcher wanted to measure. Hence validity of the questionnaire was enhanced.

Reliability of research Instrument

Reliability is ensured through the use of standardized procedures in data collection and analysis. Cronbach alpha assessed the scale’s internal consistency thus reliability. Cronbach’s α is widely regarded as a good test of reliability as it provides internal consistency’s measure within a scale or questionnaire. It measures how similar items are to one another as a group. Identifying whether the items measure the same construct is very important. If items achieve a Cronbach's Alpha >0.7 then they measure the same underlying concept or construct, and thus can be termed reliable (Creswell & Creswell, 2017).

Data Collection Methods and Procedures

Primary data was gathered via a structured questionnaire. Equally, Secondary data was from existing literature, reports, and other documents relating to construction projects in Embu County. Data collection was systematic with precise instructions given on what responses to use to attain efficient and consistent responses.

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Prior to the actual study, a sample of respondents with identical characteristics must be given a research instrument as part of the pilot testing criteria (Sekaran & Bougie, 2016). According to Saunders et al. (2014), at least 10% of the research sample should undergo pilot testing. In this study the researcher obtained 29 respondents representing 10% of the study sample and drew them for pilot study. These respondents were drawn from project construction sites within Embu County but did not undertake the actual study. The researcher then enquired on how well they understood the questions and made possible recommendations and modifications to enhance its clarity and acceptability.

Data Analyses Techniques

The association between any two variables was analysed by Pearson product-moment correlation coefficient (r). It measures the relationship between the autonomous and dependent variables, applying coefficients of determination (r^2) which calculates the influence exerted by the predictor(s) on the outcome variable. Regression analysis measured the connection between multiple predictor variables and the outcome variable.

Regression Model

Regression analysis assessed the link between risk response and construction projects' performance as per the equation below.

"Y" = "$\beta_0 + \beta_1 X_1 + \varepsilon$"…….. Equation

Where:

Y – "Performance of construction project"

X_1 – "Risk Response"

β_0 – "intercept of the dependent variables". i.e. constant term.

β_1, coefficient of risk response construct

"ε" is the error term

Data Analysis and Interpretation

Questionnaire Response Rate

The questionnaire return rate is presented below.

Table 3: Response rate

Response rate	Frequency	Percentage
Responses	284	98.61

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Non responses	4	1.39
Total sample size	**288**	**100**

Source: Field data (2025)

The size of the sample consisted of 288 participants comprised of developers, project managers, Consultants (who include engineers and architects), contractors and site supervisors. A total of 284 (98.61%) respondents out of 288 who had the questionnaire administered to returned the duly filled questionnaire. Babbie (2010) asserts that a response rate of 70% and above is very good for a study.

Reliability of research instrument

A reliability test was conducted with aid of SPSS Version 20 to determine the ultimate reliability of the scale. The results of the individual constructs and overall scale reliability are shown below

Table 4: Reliability Statistics of Specific Constructs

Scale	Cronbach's Alpha	No. of items
Risk Identification	0.866	4
Performance of project	0.896	6
Overall scale reliability	**0.927**	**10**

Source: Field data (2025)

The Cronbach's Alphas for Risk response (α.= 0. 866) and Risk monitoring and control (α.= 0.896) were all greater than the threshold of 0.7 hence the scale for the individual construct was reliable. The overall reliability of the scale showed alpha cronbach of 0.927 ≥ 0.7 hence the scale was reliable (Creswell & Creswell, 2017).

Instrument Validity

Four experts were invited to review the questionnaire (Developer, manager, consultant and supervisor), these were preferred as they had expertise in the construction sector. According to the experts invited, the questionnaire items were relevant and captured all aspects relating to the objectives.

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Descriptive statistics

The unit of focus was the Mean. The interpretation was based on the range of value in the above statistics fall. The scale is divided into about equal width bands of 0.80 units by the mean intervals. The social sciences generally embrace this approach. The mean ranges interpretations were "1.00 -1.80" = "Strongly Disagree", "1.81-2.60" =" Disagree", "2.61-3.40" = "Neutral", "3.41-4.20" = "Agree" and finally "4.21-5.00" =" Strongly agree". The standard deviation ranges and interpretations used were 0.00-0.50 = "Very low variability", 0.51-1.00 = "Moderate variability" i.e. responses are somewhat spread, >1 = diverse opinions amongst respondents i.e. "High variability". For each of the variables under study, respondents were requested to rate their level of disagreement or agreement on a Likert scale with 1 = "Strongly Disagree", 2 = "Disagree", 3 = "Neutral", 4 = "Agree", 5 = "Strongly Agree".

Risk response strategies and construction projects' performance

Questions were asked for respondents to rate the extent to which they agreed to the statement regarding RMS on a Likert scale. Table 4 below shows the findings.

Table 4: Risk response strategies and construction projects' performance

Statement	N	Mean	Std. Deviation
Risk response plans are detailed and provide clear actions for each identified risk	284	3.29	0.937
Project team has the necessary resources to implement risk mitigation strategies	284	3.38	0.915
Mitigation strategies have reduced the impact of risks on project's budget	284	3.55	0.882
Contingency plans are effectively prepared to manage potential risks	284	3.49	0.982
Overall	**284**	**3.43**	**0.785**

Source: Field data (2025)

Respondents agreed that mitigation strategies reduced the impact of risks on project's budget (Mean = 3.55) with moderate variability (SD = 0.882). Respondents

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further agreed with moderate variability that contingency plans were effectively prepared to manage potential risks (Mean = 3.49, SD =0.982). Respondents furthermore were neutral that risk response plans were detailed and provided a clear action for each (Mean = 3.29, SD=0.937) and project team had the necessary resources to implement risk mitigation strategies with moderate variability in the responses (Mean =3.38, SD=0.95). The overall mean of the responses was 3.43 indicating a moderating strong perception on risk response strategies with responses somewhat spread (SD=0.785)

Performance of construction projects in Embu County

In this section, respondents indicated the degree of agreement with statement pertaining to performance of construction projects. The results were displayed in table 5 below

Table 5: Performance of construction projects in Embu County

Statement	N	Mean	Std. Deviation
The project stays within its original cost estimates	284	3.09	0.95
Budget adjustments are effectively managed when unexpected costs arise	284	3.39	0.947
Project team meets its expected delivery for primary project deliverables	284	3.52	0.923
Time overruns are minimized and do not affect project delivery	284	3.46	0.883
Stakeholder issues are resolved within a short duration with a lot of efficiency	284	3.55	0.894
Project team is proactive in seeking stakeholder views at certain phases in the project	284	3.65	0.922
Overall	**284**	**3.44**	**0.746**

Source: Field data (2025)

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International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
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Respondents agreed that project team was proactive in seeking stakeholder views at certain phases in the project with moderate variability in the responses (Mean = 3.65, SD=9.22). Respondents also further agreed that stakeholder issues were resolved within a short duration with a lot of efficiency with responses somewhat spread (Mean = 3.55, SD=0.894). Respondents further agreed that project team meets its expected delivery for primary project deliverables with moderate variability in their responses (Mean = 3.52, SD=0.923), However respondents were neutral with moderate variability in their responses on whether project stayed within its original cost estimates (M=3.09, SD =0.950) or whether budget adjustments were effectively managed when unexpected costs arise (M=3.39, SD=0.947). Generally, respondents agreed with the statement regarding Embu county's construction projects' performance with moderate variability (M=3.44, SD=0.746).

Inferential Statistics

Pearson Correlation Coefficient Analysis

In order to establish the nature of the connection between the predictor variables and help understand how strongly they were related to the outcome variable, Pearson correlation coefficient analysis was done. A positive coefficient (r) close to +1 indicates a strong positive relationship i.e. as risk management strategy effectiveness increases, so does project performance. A coefficient of 0 or close to 0 implies no linear relationship, or there is weak positive relationship respectively, while a negative value suggests an inverse relationship. The results were presented as shown in table 6.

Table 6: Pearson correlations coefficient analysis

		RISK_RESPONSE	PROJECT_PERFORMANCE
RISK_RESPONSE	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	284	
PROJECT_PERFORMANCE	Pearson Correlation	.767**	1
	Sig. (2-tailed)	.000	
	N	284	284
**. Correlation is significant at the 0.01 level (2-tailed).			

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There exists the stronger and a positive relationship between risk response and performance (r=0.767, p = 0.001).

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.767[a]	.588	.586	.48004

a. Predictors: (Constant), RISK_RESPONSE

Table 7 shows and R value of 0.588 is the correlation signifying a "strong relationship between the independent variables and the dependent variable". The coefficient of determination (adjusted R square) is 0.586 meaning RRPS explained 58.6% of the construction projects' performance. The remaining is explained by other risk management strategies not included in this study e.g. risk assessment, risk transfer , risk identification, e.t.c

Table 8: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92.692	1	92.692	402.239	.000b
	Residual	64.984	282	.230		
	Total	157.675	283			
a. Dependent Variable: PROJECT_PERFORMANCE						
b. Predictors: (Constant), RISK_RESPONSE						

The ANOVA analysis evaluated if the regression model correctly predicts project performance. The ANOVA results in the table above shows an F-Value (F=402.239) that is significant at p=0.000 (p<0.001) implying that the predictor variable has a significance impact on the outcome construction projects' performance.

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International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Table 9: Regression coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.947	.128		7.412	.000
	RISK_RESPONSE	.729	.036	.767	20.056	.000
a. Dependent Variable: PROJECT_PERFORMANCE						

From the above table, a unit change in the risk response results in β = 0. 729 change in the performance. The predictor variable was significant in prediction of construction project's performance ($p<0.05$).

Using the above coefficients, the regression model is therefore expressed as

$Y = \beta 0 + \beta_1 X_1 + \varepsilon$…… Equation

Where:

Y = Performance of construction project

X_1 = Risk Response

B_0= constant =0. 947, β_1 = 0. 729

Construction Projects' Performance = 0.947 +0.729*(Risk Response) + ε

Where the error term "ε" accounts for variability not included in the model

Summary, Conclusions and Recommendations

Summary of Findings

Objective: To analyze the influence of risk response on construction projects' performance

The objective of this study was to analyze influence of risk response on construction projects' performance. Results showed that respondents agreed with moderate variability that mitigation strategies reduced the impact of risks on project's budget (Mean = 3.55, SD = 0.882) and further agreed with moderate variability that contingency plans were effectively prepared to manage potential risks (Mean = 3.49, SD =0.982). Respondents were neutral that risk response plans were detailed and provided a clear action for each identified risk (Mean = 3.29, SD=0.937) and project team had the necessary resources to implement risk mitigation strategies with moderate variability in

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the responses (Mean =3.38, SD=0.915). The overall mean of the responses was 3.43 indicating a moderating strong perception on risk response strategies with responses somewhat spread (SD=0.785).

The findings of the "regression" and "correlation analysis" indicated that RRPS and construction project performance are positively and significantly correlated. The regression coefficient for risk response (β = 0. 729, p= 0.001 < 0.05) indicating that risk response had a strong and significance in predicting construction projects' performance. These results match with Priya & Kothai (2014) who discovered that risk response and planning and communication help to some extent. The person correlation coefficient for risk response (r=0.767, p=0.0001<0.05) indicated a positive, significant and strong relationship between risk response and construction projects' performance

Conclusion

The research evaluated how risk response affect construction project. Results showed that risk response directly had a positive and statistically significant influence on construction projects' performance.

Recommendation for Future Research

Further research must broaden the geographic scope to encompass additional Kenyan counties or regions for carrying out comparative assessments and enhancing the overall generalization of the study results. Longitudinal studies need to be used to measure how project performance changes after risk management systems become operational. Research should examine the variations between different construction sub-sectors like single dwelling and multi-dwelling, renovations, alterations, residential and commercial projects regarding their risk management practice effectiveness. Risk response only comprised 58.6.2% of the performance. Future studies could explore constructs not included in the study.

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