INFLUENCE OF CONTRACTUAL RISK MANAGEMENT ON PERFORMANCE OF HOUSING CONSTRUCTION PROJECTS IN NAIROBI COUNTY KENYA

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ABSTRACT

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%. The general objective of this study was to investigate the influence of contractual risk management on performance of housing construction projects in Nairobi County Kenya. Specifically, the study sought to determine the influence of risk planning on performance of housing construction projects in Nairobi County Kenya, to analyze the effect of risk identification on performance of housing construction projects in Nairobi County Kenya. This study was guided by theory of change, enterprise risk management theory (ERM), uncertainty theory and prospect theory. 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 housing construction projects in Nairobi City County. Since the target population was small, the study used census method. This implies that all the 176 respondents participated in the study. This research used a questionnaire to collect primary data. Before embarking on data collection, relevant approvals were obtained. An introductory letter from the JKUAT, introducing the researcher to relevant authorities for field data collection was first obtained. The pilot study was carried out on 18 respondents. Descriptive statistics was used to analyze the data in frequency distributions and percentages which were presented in tables and figures. Inferential statistics comprised of correlation and regression analysis. The study concludes that risk planning has a positive and significant effect on performance of housing construction projects in Nairobi County Kenya. In addition, the study concludes that risk identification has a positive and significant effect on performance of housing construction projects in Nairobi County Kenya. Based on the findings, the study recommends that the management of housing construction projects should prioritize comprehensive risk planning throughout the project lifecycle. This involves conducting thorough risk assessments early in the planning stages to identify potential threats and opportunities that could affect project timelines, costs, and quality. Further, the study recommends that the management of housing construction projects should implement a robust and proactive risk identification process.

Key Words: Contractual Risk Management, Risk Planning, Risk Identification

Background of the Study

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 (Abderisak, & Lindahl, 2018). 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 (Affare, 2017). 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 (Amoah, & Pretorius, 2020).

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 (Asrat, 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).

Contractual risk management refers to the process of identifying, assessing, and mitigating risks associated with contractual agreements between parties (Bundotich, & Maina, 2020). It involves strategic planning and the implementation of measures to minimize the potential negative impact of uncertainties, disputes, and unforeseen events that may arise during the execution of a contract (Bukar, & Ibrahim, 2021). The goal of contractual risk management is to protect the interests of the parties involved by clearly defining rights, obligations, and responsibilities within the contract. This process includes a thorough analysis of contract terms and conditions, the establishment of effective indemnification and liability provisions, and the consideration of insurance strategies to mitigate financial losses (Bangsgaard, 2019.

According to Kerzner and Kerzner (2017), risk 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) (Callahan, 2019).

According to Munive-Hernandez, Dewhurst, Pritchard, and Barber (2019), 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 (Chapman, 2018). It is therefore essential to assess the influence of contractual risk management on project performance

Kenya is undergoing rapid urban growth accompanied by limited economic growth and restricted land supply. Most of the low and middle income people live in rentals because they are unable to build their own homes. The affordable housing providers have been unable to provide to provide enough housing for low and middle income earners in Nairobi (Mungai, 2017). The annual housing demands in Nairobi stands at 150,000 units while only 23% of this demand is being met. This has forced many Kenyans to live in informal settlements such as slums or remain homeless. These informal settlements are characterized by majorly congestion, poor health conditions and environmental degradation. This has negatively impacted the physical, social and economic welfare of the inhabitants (Mbaluka & Bwisa, 2018).

The government of Kenya under the vision 2030 has endeavored to provide adequate, affordable and quality housing to all its population and more specifically, the low income people. This has been done through the hiring of developers who have the responsibility of offering tax relief to construct houses with a cost of less than KES 1.6 million (USD 18,000) (World bank, 2015).The step to include the right to adequate housing in the 2020 constitution of Kenya gave a clear understanding to the government that it is their responsibility to provide good housing to every Kenyan. The provision of good housing has been further devolved to the county governments to ensure that more people are reached in this project. This means that it is the responsibility of Nairobi City County to provide affordable housing to its residents (Githenya & Ngugi, 2016).

The success of the Kenya's government project to provide affordable housing to all of its population will depend on several aspects of project implementation but majorly, project risk management. Project risk management is an essential phase of a project and it is among the most critical phases because if anything goes wrong with risk management, the whole project implementation process will fail (Nyandika & Ngugi, 2015),various projects that failed in Kenya were as a result of poor risk implementation. Therefore, the purpose of this study is to examine the influence of contractual risk management that influence performance of housing construction projects in Nairobi County Kenya.

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 contractual risk management influences project performance

Various studies regarding projects and implementation of housing construction projects 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 housing construction projects. To fill the highlighted gaps, the current study sought to assess the influence of contractual risk management on performance of housing construction projects in Nairobi County Kenya

General Objective

The general objective of this study was to investigate the influence of contractual risk management on performance of housing construction projects in Nairobi County Kenya

Specific Objectives

The study was guided by the following specific objectives;

i. To determine the influence of risk planning on performance of housing construction projects in Nairobi County Kenya.

ii. To analyze the effect of risk identification on performance of housing construction projects in Nairobi County Kenya.

Theoretical review

Theory of Change

Theory of Change (ToC) developed by Weiss (1995) is a specific type of methodology for planning, participation, monitoring, and evaluation that is used to promote social change. The theory of Change defines long-term goals and then maps backward to identify necessary preconditions. Theory of Change explains the process of change by outlining causal linkages in an initiative. Theory of Change is essentially a comprehensive description and illustration of how and why the desired change is expected to happen in a particular context. It is focused in particular on mapping out or "filling in" what has been described as the "missing middle" between what a program or change initiative does (its activities or interventions) and how these lead to desired goals being achieved (Davies, 2018).

According to Clark and Dana (2018) theory of Change is a specific type of methodology for planning, participation, and evaluation that is used in the philanthropy, non-profit and government sectors to promote social change. Theory of Change defines long-term goals and then maps backward to identify necessary preconditions. Theory of Change explains the

process of change by outlining causal linkages in an initiative, that is, its shorter-term, intermediate, and longer-term outcomes. The links between outcomes are explained by "rationales" or statements of why one outcome is thought to be a prerequisite for another. Theory of Change lies in making the distinction between desired and actual outcomes, and in requiring stakeholders to model their desired outcomes before they decide on forms of intervention to achieve those outcomes. Theory of Change was used to assess the influence of risk planning on performance of housing construction projects in Nairobi County Kenya.
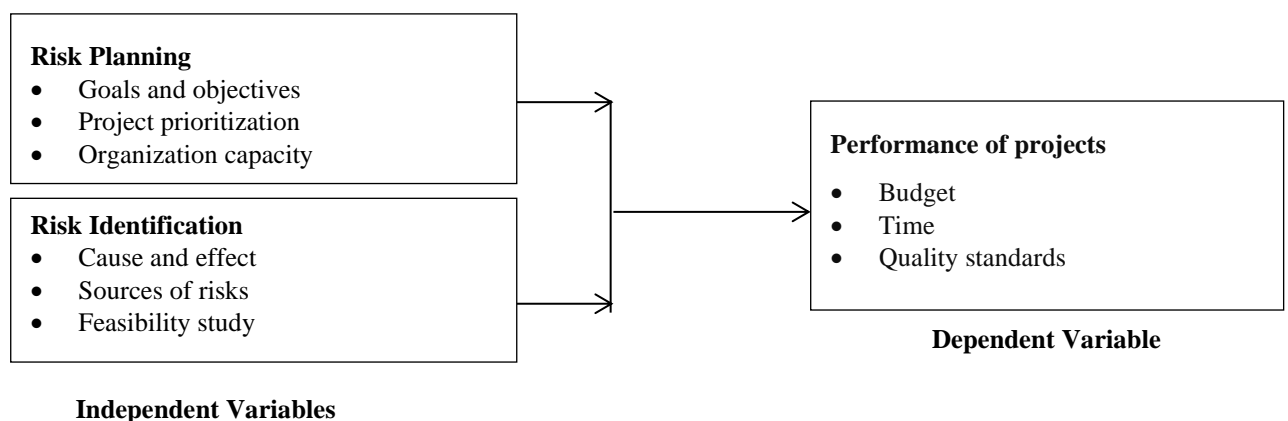
Enterprise Risk Management Theory (ERM)

Enterprise Risk Management Theory, according to Nocco (2006), advocates for the measurement and management of notable risk facing a given entity whole than the management of each risk independently. The primary objective is fundamentally to integrate risk mitigation in the company into a single, comprehensive framework. This theory insists that top management and the other employees ought to be part of risk management process and measuring and reverting to big organizational risks (Hallowell, *et al,* 2013).

According to Olson *el at,* 2010), this theory confirms if ten companies implement procedure and rules which govern appetite of risk, plan of action objectives, well arranged processes, they would enhance capability of managing risks by ascertaining, evaluating, and responding to the risks. This theory emphasis on formation of risk management philosophy that empowers all employees to play part in mitigating risks. Cormican (2015) recommended that ERM activities enhance competitiveness, customer satisfaction and organizational sustainability. Drumll (2001) points out that applications of ERM concept in the construction sector is prudent because it's done to sectors with very high chances of collapsing such as construction sector. This incompetence is brought by not identifying, reduce and hinder risk in the whole organization hence this theory is important to the study.

Enterprise Risk Management (ERM) theory provides a broader framework for managing risks across an organization, including project risk management (Ali *et al*, 2019). In the context of roads construction projects in Kenya, the application of project risk management principles influenced by ERM theory can have a significant impact on project performance. ERM theory promotes a holistic approach to risk management, considering risks at both the organizational and project levels (Alsadi & Norhayatizakuan, 2021). This study used Enterprise Risk Management Theory to establish the effect of risk identification on performance of housing construction projects in Nairobi 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 planning and risk identification while the dependent variable was performance of housing construction projects

Risk Planning
- Goals and objectives
- Project prioritization
- Organization capacity

Risk Identification
- Cause and effect
- Sources of risks
- Feasibility study

Performance of projects
- Budget
- Time
- Quality standards

Dependent Variable

Independent Variables

Risk Planning

In risk planning, establishing clear goals and objectives is essential to guide the risk management process effectively. Goals define the overarching purpose of risk management within the project, such as ensuring project success, safeguarding project resources, and protecting stakeholders' interests. Objectives, on the other hand, specify the specific outcomes or targets that the risk management process aims to achieve, such as reducing the likelihood or impact of identified risks, enhancing opportunities for project success, and ensuring compliance with relevant regulations or standards. By defining clear goals and objectives, project stakeholders can align their efforts and resources towards mitigating risks and achieving desired project outcomes (Nguru & Kaburu, 2023).

Project prioritization involves assessing and ranking risks based on their potential impact on project objectives, resources, and stakeholders. This process helps project teams focus their attention and resources on addressing the most significant risks that pose the greatest threat or opportunity to project success. Prioritization criteria may include factors such as the severity of the risk, the likelihood of occurrence, the potential impact on project scope, schedule, cost, and quality, and the availability of resources or expertise to mitigate the risk effectively. By prioritizing risks, project teams can allocate resources strategically, develop targeted risk response strategies, and maximize the likelihood of achieving project objectives while minimizing exposure to potential threats (Alsaadia & Norhayatizakuan, 2021).

Organization capacity refers to the collective capabilities, resources, and processes within the project organization that enable effective risk management. This includes factors such as the availability of skilled personnel, financial resources, technological tools, and organizational structures and processes for identifying, assessing, and responding to risks. Assessing organization capacity involves evaluating the organization's readiness and ability to manage risks effectively, identifying any gaps or limitations that may impede risk management efforts, and developing strategies to address these gaps. By enhancing organization capacity, project teams can build resilience, improve risk management practices, and increase their ability to adapt to changing project conditions and uncertainties effectively (Bissah & Nkrumah, 2021).

Risk Identification

In risk identification, understanding the cause-and-effect relationships underlying potential risks is crucial for accurately assessing their likelihood and impact. This involves identifying the root causes or drivers that may lead to the occurrence of risks and understanding how these causes can propagate through the project system to produce various effects (Niyonizera, 2021). Cause-and-effect analysis helps project teams trace potential risks back to their underlying factors or triggers, enabling them to address the root causes and develop targeted risk mitigation strategies. By identifying the causes and effects of risks, project teams can anticipate potential vulnerabilities and proactively implement measures to prevent or mitigate their impact on project objectives (Gyamfi, Pratt & Nana-Addy, 2018).

Identifying sources of risks involves identifying the specific events, conditions, or factors that may give rise to risks within the project environment. These sources can vary widely depending on the nature of the project, its context, and the stakeholders involved. Common sources of risks may include technical uncertainties, changes in project scope or requirements, resource constraints, environmental factors, market volatility, regulatory changes, and human factors such as errors, conflicts, and communication breakdowns. By systematically identifying sources of risks, project teams can broaden their understanding of potential threats and opportunities, enabling them to develop comprehensive risk management strategies that address a wide range of contingencies (Bukar & Ibrahim, 2021).

Conducting a feasibility study as part of risk identification involves assessing the viability and practicability of project objectives, plans, and strategies in light of potential risks and uncertainties. This involves evaluating the feasibility of project goals and objectives in terms

of technical, economic, operational, legal, and scheduling constraints, as well as considering potential risks that may impact project feasibility. A feasibility study helps project teams identify potential risks that may affect project success or viability, enabling them to make informed decisions about project initiation, planning, and execution. By conducting a feasibility study as part of risk identification, project teams can assess the likelihood of achieving project objectives and identify potential barriers or challenges that may need to be addressed to ensure project success (Ebole & Nyang'au, 2021).

Empirical Review

Risk Planning and Project Performance

Algremazy, *et, al* (2023) researched on the effect of risk management practices on project performance: a case study of the Libyan construction industry. Quantitative methodology was used in the study. The population comprised 450 building construction. The study found that risk management practices had substantial and favourable effects on the success of the project's execution. The study concluded that RMP-RI, RMPRA has a positive impact and significant on construction projects' performance.

Butt, *et, al* (2021) investigated on the effect of risk management at project planning phase on performance of construction projects in Pakistan. The study utilized quantitative examination plan. The target population was enlisted engineers, project chiefs and experts identified with development industry in Pakistan. The study found that there is strong positive relation between risk identification, engineer or architect selection and project performance and there is a weak positive relation between sit selection, preliminary schedule and budget and project performance. The study concluded that risk identification, engineer or architect selection, sit selection, preliminary schedule and budget are positively related to project performance.

Abdulai and Owusu-Manu (2022) conducted a study on the project risk management and construction performance: a Ghanaian study. The study used cross-sectional design. The target population was 96 construction professionals were chosen from contractors, project managers and site managers. The study found that risk management practices within construction projects are not actively conducted and project professional utilized qualitative tools and techniques then quantitative tools, in that decision-making process is centered at the top-level management. The study also found that selecting risk management tools and techniques have a positive influence on project performance. The study concluded that there is a positive relationship between quantitative and integrated risk management tools and techniques and construction projects performance and qualitative tools and techniques have a negative relationship with construction project performance.

Mukeshimana, *et, al* (2022) researched on the effect of project planning practices on improving project performance in Rwanda. a case of Huguka Dukore Akazi Kanoze project in Nyabihu district. Descriptive-analytical research design was used in this study. The target population was 123 people. The study found that there is strong relationship between project scope planning, cost planning, human resource planning as project planning practices and project performance. The study concluded that there is positive effect of project planning practices on project performance.

Otieno and Mutiso (2021) investigated on the influence of project risk management on performance of agricultural projects in Nakuru County; Kenya. Descriptive research design was used in the study. The target population was 219 agricultural projects distributed across the 11 sub-counties in Nakuru County, Kenya. The study found that risk identification and risk assessment have a significant influence on performance of agricultural projects. The study concluded that risk identification and risk assessment has a positive influence on performance of agricultural projects.

Risk Identification and Project Performance

Khang, *et, al* (2018) conducted a study on the current practice of risk management in the Malaysia construction industry–the process and tools/techniques. The study used Extensive and intensive literature review. The target population was industrial practitioners. The study found that only simple tools and techniques are used to identify, analyze, respond, and monitor the risks and the frequency of use of these tools is also found to be very low. The study concluded that conclude that the level of risk management practices in Malaysian construction companies are relatively low and lacks in knowledge on the subject.

Mohammad, Iqbal and Shakil (2017) investigated on the identification of risk factors associated with Pakistan's construction industry project manager perspective. The study used quantitative descriptive approach. The target population was project managers. The study found that if financing is enough then risk of any kind can be handled while without it every kind of expertise is useless. The study concluded that the most important group for project success or failure is Design group on which project heavily depends upon.

Bransa (2020) researched on the discovering project risk management practices in construction industry of Ghana. The study used literature review and structured questionnaires. The target population was 60 contractors. The study found that contractors mostly refer to previous and on-going similar projects for accurate program as the most effective used method for risk prevention. Close supervision of subordinates also has the most used remedial method in addressing risk factors in construction. The study concluded that the identified risks have significant effects on construction projects.

Novile (2022) investigated on the effect of risk management on rabbit project success: a case of Rabbit Ltd Rwanda. The study adopted a descriptive survey research design. The target population for this study was 80 staffs from Rabbit LTD. The study found that there is a strong relationship between risk management and the project success of Rabbit project. The study concluded that there is a considerable contribution of Rabbit Project success of workers in Rwanda.

Gathigia and Wairimu (2023) conducted a study on the risk management practices and performance of infrastructural projects in Nakuru County, Kenya. The study adopted a cross-sectional survey design. The unit of observation was 201 project managers of the infrastructural projects. The study found a strong significant relationship between risk mitigation, risk control and project performance. The study concluded that good loss prevention and control practices enhance project performance.

RESEARCH METHODOLOGY

Research Design

Cross-sectional survey design gives a clear image of the patterns and is useful at a particular point in time to monitor current research population circumstances, characteristics and their opinion. A cross-sectional survey also describes the prevalence of a given attribute in a specified population at a particular time point. The choice of this design is suitable for this study since it makes use of a questionnaire as a data collection tool. It is also suitable for this research, as it thoroughly test the relationship among variables. Other researchers who have successfully utilized a cross-sectional survey design include (Wambua, 2017; Nyambura, 2018).

Target Population

This study targeted affordable housing projects in Nairobi City County. The Boma Yangu platform is the gateway into the Affordable Housing Program. Statistics shows that seven ongoing affordable housing projects are set to produce 31,990 units in Nairobi. The first project which was launched in October 2022 was Kibra's Soweto B. The study targeted a total of 176

respondents comprising of projects managers and site engineers in charge of the seven ongoing housing construction projects in Nairobi City County.

Sample Size and Sampling Technique

A sampling technique refers to the method or approach used to select a subset of individuals or units from a larger population for the purpose of a research study or survey. Sampling is a critical step in the research process, as it allows researchers to draw inferences about the entire population based on observations from a smaller, more manageable sample (Rotich, 2016). Since the target population was small, the study used census method. This implies that all the 176 respondents participated in the study.

Data Collection Instruments

This research used a questionnaire to collect primary data. According to Patton *et. al* 2016, a questionnaire is appropriate in gathering data and measuring it against a particular point of view. It provides a standardized tool for data collection. The researcher obtained research permit from relevant authorities required for data collection. Structured and open questions were used to collect primary data from the field. The questionnaires were pilot tested to ascertain the extent to which the instrument is correct and to eliminate ambiguous questions, and improve on validity and reliability

Pilot Study

According to Bashir, (2018), validity refers to the extent to which a test measures what it is supposed to measure and the extent to its truthfulness, accuracy, authenticity, genuineness, or soundness, whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure. The pilot study was carried out on 18 respondents who are sufficient based on Glesne (2015) who stated that 10% of the population is adequate to constitute the pilot test size.

Data Analysis and Presentation

This study collected both quantitative and qualitative data. 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. The choice of the software is influenced by its ability to appropriately create graphical presentation of questions, data reporting, presentation and publishing. SPSS is also able to handle large amount of data and it is purposefully designed for social sciences.

Descriptive statistics was used to analyze the data in frequency distributions and percentages which were presented in tables and figures. Discussions and presentations of the analyzed data was done in tables of frequency distribution, percentages, bar graphs and pie charts. Measures of dispersion were used to provide information about the spread of the scores in the distribution. The study also adopted multiple regression analysis to test the relationships between the variables.

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

Descriptive Statistics Analysis

Risk Planning and Project Performance

The first specific objective of the study was to determine the influence of risk planning on performance of housing construction projects in Nairobi County Kenya. The respondents were requested to indicate their level of agreement on various statements relating risk planning and performance of housing construction projects in Nairobi County Kenya. The results were as presented in Table 4.1.

From the results, the respondents agreed that potential risks in housing construction projects are systematically identified and assessed during the planning phase (M=3.968, SD= 0.636). In addition, the respondents agreed that there are effective risk mitigation strategies in place for housing construction projects (M=3.830, SD=0.972). Further, the respondents agreed that regular risk assessments are conducted throughout the lifecycle of housing construction projects (M=3.712, SD= 0.705). The respondents also agreed that the organization has a comprehensive risk management plan specific to housing construction projects (M=3.710, SD= 0.608). In addition, the respondents agreed that stakeholders are regularly informed about potential risks and mitigation strategies in housing construction projects (M=3.697, SD=0.873). Further, the respondents agreed that contingency plans are developed and ready to be implemented for identified risks in housing construction projects (M=3.684, SD=0.798).

Table 4. 1: Risk Planning and Project Performance

	Mean	Std. Deviation
Potential risks in housing construction projects are systematically identified and assessed during the planning phase.	3.968	0.636
There are effective risk mitigation strategies in place for housing construction projects.	3.830	0.972
Regular risk assessments are conducted throughout the lifecycle of housing construction projects.	3.712	0.705
The organization has a comprehensive risk management plan specific to housing construction projects.	3.710	0.608
Stakeholders are regularly informed about potential risks and mitigation strategies in housing construction projects.	3.697	0.873
Contingency plans are developed and ready to be implemented for identified risks in housing construction projects.	3.684	0.798
Aggregate	**3.767**	**0.765**

Risk Identification and Project Performance

The second specific objective of the study was to analyze the effect of risk identification on performance of housing construction projects in Nairobi County Kenya. The respondents were requested to indicate their level of agreement on various statements relating to risk identification and performance of housing construction projects in Nairobi County Kenya. The results were as presented in Table 4.2.

From the results, the respondents agreed that potential risks are systematically identified during the initial planning stages of housing construction projects (M=3.818, SD= 0.664). In addition, the respondents agreed that a thorough risk identification process is conducted before the commencement of housing construction projects (M=3.779, SD=0.858). Further, the respondents agreed that project teams are trained to recognize and report potential risks throughout the duration of the housing construction project (M=3.755, SD= 0.902). The respondents agreed that stakeholders are involved in the risk identification process to ensure comprehensive coverage of potential risks (M=3.688, SD=0.910). In addition, the respondents agreed that regular meetings are held to review and update the list of identified risks in housing construction projects (M=3.675, SD=0.841). Further, the respondents agreed that risk identification tools and techniques (such as checklists, brainstorming sessions, and risk assessments) are effectively utilized in housing construction projects (M=3.662, SD=0.762).

Table 4. 2: **Risk Identification and Project Performance**

	Mean	Std. Deviation
Potential risks are systematically identified during the initial planning stages of housing construction projects.	3.818	0.664
A thorough risk identification process is conducted before the commencement of housing construction projects.	3.779	0.858
Project teams are trained to recognize and report potential risks throughout the duration of the housing construction project.	3.755	0.902
Stakeholders are involved in the risk identification process to ensure comprehensive coverage of potential risks.	3.688	0.910
Regular meetings are held to review and update the list of identified risks in housing construction projects.	3.675	0.841
Risk identification tools and techniques (such as checklists, brainstorming sessions, and risk assessments) are effectively utilized in housing construction projects.	3.662	0.762
Aggregate	**3.730**	**0.823**

Correlation Analysis

This research adopted Pearson correlation analysis determine how the dependent variable (performance of housing construction projects in Nairobi County Kenya) relates with the independent variables (risk planning and risk identification).

Table 4. 3: Correlation Coefficients

		Project Performance	Risk Planning	Risk Identification
Project Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	156		
Risk Planning	Pearson Correlation	.820**	1	
	Sig. (2-tailed)	.003		
	N	156	156	
Risk Identification	Pearson Correlation	.830**	.297	1
	Sig. (2-tailed)	.000	.060	
	N	156	156	156

From the results, there was a very strong relationship between risk planning and performance of housing construction projects in Nairobi County Kenya (r = 0.820, p value =0.003). The relationship was significant since the p value 0.003 was less than 0.05 (significant level). The findings are in line with the findings of Algremazy, *et, al* (2023) who indicated that there is a very strong relationship between risk planning and project performance.

Moreover, there was a very strong relationship between risk identification and performance of housing construction projects in Nairobi County Kenya (r = 0.830, p value =0.000). The relationship was significant since the p value 0.000 was less than 0.05 (significant level). The findings are in line with the findings of Khang, *et, al* (2018) who indicated that there is a very strong relationship between risk identification and project performance.

Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (risk planning and risk identification) and the dependent variable (performance of housing construction projects in Nairobi County Kenya).

Table 4. 4: **Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.875[a]	.766	.767	.10482

a. Predictors: (Constant), risk planning and risk identification

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0.766. This implied that 76.6% of the variation in the dependent variable (performance of housing construction projects in Nairobi County Kenya) could be explained by independent variables (risk planning and risk identification).

Table 4. 5: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	102.028	2	51.014	280.30	.002[b]
Residual	13.668	151	.091		
Total	115.695	155			

a. Dependent Variable: performance of housing construction projects in Nairobi County Kenya

b. Predictors: (Constant), risk planning and risk identification

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 280.30 while the F critical was 2.432. The p value was 0.002. Since the F-calculated was greater than the F-critical and the p value 0.002 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of risk planning and risk identification on performance of housing construction projects in Nairobi County Kenya.

Table 4. 6: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.345	0.090		3.833	0.001
risk planning	0.355	0.091	0.354	3.901	0.001
risk identification	0.371	0.095	0.370	3.905	0.000

a Dependent Variable: performance of housing construction projects in Nairobi County Kenya

The regression model was as follows:

$Y = 0.345 + 0.355X_1 + 0.371X_2 + \varepsilon$

According to the results, risk planning has a significant effect on performance of housing construction projects in Nairobi County Kenya $\beta_1=0.355$, p value= 0.001). The relationship was considered significant since the p value 0.001 was less than the significant level of 0.05. The findings are in line with the findings of Algremazy, *et, al* (2023) who indicated that there is a very strong relationship between risk planning and project performance.

The results also revealed that risk identification has a significant effect on performance of housing construction projects in Nairobi County Kenya, $\beta_1=0.371$, p value= 0.000). The relationship was considered significant since the p value 0.000 was less than the significant

level of 0.05. The findings are in line with the findings of Khang, *et, al* (2018) who indicated that there is a very strong relationship between risk identification and project performance.

Conclusions

The study concludes that risk planning has a positive and significant effect on performance of housing construction projects in Nairobi County Kenya. Findings revealed that goals and objectives, project prioritization and organization capacity influence performance of housing construction projects in Nairobi County Kenya.

In addition, the study concludes that risk identification has a positive and significant effect on performance of housing construction projects in Nairobi County Kenya. Findings revealed that cause and effect, sources of risks and feasibility study influence performance of housing construction projects in Nairobi County Kenya.

Recommendations

The study recommends that the management of housing construction projects should prioritize comprehensive risk planning throughout the project lifecycle. This involves conducting thorough risk assessments early in the planning stages to identify potential threats and opportunities that could affect project timelines, costs, and quality.

Further, the study recommends that the management of housing construction projects should implement a robust and proactive risk identification process. This involves systematically identifying and analyzing potential risks at various stages of project development, from initial planning to completion

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