Int Journal of Social Sciences Management and Entrepreneurship 8(1): 716-731 2024

ISSN 2411-7323

www.sagepublishers.com

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

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ABSTRACT

This study sought to establish the influence of project risk management practices on performance of affordable housing projects in Nairobi city county, Kenya. Specifically, the study sought to examine the influence of risk analysis on performance of affordable housing projects in Nairobi city county, Kenya and to assess the influence risk control on performance of affordable housing projects in Nairobi city county, Kenya. The research used a cross-sectional survey design. The study targeted a total of 176 respondents comprising of projects managers and site engineers in charge of the seven ongoing affordable housing projects in Nairobi City County. Since the target population is small, the study used census method. This implies that all the 176 respondents participated in the study. This study also used questionnaire to collect data relevant to this study. Quantitative data collected was analyzed using descriptive statistical techniques which are frequencies, mean, standard deviation. Inferential statistics which include Pearson correlation and the Regression Analysis Model were used to test the relationship between study variables. The significance of the model was tested at 5% level of significance. The regression analysis revealed statistically significant associations between risk analysis, risk control, and the performance of affordable housing projects in Nairobi City County, Kenya. Risk analysis ($\beta = 0.317$, $p < 0.001$), and risk control ($\beta = 0.386$, $p < 0.001$) all exhibited positive and statistically significant effects on project performance, indicating their substantial influence. The model summary statistics further demonstrated a high level of explanatory power, with an R-squared value of 0.710, indicating that the regression model explained 71.0% of the variance in project performance. These findings highlight the critical role of comprehensive risk management practices in driving the success of affordable housing projects, emphasizing the need for their integration into project planning and execution strategies.

Key Words: Project Risk Management Practices, Risk Analysis, Risk Control, Affordable Housing Projects

Background of the Study

Sustainable society foundation defines three dimensions of sustainability in any society/country: human wellbeing, Environmental wellbeing and economic wellbeing. Human wellbeing has three sub categories: basic needs, personal development and well-balanced society. Therefore, having an access to food and shelter are considered basic necessities, thus constitutes an important element of having a sustainable society. In most societies, housing is a major component in creating a stable and healthy society. Moreover, housing is often the largest single household expenses (ARA, 2019). The goal of affordable housing is to ensure affordability of rental or owner occupied of houses to everyone in the society, regardless of their level of income (Hoek_smith & Diamond 2019). Housing has a peculiar position in the welfare state. Affordable housing is subsidized directly and indirectly in all societies. At the macro level housing has been assessed an important driver of the banking crisis in 2008. This sector was much affected by a crisis in Europe which showed the need for implementing the EU policy open to changing social housing systems (Czischke 2019). Social housing providers are under pressure to negotiate their policies and explain their achieved results to local authorities and other stakeholders, in a way to balance the effect of increased market-orientation and decreased central government control (Mullins 2019).

Completion of projects is an indicator of efficient construction industry. Construction timely often serves as a benchmark for assessing the performance of a project and the efficiency of the project organisation. A project is said to be successful on timely completion. The time required to complete construction of projects is often more than specified time in Contract. These overruns‘ or, time extensions happens due to many reasons, such as designer changes or errors, economic conditions, resource availability and performance of project parties (Emmanuel, 2020). Usually, majority of project delay occurs during Construction phase, where unforeseen factors (environmental concerns and restrictions, ground conditions) are always involved. Construction delays lead to increase in overall project cost, henceforth completing projects on time is beneficial to all parties involved in projects (Abderisak, & Lindahl, 2018). According to Adeleke (2019) revealed that risk management is recognized as an important exercise that creates value to a project and improves project performance. Time, cost and quality are the primary measures of a project performance in this industry. The risk management process relies on these techniques since they enable them to be sure of the results and opinions from multiple experts hence improving the results of the analysis. For such a procedure to be considered appropriate in decreasing the influences of individual perceptions and biases, the identification and estimation of risks have to be done in the initiation phase first then closely monitored throughout the implementation phase which improves the efficiency of risk management process (Luwesi, Kinuthia, Doke & Ruhakana, 2015).

According to Kerzner and Kerzner (2017), risk management planning is the fundamental management function, which involves deciding beforehand, what is to be done, when is it to be done, how it is to be done, and who is going to do it. It is an intellectual process that lays down objectives and develops various courses of action, by which the organization can achieve those objectives. Risk management planning minimizes risk and uncertainty, by looking ahead into the future (Klijn, Kreibich, De Moel & Penning-Rowsell, 2015). By planning process, an organization not only gets the insights of future risks, but it also helps the organization to shape its future. Interestingly, most literature promote risk identification as the first step of PRM (Project Risk management), standards Australia highlights thet need of first understanding’ the project context’: through; project scope, goal and objectives (e.g cost,time, quality) (Baccarini, 2001).

According to Munive-Hernandez, Dewhurst, Pritchard, and Barber (2014), planning involves the plan or pattern of the act that adds company main goals, policies, and action systems that are unified into a whole. Sorel and Pennequin (2018) advocate for planning to involve developing

objectives or the organizational strategic plans and looking for resources that would best be suited in achieving the organizational goals as outlined in strategic plans. Each goal should have financial and human resource projections associated with its completion so that it becomes successful. The planning process also creates timelines for when the plans should be achieved. According to Ballou (2017), planning also involves developing the tracking and assessment method that will be used to monitor the project process.

According to Kwak, Rodrigues, Mason, Pettit, and Beresford (2018), risk identification is a process for identifying and recording potential project risks that can affect project delivery. This step is crucial for efficient risk management throughout the project. The outputs of the risk identification are used as an input for risk analysis, and they reduce a project manager's uncertainty (Antwi-Agyei, Cairncross, Peasey, Price, Bruce, Baker & Ensink, 2015). The process involves creating a systematic process. The risk identification process begins with project objectives and success factors. Reliable and high-quality information is essential for effective risk management and applying risk identification tools and techniques. Identified risks should be documented in a risk register and a risk breakdown structure, along with their causes and consequences.

According to Hardaker, Lien, Anderson, and Huirne (2019), risk analysis is the process of identifying and analyzing potential issues that could negatively impact key business initiatives or critical projects to help organizations avoid or mitigate those risks Performing a risk analysis includes considering the probability of adverse events. Risk analysis is used to anticipate and reduce the effect of harmful results from adverse events and to evaluate whether the potential risks of a project are balanced by its benefits to aid in the decision process when evaluating whether to move forward with the project (Dahal, et al., 2018).

Statement of the Problem

In the current economy, it is estimated that 22% of Kenyans live in the cities and the population in the urban areas is growing at a rate of 4.2% equivalent to 500,000 new city dwellers per year. The current housing shortfall stands at approximately 2 million houses and about 61% of the urban population live in the slums. The level of growth is drastic and this means that 200,000 housing units are required to be built on yearly basis in order to meet the growth demands. However, only 50,000 houses are built per year leaving a discrepancy of 150,000 homes per year. This has led to the price of houses to increase by 100% since 2004 (KPDA, 2018).This reduction in the supply of housing is as a result of poor Project Management whereby a significant portion of the land in Kenya is unserviced forcing developers to incur an additional infrastructure cost when constructing. A survey undertaken by CAHF shows that the average land and infrastructure cost in Kenya makes up 10 to 35% of the total cost of construction (KPDA, 2018).

A number of housing projects in Kenya have either paused or got terminated after their commencement.The housing project delays have increased to 184.7% lead to cost overruns of up to 152.3% (KPDA, 2018). Large amounts of money have been set aside for housing projects but they have been performing poorly (Gacheru, 2018). Delays in the completion of housing projects means delay in the implementation of new housing projects which in turn bears far-reaching consequences in the lives of citizens and hinders the government from meeting the constitutional obligation which is to offer decent housing to all citizens. Research has shown that project risk management influences project performance

Various studies regarding projects and implementation of low-cost housing have been done both globally and locally. Bakar and Awang (2018) conducted a study on the critical success factors for project management best practices in sustainable housing in Malaysia. The study focused on the concept of project management and it was conducted in a different context. In addition, none of

the studies established the influence of project risk management practices on performance of affordable housing projects. To fill the highlighted gaps, the current study sought to assess the influence of project risk management practices on performance of affordable housing projects in Nairobi city county, Kenya

Specific Objectives

The study was guided by the following specific objectives;

i. To examine the influence of risk analysis on performance of affordable housing projects in Nairobi city county, Kenya.

ii. To assess the influence risk control on performance of affordable housing projects in Nairobi city county, Kenya.

LITERATURE REVIEW

Theoretical review

Uncertainty Theory

The Uncertainty theory was presented by Li and Liu 2010 is used in deciding on which risk analysis tools such as the probability impact matrix that is applied to analyze the possibility of a risk occurring and the impact that it has on the project success (Li & Liu 2010). During the risk analysis process, the project manager can also use the Montecarlo simulation technique that is a methodology for calculating the risks that may occur in a project through models that substitute a range of values which have a possibility of occurrence by calculating the results over and over while using a different set of randomly selected values from the possibility of occurrence. A project manager needs to guarantee that risk management is implemented from the project identification stage and not when it happens amid project implementation (Dongli, Yinglong, Cunping & Renle, 2018). Early advancement of activity network techniques during the 1950s, for example, PERT (Program Evaluation and Review Technique), perceived the likelihood of variety in task duration. Qualitative approaches that require the examination and audit of different tools and furthermore the event and effects that may cause problems through the project were produced to guide project managers to get ready for vulnerability with risks decrease and utilization of different possibility measures (Henriksen & Uhlenfeldt, 2016).

A project manager will ensure that in the risk identification process, he incorporates the data collected before the initiation of the project, through techniques like the brainstorming process, Delphi techniques which will include expert opinions and judgment, he will also do a checklist analysis whereby he will compare other projects that had been done earlier to get the lessons learned from them, the project manager can also use the risk breakdown structure which will be used in the classification of various risks according to the impact that they have and chances that they might happen, this helps in coming up with the appropriate response strategies (Yoe, 2016).

A project leader needs to ensure that the team he picks for the project has the required skills that help in managing their interactions with the various project stakeholders which in turn builds ownership of the project while tools as contract formalization and enforcement throughout the project enables accountability of each member since there are rules and regulations set, responsibility charts such as a daily site report that is filled by the site supervisor and reviewed regularly (Kochenderfer, 2015). Uncertainty risks additionally influence how project management should approach stakeholder management because of the way that it is difficult to maintain a strategic distance from the struggle because of the elements of a group. To successfully deal with these uncertainties, the project manager requires disciplined risk management that guarantees that

the identification of potential risk that could influence the project is all around reported and methodologies set up for risk response which is trailed by the planning of preventive measures to block adverse events and numerous contingent approaches that are then triggered by such events (Young & Jordan, 2018). Uncertainty Theory was used in this study to assess the influence of risk analysis on performance of affordable housing projects in Nairobi city county, Kenya.

Prospect theory

The prospect theory depicts that area normally influences chances of propensity. On the other hand, losses possess additional emotional effects as compared to equivalent sums of profits; therefore, they highly influence our sense of selection (Tversky & Kahneman, 1975). Making decisions means that a choice maker has to multiply the value of each final result depending on the weight of a decision. Significantly, the selection weights serve a small role as determinants of ascertained outcomes but can constitute to evaluations that are empirically derived from the manner in which humans reach their feelings of likelihood. One important attribute of weighting is the fact that low possibilities get overweighed while medium and high possibilities are instinctively underweighted (Mutula, 2018).

This theory that explains how individuals make decisions under conditions of uncertainty. It suggests that people tend to value potential gains and losses differently and that their decisions are influenced by psychological factors such as risk aversion and framing effects (Adeusi *et al*.2018). By considering Prospect Theory in the context of risk control in food security projects in Kenya, project managers can better understand stakeholders' decision-making behaviors, risk preferences, and the framing of risk control measures. Understanding these psychological factors can inform the design and implementation of risk control strategies, enhance stakeholder engagement, and ultimately improve the overall performance and impact of food security projects in the country (Bukar & Ibrahim, 2021). This study used prospect theory to assess the influence risk control on performance of affordable housing projects in Nairobi city county, Kenya.

Conceptual Framework

The conceptual framework is characterized as a scientific device that is a diagrammatic introduction of the different variables that manage a study while demonstrating the connection between the independent and dependent variables in a graphic form using a chart to indicate the variables or utilizing a representation of the variables (Wagana, 2015). In this study the independent variables include;, risk analysis and risk control while the dependent variable is performance of affordable housing projects in Nairobi city county, Kenya.

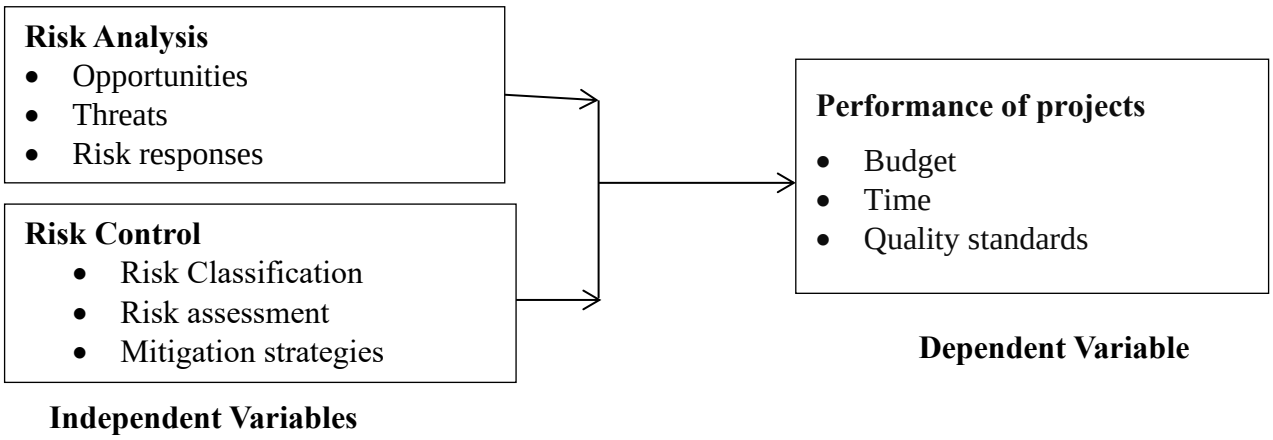

Figure 2.1: Conceptual Framework

Risk Analysis

Risk analysis involves a detailed examination of potential risks and their impact on project or organizational objectives. Beyond just identifying threats, risk analysis also delves into recognizing opportunities that may arise (Ebole & Samson, 2021). Opportunities are positive deviations from the expected outcomes that can enhance project success. In the context of risk analysis, identifying opportunities involves assessing uncertainties that, if exploited, can lead to positive outcomes or additional benefits. Analyzing opportunities allows project managers to develop strategies to maximize these favorable events. By adopting a proactive stance and leveraging identified opportunities, organizations can turn uncertainties into advantages, fostering innovation, growth, and overall project success (Amoah & Pretorius, 2020).

Threat analysis is a crucial component of risk analysis, focusing on potential events that could adversely affect project or organizational goals. These threats can manifest in various forms, including financial risks, technological challenges, market fluctuations, and unforeseen external factors. During threat analysis, the goal is to assess the probability and impact of these negative events. Understanding the nature of threats enables project managers to prioritize risks, focusing on those with the highest potential impact. By recognizing and analyzing threats comprehensively, organizations can develop effective risk mitigation and response strategies, ultimately minimizing the likelihood of negative consequences and ensuring project resilience (Kinyua, Ogollah & Mburu, 2015).

Once risks, both opportunities, and threats, have been identified and analyzed, the next step in the risk management process involves developing and implementing risk responses. Responses are strategies or actions taken to address the potential impact of risks on project objectives (Ebole & Samson, 2021). For opportunities, organizations may choose to exploit them by allocating resources to maximize the positive outcome. Alternatively, for threats, responses may include risk mitigation (reducing the probability or impact of the threat), risk transfer (shifting the risk to a third party, such as insurance), risk acceptance (acknowledging the risk without specific actions), or risk avoidance (altering project plans to eliminate the risk). Effective risk responses are tailored to the specific nature of each risk, align with project goals, and are regularly monitored and adjusted as the project progresses. By implementing well-thought-out responses, organizations can enhance their ability to navigate uncertainties and achieve project success (Ebole & Samson, 2021).

Risk Control

Risk control is a critical phase in the risk management process, encompassing strategies and actions aimed at mitigating or managing identified risks. One key aspect of risk control is risk classification, which involves categorizing risks based on various criteria such as severity, likelihood of occurrence, and impact on project objectives (Adeusi *et al*. 2018). This classification helps prioritize risks, allowing project managers to focus their efforts on addressing the most significant and urgent threats. By categorizing risks systematically, organizations can allocate resources efficiently, tailor mitigation strategies to specific risk categories, and enhance overall risk management effectiveness (Bukar & Ibrahim, 2021).

Risk assessment is a fundamental element of risk control, involving the continued evaluation of identified risks to gauge their current status and potential impact. This ongoing process allows project teams to monitor changes in the risk landscape, reassess the probability and consequences of risks, and adjust mitigation strategies accordingly. Regular risk assessments contribute to the adaptability and resilience of projects, enabling teams to respond proactively to emerging threats or opportunities. The assessment phase involves not only quantitative analysis but also qualitative

judgments to ensure a comprehensive understanding of the evolving risk profile. By maintaining a continuous risk assessment process, organizations can refine their risk control strategies and optimize project outcomes (Marly *et al*, 2019).

Mitigation strategies form the core of risk control, outlining the actions and measures taken to reduce the probability and impact of identified risks. These strategies can vary widely based on the nature of the risk and its classification. For high-impact risks with severe consequences, proactive mitigation measures may include implementing redundancy, developing contingency plans, or allocating additional resources. Conversely, for lower-impact risks, organizations may choose risk acceptance as a strategy, acknowledging the risk without expending significant resources on mitigation. Risk transfer, such as purchasing insurance, is another common mitigation strategy. Effective risk control requires a combination of preventive measures, monitoring mechanisms, and responsive actions to ensure that the project remains on track despite uncertainties. Regular review and adjustment of mitigation strategies are essential to align with changing project conditions and to maintain an adaptive risk management approach (Adeusi *et al*., 2018).

Empirical Review

Risk Analysis and Project Performance

Amoah and Pretorius (2020) conducted a study on evaluation of the impact of risk analysis on project performance in small construction firms in South Africa: The case study of construction systems. A case study of a single construction company was used for this study. Data were collected through structured questionnaire to 16 respondents who are involved in the project execution in the case study company. Two managing directors of the case study company were also interviewed. In total, 11 project site meetings were also attended to observe meeting proceedings and to record issues discussed. The findings indicate that small construction companies with respect to the case study company do not have a specific laid down risk management processes that project team are made to go through before and during the execution of their projects. There is, however, no conclusive evidence regarding the impact of risk management on project performance as a significant number of projects done were able to meet a successful project performance indicators even though risk management exercises were not done

Kinyua, Ogollah and Mburu (2015) conducted a study on effect of risk analysis on project performance of small and medium information communication technology enterprises in Nairobi, Kenya. Target population was 48 ICT SMEs in Nairobi, Kenya. The study adopted random sampling technique to select sample size of the project staff in the target population. Primary data was collected using a questionnaire which was self-administered through drop and pick questionnaires to sampled members of the employees working in the ICT SMEs. The data was then summarized, coded and tabulated. A multiple regression model was applied. The study found that risk analysis influences project performance.

Ebole and Samson (2021) researched on the effect of risk analysis on the performance of infrastructure projects in Kiambu County, Kenya. The target population therefore comprised of 484 respondents who weredrawn from the infrastructure companies from Kiambu County. This study utilized a sample size of 145. The response rate was drawn from 121 questionnaires that were fully filled and returned. The researcher used questionnaires as the research instrument to gather the relevant data. The quantitative data was analyzed using descriptive statistics as well as multiple regression analysis. The analysis was conducted scientifically through SPSS (Statistical Package for the Social Sciences). The study also concluded risk monitoring and risk analysis had significant and a positive effect on infrastructure projects in Kiambu County.

Risk Control and Project Performance

Bukar and Ibrahim (2021) researched on investigating the impact of risk control on project performance in construction industry: Evidence from Nigeria. A quantitative research design was used and adopting a descriptive study for more in-depth into the risks and risk management issues in the industry. Survey questionnaires used in collecting data from 84 sample respondents. Data generated were analysed using simple linear regression model. The results revealed that risks (internal and external) and risk management significantly impacted on project performance. The research paper, therefore, presents the result of study conducted among the major stakeholders (contractors, consultants, and the client) of projects in Abuja, Lagos and Portharcourt all in Nigeria. In addition, the result revealed that the major problem of the construction industry in risk is the lack of a regulatory framework to be imbibed and implemented by the companies and firms in the industry. The framework is to be created and monitored by the Bureau of Public Procurement (BPP) and the monitoring process is to include risk audits, risk reassessment, risk technical performance, reserve analysis and status meeting.

Adeusi *et al*.(2018), examined the effect of risk control on the financial performance of Nigerian banks. The risk control was conceptualised using three dimensions; Liquidity risk, credit risk and capital risk and these were measured using four techniques or tools while performance was conceptualized using tree dimensions; return on capital employed (ROCE), return on asset (ROA) and return on equity (ROE) and these were measured using 9-item model. Data on risk management and performance were collected from annual reports and financial statements of 10 Nigerians banks. The data collected were analysed using panel data estimation technique and the result revealed that the three dimensions of risk control had significant impact on performance

Marly et al (2019) conducted a study on the influence of risk control on project performance. This methodological approach involves a literature review to underpin the conceptual framework and a survey for empirical validation, using structural equation modelling. The hypotheses were tested based on a field study involving 263 projects distributed among eight industries. The fieldwork involved interviews with project managers and risk managers and an analysis of internal company documents about the projects' performance. The structural model presented herein provides a means for correlating the hard and soft sides of risk management with project success, understanding the moderating effect of project complexity. The soft side of risk management appears most prominently and explains 10.7% of the effect on project success.

RESEARCH METHODOLOGY

The research used a cross-sectional survey design. The study targeted a total of 176 respondents comprising of projects managers and site engineers in charge of the seven ongoing affordable housing projects in Nairobi City County. Since the target population is small, the study used census method. This research used a questionnaire to collect primary data. This study adopted the self-administered questionnaire approach. Qualitative data analyzed by use of content analysis. Quantitative data was coded then analyzed using Statistical Package for Social Sciences (SPSS) computer software version 28. Descriptive statistics were used to analyze the data in frequency distributions and percentages which were presented in tables and figures. Statistically, analysis was carried out using the multiple regression model

RESEARCH FINDINGS AND DISCUSSION

Out of the 158 questionnaires distributed, 132 were completed and returned, representing a response rate of 83.5%. As indicated by Metsamuuronen (2017), a response rate that is above fifty percent is considered adequate for data analysis and reporting while a response rate that is above

70% is classified as excellent. Hence, the response rate of this study was within the acceptable limits for drawing conclusions and making recommendations.

Descriptive Statistics Analysis

analysis includes measures such as mean, and standard deviation to describe the data comprehensively. The study requested respondents to rate their responses in a scale of 1-5 where 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree. The means and standard deviations were used to interpret the findings where a mean value of 1-1.4 was strongly disagree, 1.5-2.4 disagree, 2.5-3.4 neutral, 3.5-4.4 agree and 4.5-5 strongly agree. Standard deviation greater than 2 was considered large meaning responses were widely spread out and not tightly clustered around the mean.

Risk Analysis

The first objective of the study was to examine the influence of risk analysis on performance of affordable housing projects in Nairobi city county, Kenya. Respondents were therefore asked to indicate the extent to which they agree or disagree with the statements relating to influence of risk analysis on performance of affordable housing projects in Nairobi city county, Kenya. Table 1 presents summary of the findings obtained.

Table 1: Descriptive Statistics on Risk Analysis

Statement	Mean	Std. Dev.
Thorough risk analysis significantly enhances the overall success of affordable housing projects.	3.899	0.456
Identifying opportunities during risk analysis contributes to increased innovation and growth in affordable housing projects.	3.787	0.426
Effectively analyzing risks helps in prioritizing and focusing on those with the highest potential impact on affordable housing project success.	3.855	0.599
The identification and analysis of risks are integrated seamlessly into the overall project planning for affordable housing projects.	3.779	0.558
Proactive risk analysis allows for the development of strategies to exploit positive outcomes, contributing to the success of affordable housing projects.	3.765	0.812
The analysis of threats is a crucial component in mitigating potential negative impacts on the performance of affordable housing projects.	3.752	0.331
Regular and comprehensive risk assessments are essential for adapting strategies and ensuring the resilience of affordable housing projects.	3.718	0.705
Aggregate Score	**3.794**	**0.555**

From the findings, the respondents agreed on average that thorough risk analysis significantly enhances the overall success of affordable housing projects. (M= 3.899, SD= 0.456); that identifying opportunities during risk analysis contributes to increased innovation and growth in affordable housing projects (M= 3.787, SD= 0.426); and that effectively analyzing risks helps in prioritizing and focusing on those with the highest potential impact on affordable housing project success (M= 3.855, SD= 0.599). They also agreed that the identification and analysis of risks are integrated seamlessly into the overall project planning for affordable housing projects (M= 3.779, SD= 0.558); and that proactive risk analysis allows for the development of strategies to exploit positive outcomes, contributing to the success of affordable housing projects (M= 3.765, SD= 0.812). They further agreed that the analysis of threats is a crucial component in mitigating potential negative impacts on the performance of affordable housing projects (M= 3.752, SD=

0.331); and that regular and comprehensive risk assessments are essential for adapting strategies and ensuring the resilience of affordable housing projects (M= 3.718, SD= 0.705).

The findings show that respondents agreed that risk analysis affects performance of affordable housing projects in Nairobi city county, Kenya as shown by an aggregate mean of 3.794 (SD= 0.555). The findings align with research by Amoah and Pretorius (2020) in South Africa who highlighted the significant impact of risk analysis on project performance in small construction firms. Their study emphasized the importance of systematically evaluating potential risks and opportunities to inform strategic decision-making and enhance project outcomes. Additionally, Kinyua, Ogollah, and Mburu (2015) conducted a study in Nairobi, Kenya, focusing on the effect of risk analysis on project performance in small and medium information communication technology enterprises. Their findings underscored the critical role of risk analysis in mitigating uncertainties and optimizing project performance. In agreement with these studies, the current findings suggest that effective risk analysis practices are essential for identifying and addressing potential risks, ultimately contributing to the success of affordable housing projects in Nairobi City County.

Risk Control

The second objective of the study was to assess the influence risk control on performance of affordable housing projects in Nairobi city county, Kenya. Respondent were therefore asked to indicate the extent to which they agree or disagree with the following statements relating to influence of risk control on performance of affordable housing projects in Nairobi city county, Kenya. The findings were as presented in Table 2.

Table 2: Descriptive Statistics on Risk Control

Statement	Mean	Std. Dev.
Categorizing risks based on severity, likelihood, and impact helps prioritize resources for affordable housing projects efficiently.	3.904	0.705
Risk classification, involving categorizing risks based on various criteria, is crucial for prioritizing efforts in addressing significant threats to affordable housing projects.	3.901	0.801
Regular risk assessments and adjustments are necessary for maintaining an adaptive risk management approach in affordable housing projects.	3.866	0.591
Implementing effective risk control measures significantly contributes to the success of affordable housing projects.	3.850	0.879
The continuous evaluation of identified risks during the project lifecycle is essential for adapting risk control strategies in affordable housing projects.	3.833	0.629
Mitigation strategies, such as risk transfer and acceptance, are tailored to the specific nature of risks in affordable housing projects.	3.825	0.991
Proactive risk control significantly minimizes the likelihood of negative consequences and enhances the overall resilience of affordable housing projects.	3.770	0.604
Aggregate Score	**3.850**	**0.743**

From the findings in Table 2, the respondents agreed on average that categorizing risks based on severity, likelihood, and impact helps prioritize resources for affordable housing projects efficiently (M= 3.904, SD= 0.705); that risk classification, involving categorizing risks based on various criteria, is crucial for prioritizing efforts in addressing significant threats to affordable housing projects (M= 3.901, SD= 0.801); and that regular risk assessments and adjustments are

necessary for maintaining an adaptive risk management approach in affordable housing projects (M= 3.866, SD= 0.591). Respondents further agreed that implementing effective risk control measures significantly contributes to the success of affordable housing projects (M= 3.850, SD= 0.879); and that the continuous evaluation of identified risks during the project lifecycle is essential for adapting risk control strategies in affordable housing projects (M= 3.833, SD= 0.629) Further, respondents agreed that mitigation strategies, such as risk transfer and acceptance, are tailored to the specific nature of risks in affordable housing projects (M= 3.825, SD= 0.991); and that proactive risk control significantly minimizes the likelihood of negative consequences and enhances the overall resilience of affordable housing projects (M= 3.770, SD= 0.604).

The findings above and supported by an aggregate mean of 3.850 (SD= 0.743) show that risk control affects performance of affordable housing projects in Nairobi city county, Kenya. The findings align with research by Bukar and Ibrahim (2021) in Nigeria emphasizing the crucial role of risk control in enhancing project performance in the construction industry highlighting the importance of implementing effective risk management strategies to minimize the impact of potential risks on project outcomes. Additionally, Adeusi et al. (2018) examined the effect of risk control on the financial performance and the findings underscored the significant impact of risk control measures, such as liquidity risk management and credit risk assessment, on overall financial performance. In agreement with these studies, the current findings suggest that robust risk control practices are essential for mitigating uncertainties and optimizing the performance of affordable housing projects in Nairobi City County.

Performance of Affordable Housing Projects

The general objective of this study was to investigate the influence of project risk management practices on performance of affordable housing projects in Nairobi city county, Kenya. Respondents were therefore asked to indicate the extent to which they agree with statements relating to performance of affordable housing projects in Nairobi city county, Kenya. Table 4.8 presents summary of the findings obtained.

Table 3: Descriptive Statistics on Performance of Affordable Housing Projects

Statement	Mean	Std. Dev.
Comprehensive risk analysis significantly enhances the resilience of affordable housing projects to external challenges.	3.881	0.292
Adequate risk identification contributes to the overall quality and success of affordable housing projects.	3.807	0.607
Stakeholder satisfaction with affordable housing projects is positively influenced by the successful integration of risk management practices.	3.803	0.216
Affordable housing projects that prioritize risk management practices tend to achieve better overall performance outcomes.	3.779	0.970
The successful completion of affordable housing projects is closely tied to the effective implementation of risk planning strategies.	3.758	0.454
Regular monitoring and adjustment of risk management strategies contribute to the adaptability and overall success of affordable housing projects.	3.747	0.864
The implementation of proactive risk control measures is crucial for mitigating potential negative consequences and ensuring the success of affordable housing projects.	3.723	0.878
Aggregate Score	**3.785**	**0.612**

The findings show that the respondents agreed that the respondents agreed on average with the statements that comprehensive risk analysis significantly enhances the resilience of affordable housing projects to external challenges (M= 3.881, SD= 0.292); that adequate risk identification contributes to the overall quality and success of affordable housing projects (M= 3.807, SD= 0.607); and that stakeholder satisfaction with affordable housing projects is positively influenced by the successful integration of risk management practices (M= 3.803, SD= 0.216). They were also in agreement that affordable housing projects that prioritize risk management practices tend to achieve better overall performance outcomes (M= 3.779, SD= 0.97); and that the successful completion of affordable housing projects is closely tied to the effective implementation of risk planning strategies (M= 3.758, SD= 0.454). Further, respondents agreed that regular monitoring and adjustment of risk management strategies contribute to the adaptability and overall success of affordable housing projects (M= 3.747, SD= 0.864); and that the implementation of proactive risk control measures is crucial for mitigating potential negative consequences and ensuring the success of affordable housing projects (M= 3.723, SD= 0.878).

The findings indicating that respondents agreed on the importance of comprehensive risk management practices in enhancing the resilience, quality, and success of affordable housing projects in Nairobi City County, Kenya align with existing literature on project risk management. Research by Amoah and Pretorius (2020) in South Africa emphasized the significant impact of comprehensive risk analysis on project success in small construction firms. Their study highlighted the importance of systematically evaluating potential risks and opportunities to inform strategic decision-making and enhance project outcomes. Additionally, Roque and de Carvalho (2018) explored the impact of risk management practices on IT project performance in Brazilian vendor companies, emphasizing the critical role of adequate risk identification and stakeholder satisfaction in project success. In agreement with these studies, the current findings suggest that prioritizing risk management practices, including risk analysis, and control, contributes to better overall performance outcomes and the successful completion of affordable housing projects.

Correlation Analysis

The study computed correlation analysis to test the strength and the direction of the relationship that exists between the dependent and the independent variables. The correlation values range from 0 to 1; if the correlation values are r = ±0.1 to ±0.29 then the relationship between the two variables is small, if it is r = ±0.3 to ±0.49 the relationship is medium, and when r= ±0.5 and above there is a strong relationship between the two variables under consideration. Table 4 presents correlation analysis findings for this study.

Table 4: Correlation Analysis

		Performance	Risk Analysis	Risk Control
Performance of affordable housing projects	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	132		
Risk Analysis	Pearson Correlation	.708**	1	
	Sig. (2-tailed)	.000		
	N	132	132	
Risk Control	Pearson Correlation	.806**	.090	1
	Sig. (2-tailed)	.000	.057	
	N	132	132	132

The correlation analysis reveals a significant positive association between risk analysis and the performance of affordable housing projects ($r = 0.708$, $p < 0.05$). This suggests that projects with comprehensive risk analysis tend to achieve better performance outcomes. This finding is consistent with prior literature emphasizing the importance of thorough risk analysis in project success. For instance, Kinyua, Ogollah, and Mburu (2015) demonstrated in their study on information communication technology (ICT) enterprises in Kenya that effective risk analysis positively influences project performance. Additionally, Amoah and Pretorius (2020) highlighted the significance of robust risk analysis practices in enhancing project performance in small construction firms in South Africa. These studies support the idea that rigorous risk analysis contributes to better decision-making and improved project outcomes, aligning with the observed correlation between risk analysis and project performance.

Moreover, the correlation analysis indicates a strong positive relationship between risk control and the performance of affordable housing projects ($r = 0.806$, $p < 0.05$). This suggests that projects with effective risk control measures tend to exhibit higher performance levels. This finding is consistent with existing literature emphasizing the critical role of risk control in project success. For example, Bukar and Ibrahim (2021) found in their study on the construction industry in Nigeria that robust risk control practices significantly influence project performance. Similarly, Adeusi et al. (2018) demonstrated the importance of effective risk control measures in enhancing the financial performance of Nigerian banks. These studies underscore the significance of proactive risk control in mitigating potential negative consequences and ensuring project success, supporting the observed correlation between risk control and project performance.

Multiple Regression Analysis

Model Summary

The model summary shows the amount of variation in dependent variable that can be explained by changes in independent variables. The model summary provides an overview of the regression model used to analyze the relationship between the predictors (Risk Analysis, and Risk Identification) and the outcome variable (Performance of affordable housing projects). Table 5 presents the findings.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.842[a]	.710	.700	.46476

a. Predictors: (Constant), Risk Analysis, Risk Identification

The R-squared value of 0.710 indicates that approximately 71% of the variance in the performance of affordable housing projects can be explained by the predictors included in the model. This suggests that the combined influence of Risk Analysis, and Risk Identification accounts for a substantial portion of the variation observed in project performance. The adjusted R-squared value of 0.700 indicates the proportion of variance in the outcome variable that is explained by the predictors while adjusting for the number of predictors in the model. This adjusted value is slightly lower than the R-squared value, which suggests that the model may be slightly overfitting the data, but it still indicates a strong overall fit. Overall, the model summary suggests that the combination of Risk Analysis, and Risk Identification variables significantly contributes to explaining the variation in the performance of affordable housing projects in Nairobi city county, Kenya.

Analysis of Variance

The ANOVA table provides information about the overall fit of the regression model and whether the predictors included in the model significantly contribute to explaining the variance in the dependent variable. In this study, the significance of the model was tested at 5% confidence interval. The ANOVA table presents the results of the analysis of variance for the regression model used to assess the relationship between Risk Analysis, and Risk Identification and the performance of affordable housing projects. Table 6 presents summary of the findings obtained.

Table 6: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	67.008	4	16.752	77.555	.000[b]
	Residual	27.432	127	.216		
	Total	94.440	131			

a. Dependent Variable: Performance of affordable housing projects
b. Predictors: (Constant), Risk Analysis, Risk Identification

The F-statistic tests the overall significance of the regression model by comparing the variance explained by the predictors to the unexplained variance. In this model, the F-value is 77.555, with a corresponding p-value (Sig.) of .000. This indicates that the regression model is statistically significant at the 0.05 level, suggesting that at least one of the predictors significantly contributes to explaining the variation in the performance of affordable housing projects. Therefore, the ANOVA results suggest that the regression model, which includes risk analysis, and risk identification as predictors, significantly explains the variation in the performance of affordable housing projects.

Beta Coefficients

Table 7: Beta Coefficients of Study Variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.164	.117		26.948	.000
	Risk Analysis	.317	.070	.448	4.533	.000
	Risk Control	.386	.081	.441	4.779	.000

a. Dependent Variable: Performance of affordable housing projects

The fitted regression model was as follows:

$$Y = 3.164 + 0.317\ X_1 + 0.386\ X_2$$

Risk analysis demonstrates a coefficient (B) of 0.317 with a p-value of .000. This implies that for each unit increase in risk analysis, there is a corresponding increase of 0.317 units in the performance of affordable housing projects. The significant p-value suggests that risk analysis significantly contributes to project performance, consistent with literature highlighting the importance of detailed risk analysis in enhancing project outcomes. Amoah and Pretorius (2020) conducted a study on the impact of risk analysis on project performance in small construction firms, highlighting its role in enhancing project outcomes. Similarly, our findings indicate a significant positive relationship between risk analysis and the performance of affordable housing projects.

Finally, risk control exhibits a coefficient (B) of 0.386 with a p-value of .000. This indicates that for each unit increase in risk control, there is a corresponding increase of 0.386 units in the performance of affordable housing projects. The significant p-value suggests that risk control significantly impacts project performance, in line with literature emphasizing the effectiveness of proactive risk control measures in ensuring project success. Bukar and Ibrahim (2021) focused on investigating the impact of risk control on project performance in the construction industry, emphasizing the effectiveness of proactive risk control measures in ensuring project success. Consistently, our findings demonstrate a significant positive relationship between risk control and the performance of affordable housing projects

Conclusions

Furthermore, the analysis demonstrates that thorough risk analysis enhances project success, innovation, prioritization, strategic planning, positive outcome exploitation, and threat mitigation. This highlights the critical role of analyzing potential risks and opportunities to inform strategic decision-making and enhance project outcomes. From the findings, it was concluded that risk analysis affects performance of affordable housing projects in Nairobi city county, Kenya.

Lastly, the findings indicate that effective risk control measures significantly contribute to project success, resource prioritization, adaptive management, continuous evaluation, tailored mitigation strategies, and resilience enhancement. This emphasizes the importance of implementing proactive risk control measures to minimize the likelihood of negative consequences and ensure the success of affordable housing projects. Based on the findings, the study concludes that risk control affects performance of affordable housing projects in Nairobi city county, Kenya.

Recommendations

Risk Analysis

For risk analysis, it is recommended that project teams invest in robust risk analysis methodologies and tools to systematically evaluate potential risks and opportunities. This includes identifying and prioritizing risks based on their potential impact on project success and developing strategies to exploit positive outcomes while mitigating threats. Regular review and adjustment of risk analysis findings throughout the project lifecycle are also recommended to ensure that risk management strategies remain aligned with project objectives. Furthermore, fostering a culture of innovation and continuous improvement within project teams can facilitate the identification of new opportunities during risk analysis. By implementing these recommendations, affordable housing projects can enhance their resilience to external challenges and improve overall project success.

Risk Control

In terms of risk control, it is recommended that project stakeholders implement proactive risk control measures to mitigate potential negative consequences and ensure project success. This involves categorizing risks based on severity, likelihood, and impact to prioritize resources efficiently and developing tailored mitigation strategies for identified risks. Regular risk assessments and adjustments should be conducted to maintain an adaptive risk management approach, and continuous monitoring of identified risks is essential for timely intervention and response. Moreover, fostering a culture of accountability and ownership among project teams can enhance the effectiveness of risk control measures. By adhering to these recommendations, affordable housing projects can minimize the likelihood of project delays and cost overruns, ultimately improving project outcomes and stakeholder satisfaction.

Recommendations for Further Studies

Further studies should consider expanding the geographical scope beyond Nairobi City County to encompass other regions in Kenya or similar contexts, providing a more comprehensive understanding of risk management practices in affordable housing projects nationwide. Additionally, researchers could explore additional variables such as project governance structures, stakeholder engagement practices, and environmental sustainability measures to complement the analysis of risk management practices. Qualitative research could further elucidate the specific mechanisms through which risk management practices impact project outcomes, while longitudinal studies could track project performance over time.

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