

RISK MANAGEMENT AND PERFORMANCE OF AFFORDABLE HOUSING PROJECTS IN NAIROBI CITY COUNTY, KENYA

^{1*}Anthony Mwaura Waweru, & ²Dr. Emmy Rotich

¹Postgraduate student, Jomo Kenyatta University of Agriculture and Technology, Kenya

²Lecturer, Jomo Kenyatta University of Agriculture and Technology, Kenya

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ABSTRACT

Purpose of the Study: This study examined the effect of risk management practices on the performance of affordable housing projects in Nairobi City County, Kenya. Specifically, the study investigated the influence of risk identification, risk assessment, risk mitigation, and risk monitoring and control on project performance.

Statement of the Problem: Affordable housing projects play a critical role in addressing the growing housing deficit in urban areas. However, many affordable housing projects continue to experience cost overruns, delays, and quality shortfalls, which are often associated with inadequate risk management practices. This has created the need to examine how structured risk management practices influence the performance of affordable housing projects.

Research Methodology: The study was anchored on relevant project management and risk management theories and adopted a descriptive research design. The target population comprised 280 key stakeholders involved in affordable housing projects, including project managers, contractors, government officials, financial institution representatives, and other project participants. Stratified random sampling was used to ensure fair representation of all stakeholder groups, while Slovin's formula was applied to calculate a sample size of 165 respondents. Primary data were collected using a structured questionnaire. Out of 165 questionnaires distributed, 149

were returned and deemed suitable for analysis, yielding a response rate of 90 percent. Data were analyzed using Statistical Package for Social Sciences version 26. Descriptive and inferential statistics were employed, including correlation and multiple regression analysis.

Findings: The regression model summary results showed $R = .577$ and $R^2 = .333$. This indicates that approximately 33.3 percent of the variation in the performance of affordable housing projects could be explained by the four risk management variables included in the model. The findings imply that risk identification, risk assessment, risk mitigation, and risk monitoring and control are important predictors of affordable housing project performance.

Conclusions: The study concluded that effective and structured risk management is essential for improving cost efficiency, timely completion, quality delivery, and overall project outcomes in affordable housing initiatives. The findings demonstrate that affordable housing projects perform better when risk management practices are integrated throughout the project lifecycle.

Recommendations: The study recommends that project managers and stakeholders in affordable housing projects should institutionalize comprehensive risk management frameworks that integrate risk identification, risk assessment, risk mitigation, and continuous risk monitoring and control. Strengthening these practices can enhance project sustainability and contribute to the successful delivery of affordable housing in Nairobi City County. Further research should explore additional contextual factors influencing project performance in other regions or infrastructure sectors.

Keywords: *Risk Management Practices, Risk Identification, Risk Assessment, Risk Mitigation, Risk Monitoring and Control, Affordable Housing Projects, Project Performance, Nairobi City County, Kenya*

BACKGROUND OF THE STUDY

Affordable housing has become a critical development priority in many developing countries, including Kenya, where rapid urbanization and population growth have created a severe housing deficit. In response, the Government of Kenya, through the Big Four Agenda, prioritized affordable housing construction to address the rising demand in urban areas such as Nairobi City County (Kamau & Mohamed, 2020). However, despite this commitment, affordable housing projects continue to face setbacks related to delays, cost overruns, quality shortfalls, and weak project

coordination. Moghayedi et al. (2021) argue that affordable housing projects are complex because they involve multiple stakeholders, financing arrangements, regulatory requirements, and project management processes, making them highly vulnerable to risks that can undermine successful delivery.

Risk management is therefore a fundamental component of affordable housing project implementation. It involves identifying, assessing, mitigating, monitoring, and controlling risks that may affect project objectives (Hubbard, 2020). In construction projects, risks may arise from legal issues, financial instability, design flaws, procurement challenges, stakeholder conflicts, environmental uncertainty, and regulatory delays (Khalef et al., 2021). When such risks are not properly managed, projects may experience disputes, budget escalation, delayed completion, compromised quality, and even abandonment. Globally, risk management has been recognized as a key determinant of successful construction and housing project performance. In Europe and North America, project managers increasingly use structured risk management frameworks and stakeholder engagement approaches to identify and address project risks early.

Bridoux and Stoelhorst (2022) emphasize that early stakeholder involvement helps detect risks that may otherwise be overlooked, thereby reducing delays and cost increases. In Asia, advanced risk assessment models such as the Enhanced EDAS method have been applied to evaluate and prioritize risks in large-scale urban development projects (Huang, Lin, & Chen, 2021). Similarly, in the Middle East, simulation tools such as Monte Carlo-based risk matrices have enabled project managers to anticipate, prioritize, and respond to risks in sustainable construction projects (Qazi et al., 2021). These global experiences show that systematic and proactive risk management is essential for improving project outcomes.

Across Africa, affordable housing projects continue to face challenges associated with weak risk management systems. In countries such as Nigeria, South Africa, and Ghana, housing projects are affected by financial instability, legal compliance problems, environmental risks, stakeholder conflicts, and inadequate project planning. Akinsulire et al. (2024) observe that in Nigeria, weak strategic planning and inadequate investment risk analysis contribute to financing gaps and project abandonment. In South Africa, Ebirim et al. (2024) highlight climate-related risks as a growing concern in housing and real estate construction, especially where project teams fail to adopt adaptive risk management strategies. In Ghana, Moghayedi et al. (2021) found that poor early-

stage risk identification, weak communication, and lack of stakeholder alignment contribute to stalled affordable housing projects. These regional experiences demonstrate the need for continuous risk identification, assessment, mitigation, and monitoring throughout the project lifecycle.

In Kenya, affordable housing has been positioned as a key pillar of national development, but its implementation has faced persistent performance challenges. Although the government targeted the delivery of 500,000 affordable housing units by 2022, progress was slowed by ineffective risk management practices, financing constraints, regulatory delays, and stakeholder coordination challenges (Kamau & Mohamed, 2020). Affordable housing projects in Kenya involve government agencies, private developers, financiers, contractors, consultants, and end-users, creating a complex multi-stakeholder environment with financial, legal, operational, and reputational risks (Muthoni & Obuba, 2023). Kimotho (2023) notes that inadequate risk identification at the planning stage has contributed to missed deadlines and increased construction costs in Nairobi City County.

Risk mitigation, monitoring, and control also remain major concerns in Kenya's affordable housing sector. Kimani and Kamaara (2024) argue that many project managers respond to risks reactively rather than proactively, leading to delays, cost escalation, and quality concerns. Nyangena and Mungai (2024) further observe that many housing projects lack continuous tracking of risks, regular updates of risk registers, and adaptive control mechanisms. As a result, emerging risks often escalate into disputes, financial losses, stalled works, and poor project outcomes. In Nairobi City County, where demand for affordable housing remains high, weak risk identification, assessment, mitigation, monitoring, and control continue to undermine project performance. This creates the need for structured, proactive, and continuous risk management frameworks that can improve timeliness, cost efficiency, quality delivery, and sustainability of affordable housing projects.

STATEMENT OF THE PROBLEM

Affordable housing remains one of the most critical socioeconomic challenges in Kenya, particularly in Nairobi City County, where rapid urbanization and population growth continue to outpace housing supply. Kenya currently faces a housing deficit of more than 2 million units, while annual housing demand stands at approximately 250,000 units against a supply of less than 50,000 units per year. As a result, nearly 60 percent of urban residents live in informal settlements

characterized by overcrowding, poor sanitation, inadequate infrastructure, and insecure housing conditions. In response to this crisis, the Government of Kenya, under the Big Four Agenda, targeted the construction of 500,000 affordable housing units by 2022. However, only about 65,000 units had been completed by the deadline, representing approximately 13 percent of the intended target (Kimani & Kamaara, 2024). This poor performance demonstrates serious implementation challenges within affordable housing projects despite substantial government support and increased private sector participation.

A major factor contributing to the poor performance of affordable housing projects is ineffective risk management. Affordable housing projects in Nairobi City County continue to experience delays, cost overruns, stalled construction works, and compromised quality standards due to financial, legal, operational, political, and environmental risks. Studies indicate that construction projects in Kenya record average cost overruns ranging between 20 percent and 45 percent due to poor risk planning and inadequate financial management (Kimocho, 2023). In addition, Juma and Kamaara (2024) established that more than 42 percent of affordable housing projects in Nairobi experienced delays because critical risks were not identified during the planning phase. Similarly, Muthoni and Obuba (2023) found that approximately 30 percent of affordable housing projects lacked effective risk monitoring and control systems, resulting in uncontrolled escalation of emerging risks and financial losses. Further, Komu and Mungai (2024) observed that 35 percent of stalled real estate projects in Nairobi lacked structured mitigation frameworks such as contingency planning, insurance coverage, and risk-sharing mechanisms.

The problem is further complicated by the involvement of multiple stakeholders, including national and county governments, contractors, developers, financiers, consultants, and beneficiaries, whose competing interests often increase project uncertainty and implementation challenges. Despite the increasing number of affordable housing projects in Nairobi City County, many projects still fail to meet expected performance indicators in terms of timeliness, cost efficiency, and quality delivery. Existing studies on affordable housing in Kenya have largely focused on financing models, policy frameworks, and stakeholder engagement, while giving limited attention to the influence of specific risk management practices on project performance. Consequently, there remains inadequate empirical evidence on how risk identification, risk

assessment, risk mitigation, and risk monitoring and control affect the performance of affordable housing projects in Nairobi City County.

This study, therefore seeks to investigate the relationship between risk management practices and the performance of affordable housing projects in Nairobi City County, Kenya. Specifically, the study examines how risk identification, risk assessment, risk mitigation, and risk monitoring and control influence project performance in terms of timeliness, cost efficiency, and quality of housing delivery. The findings of the study are expected to provide empirical evidence that can support policymakers, project managers, contractors, and other stakeholders in strengthening risk management frameworks to improve the success and sustainability of affordable housing projects in Kenya.

RESEARCH OBJECTIVES

- i. To evaluate the relationship between risk identification and performance of affordable housing projects in Nairobi City County, Kenya.
- ii. To evaluate the relationship between risk assessment and performance of affordable housing projects in Nairobi City County, Kenya.
- iii. To evaluate the relationship between risk mitigation strategies and performance of affordable housing projects in Nairobi City County, Kenya.
- iv. To evaluate the relationship between risk monitoring and control and performance of affordable housing projects in Nairobi City County, Kenya.

LITERATURE REVIEW

This chapter provides an extensive examination of the literature pertinent to the study.

Theoretical Framework

The theoretical framework is the structure that encompasses not just the theory, but the narrative explanation about how the researcher engages in using the theory and its underlying assumptions to investigate the research problem (Omodan, 2024). The study was anchored on the Risk Management theory, Prospect theory, Contingency theory and Control. Risk Management Theory was postulated by Gustav Hamilton in 1970 and explains the need for a structured and systematic approach to identifying, analyzing, and responding to risks that may affect project objectives. The theory assumes that all projects operate under uncertainty and therefore require proactive

identification of possible threats before they escalate into major challenges. This theory informed the variable of risk identification in the study because affordable housing projects are exposed to financial, legal, procurement, environmental, and stakeholder-related risks. Through tools such as risk registers, brainstorming, expert consultations, and scenario analysis, project managers can identify risks early and prepare appropriate responses. Therefore, the theory supports the argument that effective risk identification enhances project performance by reducing delays, cost overruns, quality shortfalls, and project failure.

Prospect Theory was developed by Daniel Kahneman and Amos Tversky in 1979 and explains how individuals make decisions under risk and uncertainty. The theory suggests that people do not always make rational decisions because they often weigh potential losses more heavily than possible gains. This theory informed the variable of risk assessment in the study because project managers and stakeholders in affordable housing projects must evaluate risks based on their likelihood, impact, and priority. In practice, Prospect Theory helps explain why some risks may be overemphasized while others may be underestimated due to subjective judgment or fear of loss. Therefore, the theory supports the need for objective and structured risk assessment frameworks that enable project teams to prioritize critical risks and make informed decisions that improve project performance.

Contingency Theory was advanced by Fred Fiedler in 1964 and argues that there is no single best way to manage an organization or project because effective management depends on the situation. The theory emphasizes that project responses should be guided by the nature of the risk, project environment, available resources, stakeholder interests, and changing conditions. This theory informed the variable of risk mitigation in the study because affordable housing projects require flexible and context-specific strategies to address different risks. For example, financial risks may require contingency budgeting, legal risks may require clear contracts, while stakeholder risks may require stronger consultation and communication. Therefore, Contingency Theory supports the view that effective risk mitigation improves project performance by enabling project managers to adopt suitable strategies that reduce delays, control costs, and maintain quality standards.

Control Theory was introduced by Norbert Wiener in 1948 and focuses on feedback, monitoring, and corrective action to maintain desired performance. In project management, the theory emphasizes the need to set performance standards, monitor progress, detect deviations, and take

corrective measures before problems become severe. This theory informed the variable of risk monitoring and control in the study because affordable housing projects require continuous tracking of risks throughout the project lifecycle. Through regular risk audits, progress reviews, risk reporting, stakeholder meetings, and corrective action plans, project managers can ensure that emerging risks are identified and controlled on time. Therefore, Control Theory supports the argument that effective risk monitoring and control enhances project performance by improving accountability, reducing cost escalation, preventing delays, and ensuring quality delivery.

Conceptual Framework

This study's conceptual framework illustrates that performance of affordable housing is the dependent variable. However, the framework depicts Risk Identification, Risk assessment, Risk mitigation, and Risk monitoring and control as the independent variables.

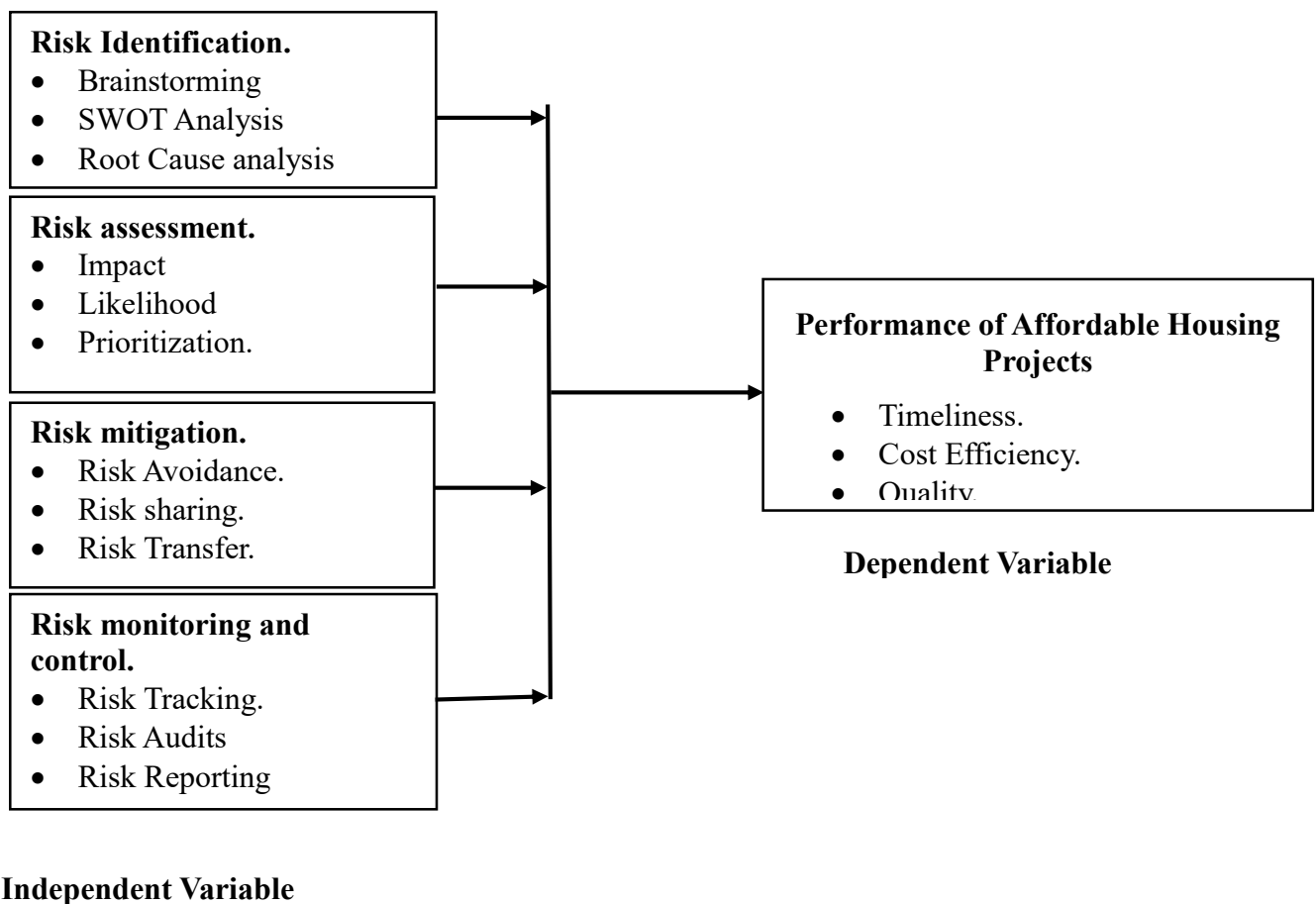


Figure 1: Conceptual Framework

Empirical Review

Mu et al. (2024) conducted a study on how artificial intelligence, big data, and the Internet of Things enhance risk identification in food safety systems. The study found that early risk identification supported by real-time data, predictive tools, stakeholder involvement, clear documentation, updated risk registers, and regular review meetings improves the ability to detect and manage disruptions before they affect performance. Although the study focused on the food industry, its findings are relevant to affordable housing projects because such projects face financial constraints, legal hurdles, procurement weaknesses, stakeholder conflicts, and operational inefficiencies. The study therefore shows that systematic and continuous risk identification can improve affordable housing project performance by reducing delays, cost overruns, and quality compromises.

Huang et al. (2023) reviewed risk assessment methods in maritime transport, including probabilistic risk assessment, fuzzy logic, and scenario analysis. The study found that effective risk assessment enables managers to evaluate risks based on likelihood and severity, prioritize risks, allocate resources properly, and develop mitigation plans. The authors further found that scenario-based analysis helps managers anticipate possible outcomes and prepare flexible responses. These findings apply to affordable housing projects because housing initiatives operate under strict timelines, limited budgets, regulatory pressures, and changing market conditions. Therefore, the study shows that structured and continuous risk assessment improves project performance by supporting better decision-making, reducing uncertainty, minimizing delays, and improving cost and quality control.

Torrence et al. (2023) examined environmental and health risks associated with perovskite solar modules and emphasized the importance of better test standards and strong risk mitigation solutions. The study found that risk identification alone is not enough unless suitable mitigation measures are designed and implemented before risks escalate. The authors also found that tailored mitigation frameworks, risk avoidance, risk transfer, insurance, shared stakeholder responsibility, feedback loops, and continuous review of mitigation strategies improve performance outcomes. These findings are applicable to affordable housing projects because risks such as material price fluctuations, contractor failure, funding delays, regulatory bottlenecks, and design changes require practical mitigation measures. The study therefore shows that strong and adaptive risk mitigation

enhances project performance by protecting timelines, controlling costs, improving quality, and strengthening stakeholder confidence.

Tariq et al. (2023) studied the development of a Deep-AI soft sensor for sustainable health risk monitoring and control of fine particulate matter in underground spaces. The study found that continuous risk monitoring, real-time tracking, adaptive control mechanisms, automated reporting, and feedback systems improve performance in complex environments. The authors further found that timely reporting and corrective action enable managers to respond quickly to emerging risks before they disrupt operations. These findings are relevant to affordable housing projects because project risks change throughout the project lifecycle and require regular tracking. The study therefore shows that risk monitoring and control through site audits, progress reviews, stakeholder meetings, risk reporting, updated risk registers, and corrective actions improves affordable housing project performance by reducing cost overruns, preventing delays, strengthening accountability, and supporting timely and quality delivery.

RESEARCH METHODOLOGY

The study adopted a mixed-methods research design combining quantitative and qualitative approaches to examine the relationship between risk management practices and the performance of affordable housing projects in Nairobi City County, Kenya. The unit of analysis was affordable housing projects, while the units of observation were stakeholders directly involved in the projects, including project managers, project supervisors, civil engineers, project officers, contractors, government officials, financial institutions, community leaders, and housing beneficiaries. The target population comprised 280 stakeholders, from which a sample size of 165 respondents was determined using Slovin's formula at a 95% confidence level and a margin of error of 0.05. Stratified random sampling was used to ensure fair representation of all stakeholder groups. Primary data were collected using a self-administered structured questionnaire containing closed-ended questions measured on a five-point Likert scale. Before actual data collection, the researcher obtained an introductory letter from Jomo Kenyatta University of Agriculture and Technology and a research permit from NACOSTI. A pilot test involving 21 stakeholders, representing 13% of the sample size, was conducted to assess the validity and reliability of the questionnaire. Quantitative data were coded, cleaned, and analyzed using SPSS version 26 through descriptive statistics, correlation analysis, and multiple regression analysis, while qualitative data were analyzed

thematically. The regression model tested the effect of risk identification, risk assessment, risk mitigation, and risk monitoring and control on the performance of affordable housing projects.

RESEARCH FINDINGS AND DISCUSSIONS

This chapter presents the analysis and interpretation of the data collected in respondents drawn from affordable housing projects in Nairobi City County, Kenya. The purpose of this chapter is to help present the findings of the study which is empirical and discuss them in the light of the research objectives and the hypotheses.

Response Rate

A total of 165 questionnaires were first handed out to affordable housing project stakeholders in Nairobi City County, Kenya. These respondents included project managers, contractors, government representatives, representatives of financial institutions, community leaders, and other professionals involved in the implementation of housing projects. Out of the 165 handed out questionnaires, 149 questionnaires were successfully completed and returned to the respondents and 16 questionnaires were not returned. This gave a first reading rate of about 90 percent. According to the considerations of the research methodology, more than 70 percent response rate is regarded as adequate for statistical analysis and assures the reliability of the study findings. For the purpose of data analysis, there were only returned questionnaires considered. The 149 completed questionnaires were considered a valid sample for the study, representing 100 percent of usable responses. The returned questionnaires were thoroughly checked for completeness before being coded and entered into the Statistical Package for the Social Sciences (SPSS) for analysis. The high response rate in this study was considered sufficient to support reliable statistical analysis and generalization of the findings in the context of affordable housing projects in Nairobi City County.

Table 1: Response Rate

Strata	Frequency	Percentage
Response	149	90.3%
Non-Response	16	9.7%
Total	165	100.00%

Descriptive Results

Objective One: Risk Identification and Performance of Affordable Housing Projects

The first objective sought to evaluate the relationship between risk identification and the performance of affordable housing projects in Nairobi City County, Kenya. The descriptive results showed that risk identification had an overall mean of 3.835 and a standard deviation of 0.721, indicating general agreement among respondents that risk identification practices were applied in affordable housing projects. The highest mean scores were recorded for the statements that brainstorming activities involved input from a wide range of project stakeholders and that SWOT analysis was conducted during project planning to uncover internal and external risks, both with a mean of 3.87. The use of brainstorming sessions to identify potential project risks also recorded a high mean of 3.86. These findings suggest that project teams commonly used collaborative methods such as brainstorming, SWOT analysis, and root cause analysis to identify possible risks. Therefore, effective risk identification was perceived as an important practice for improving project performance by reducing delays, controlling costs, and enhancing quality delivery.

Objective Two: Risk Assessment and Performance of Affordable Housing Projects

The second objective examined the relationship between risk assessment and the performance of affordable housing projects in Nairobi City County, Kenya. The descriptive findings indicated that risk assessment had an overall mean of 3.795 and a standard deviation of 0.716, showing that respondents generally agreed that risk assessment practices were used in the projects. The highest mean score was recorded for the statement that the project had a structured risk prioritization framework, with a mean of 3.83. This was followed by the assessment of identified risks based on their potential effect on project objectives, which recorded a mean of 3.82. The lowest mean was recorded for the statement that project teams conducted impact analysis to determine critical risks, with a mean of 3.76. These results imply that affordable housing project teams assessed risks based on impact, probability, severity, and urgency. As a result, risk assessment supported project performance by helping managers prioritize risks, allocate resources properly, and make informed decisions.

Objective Three: Risk Mitigation and Performance of Affordable Housing Projects

The third objective sought to evaluate the relationship between risk mitigation and the performance of affordable housing projects in Nairobi City County, Kenya. The descriptive results showed that risk mitigation had an overall mean of 3.81 and a standard deviation of 0.752, indicating general agreement that risk mitigation strategies were applied in affordable housing projects. The highest mean scores were recorded for the statements that project plans were adjusted to eliminate identified high-probability risks and that subcontracting was used to transfer operational risks to qualified third parties, both with a mean of 3.85. Other mitigation practices included proactive risk avoidance, risk sharing through contracts, stakeholder collaboration, and the use of insurance policies to transfer selected risks. These findings suggest that affordable housing projects applied both preventive and transfer-based mitigation strategies. Therefore, risk mitigation contributed to project performance by reducing exposure to disruptions, minimizing cost escalation, protecting timelines, and supporting quality outcomes.

Objective Four: Risk Monitoring and Control and Performance of Affordable Housing Projects

The fourth objective examined the relationship between risk monitoring and control and the performance of affordable housing projects in Nairobi City County, Kenya. The descriptive findings showed that risk monitoring and control had an overall mean of 3.785 and a standard deviation of 0.774, indicating moderate agreement that monitoring and control mechanisms were applied in the projects. The highest mean score was recorded for the statement that risk tracking was part of routine project review meetings, with a mean of 3.83, followed by the maintenance of an up-to-date risk register for tracking purposes, with a mean of 3.82. However, regular risk audits recorded the lowest mean of 3.73, suggesting that this practice was less strongly applied compared to other monitoring activities. These findings imply that risk monitoring and control were practiced through risk registers, review meetings, audits, reporting, and channels for identifying emerging risks. This helped improve project performance by enabling early detection of deviations, timely corrective action, stronger accountability, and better control of project timelines, costs, and quality.

Correlation Results

Pearson correlation analysis has been performed to see the relationship between independent variables (risk identification, risk assessment, risk mitigation, and risk monitoring and control) and the dependent variable (project performance). The results showed that risk identification had a positive and statistically significant relationship to project performance ($r=.350$, $p<.001$). This suggests that quality risk identification practices are related to better performance of affordable housing projects. Risk assessment was also positively and significantly correlated with project performance ($r=.413$, $p<.001$). This means that a good risk assessment leads to better results of the project. Risk mitigation showed the strongest correlation with project performance out of the independent variables ($r=.433$, $p<.001$). This finding suggests that an important role in the performance of affordable housing projects has been the effective implementation of risk mitigation strategies. Risk monitoring and control: Risk monitoring and control also had a positive and statistically significant relationship with project performance ($r=.330$, $p<.001$). This suggests that appropriate monitoring and control of risks do contribute to better business performance on projects. Overall, the correlation results show that all four risk management components were positively correlated with the performance of the affordable housing project.

Table 2: Correlations Results

		RI_MEAN	RA_MEAN	RM_MEAN	RMC_MEAN	PP_MEAN
RI_MEAN	Pearson Correlation	1.000				
	Sig. (2-tailed)					
RA_MEAN	N	149				
	Pearson Correlation	.331	1.000			
	Sig. (2-tailed)	.000				
	N	149	149			
RM_MEAN	Pearson Correlation	.230	.239	1.000		
	Sig. (2-tailed)	.005	.003			
RMC_MEAN	N	149	149	149		
	Pearson Correlation	.192	.275	.337	1.000	
	Sig. (2-tailed)	.019	.001	.000		
PP_MEAN	N	149	149	149	149	
	Pearson Correlation	.350	.413	.433	.330	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	149	149	149	149	149

Regression Analysis

The regression analysis examined the effect of four independent variables namely Risk Identification, Risk Assessment, Risk Mitigation, and Risk Monitoring and Control on the performance of affordable housing projects in Nairobi City County. Risk Identification involves recognizing and documenting potential risks that may affect project execution. Risk Assessment refers to evaluating the likelihood and impact of identified risks to determine their severity and priority. Risk Mitigation entails implementing strategies aimed at reducing or eliminating the negative effects of risks on project outcomes. Risk Monitoring and Control involves continuous tracking, reviewing, and responding to emerging project risks throughout the project lifecycle. The findings revealed that all four variables had a positive and statistically significant effect on the performance of affordable housing projects, with Risk Monitoring and Control and Risk Mitigation emerging as the most influential predictors of project performance. The results provide important insights into how effective risk management practices contribute to improved timeliness, cost efficiency, and quality of affordable housing projects.

Model Summary

The Model Summary results indicated a strong relationship between the independent variables namely Risk Identification, Risk Assessment, Risk Mitigation, and Risk Monitoring and Control, and the dependent variable, Performance of Affordable Housing Projects. The R value of 0.812 suggested a strong correlation between the study variables, while the R Square value of 0.659 implied that approximately 65.9 percent of the variation in the performance of affordable housing projects could be explained by the four risk management practices included in the model. The Adjusted R-Square value of 0.645 further confirmed the reliability of the regression model after adjusting for the number of predictors used in the analysis. Additionally, the standard error of estimate of 0.432 indicated minimal deviation between observed and predicted values, demonstrating that the regression model had a good fit. Further, the Durbin-Watson statistic of 1.987 indicated the absence of autocorrelation among the residuals, meaning that the errors were independent and did not follow a systematic pattern. This strengthened the reliability and validity of the regression findings. The results therefore suggest that effective risk management practices play a significant role in improving the performance of affordable housing projects in Nairobi City County. The high explanatory power of the model reinforces the importance of structured risk

management frameworks in enhancing project timeliness, cost efficiency, and quality delivery. Table 3 presents the model summary results.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin Watson
1	.812 ^b	.659	.645	.432	1.987

a. Predictors: (Constant), Risk Identification, Risk Assessment, Risk Mitigation, and Risk Monitoring and Control

b. Dependent Variable: Performance of Affordable Housing Projects

ANOVA

The ANOVA results indicated that the overall regression model was statistically significant, as shown by the F value of 132.754 and the p value of 0.000, which was below the 0.05 significance level. This confirmed that the independent variables namely Risk Identification, Risk Assessment, Risk Mitigation, and Risk Monitoring and Control collectively had a statistically significant effect on the performance of affordable housing projects.

In addition, the Regression Sum of Squares value of 15.842 compared to the Residual Sum of Squares value of 4.025 showed that a large proportion of the variation in project performance was explained by the predictor variables. These findings demonstrate that effective risk management practices significantly influence the performance of affordable housing projects in Nairobi City County. The results further suggest that organizations implementing structured risk management systems are more likely to achieve timely completion, cost efficiency, and improved project quality. Table 4 presents the ANOVA results.

Table 4: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.842	4	3.960	132.754	.000 ^b
Residual	4.025	85	.047		
Total	19.867	89			

a. Predictors: (Constant), Risk Identification, Risk Assessment, Risk Mitigation, and Risk Monitoring and Control

b. Dependent Variable: Performance of Affordable Housing Projects

Regression Coefficients

From the coefficients table, when the unstandardized regression coefficients (B) were substituted into the multiple regression equation, the final predictive model became:

$$Y = 1.228 + 0.137X_1 + 0.168X_2 + 0.182X_3 + 0.195X_4$$

Where:

Y = Performance of Affordable Housing Projects

X₁ = Risk Identification

X₂ = Risk Assessment

X₃ = Risk Mitigation

X₄ = Risk Monitoring and Control

The regression coefficients indicate the expected change in the performance of affordable housing projects resulting from a one-unit increase in each independent variable while holding other factors constant. The constant term of 1.228 represented the baseline level of project performance when all predictor variables were held constant. A one-unit increase in Risk Identification improved project performance by 13.7 percent, implying that early recognition and documentation of project risks enhances preparedness and reduces project disruptions. A one-unit increase in Risk Assessment improved project performance by 16.8 percent, demonstrating that evaluating the likelihood and severity of risks helps project teams allocate resources effectively and prioritize critical risks. Further, a one unit increase in Risk Mitigation improved project performance by 18.2 percent, indicating that implementing contingency plans, insurance mechanisms, and corrective strategies minimizes project delays and cost overruns. Lastly, a one-unit increase in Risk Monitoring and Control improved project performance by 19.5 percent, making it the most influential predictor. This implies that continuous monitoring, risk tracking, reporting, and corrective actions are critical in ensuring successful project delivery.

The regression analysis further confirmed that all four independent variables had statistically significant effects on the performance of affordable housing projects, as indicated by the p-values of 0.000, which were below the 0.05 significance level. The t-values were also sufficiently high, confirming the reliability of the predictor variables in explaining project performance. In addition,

the Variance Inflation Factor (VIF) values were all below 2, indicating the absence of multicollinearity problems among the independent variables. The standardized beta coefficients showed that Risk Monitoring and Control ($\beta = 0.342$) was the most influential predictor, followed by Risk Mitigation ($\beta = 0.312$). These findings highlight the importance of effective and continuous risk management practices in improving the performance of affordable housing projects in Nairobi City County.

Table 5: Regression Coefficients

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Tolerance	VIF
(Constant)	1.228	.109		11.271	.000		
Risk Identification (X1)	.137	.026	.223	5.120	.000	.752	1.330
Risk Assessment (X2)	.168	.030	.289	5.606	.000	.569	1.757
Risk Mitigation (X3)	.182	.025	.342	7.025	.000	.658	1.519
Risk Monitoring and Control (X4)	.195	.031	.312	6.154	.000	.635	1.575

Dependent Variable: Performance of Affordable Housing Projects (Y)

CONCLUSION

Based on the study's findings, several conclusions can be drawn about the relationship between risk management practices and the performance of affordable housing projects in Nairobi City County. The study concludes that the identification of risks is a critical element in the successful project management process for affordable housing projects. Early identification of potential risks enables project teams to anticipate such challenges and devise strategies to deal with them before they become a major problem. Organizations involved with housing development should therefore include systematic risk identification processes in their project planning activities.

The study concludes that proper risk assessment significantly contributes to the great performance of projects. Evaluating risks by their probability and potential impact helps project managers prioritize them and allocate resources accordingly. Affordable housing works that utilize structured risk assessment frameworks are more likely to meet their project objectives in terms of cost-efficiency, time management, and quality results. The study concludes further that risk mitigation

strategies are a critical part of improving the performance of affordable housing projects. Feeling the capacity of the risk reduction, transfer, or avoidance with proper strategies increases the success of the project to a great extent. Project stakeholders should therefore put in place proactive mitigation strategies such as contractual risk sharing mechanisms, insurance coverage, or collaborative risk management approaches.

The study concludes that although risk monitoring and control practices are important in project management, its influence on project performance may depend on the effectiveness of their implementation. Continuous risk monitoring e.g through regular audits and risk reporting systems, is important for ensuring that newly emerging risks are identified and dealt with as soon as possible. However, the study results indicate that the biggest contribution that can be made for better performance of the project lies in the earlier stages of risk management activities, especially at the identification, assessment, and mitigation stages.

RECOMMENDATIONS

Project managers involved in affordable housing projects should enhance the risk identification process during the planning phase of projects. Brainstorming sessions and stakeholder consultations can be conducted on a regular basis to spot possible risks early on in the project's lifecycle. Project teams also must establish formal risk assessment processes for assessing risks according to the likelihood and potential consequences. This will give the project managers to effectively assign priorities to risks and allocate resources accordingly. Furthermore, organizations should implement proactive risk mitigation strategies that focus on risk prevention before they occur. Measures such as risk sharing contracts, insurance, and collaborative work among stakeholders can substantially decrease the project risks.

Government agencies and policymakers that are involved in housing development should set clear guidelines for risk management for affordable housing projects. These guidelines are intended to promote project stakeholders to employ orderly risk management schemes across the project OSM. Policymakers should also encourage training programmes and capacity-building exercises that will improve the skills of those who engage in housing development in risk management. Strengthening risk management practices will help improve project performance and the successful implementation of affordable housing programs.

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