

**INFLUENCE OF PROJECT RISK MANAGEMENT PRACTICES ON
COMPLETION OF ROAD PROJECTS IN NAKURU COUNTY, KENYA**

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REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
SCIENCE IN PROJECT MANAGEMENT
OF
MOUNT KENYA UNIVERSITY**

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DECLARATION AND APPROVAL

This study project is entirely unique with no submissions to other universities for review.

Signed:



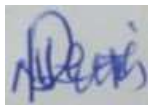
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DEDICATION

A dedication to my beloved mother, Lydia Tirop and Brother Victor Ng'etich for their love, care, and support during my academic journey



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I express my gratitude to the Almighty God for bestowing upon me the fortitude, well-being, and discernment necessary to finish this study. I thank my supervisor, **Dr. Ruth Winnie Munene**, for all her help with this research endeavor. I appreciate her constructive criticism, perseverance, knowledge, and encouraging guidance. I want to thank my son Enzo Berur Koech and my mother Lydia Tirop for their support and affection during this whole journey.



ABSTRACT

This study aimed to explore the impact of project risk management practices on the completion of road projects in Nakuru County, Kenya. Specifically, it examined how risk identification, risk analysis, risk response, and risk control practices influence the completion of these projects. The research was grounded in three theoretical frameworks: the enterprise risk management theory, the contingency theory, and the prospect theory. A descriptive survey study design was utilized to gather data. The study involved 98 respondents, including engineers, risk managers, subcontractors, and contractors involved in seven different road construction projects overseen by the Nakuru County government. To collect primary data, standardized questionnaires were used. The pilot test was done by the Kericho County Government to assess the research tool's validity and dependability. SPSS version 24 was used to analyze the collected data. The results of descriptive statistics were given as percentages, means, standard deviations, and tables. To determine the relationship between the variables, regression and correlation studies were conducted. Based on the findings, the study found that project risk identification has an influence on subsequent completion of road construction projects in Nakuru county ($r=0.533$, $p=0.000$). There is a positive and substantial association between project risk analysis and subsequent completion of road construction projects in Nakuru County ($r=0.531$, $p=0.000$). There was a positive statistically significant link between project risk responses and sequential completion of road construction projects in Nakuru County ($r=0.219$, $p=0.002$). There was a statistically significant association between project risk control and the completion of road construction projects in Nakuru County ($r=0.269$, $p=0.004$). This demonstrated that project risk identification, risk analysis, risk response, and risk control all had an impact on the timely completion of road building projects in Nakuru County, Kenya. This study suggests that all these factors should be considered for effective road construction projects. The report recommends that additional research be performed on project risk management strategies, how they are employed in capital projects, and how they affect project success.

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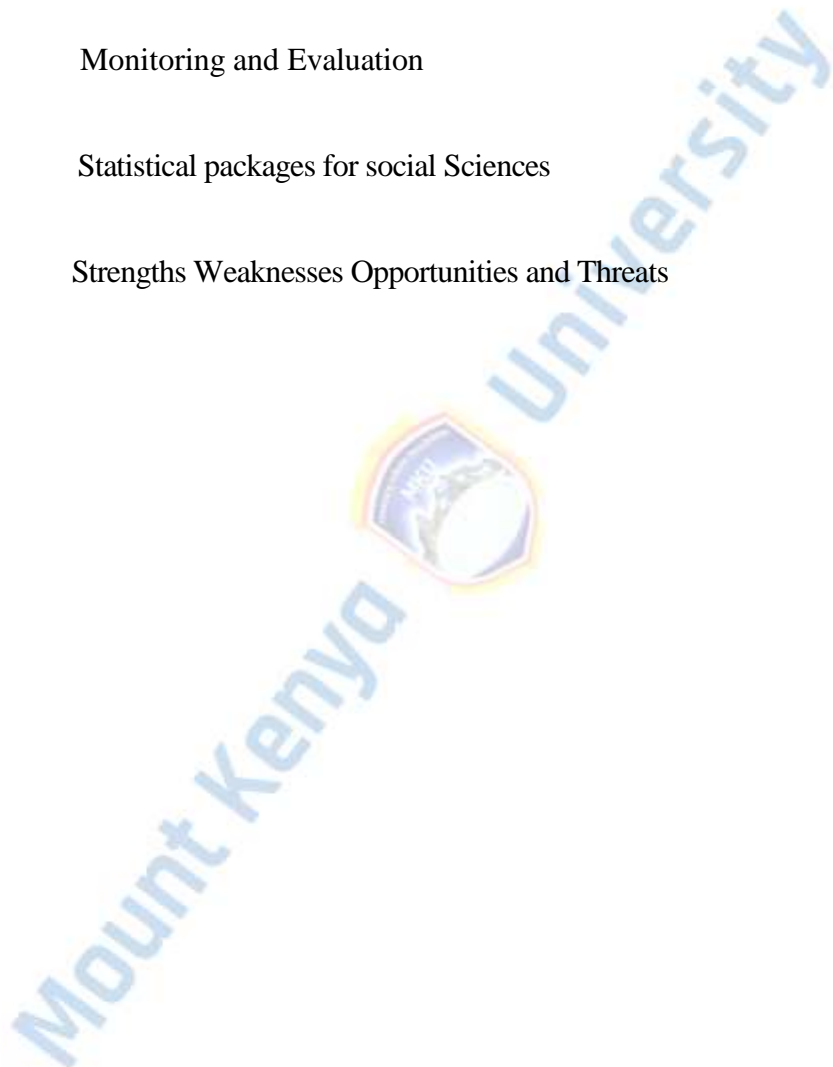
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ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|--|
| APA: | America Psychology Association |
| COSO: | Committee of Sponsoring Organizations |
| M&E: | Monitoring and Evaluation |
| SPSS: | Statistical packages for social Sciences |
| SWOT: | Strengths Weaknesses Opportunities and Threats |



CHAPTER ONE

INTRODUCTION

1.1 Study Background

Construction of road projects is contemplated as among the most supportive and essential pillars for business environment in an economy (Pimchangthong & Boonjing, 2017). Nevertheless, the road construction projects continue to brawl to attain the ideal implementation level.

1.1.1 Global perspective

China has heavily invested in mega construction projects including the underwater railway tunnels but most of them have remained unsuccessful. For instance, since 2011, a total of 8 constructed bridges in China have collapsed in the country resulting into significant loss of human life. In 2015, the Yangmingtan bridge project in China that was valued at \$300 million collapsed (Langfitt, 2017). In India, the face a major problem of inability to implement construction projects at the required paced resulting into a backlog of these projects. Currently, a total of 218 construction projects have been delayed India and the government is facing the challenge of clearing their approval (Nallathiga, Shaikh & Sheik, 2019).

In Pakistan for instance, failure of infrastructure construction project is a common occurrence as illustrated by the collapse of Sher shah Bridge in Karachi (Wasima & Khalidi, 2018). In Jordan, most of the construction projects have remained unsuccessful contributed to by internal system hierarchy particularly from the perspective of the contractors (Khlaifat,

Alyagoub, Sweis & Sweis, 2019). Evidence from Iran indicates that 597 thousand billion Rials was invested in construction projects in 2015, although 80% of these projects were unsuccessful while others reported time and cost overruns (Shahhossein, Afshar & Amiri, 2018). Additionally, the Research Center of the parliament of Iran reported that the unfinished construction projects have negatively impacted on the annual economy of Iran by costing the state above 200 thousand billion Rials which is close to 30% of the development annual budget of the country.

1.1.2 Regional perspective

Africa views the improvement of its infrastructure as essential to the continent's economic progress. It makes greater productivity possible, lowers poverty, and improves human welfare. Consequently, it is believed that infrastructure development is a key component that can affect the accomplishment of the Millennium Development Goals (MDGs). Infrastructure investment is responsible for more than half of Africa's recent economic growth (Birdsall, 2018). More investments in this field could lead to greater success. The World Bank (2018) claims that raising the caliber and quantity of infrastructure to match the world's top-performing nations may boost GDP, raise living standards, and promote greater equality throughout Africa.

In order to raise a substantial amount of money to build roads, clinics, and dams throughout Africa, Ghana's government has been pleading with the World Bank and the African Development Bank (Damoah & Akwei, 2017). The major emphasis of the past national budgets of Ghana has been on funding construction projects. However, in spite of all these efforts made by the Ghanaian government to support and invest in these construction

projects, success of these project has remained a challenge (Damoah & Akwei, 2017, and Damoah & Kumi, 2018). Nigeria is one the countries in Africa that has a high number of abandoned, failed and ongoing construction projects presently (Obebe, Kolo, Enagi, & Adamu, 2020). Some of these unsuccessful construction projects in Nigeria include the Lagos-Calabar Railway Project (estimated at \$11billion USD), Mambilla hydroelectric power plant project (valued at \$5.8 billion), Ibeju Lekki Deep Seaports (valued at \$1.2 billion) with an expected completion by 2021, the Lagos–Ibadan standard gauge rail line (valued at \$2.1billion USD), Baro Inland Port Project (valued at N5.8 billion) (Obebe et al., 2020).

In South Africa, rarely are infrastructure construction projects successfully completed without undergoing some challenges and constraints that lead to cost and time overruns leading of incompleteness or poor quality of the final output (Mugumbate & Kruger, 2021). This challenge has been ongoing especially in public sector leading to failure of construction projects at local, provincial and national government levels (Mugumbate & Kruger, 2021). In Uganda, most infrastructure construction projects have remained uncompleted at varied stages while others have been marked as whiteprint or blueprint and never implemented (Otim, Alinaitwe, Tindiwensi & Kerali, 2015).

According to the literature that is currently accessible, project risk management techniques help infrastructure construction projects succeed (Alsaadi & Norhayatizakuan, 2021). Risk identification helps in establishment and categorization of risk whose materialization would have significant adverse implication on the project (Mutunga & Ondara, 2021). Using qualitative and quantitative methodologies, risk analysis aims to identify risks individually or collectively so that they can be prioritized based on the project team's appetite for risk

(Maritim & Chelule, 2018). The project team may identify and choose the best course of action to handle risks with the aid of risk response (Imbrizi & Mazieri, 2018). This is characterized by reactivity or reactivity towards risks by the project team. Risk control helps in monitoring the actions put in place for mitigation and undertake reassessment of the already known and the new risks that may emerge as the project progresses in the lifecycle (Aduma & Kimutai, 2018).

After complete failure and collapse of Somalia in 1991, infrastructure development in the country was adversely affected. However, since 2012, an internationally recognized government has been in place. Many areas including Galmudug State were adversely affected in terms of road development by the decades of civil war. In effort to realize economic recovery, the government of Somalia in collaboration with international partners has been working to implement infrastructure construction projects aimed at opening up the country and spurring trade. The implementation of these road construction projects in Somalia is critical towards the economic recovery efforts (BTI, 2022).

1.1.3 Local perspective

Since implementing its Vision 2030 plan, Kenya has given infrastructure development a high priority, among other things. In addition to creating a favorable economic climate, Vision 2030 seeks to establish and maintain Kenya's middle-income position (Government of Kenya, 2018). Assuring food security, offering universal healthcare, advancing manufacturing through industrialization, and providing cheap housing are the four main goals of Kenya's current Big Four Development Agenda. Appropriate and high-quality road infrastructure is needed to do this.

The Ministry of Roads and Transport's Infrastructure State Department oversees Kenya's road network (MoRT). The department's job is to build and maintain the nation's road network. It carries out its mandate through the Kenya Roads Board (KRB), which uses fuel levies to finance, supervise, and plan all road network upkeep in Kenya; Kenya Rural Roads Authority (KeRRA) is responsible for managing, developing, and maintaining Class C roads; Kenya National Highways Authority (KeNHA) oversees, develops, and maintains national trunk roads, which are classed as Class S, A, and B roads; Kenya Wildlife Service (KWS) is responsible for managing, developing, and maintaining roads located within game reserves and national parks. Kenyan County Governments are in charge of managing, developing, and maintaining County Roads, which are roads classified below class C. (Kenya Roads Board,) Similar to other counties, the county administration of Nakuru has benefited from these efforts by implementing several projects inside the county. The county's numerous road agencies, including KeNHA, KURA, KeRRA, and the County Government, have completed several projects and are working on others.

1.1.4 Project Risk Management Practices

A project is a brief activity started with the intention of producing a special good, service, or outcome (PMBOK 2020). Planning, organizing, and managing resources are all part of project management, which helps to accomplish the aims and objectives of the endeavor. The most difficult aspect of project management is achieving all project goals and objectives while remaining cognizant of project restrictions. Time, money, and scope are common constraints. The secondary and more ambitious aim is to optimize the allocation and integration of the inputs required to achieve the set objectives. Le, Chong, and Kashiwagi (2020) define risk as the likelihood of being exposed for profit or cost multiplied by the

corresponding size. The PMBOK (2020) defines risk as an unanticipated event or scenario that, if realized, could have a positive or negative impact on the project's aims. Aven (2016) underlines the importance of including opportunity management into all risk management procedures.

The process of carrying out risk management planning, identification, analysis, reactions, monitoring, and control on a project is included in project risk management (PMBOK, 2020). Over the past few decades, the field of project risk management has grown and become a crucial component of project management. Numerous scholars, including Mohan & Tan-Mullins (2019) and Foulger, Wilson, Gluyas, Julian, & Davies (2018), contend that risk is an exposure to the likelihood of suffering a loss. Risk can have both positive and negative implications depending on the context in which it is used. Risk management procedures entail recognizing, comprehending, and calculating the possible unfavorable results that could have an impact on a project. Following the discovery of these undesirable occurrences, the risks are assessed according to their impact and likelihood. Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis, probability/impact matrices (Risk matrices), and the top ten risk item tracking approach Godfrey, (2022) are tools used in risk assessment. Following analysis, risks are prioritized or classified according to how important they are to a given project.

A five-point rating system for risk assessment can be used to rank probability and impact, according to Qazi & Simsekler (2021). The levels of risk are critical, serious, moderate, minor, and inconsequential. Mitigation, transfer, acceptance, and avoidance are all part of risk control and response. Positive risks are shared, increased, and exploited (PMBOK, 2020). Hazards are assessed and reevaluated on a regular basis with the goal to identify new

hazards and assess the effectiveness of risk management and solutions. Rehacek (2017) identifies five project risk management strategies, including probabilistic risk analysis, which evaluates the possibility of a risk occurring and its potential consequences; methodical risk verification through documentation reviews and information-gathering methods such as interviews and SWOT analysis; Uncertainty planning to reduce the possibility and/or impact of a negative risk occurrence to a tolerable level; methodical trade-off analysis that results in a comprehensive risk response plan; and the assignment of a risk manager.

1.1.5 Success of a Project

Typically, a project's success is decided by its requirements, budget, and timeline. This criterion is still often used in reports on project performance in IT projects, despite widespread criticism (Royal Academy of Engineering, 2017). The critique focuses on three aspects related to the fundamental presumptions of this definition: the task's accomplishment can be measured at the moment it produces its outputs; the initiative's fulfillment can be determined at the start of the project, regardless of the amount of effort, resources, or requirements; and all participants in the project can contribute equally to the project's completion. Establishing time and budgetary restrictions, as well as requirements, is always done at the start of an undertaking, when unpredictability is at its peak (Ika & Pinto, 2022) and it is practically impossible to set appropriate goals and constraints.

A project is considered successful, according to Castro, Bahli, Barcaui, and Figueiredo (2021), provided it stays within the three constraints of time, money, and specifications. Adequate feasibility assessments, commitment to project procedure, preparation, successful oversight, and inspection are just a few of the success factors in a project. The main

performance metrics are project sickness (the project's ability or inability to provide the intended outcomes) and time and expense overruns. The focus is mostly on the results. Rabechini & Carvalho (2015). When a project is finished on schedule, on budget, to the satisfaction of all stakeholders, and in compliance with the specifications, it is often considered successful.

According to Ola-awo, Alayande, Olarewaju, and Oyewobi (2021), other markers of project success include working correctly, contractor revenue, the absence of lawsuits and court proceedings, and "fitness for mission." Alemayhu (2023) states that the three transaction criteria of time, money, and quality determine a project's success. Completion within the constraints of time, money, and quality will be just as important as completion itself in terms of success. The majority of projects in Kenya encounter a number of difficulties, such as completion delays, cost revaluations that increase, subpar craftsmanship, and early project termination. The researchers, consumers, funding bodies, contractors, and other interested parties are deeply worried about the recurring reports of delays and cost increases for major public-sector projects in Kenya. These occurrences raise severe concerns about the government's capacity to deliver value for taxpayers' money.

Major projects at KAA have not been finished on schedule, within budget, or in accordance with quality and design criteria, which is another example of this issue. As a result, contractors must obtain time extensions (EoT), price variations, &/or modification requests for the purpose to complete projects and cover the costs associated with scope revisions. While many project deliverables fail during the project liability period, in some cases they fail before being turned over to the project sponsor. According to Ashill, Naumann, and Jackson (2015), acknowledging big risks at each step of the development process and

devising plans to deal with the whole range of potential outcomes increases the likelihood of a project's success. According to Xia Zou, Griffin, Wang, and Zhong (2018), risk management helps ensure that projects succeed because stakeholders modify their expectations and behavior based on their awareness of potential hazards.

1.2 Problem Statement

It is really concerning how frequently road building projects fail worldwide. Statistics from Global Data indicate that in Latin America, most infrastructure construction projects are characterized by cancelations and delays (Data Journalism Team, 2022). Information from North Korea provide evidence that unsuccessful completion of road construction projects is a global challenge with Ryugyong Hotel, the seventh largest building in the world whose construction started in 1987 although it has remained uncompleted, and it is no even likely to be successfully completed any sooner (Dolan, 2020). This has been attributed to high costs required towards its successful implementation.

Road construction projects initiatives are crucial for each nation's economic development. A significant proportion of revenue of the government is spent on these Infrastructure construction projects, and this holds in countries like Kenya. Notwithstanding, failure of these road construction projects is a waste of public resources that would otherwise have been spent on other alternatives for economic prosperity. It remains a fact that countries around the world including Kenya have initiated infrastructure construction projects that have not been successfully implemented or completed. In developing countries like Kenya,

The government has prioritized the timely, cost-effective, and standard-compliant completion of construction projects, and risk management compliance is necessary to meet

project performance expectations. According to Hillson & Simon (2020), the Kenya Rural Roads Authority faces financial risks and political intervention when building roads, which might hinder the project's completion. Project management requires the application of risk management techniques. According to Qazi, Quigley, Dickson, and Kirytopoulos (2016), minimizing construction project risks is essential for the success of any project, and mitigating project risks is one of the most significant components of project management success. To achieve construction project performance, project managers in Kenya have incorporated risk management approaches, recognizing risks, analyzing them, and risk planning. Mbugua and Otuya, (2020). Although risk management techniques are used by top management, less is known about how much of a factor risk management play in Kenyan construction projects' success or failure.

The ongoing road construction projects in Nakuru include Molo-Kibunja (Ksh.478 million), Salgaa-Rongai (Ksh.252.5 million), Subukia-Shrine (Ksh.241 million), Mau-Summit – Junction (Ksh.199 million), Maili Kumi-Nyahururu (Ksh.195.3 million) and Maraigishu-Kinungi (Ksh.41 million) and Mang'u-Berer (Ksh.40 million). A lot of people in the academic and professional spheres believe that risk management plays a significant role in project success. Researchers, project sponsors, contractors, and other stakeholders are deeply worried about the frequent instances of project delays, cost overruns, poor workmanship, and premature termination of significant government projects in Kenya. These flaws raise major concerns and cast doubt on the government's capacity to offer value for taxpayer dollars. To overcome these gaps, the study sought to examine how risk mitigation strategies influence the sequential completion of road building projects in Nakuru County, Kenya.

1.3 Study Purpose

The purpose of the research was to establish how project risk management practices influence successive completion on road construction projects in Nakuru county, Kenya.

1.4 Objectives

- i. To assess the influence of project risk identification practice on completion of road construction projects in Nakuru county, Kenya.
- ii. To determine the influence of project risk analysis practice on completion of road construction projects in Nakuru county, Kenya.
- iii. To establish the influence of project risk response risk practice on completion of road construction projects in Nakuru county, Kenya
- iv. To establish the influence of risk control practice on completion of road construction projects in Nakuru county, Kenya

1.4 Research Questions

The following research questions were addressed in the study:

- i. What is the influence of project risk identification practice on completion of road construction projects in Nakuru county Kenya?
- ii. How does project risk analysis practice influence completion of road construction projects in Nakuru county, Kenya?
- iii. How does risk response planning practice influence completion of road construction projects in Nakuru county, Kenya?
- iv. How does risk control practice influence completion of road construction projects

in Nakuru County, Kenya?

1.5 Study Significance

The following project management stakeholders are expected to benefit from the study's findings: Because the study will give information on the influence of project risk management on project success, the Kenya Roads Authority would be able to optimize its project execution procedure. Practitioners of project risk management will gain important knowledge about how risk management procedures affect project success. Project managers will also benefit from this study's understanding of how successful project risk management techniques are in guaranteeing project success. Scholars will use the study as a foundation for developing project risk management as a field of study and for more research on the relationship between project success and project risk management. The study results will also provide fresh insights into project risk management within the community's public sector and lay the groundwork for future investigations.

1.6 Study Assumptions

The research assumed that the respondents selected and included in data collection were the true reflection of the population and provided relevant information depending on their experiences. It was also assumed that there was no random and unpredictable occurrence that would have affected collecting information from the respondents.

1.7 Study Delimitations

This study focused on project risk management approaches and the effective completion of road building projects. The practice of project risk identification, analysis, reaction planning,

and control was the primary focus of this study in terms of project success. This study focused on the Nakuru, Kenya, county administration's road-building projects.

1.8 Limitations

It's probable perhaps certain participants were preoccupied with work while the data was being collected. As a result, collecting data from responders throughout a session was impractical. The researcher deleted the questionnaires and scheduled a later time to choose the completed ones, allowing participants enough time to respond to them. This allowed respondents enough time to react without interfering with their work routine.

1.9 Meaning of Key terms.

Risk analysis practice: It includes qualitative and quantitative analysis of risks, risk assessment and allocation.

Risk control practice: It include risk audit, risk tracking and status, corrective course of action and period reporting.

Risk identification practice: it covers the tools and techniques for identifying risks, risk registration, determination of the types and sources of risks.

Risk management practices: They include the identification, analysis, response planning and control of risks in the infrastructure construction projects.

Risk response planning practice: It involve the avoidance, transfer, mitigation, or acceptance of the risks **once** they have been identified and analyzed.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The review of empirical research and theories pertaining to project risk management and project success is presented in this chapter. The conceptual framework, a summary of the literature evaluation, and the research gap are also provided.

2.2 Project Risk Management and road construction projects

A project is a brief undertaking started with the intention of producing a special good, service, or outcome. To accomplish project goals and objectives, project management includes initiating, planning, coordinating, and managing resources (PMBOK, 2020). Le, Chong, and Kashiwagi (2020) define risk as susceptibility to gain or loss multiplied by its equivalent size. Risk is defined by the PMBOK (2020) as an unpredictable occurrence or circumstance that, if it materializes, might have a favorable or unfavorable impact on the goals of a project. The process of managing risks through planning, identification, analysis, reactions, monitoring, and control in a project is included in project risk management (PMBOK, 2020).

Over the past few decades, the field of project risk management has grown and become a crucial component of project management. Numerous scholars, including Mohan & Tan-Mullins (2019) and Foulger, Wilson, Gluyas, Julian, & Davies (2018), contend that risk is an exposure to the likelihood of suffering a loss. The interest in the relationship between risk management and project performance dates to Szymański's (2017) paper from the 1970s, which says that the likelihood of process execution should be the key concern. Product implementation places emphasis on benefits to clients and the level of satisfaction. Organization success recognizes the strategic and business-related benefits. In a nutshell

therefore, implementation of infrastructure projects can be used in reference to the projects completed, adherence to time, compliance with costs and satisfaction of the beneficiaries (McLeod et al., 2017).

Most of the other research that was looked at focused on project risk management procedures. Segismundo and Miguel (2019), for example, looked at Failure Mode and Effect 8 Analysis (FMEA) in relation to risk management for the creation of new products. According to Godfrey (2022), most construction contractors, particularly those in the small and medium-sized category in Sub-Saharan Africa, implement formal risk management methods relatively infrequently. This could result in a persistent lack of project performance in the construction industry. Even though a lot of academics have studied project risk management, it doesn't seem like any research has looked at how project risk management affects projects' performance in Kenya. Study conducted in Kenya has concentrated on functional silos including TQM, quality management, and project risk management, according to a detailed analysis of the research. According to Bolinger, Seel, and Robson (2019), project management techniques used at ILR1 are influenced by foreign exchange risk. When Kumar, Maiti, and Gunasekaran (2018) looked at the quality management methods used by big construction companies in Kenya, they discovered that only few of them were utilizing modern methods. Kipngetch and Bett's (2018) investigation of the degree of Total Quality Management (TQM) adoption in Kenya's construction sector found that very few companies were using it.

The studies that are available include Rodriguez-Rivero et al. (2020), who looked to connect risk management to the implementation of foreign development projects in Cambodia. It was observed that the key risks in development projects are linked to political, cultural as well as economic factors. Alsaadi and Norhayatizakuan (2021) utilized Oman as a point of reference

to examine risk management strategies and performance with a focus on building projects. There was shown to be a strong correlation between risk management and project performance. The study conducted by Kinyua Ogollah and Mburu (2015) examined risk management techniques and their impact on project performance, with a particular focus on information technology projects in Kenya. The study found a favorable correlation between project performance and risk management techniques. Njuguna (2019) assessed risk management techniques and their effects on project performance in Nairobi. The study discovered that the risk management techniques of control, prevention, and transfer had a major impact on the project's performance.

According to Szymański (2017), understanding the major uncertainties at every step of the development process and coming up with plans for handling the gamut of potential outcomes will help raise the probability that a project will be completed successfully. Nonetheless, as the term "suggest" implies, it can be challenging to prove the benefits of risk management. Several other studies have been conducted on project risk management and project management in general. For example, de Carvalho, Patah, & de Souza Bido (2015) found that risk management is only useful in certain project scenarios when examining whether risk management increases the success of IT projects. According to Xia et al. (2018), risk management helps ensure that projects succeed because stakeholders modify their expectations and behavior based on their awareness of the existence of risks.

2.3 Risk Identification Practice and successive completion on road construction projects

The following methods are linked to risk identification: expert judgment, Delphi approach, brainstorming, and interviews (Godfrey, 2022). When identifying risks, the project team first

considers a variety of possible occurrences that might come from both internal and external sources. The process of identifying risks involves comprehending and ascertaining the possible unfavorable consequences that might impact a project. By identifying the main sources and categories of risks and properly documenting their characteristics, risk identification aids in risk management (PMI, 2020). With road construction projects, it is critical to identify and document the sources and attributes of any inherent risks within a risk register. Prioritizing these risks for future actions should be done when they have been recognized, with an evaluation of the likelihood of occurrence and the effect (Janita et al, 2023). Project management and organizational, external, and technical risks are the four main categories into which risks are classified because of risk identification practices. Internal and external risks are two more broad categories of hazards during the identification stage (Pimchangthong & Boonjing, 2017).

Risk identification practice within infrastructure construction projects can be conducted through several methods which include the use of document review, checklists, brainstorming, through surveys, after a strength-weakness opportunity threat (SWOT) analysis as well as through use of Delphi method among others. Brainstorming is one of the widely embraced methods of identification of risks in construction projects by the contractors (Jepson, Kirytopoulos & London, 2020). As a result, recognizing risks is an essential component of the project organization's overall risk management framework, and it includes activities such as information gathering, leveraging risk identification techniques and tools, and documenting all identified risks in a register for future reference. It is a critical practice that helps the project managers to identify the sources and types of risks that are likely to impact on success of the project outcomes (Mavi, & Standing, 2018).

Otaalo, Muchelule, and Asinza (2019) looked at risk identification and analysis and how those factors affected project success in Kenya. Leveraging questionnaire as a tool for gathering information, the participants covered 80 managers of the project, engineers, supervisors, inspectors, surveyors, and contractors within the County of Kakamega. Both ongoing and the fully completed projects formed the unit of analysis of the inquiry. It emerged from the analysis that risk identification and the practices of managing risks in a project organization are significantly linked with each other (Muchelule & Asinza, 2019). In another study done by Mutunga and Ondara (2021), risk identification was explored as a general practice in an organization and its contribution towards performance of the projects at Kenya Airports Authority was analyzed. It was observed that risk identification is a critical activity that significantly predicts performance of the project.

A study by De-Araújo-Lima, Marcelino-Sadaba and Verbano (2021) placed emphasis on how to successfully put in place project risk management with a focus on small and medium firms. This was a cross case inquiry. The participants were project managers drawn from Italy and Spain. It emerged that the features of the project and the attributes of the project organization are instrumental when it comes to adoption of risk management in projects. Research in Rwanda by Igihozo and Irechukwu (2022) placed emphasis on the process of managing risks in projects and the contribution towards performance with focus on construction projects. Upon using stratified sampling and applying Sloven's formula to determine sample size, it became evident from the findings that risk identification is a crucial project management strategy that enhances the project's overall performance. Another study conducted by Marinich (2020) combined the identification and response to risks and their implication on success of the projects. This was a quantitative correlational inquiry that that was done in United States

through survey. The participants were the project managers and it emerged that risk identification and success of the project are significantly connected.

A study was undertaken on practices of managing risks and their implication performance with emphasis on construction projects by AlSaadi and Norhayatizakuan (2021) within the context of Oman. This nexus was explored quantitatively with the aid of the survey. It emerged that risk Identification is an instrumental part of the risk management framework that significantly enhance performance of the project activities. Another study whose focus was on risk identification and its essence in the entire risk management framework in project was done by George (2020). In this study, the meaning, significance, and effective management of risks were discussed. In addition, the techniques critical for identification of risks were identified, the role of the project risk register and categorization. Given that risks are forms of uncertainties, the need for project managers to carefully plan for them emerged in this study. This calls for the risk management plan that helps in preventing wastage of the resources of the project (George, 2020).

2.4 Risk Analysis Practice and successful completion of Road Construction Projects

Risk analysis Risk analysis entails evaluating the likelihood and impact of risks to determine their magnitude. This includes identifying the range of forces that could have a negative impact, the holdings that might be impacted, the characteristics that boost the probability of the risk being detected, and the degree to which the threat manifests. The 16 tools associated with this stage include the use of probability/impact matrices, SWOT analysis, and the most prominent ten risk item monitoring methodology (Godfrey, 2022).

An analysis of the risks within the project can be conducted through quantitative as well as qualitative methods. Risks are prioritized for additional analysis or auctioning in qualitative

risk analysis after their likelihood and impact have been determined. Based on the severity of the risk effect and the likelihood of occurrence, dangerous events are ranked as high, medium, or low during qualitative risk analysis (Nturanu & Mundia, 2019). For quantitative risk analysis, the combined impact of the established risks is numerically analyzed and determined for calculation of the frequency of risks and the degree of their impact. There are a number of techniques that play an instrumental role during risk analysis for instance, decision trees, Delphi techniques and sensitivity analysis among others. As a result, risk analysis is essential for figuring out the significance and probability of the hazards that have been discovered.

The main emphasis of a study by De-Marco and Thaheem (2014) was risk analysis in projects involving building operations. The inquiry aimed at proposing a practical framework methodology for assisting the managers of projects in selecting of ideal techniques of analyzing risk depending on some established drivers of the project. By include project management organizations and project-related indications of a successful project endeavor, the suggested approach expanded the scope of the standard project success indicators. In a study conducted by Tepeli (2020), risk analysis at the early stages of complex infrastructure projects was the primary emphasis. It was hypothesized that due to complexity of the infrastructure projects, interdependent risks are so evident. It is very hard when it comes to anticipation and controlling of these risks.

Risk management and its impact on the performance of small construction firms in South Africa were assessed by Amoah and Pretorius (2019). For the chosen case study design, data was collected using a well-organized survey. It emerged that the small construction entities had no clearly established processes of managing. Although risk management was not evident, most of the projects executed had attained the indicators of project performance. The research

carried out by Simon and Mutiso (2021) placed emphasis on risk management within projects and the contribution to performance. The investigation was centered on farming initiatives in the Nakuru County. The study evaluated risk analysis's function as a risk management technique for projects. Contingent theory provided anchorage to the inquiry and the results obtained confirmed that the analysis of project risks significantly impacts performance of projects.

2.5 Risk Response Planning Practice and successful completion of Road Construction Undertakings

Risk response planning is a process that helps in creation of strategies or options aimed at solving the positive as well as negative risks in projects. Both positive and negative events are viewed as opportunities and risks respectively. Negative risks identified can be treated in four key strategies: avoidance, transfer, mitigation, and acceptance (Safaeian, et.al, 2022). For infrastructure development projects, risks can be minimized or eliminated by eliminating the source, reducing the specific hazard, or shifting the risk to another entity. In addition, a project organization can accept risks by creating a backup plan that can be put into action if the risk materializes. For positive risks (opportunities), there are also four alternatives that can be adopted in their responses including exploitation, enhancement, sharing and acceptance (Naji & Ali, 2017).

A study conducted by Ahmadi-Javid, Fateminia & Gemünden (2020) was an appraisal of risk response planning and its implication on project portfolio management. The inquiry offered a method informed by mathematical optimization to come up relevant responses to project risks. The proposed framework was seen to play an instrumental role in management of projects. There is another body of literature that classifies five broad strategies of responding to risky events: prevention, reduction, sharing, transferring and acceptance. Risk prevention covers an array of ways that can be adopted to avoid any inherent risk occurrence as the project moves

in the cycle (Yan, Liu, Zhao & Skitmore, 2021).

The purpose of risk reduction is to reduce the impact of delays on project performance. Risk sharing occurs when a certain percentage of the costs of risks are transferred among parties to the contract. Risk transfer is a situation when all the costs of risks are passed to third parties like insurance firms. Risk acceptance is where all the uncertainties are accepted (Marinich, 2020).

In Malaysia, research with focus on construction projects by Karunakaran, Abdullah, Nagapan, Sambasivan and Sekar (2020) was to link project risk response as a moderator in the nexus between delay factors in projects and performance. This investigation was a thematic survey of the existing literature. A synopsis of the themes included concerns about project performance, risk response strategies, and delays. It was revealed that there is an adverse correlation between project performance and delays. However, a clear correlation was found between the project's performance and its reaction to risks.

2.6 Risk Control Practice and successful completion of Road Construction Projects

Risk control procedures help to monitor the implementation of backup plans by tracking known risks, detecting new ones, and evaluating the efficacy of the risk management process. Risk control aids in resolving discrepancies between intended and desired responses to hazards and contributes to an overall improvement in risk management procedures and activities. Monitoring the project's risk status is a continuous process that helps identify any deviation from the intended level of performance (Obondi, 2022). The various activities that can be done during risk control can range from the implementation of contingency plan, taking of corrective course as well as re-planning of the project. Uncontrolled risks in construction projects can lead cost and quality overruns as well as the delays in scope and schedule. Efforts should be in place for the risk owner to ensure there is periodic reporting to risk team and the project

manager (Amoah & Pretorius, 2019).

Kiage and Namusonge (2016) performed research in Kenya that examined risk management, project performance, and monitoring and evaluation (M&E) in telecommunications companies. Based on the results, the vast majority of those surveyed believed that components such as the importance of routine risk analysis and project managers' engagement in risk analysis had a significant impact on how effectively projects worked. Another study conducted by Obondi (2020) focused on project risk management approaches and their impact on the project's operational success. The inquiry focused solely on construction projects. The variables included risk audits, risk status meetings, risk assessments, and contingency reserve analysis. The study was carried out in the United States, and the results revealed that risk monitoring and control had a significant and positive impact on project success.

2.7 Sources of Projects Risks

The external or internal environment might provide dangers to a project. Muto Performance Corp. (2010) conducted a global study on the most prevalent ten risks or reasons for project failure, which are diverse and significant. Scope creep and scope adjustments can have a substantial impact on project limits and objectives. Projects frequently suffer from limited resources, especially cash, and time to fulfill the job at hand. Furthermore, confusing or missing crucial requirements can stymie progress, as can insufficiently project testing and late delivery of key jobs. Insufficient project finance remains a crucial concern, as does the lack of authority assigned to key team members, which impedes decision-making procedures. Furthermore, the incapacity of the project sponsor to give consent for major choices and the absence of vital skills among key team members contribute to the project failures.

2.8 Project Success

When a project is finished on schedule, on budget, to the satisfaction of all stakeholders, and in compliance with the specifications, it is often considered successful. Functional measures of project performance include contractor profitability, a lack of disputes and legal issues, and occupier "fitness for purpose" (Ola-awo et al, 2021). Traditional project success measures include time, budget, and requirements specifications. This criterion is still often used in reports on project performance in IT projects, despite widespread criticism (Royal Academy of Engineering, 2017). The criticism focuses on three concerns relating to the underlying assumptions of this definition: The project's success can be measured when it has produced its deliverables; the project's success can be determined at the beginning of the project, regardless of the amount of time, money, or needs; and each project stakeholder can contribute equally to the project's success. Establishing time and financial constraints as well as objectives are always done at the start of the project, when uncertainty is at its highest and it is nearly hard to establish reasonable goals and constraints Ika, & Pinto, (2022).

A project is considered successful, according to Castro et al. (2021), if it stays within the three constraints of time, money, and specifications. Competent feasibility assessments, commitment to project approach, preparation, efficient evaluation, and assessment are just a few of the success factors in a project. The focus is on the outcomes, and the key performance indicators are project sickness (the project's capacity or inability to provide the expected objectives) and schedule and cost overruns (Carvalho, & Rabechini, 2015). It goes without saying that evaluating a project's success or failure is difficult and confusing. Ika and Pinto (2022) have noted that because different project stakeholders have differing perspectives on success or failure, it is still unclear how to quantify project success.

According to research by Demirkesen & Ozorhon (2017), project management success is

determined by factors including cost, time, and quality/performance, whereas project success is evaluated based on the project's overall objectives. They emphasized the importance of distinguishing between project performance, which can be reviewed during the project's life cycle, and accomplishment of the project, which cannot be verified until the project is completed. Nonetheless, Albert et al (2017) believe that project success is evaluated by assessing both project management and product (including facilities) factors. A construction project's success is largely determined by its financial, scheduling, and quality goals.

According to Castro et al. (2021), project management success is judged by parameters such as expenses, schedule, and quality/performance, whereas project success is assessed based on the project's overall goals. Alemayhu, (2023) states that three transaction metrics—budget, time, and quality—determine a project's success. Completion within the constraints of time, money, and quality will be just as important as completion itself in terms of success. He made the argument that these elements influence several aspects of a project's success. Planning effort throughout project design, planning during construction, goal commitment, project team motivation, technical capability, and scope are some of these success aspects.

Muto Performance Corp. conducted a 2010 study that found that project failures are frequently caused by several significant factors. These include the project sponsor's inability to approve strategic decisions, changes in project scope, and insufficient resources (excluding financing). Insufficient time to complete the project, unclear or missing crucial requirements, and insufficient project testing all lead to project delays. Other contributing reasons include late completion of crucial project tasks, insufficient power assigned to key team members, insufficient project finance, and a lack of critical skills among key members. The third reason is that, as noted by de Wit (2018) as well, the goals and priorities of each project stakeholder

are established differently at various points in the management hierarchy and throughout the project life cycle. It is important to differentiate between the success of a project and its management, as well as between its performance and success. It is important to differentiate between the success of a project and its management, as well as between its performance and success.

2.9 Theoretical Review

The investigation will be based on the following theories: enterprise risk management, contingency theory, and prospect theory.

2.9.1 Enterprise Risk Management Theory

The Treadway Commission's Committee of Sponsoring Organizations (COSO) created the theory in 2018. The idea supports the necessity for overall organization-wide risk measurement and management as opposed to discrete risk management for each set of hazards. According to the notion, initiatives should be made to integrate an organization's disparate risk management systems into a thorough and all-encompassing framework (COSO, 2018). According to the notion, employees and top corporate leaders must actively participate in the process of analyzing and responding to various types of hazards inside a business. The theory requires all staff in a project organization to participate in management of the risks as opposed to some identified few individuals with the risk department (Shefika, Barkhuizen, & Schutte, 2018).

This theory further provides a highlight of the essence of having clearly established policies and process of risk management. The theory argues that when the project organization can adopt formal policies which help in defining the appetite to risks, strategic goals as well as

the tolerance, the whole risk management framework in an organization is likely to be improved. The theory reinforces the need to create a risk management culture where all the stakeholders undergo empowerment to remain accountable in reference to management of risks in a project organization (Holbeche, 2018).

The study that focuses on risk management techniques is determined to be pertinent to this theory. According to this theory, to increase the likelihood of the successful completion of the construction of roads in Nakuru County, Kenya, all staff members, and stakeholders—including the project organization's senior management—must be involved in the adoption and implementation of these risk management strategies.

2.9.2 Contingency Theory

The proponents of this theory include Fielder in 1960 with further development by Lawrence and Lorsch in 1967 and its argument is that no single exists for organizing and leading a project organization or for making management decision about the project. The theory goes further and argues that the ultimate and optimum course of action to be undertaken is informed by external and internal situations to the project organization. Thus, the forces with internal and external surrounding present some risks to the project organization which need to be addressed. Within the internal environment, risks emanating from the project organization like operational flaws are presented (Le, Chong & Kashiwagi, 2020). From the external environment, some challenges related to regulations and politics are presented.

The theory is premised on the fact that different project organizations are guided by varied structures. As such, there is no specific structure that is suitable to a given project organization. However, several variables, including the kind of technology, environmental fluctuations,

project scale, and the company's internal structures, affect how effective the project organization is (Miterev, Mancini, & Turner, 2017). The theory shed light on the risk control variable and how it affects project implementation. The theory implies that the use of some specific risk control practices is contingent to several issues in a project organization including the structure are important in successful completion of project in this case road construction project in county government of Nakuru, Kenya.

2.9.3 Prospect Theory

Tversky and Kahneman proposed this theory in 1979, and it supports decision-making under risk and uncertainty. The theory offers a description, explanation and prediction of the choices that are made by a typical individual when faced with uncertainties. The theory looks at how these choices undergo framing and evaluation when making decisions. When making judgments, the theory considers two stages: the assessment phase and the editing/framing phase. Framing is the study of how an option or choice is affected or sequence in which it is presented to the decision-maker. There are two parts in the evaluation phase of this theory: value and weight function. The losses and gains in relation to some reference point inform the value gain.

Therefore, considering this prospectus theory, individuals make decisions based on the potential value of gains and losses as compared to the ultimate outcome. There are some specific heuristics that guide people when evaluating these gains and losses. Risk is exposure to probability of financial or economic gain or loss, delay, physical damage, injury due to uncertainty that is linked with undertaking of a given cause of action. The relevant of this theory to the study is that, within construction projects, the occurrence of risks can have significant negative implication on quality and schedule as well as the budget provisions.

Effective management of risks in construction projects required detailed planning, identification, analysis, development of adequate response strategies and the need to monitor and control risky events to ensure successful completion of road construction projects.

2.9.4 Risk Aversion Theory

Risk aversion is a concept in economics and finance, particularly in the study of uncertain decision-making. Daniel Bernoulli was an early and influential figure in the development of risk aversion theory. In 1738, he proposed a solution to the St. Petersburg paradox that introduced the concept of diminishing marginal utility of wealth, which helps explain risk-averse behavior. Bernoulli's theory proposed that people evaluate risk based on the potential utility of outcomes rather than just the expected monetary value, which causes them to prefer certain outcomes over uncertain ones with the same expected value.

During The twentieth century the risk aversion theory saw further developments, by John von Neumann and Oskar Morgenstern, who formalized the expected utility theory in their 1944 book "Theory of Games and Economic Behavior." This theory established a mathematical foundation for understanding decision-making under uncertainty and expanded on the concept of risk aversion. In the 1960s, Kenneth Arrow and John Pratt independently developed risk aversion measures, which became the foundation for understanding and quantifying risk preferences. This theoretical framework serves as the foundation for the investigation into how risk aversion influences the effectiveness of risk management practices where construction projects are managed.

Using risk aversion theory principles, this study seeks to examine how project stakeholders' decisions regarding project risk management ranging from project managers, contractors, and

financiers determine the outcome of the project. Understanding these dynamics is critical for developing projects risk management strategies that are aligned with stakeholders' risk preferences, resulting in increased project efficiency and performance. The risks aversion theory explores various risk management interventions and their influence on project timelines, budgets, and overall success. By correlating risk aversion measures with project outcomes, the study hopes to provide empirical evidence on the ability of various risk management strategies in informing policy decisions and directing resource allocation towards the most effective practices.

2.10 Conceptual Framework

Figure 2.1's conceptual framework will serve as the study's compass. Practices in risk identification, risk analysis, risk response planning, and risk control are among the independent factors. The dependent variable (completion of road projects) will be impacted by the existence, non-existence, or magnitude of these independent factors.

2.10.1 Risk Identification Practice:

The first distinct factor in the conceptual framework is the risk detection Practice, which refers to the systematic processes involved in identifying possible risks in road construction projects. This independent variable encompasses several sub-variables, including the employment of various risk identification tools and techniques, the thoroughness of risk registration, the classification of different types of risks, and the identification of sources from which risks may arise. The Risk Identification Practice variable, on the other hand, serves as a predictor of project success, reflecting the effectiveness of strategies employed to anticipate and mitigate potential risks throughout the project lifecycle.

2.10.2 Risk Analysis Practice:

The second independent variable is Risk Analysis Practice, which involves the detailed examination of identified risks. This comprises evaluations of the possible effect and probability of hazards using both qualitative and quantitative methods. The procedure also includes assessing hazards overall and allocating resources to properly manage and reduce these risks. The Risk Analysis Practice variable serves as a determinant of project success, encapsulating the methodologies and approaches employed to comprehensively evaluate and manage project risks. Qualitative risk analysis involves the subjective assessment of risks based on their perceived likelihood and impact, whereas quantitative risk analysis utilizes numerical data and probabilistic models to quantify risk exposure more precisely. Risk assessment encompasses the overall evaluation of identified risks to prioritize and allocate resources effectively, while risk allocation strategies determine how risks are distributed among project stakeholders.

2.10.3 Risk Response Planning Practice:

The third independent variable is Risk Response Planning Practice, focusing on how the project team plans to address identified risks. This involves formulating strategies for risk avoidance, transfer, mitigation, and acceptance. With a proactive approach to prospective issues, each of these sub-variables is essential in designing the overall risk response plan. This independent variable encompasses various strategies employed to address identified risks throughout the project lifecycle. These strategies include risk avoidance, which involves altering project plans or scope to circumvent high-risk activities or conditions; risk transfer, which involves shifting risk responsibility to external parties through contracts or insurance arrangements; risk mitigation, which involves implementing measures to reduce the probability or impact of identified risks; and risk acceptance, which involves acknowledging certain risks as unavoidable and preparing contingency plans to manage their consequences.

2.10.4 Risk Control Practice:

The fourth independent variable, Risk Control Practice, encompasses on-going activities to monitor and manage risks throughout the project lifecycle. This involves conducting risk audits, tracking, and assessing risks, implementing corrective courses of action when necessary, and providing periodic risk reporting. This independent variable encompasses a range of practices aimed at managing and mitigating risks throughout the project lifecycle. These practices include conducting risk audits to assess the effectiveness of risk management strategies, tracking and monitoring risks as they evolve, implementing corrective courses of action to address identified risks promptly, and providing periodic risk reporting to stakeholders to maintain transparency and facilitate informed decision-making. Additionally, the concepts of risk tolerance and risk appetite are incorporated into the framework, reflecting the organization's willingness to accept and manage risks in pursuit of its objectives.

2.10.5 Completion of Road Construction Undertakings:

The successful completion of road construction projects is the dependent variable in the conceptual framework. The dependent variable encompasses several key dimensions. Firstly, adherence to time reflects the extent to which projects are completed within the scheduled timeframe, indicating efficiency and timely delivery. Secondly, compliance within costs pertains to the ability of projects to stay within the allocated budgetary constraints, ensuring financial sustainability and resource optimization. Thirdly, quality compliance denotes the degree to which construction projects meet established standards and specifications, ensuring durability, safety, and functionality of the infrastructure. Lastly, client acceptance reflects stakeholders' satisfaction and approval of the completed projects, encompassing factors such as meeting stakeholder expectations, fulfilling project requirements, and addressing community needs.

2.10.6 Intervening Variables:

Finally, the intervening variables serve as outside variables that might affect or have an impact on how well risk management techniques work. To guarantee a more comprehensive and practical approach to risk management in the context of road building projects, it is imperative to comprehend and take these factors into consideration. These intervening variables include Government Policies and Regulations, Political Influence, and Emergencies in Budgeting. Government policies and regulations set the legal and procedural frameworks within which road construction projects operate, influencing project planning, execution, and compliance. Political influence, stemming from political agendas, affiliations, and power dynamics, can impact project priorities, funding allocations, and decision-making processes, potentially affecting project timelines and outcomes. Emergencies in budgeting, such as unexpected economic downturns or financial crises, may disrupt funding streams and resource allocations for road construction projects, necessitating adjustments in project management strategies and priorities.

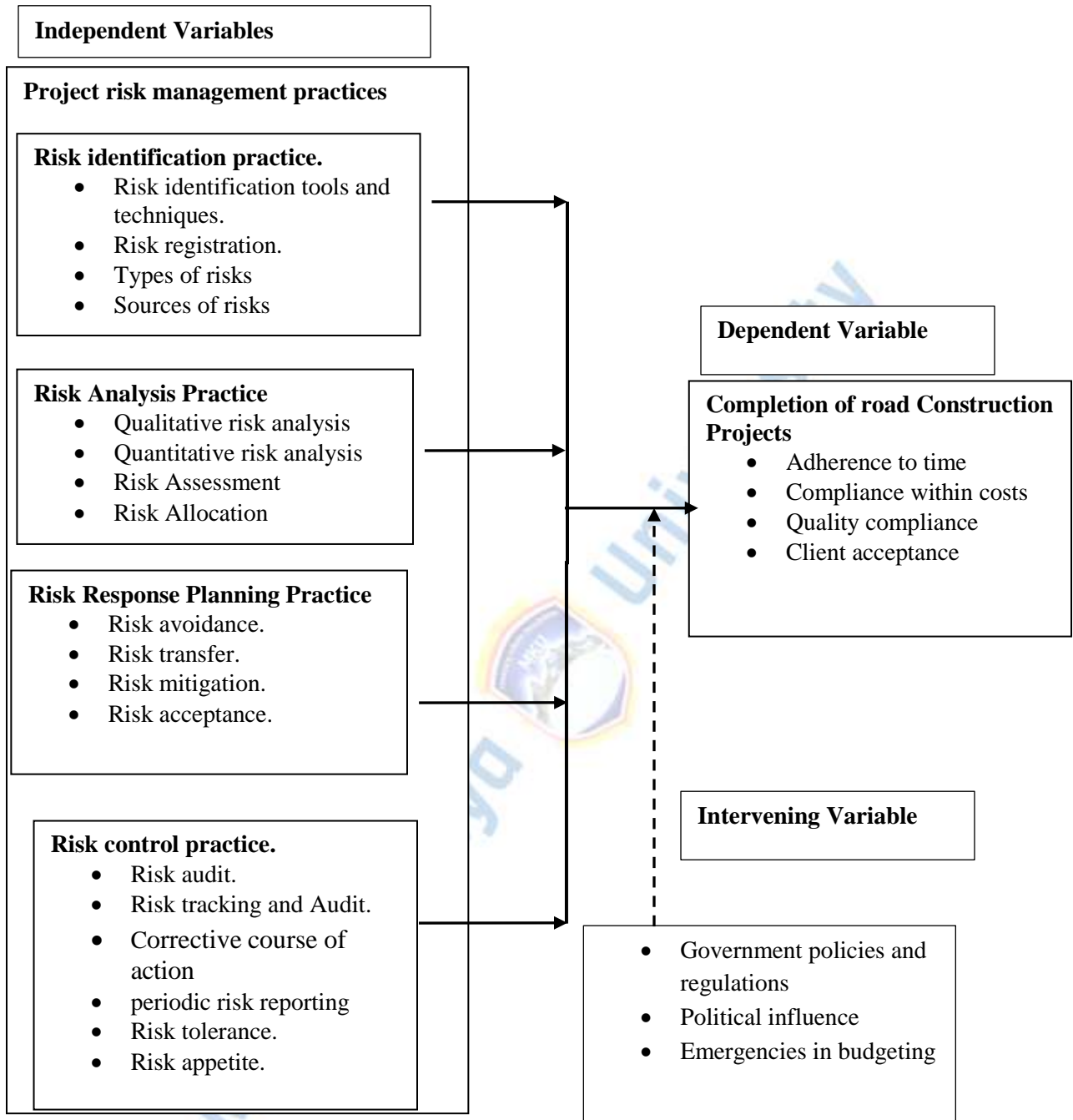


Figure 2. 1: Conceptual framework

Source: Researcher

2.11 Recap of Literature

The study's assessment of the literature brought to light several domestic and foreign research on project risk management. Bolinger, Seel, and Robson's (2019) local research looked on the degree of foreign exchange risk in ILRI project management. Kumar, Maiti, and Gunasekaran (2018) evaluated the quality management methods of significant construction firms in Kenya and discovered that just a few firms used current quality management practices. Waweru and Omwenga (2015) aimed to research and document material quality management procedures in Kenya's building industry. According to Kipngetich and Bett (2018), just a few businesses used TQM concepts when carrying out building projects. According to Szymański (2017), identifying and managing risks can increase the likelihood of project success. Bakker et al. (2019) concluded in research of the association between risk management and IT project success that risk management is only beneficial in specific project settings. According to Kutsch and Hall (2015), knowing the threats does not guarantee that one will utilize that awareness to manage those risks.

Other scholars who focus on the project risk management process believe that current risk handling approaches are inadequate for commercial environments and that a risk management framework and philosophy should be able to quickly reassess the project's strategic alternatives in the event of unforeseen circumstances while also providing a methodical foundation for restructuring. Despite a lot of criticism, the bulk of study found that time, money, and needed criteria are frequently employed to define project success. They include, among others, Ola-awo et al. (2021), Castro et al. (2021), Carvalho & Rabechini (2015), Ika & Pinto (2022), and Royal Academy of Engineering (2018). The evaluated research focused more on certain functional silos. As a result, the scope of these investigations was rather constrained. The three concepts of project risk management

strategies, how they are applied in capital projects, and how they affect project success do not appear to have been investigated in study.



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

A summary of the study design, target population, sampling strategy, methods of data collecting, and analytic techniques were provided in this chapter. The issue of ethical reviews is also covered in this chapter.

3.2 Research Design

Dźwigoł (2019) defines a research design as a plan that guides data collecting and analysis. It acts as a guide for the methodologies utilized in data gathering, analysis, and interpretation. In this study, a descriptive survey research design was utilized. Harris et al (2019) define descriptive survey research design as the collection of data to provide responses to questions regarding the condition of an investigation. Some of the most important topics that require investigation using this kind of design are pertinent behaviors and characteristics. Adopting this design was justified by the fact that it enabled the research to give an account of the present situation regarding project risk management procedures and the accomplishment of road building projects in the county government of Nakuru, Kenya.

3.3 Target Population

The demographic that was the focus of the study included engineers, risk managers, subcontractors, and project contractors. Target population is a representation of items as well as individuals that are in line with established criteria for selection and inclusion in the study (Thanem & Knights, 2019). There are seven road construction projects in county government of Nakuru, Kenya (appendix III).

Table 3. 1: Target Population

| Category of employment | Target population |
|-------------------------------|--------------------------|
| Contractors | 14 |
| Sub-Contractors | 42 |
| Engineers | 28 |
| Risk Managers | 14 |
| Total | 98 |

Source: Ministry of Public Works (2022)

3.4 Sampling Size and Procedures

The process of choosing participants for an investigation is called sampling (Hennink, Hutter & Bailey, 2020). In contrast, the sample size refers to the smaller percentage taken from the wider population that serves as the foundation for the results' generalization (Ghauri, Grønhaug & Strange, 2020). This study used a census methodology due to the comparatively smaller sample size, meaning that all 98 respondents were included in the analysis. According to Gravetter and Forzano (2018), a census is the best option when the target population is less than 200 persons per unit.

3.5 Data Collection Techniques

According to Quinlan et al (2019), data collection is the methodical and careful gathering of information that is pertinent to answering research questions. This research employed questionnaires to collect primary data. According to Privitera (2018), the study's field information is what counts as primary data. Structured questionnaire helped in collecting primary data that was used for the study analysis and interpretation. The

questionnaire was structured to in such a way to ensure that a list of relevant alternatives that gives an option for participants to select from. A survey was designed using a 5-point Likert scale with 1-strongly disagree and 5-strongly agree options. The general information and the variables of the inquiry were covered in separate parts of the questionnaire.

3.6 Pilot Testing

After the major inquiry, a small-scale pilot test was conducted in the county government of Kericho. The county was conveniently picked for piloting given its proximity to the researcher's workplace to cut the cost of piloting. The aim was to provide guideline for examining specific issues of the survey (Bell, Bryman & Harley, 2018). It helped in testing of understandability and clarity of the questions on the questionnaire. Adams and McGuire (2022) suggest that 1–10% of the respondents from the target demographic be utilized for the pilot test. Therefore, in the current study, 10% of the sample group comprised of 10 respondents, who were chosen to participate in the pilot study. To prevent any bias, the researcher selected county government of Kericho as it has similar characteristics with county government of Nakuru which is the area under study.

3.6.1 Validity test

Validity test is the extent which the test provides measurement of what it is designed to indicate. It is critical for the questionnaire to be aligned with the definition that has been used to operationalize the study variables (Hair, Page & Brunsveld, 2019). A reliable measure can easily be understood, and the results can be understood and clearly utilized. The supervisor and two designated risk management specialists each received a copy of the questionnaire, and they provided their opinions. All their suggestions and concerns were factored in and addressed before the final data collection process in the field.

3.6.2 Reliability test

The dependability, stability, and consistency of the data and opinions that participants have contributed make up the reliability test. It is the extent to which a measurement yields steady and consistent findings (Greener & Martelli, 2018). Cronbach Alpha values were computed using the fully completed pilot test questionnaire to assess reliability. The following general guideline is recommended by Creswell & Creswell (2017) for interpreting Cronbach Alpha values: Excellent is denoted by >0.9, decent by >0.8, acceptable by >0.7, and doubtful by >0.6.

3.7 Data Collection Procedure

A research permit NACOSTI and an introduction letter from Mount Kenya University's postgraduate school Before heading out into the field to gather data from the intended responders, was prepared. Participants who were anticipated to provide a higher response rate from the research participants self-administered the questionnaire. Participants received ample time to finish the survey before it was collected at the point of administration. This strategy was meant to increase the response rate.

3.8 Proposed Data Analysis and Presentation

Assarroudi et al. (2018) define data analysis as the application of logic to comprehend obtained data to foresee consistent trends and summarize relevant features. The data were entered into SPSS version 24, which returned the percentages, mean values, and standard deviations. To describe the variables, the data was presented in tables and frequencies. The study employed a multivariate regression analysis model to determine the variables' strength and correlation. This is how the regression model looked:

$$PS = \beta_0 + \beta_1RIP + \beta_2RAP + \beta_3RRPP + \beta_3RCP + \epsilon$$

Were.

PS = Successive implementation of road construction projects

RIP = Risk Identification Practice

RAP = Risk Analysis Practice

RRPP = Risk Response Planning Practice

RCP = Risk Control Practice

ε is the error term

β is the regression beta coefficient

3.9 Ethical Considerations

Ethics describe the norms that provide guideline on how the research should be conducted (Privitera, 2018). The research sought authority from NACOSTI, ERC Ethical Review Committee and introductory letter from Mount Kenya University postgraduate. The research also issued informed consent to the respondents to participate, and all information provided was kept in the strictest confidence.

CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The purpose of the research was to establish how project risk management practices influence successive completion on road construction projects in county government of Nakuru, Kenya. This chapter presents and discusses the research findings of the respondent's profile followed by both the descriptive and inferential analyses of the study objectives. The chapter also discusses the findings and their implications to the study.

4.2 Response Rate

The study had a sample size of 98 respondents, of whom 93 filled out and returned the questionnaires, yielding a response rate of 95%. Five questionnaires were not collected from the respondents, resulting in a 5% response failure. With a 95% response rate, the study had a large sample size that was appropriate for the investigation. According to Barbie (2014), a high response rate is beneficial since it significantly minimizes non-response bias when compared to a low response rate.

Table 4. 1: Response Rate

| Sampled No. of respondents | No. of Questionnaires Returned | Response Rate (%) |
|-----------------------------------|---------------------------------------|--------------------------|
| 98 | 93 | 95 |

(Source field data,2023)

4.3 Pilot Test Results

The study conducted a pilot test which was conducted at a pilot test was carried out in county government of Kericho County whereby 10 questionnaires were issued to engineers, risk managers, subcontractors, and project contractors. The result of the findings is shown Table 4.2

Table 4. 2: Reliability Test Results

| Variable | No. of Items | N | Cronbach's Alpha Value |
|--|--------------|----|------------------------|
| project risk identification | 7 | 10 | .764 |
| project risk analysis | 7 | 10 | .747 |
| project risk planning response | 6 | 10 | .751 |
| Project risk control | 7 | 10 | .812 |
| completion of road construction projects | 4 | 10 | .741 |

(Source filed data 2024)

Cronbach Alpha values for the pilot research were 0.764, 0.747,.751,.812, and.741, respectively. As a result, the Cronbach values for project risk identification, project risk analysis, project risk planning response, project risk control, and road construction project completion were all more than 0.7. Cronbach correlation coefficients of 0.7 or above are considered satisfactory by George and Mallery (2003). According to Field (2009), a Cronbach's α value greater than 0.7 indicates a reliable research instrument.

4.4 Demographic Profile of the Response

The study examined the demographic makeup of the respondents based on age, sex, work experience, and academic qualification.

4.4.1: Gender Classification

The survey intended to determine the gender of the respondents. Table 4.3 shows the findings of the analysis.

Table 4. 3: Gender of the Respondents

| Gender | Frequency (n) | Percentage |
|--------------|---------------|------------|
| Male | 61 | 66 |
| Female | 32 | 34 |
| Total | 93 | 100 |

(Source field data 2024)

According to the findings, 66% of respondents were men, while 34% were women. This suggests that most responders participating in road construction projects are males.

4.4.2: Age of respondents

The study sought to find out the age of the respondents, the results of the analysis are indicated in Table 4.4

Table 4. 4: Age of respondents

| Age | Frequency (n) | Percentage |
|----------------|---------------|------------|
| 18-30 years | 20 | 22 |
| 31-40 years | 33 | 35 |
| 41-50 years | 21 | 23 |
| Above 51 years | 19 | 20 |
| Total | 93 | 100 |

(Source field data 2024)

According to the findings, 22% of respondents were aged between 18 and 30 years. 35 percent were between the ages of 31 and 40. Those aged 41 to 50 were 23%, while those over 51 were 20%. This means that most responders working in the road construction project were between the ages of 31 and 40.

4.4.3: Work experience in road construction projects

The study sought to find out the working experience of the respondents in road construction projects. The results of the analysis are indicated in Table 4.5

Table 4. 5: Work experience in road construction projects

| Years | Frequency(n) | Percentage |
|------------------|---------------------|-------------------|
| Less than 5 Year | 19 | 20 |
| 5-10 Years | 41 | 44 |
| 11-20 Years | 25 | 27 |
| Above 21 Years | 8 | 9 |
| Total | 93 | 100.0 |

(Source field data 2024)

From the finding 20% of the respondents stated that they had been in the road construction project for less than 5 years, 44 % had been working in the road construction project for 5-10 years, 27% had been working in road construction project between 11-20 years while 9% had been working in the road construction for more than 21 years. This implies that majority of the respondents have been working in road construction projects between 5-10 years implying that they had experience on road construction projects.

4.4.4: Level of education

The study intended to determine the academic qualification of the respondents; the findings of the analysis are given in Table 4.6

Table 4. 6: Level of education

| Level of education | Frequency (n) | Percentage |
|--------------------|---------------|------------|
| Primary | 0 | 0 |
| Secondary | 0 | 0 |
| Diploma | 12 | 13 |
| Bachelor | 68 | 73 |
| Masters | 11 | 12 |
| Doctorate | 2 | 2 |
| Total | 93 | 100 |

(Source field data 2024)

From the findings none of the respondents had primary and secondary qualification at 0%. Those respondents who had diploma as their education qualification were 13%. 73% of respondents have a bachelor's degree. 12% of respondents had a master's degree, and 2% had a doctorate degree. This implies that majority of the respondents were well educated with majority holding bachelor's degree hence they answered the questions correctly and were all qualified to work in the road construction projects.

4.5 Descriptive Statistics for the study factors

The section discusses the descriptive data for the study parameters. The findings are reported in terms of a percentage form, mean, and standard deviation.

4.5.1 Risk Identification Practice and Successful completion of road construction projects

The study's primary goal was to evaluate the impact of project risk identification methodology on subsequent completion of road construction projects in the county government of Nakuru, Kenya. The results of the investigation are reported in Table 4.7

Table 4. 7: project risk identification practice on successive completion on road construction projects

| project risk identification practice | SA | A | N | D | SD | N | Mean | Std |
|--|-----|-----|----|-----|----|----|------|-------|
| Document review is used to identify risks in the road construction projects | 56% | 34% | 6% | 4% | 0% | 93 | 4.54 | 0.856 |
| Risks in road construction projects are identified through Delphi technique | 33% | 62% | 2% | 3% | 0% | 93 | 4.62 | 0.745 |
| Brainstorming is a technique used to identify risks in the road construction projects | 51% | 42% | 5% | 2% | 0% | 93 | 4.49 | 0.557 |
| A technique known as SWOT analysis is used to find risks that could have an impact on road construction projects | 57% | 43% | 6% | 11% | 0% | 93 | 4.19 | 0.631 |

| | | | | | | | | |
|--|-----|-----|----|----|----|----|------|-------|
| All the identified risks in the road construction projects are documented in a register for reference | 42% | 43% | 9% | 6% | 0% | 93 | 4.22 | 0.623 |
| All the identified risks in the road construction projects are categorized into their respective types | 22% | 63% | 7% | 8% | 0% | 93 | 4.13 | 0.613 |
| The sources of risk information in the road construction projects. | 32% | 53% | 8% | 7% | 0% | 93 | 4.29 | 0.647 |

(Source field data 2024)

From the findings, the respondents on project risk identification practice showed the following results. Majority of the respondents agreed at 90% with a (mean = 4.54; standard deviation = 0.856) that the document review is used to identify risks in the road construction projects. In addition, 95% of respondents agreed (mean = 4.62; standard deviation = 0.745) that hazards in road construction projects are detected using the Delphi technique. Furthermore, 93% of respondents agreed (mean = 4.46; SD = 0.567) that brainstorming is a strategy used to uncover risks in road construction projects. It was also reported that 90% of respondents agreed (mean = 4.19; standard deviation = 0.631) that a technique known as SWOT analysis is used to identify hazards that may affect road construction projects.

In addition, 85% of respondents (mean = 4.22; standard deviation = 0.623) agreed that all identified risks in road building projects are noted in a registry for future reference. The results on all the

identified risks in the road construction projects categorized into their respective types showed that majority agreed at 85% (mean = 4.13; standard deviation = 0.613). Furthermore, the researcher discovered that 85% of those surveyed felt that the sources of risk guide risk identification in road construction projects (mean = 4.29; SD = 0.647).

This result agrees with (Jepson, Kirytopoulos & London, 2020) who argued that risk identification practice within infrastructure construction projects can be conducted through several methods which include the use of document review, checklists, brainstorming, through surveys, after a strength-weakness opportunity threat (SWOT) analysis as well as through use of Delphi method among others. Brainstorming is one of the widely embraced methods of identification of risks in construction projects by the contractors (Jepson, Kirytopoulos & London, 2020). As a result, the identification of risks is an essential component of the project organization's comprehensive risk management framework, and it includes activities such as information gathering, leveraging risk identification techniques and tools, and documenting all identified risks in a register for future reference. It is a vital activity that assists project managers in identifying the root causes and varieties of hazards that are likely to affect project success (Mavi & Standing, 2018).

4.5.2 Risk Analysis risk practice and successful completion of road Construction Project

The study's second goal was to examine the impact of project risk analysis practice on the completion of road construction projects in the county government of Nakuru, Kenya. The respondents were asked to provide feedback on risk management practices following the completion of a road construction project. The results were given in Table 4.8

Table 4. 8: project risk analysis practice on successive completion on road construction

projects

| Project risk analysis | SA | A | N | D | SD | N | Mean | Std |
|--|-----|-----|-----|-----|----|----|------|-------|
| The analysis of risks in the road construction projects is conducted using qualitative methods | 40% | 43% | 9% | 8% | 0% | 93 | 4.20 | 0.433 |
| During qualitative analysis of risks, ranking is done based on severity of the risk impact to the road construction projects | 46% | 34% | 13% | 7% | 0% | 93 | 4.16 | 0.401 |
| Qualitative analysis of risks in the road construction projects is done to establish probability of occurrence | 47% | 31% | 16% | 7% | 0% | 93 | 4.19 | 0.422 |
| Quantitative methods are utilized to analyze risks in the road construction projects | 49% | 31% | 3% | 17% | 0% | 93 | 4.12 | 0.511 |
| Quantitative methods are utilized to analyze risks in the road construction projects | 29% | 41% | 13% | 17% | 0% | 93 | 4.02 | 0.520 |
| Risk allocation in the road construction projects is conducted. to complement analysis process | 37% | 40% | 15% | 8% | 0% | 93 | 4.12 | 0.423 |

From the research findings on project risk analysis on completion of road construction projects showed the following results. Most respondents (83%, mean = 4.20, standard deviation = 0.433) agreed that risk analysis in road construction projects is undertaken using qualitative methods.

Furthermore, 80% of respondents agreed, with a mean of 4.16 and a standard deviation of 0.401, that during qualitative risk analysis, rankings are made based on the severity of the risk impact on road building projects. Most respondents (78%) agreed, with a mean of 4.19 and a standard deviation of 0.422, that qualitative risk analysis is performed in road building projects to determine the probability of occurrence.

According to the survey, 80% of respondents agreed (mean = 4.12, SD = 0.511) that quantitative approaches are used to examine hazards in road construction projects. The findings also revealed that most respondents (70%) agreed, with a mean of 4.02 and a standard deviation of 0.520, that quantitative approaches are used to assess hazards in road construction projects. Finally, 77% of respondents agreed (mean = 4.12, SD = 0.423) that risk allocation in road construction projects is done to supplement the analysis process. The findings indicated that respondents agreed with the Project Risk Analysis Practice Statements on the completion of road building projects in Nakuru County.

These results agree with (Nturanu & Mundia, 2019). Who argued that an analysis of the risks within the project can be conducted through quantitative as well as qualitative methods. Risks are prioritized for additional analysis or auctioning in qualitative risk analysis after their likelihood and impact have been determined. Based on the severity of the risk effect and the likelihood of occurrence, dangerous events are ranked as high, medium, or low during qualitative risk analysis (Nturanu & Mundia, 2019). For quantitative risk analysis, the combined impact of the established risks is numerically analyzed and determined for calculation of the frequency of risks and the degree of their impact. There are several techniques that play an instrumental role during risk analysis for instance, decision trees, Delphi techniques and sensitivity analysis among others.

4.5.3 Risk Response Planning Practice and successful completion of road construction projects.

The third goal of the study was to determine the impact of project risk response risk practice on the completion of road building projects in the county government of Nakuru, Kenya. The results are as given in Table 4.9

Table 4. 9: project risk response risk practice on successive completion on road construction projects

| Risk Response Planning Practice | SA | A | N | D | SD | N | Mean | Std |
|---|-----------|----------|----------|----------|-----------|----------|-------------|------------|
| The identified negative risky events in the road construction projects are avoided through elimination of the cause | 42% | 38% | 18% | 2% | 0% | 93 | 4.18 | 0.504 |
| Risks in the road construction projects are avoided through reduction of the specific threat | 39% | 31% | 12% | 8% | 0% | 93 | 4.42 | 0.341 |
| The identified risks in the road construction projects are mitigated through transfer to insurance firms | 41% | 44% | 11% | 4% | 0% | 93 | 4.46 | 0.734 |
| Positive risky events in the road construction projects are responded to through exploitation | 51% | 34% | 10% | 5% | 0% | 93 | 4.41 | 0.743 |
| Road construction projects respond to the identified positive risks through | 44% | 44% | 12% | 6% | 0% | 93 | 4.20 | 0.654 |

enhancement.

| | | | | | | | | |
|---|-----|-----|----|----|----|----|------|-------|
| Sharing is a response strategy to the identified risks in the road construction projects. | 31% | 50% | 4% | 5% | 0% | 93 | 4.42 | 0.745 |
|---|-----|-----|----|----|----|----|------|-------|

(Source field data 2024)

The research findings on project risk response risk practice on sequential completion of road construction projects in Nakuru County, Kenya, indicated the following outcomes. Most respondents (80%, mean = 4.18, standard deviation = 0.504) agreed that the detected unfavorable dangerous events in road construction projects are avoided by eliminating the source. The findings also revealed that 70% of respondents, with a mean of 4.42 and a standard deviation of 0.341, believed that hazards in road construction projects can be avoided by reducing the specific threat. Most respondents (85%), with a mean of 4.46 and standard deviation of 0.734, believed that positive dangerous events in road construction projects are dealt with through exploitation. Most respondents (88%), with a mean of 4.20 and standard deviation of 0.654, agreed that road construction projects address the highlighted positive risks through enhancement. Overall, 81% of respondents (mean = 4.42, SD = 0.745) agreed that sharing is a risk-reduction method for road construction projects. The results indicated that respondents agreed on the project risk response risk practice on sequential completion of road construction projects in the county government of Nakuru, Kenya.

The study findings are consistent with those of Ahmadi et al. (2020), who examined an assessment of risk response planning and its impact on project portfolio management. The inquiry offered a method informed by mathematical optimization to come up relevant responses to project risks. The proposed framework was seen to play an instrumental role in management of projects. There is another body of literature that classifies five broad strategies of responding to risky events: prevention, reduction, sharing, transferring and acceptance. Risk prevention covers an array of ways that can be adopted to avoid any inherent risk occurrence

as the project moves in the cycle (Yan, Liu, Zhao & Skitmore, 2021).

The purpose of risk reduction is to reduce the impact of delays on project performance. Risk sharing occurs when a certain percentage of the costs of risks are transferred among parties to the contract. Risk transfer is a situation when all the costs of risks are passed to third parties like insurance firms. Risk acceptance is where all the uncertainties are accepted (Marinich, 2020).

4.5.4 Risk control office on Successful completion of road construction Projects

The fourth goal of the study is to determine the impact of project risk control practices on subsequent completion of road building projects in the county government of Nakuru, Kenya.

The results were given in Table 4.10

Table 4. 10: project risk response risk practice on successive completion on road construction projects

| Risk Control Practice | SA (%) | A (%) | N (%) | D (%) | SD (%) | N | Mean | Std. |
|---|---------------|--------------|--------------|--------------|---------------|----------|-------------|-------------|
| There is continuous tracking of all the identified risky events in the road construction projects | 48 | 34 | 6 | 6 | 6 | 93 | 4.17 | 0.702 |
| Risk tracking observes the risk status of the road construction projects so that any deviation from the desired level of performance of the project can be identified | 30 | 48 | 14 | 8 | 0 | 93 | 3.94 | 0.830 |
| Risk status meetings are convened in the road construction Projects | 40 | 34 | 18 | 4 | 4 | 93 | 4.15 | 0.712 |
| Risk audit is done to identify new sources of risks in the road construction projects | 44 | 36 | 12 | 5 | 3 | 93 | 4.53 | 0.628 |
| Risk audit is conducted to establish the extent of adherence to the contingency plan in the road construction projects | 30 | 40 | 20 | 10 | 3 | 93 | 4.63 | 0.598 |

| | | | | | | | | |
|--|----|----|----|---|---|----|------|-------|
| Risk audit is conducted to establish the extent of adherence to the contingency plan in the road construction projects | 26 | 36 | 28 | 6 | 4 | 93 | 4.56 | 0.621 |
| There is periodic reporting of risks in the road construction Projects | 28 | 40 | 23 | 7 | 2 | 93 | 4.13 | 0.543 |
| There is monitoring of the execution of the contingency plans to undertake a relevant corrective course | 48 | 40 | 3 | 5 | 4 | 63 | 4.31 | 0.536 |

(Source field data 2024)

The research findings on project risk control practice on successive completion on road construction projects in county government of Nakuru, Kenya revealed the following results.

Majority the respondents at 82 % with a mean of 4.17 and standard deviation of 0.702 agreed that there is continuous tracking of all the identified risky events in the road construction projects.

The results also showed that majority of the respondents at 78 % with a mean of 3.94 and standard deviation of 0.830 agreed that risk tracking observes the risk status of the road construction projects so that any deviation from the desired level of performance of the project can be identified. Majority the respondents at 74 % with a mean of 4.15 and standard deviation of 0.712 agreed that risk status meetings are convened in the road construction Projects. Majority the respondents at 80 % with a mean of 4.53 and standard deviation of 0.628 agreed that risk audit is done to identify new sources of risks in the road construction projects.

The results also showed that majority the respondents at 70 % with a mean of 4.63 and standard deviation of 0.598 agreed that risk audit is conducted to establish the extent of adherence to the contingency plan in the road construction projects. Majority the respondents at 62 % with a mean of 4.56 and standard deviation of 0.621 agreed that risk audit is conducted to establish the extent of adherence to the contingency plan in the road construction projects. Majority the

respondents at 68 % with a mean of 4.13 and standard deviation of 0.543 agreed that there is periodic reporting of risks in the road construction projects. Finally, the results showed that majority the respondents at 88 % with a mean of 4.31 and standard deviation of 0.536 agreed that there is monitoring of the execution of the contingency plans to undertake a relevant corrective course. The overall results implied that the respondents agreed on the project risk control risk practice on successive completion on road construction projects in county government of Nakuru, Kenya

These research findings agree with Kiage and Namusonge (2016) who performed research in Kenya that examined risk management, project performance, and monitoring and evaluation (M&E) in telecommunications companies. According to the findings, many respondents felt that elements like the necessity of routine risk analysis and the involvement of project managers in risk analysis greatly influenced how well projects performed. In another study by Obondi (2020), the methods for project risk management and their effect on the project's operational success were the primary focus. The investigation focused specifically on building projects. Risk audits, risk status meetings, risk assessment, and contingency reserve analysis were all included in the variables. The study was conducted in the United States, and the findings indicated that risk monitoring and control had a major and beneficial impact on project success.

4.5.5 Successful completion of road construction projects

The study's dependent variable aimed to determine the impact of project risk management strategies on the sequential completion of road construction projects in Nakuru County Government, Kenya. Respondents were asked to indicate the aspect of sequential completion of road development projects. The results were given in Table 4.11

Table 4. 11: Successive completion on road construction projects in county government of Nakuru, Kenya.

| successive completion on road construction projects | SA (%) | A (%) | N (%) | D (%) | SD (%) | Mean | Std. Deviation |
|--|---------------|--------------|--------------|--------------|---------------|-------------|-----------------------|
| There has been adherence to time when implementing road Nakuru, Kenya | 48 | 23 | 12 | 14 | 3 | 4.25 | 0.868 |
| Infrastructure construction projects in county government of Nakuru, Kenya, have been completed in the established costs | 29 | 47 | 14 | 5 | 5 | 4.43 | 0.575 |
| The execution of infrastructure construction projects in county government of Nakuru, Kenya has been done based on established quality standards | 40 | 45 | 10 | 2 | 3 | 4.15 | 0.870 |
| The completed road construction projects have been accepted by clients in county government of Nakuru, Kenya | 33 | 40 | 12 | 8 | 7 | 4.42 | 0.529 |

(Source field data 2024)

The research findings on the sequential completion of road development projects in the county government of Nakuru, Kenya revealed the following conclusions on the assertions below. Most respondents (71%), with a mean of 4.25 and a standard deviation of 0.868, agreed that time was adhered to when executing road Nakuru in Kenya.

Furthermore, 76% of respondents (mean = 4.43, standard deviation = 0.575) agreed that infrastructure construction projects in the county government of Nakuru, Kenya, were finished on time and within budget. The respondents also agreed (85%, mean = 4.15, SD = 0.870) that infrastructure construction projects in the county government of Nakuru, Kenya, were carried out in accordance with set quality standards. On the same note, 73% of respondents agreed, with a mean of 4.42 and a standard deviation of 0.529, that finished road construction projects had been accepted by clients in Nakuru County, Kenya.

These findings coincide with Demirkesen and Ozorhon (2017), who state that project management success is defined by parameters such as cost, time, and quality/performance, whereas project success is assessed based on the project's overall objectives. They emphasized the importance of distinguishing between project performance, which can be reviewed during the project's life cycle, and project success, which cannot be verified until the project is completed. Nonetheless, Albert, Balve, and Spang (2017) believe that project success is evaluated by assessing both project management and product (including facilities) factors. A construction project's success is largely determined by its financial, scheduling, and quality goals.

4.6 Diagnostic Test

To justify the employment of the regression model, diagnostic tests were performed. In this example, diagnostic tests included the multicollinearity test, the normality test, and the

heteroscedasticity test. This was done to prevent erroneous regression results from being obtained.

4.6.1 multi-collinearity

A multi-collinearity analysis was performed to guarantee that the independent variables did not exhibit co-linearity with one another. The variance inflation factors (VIF) and tolerance were employed to evaluate multicollinearity. The variance inflation factor, or VIF, is $(1/\text{tolerance})$, and as a general guideline, a variable with a VIF value more than 10 may warrant further research. If the VIF value ranges between 1 and 10, there is no multicollinearity. Table 4.12: Tolerance and VIF Test.

Table 4. 12: Collinearity Statistics

| Model | Tolerance | VIF |
|-----------------------------|-----------|-------|
| 1 (Constant) | | |
| project risk identification | .154 | 6.142 |
| project risk analysis | .352 | 2.705 |
| project risk response | .880 | 1.125 |
| Project risk control | .767 | 1.283 |

a. Dependent Variable: successive completion on road construction projects

According to the findings, project risk identification had a tolerance of 0.154 and a VIF of 6.142; project risk analysis had a tolerance of 0.352 and a VIF of 2.705; project risk response had a tolerance of 0.880 and a VIF of 1.125; and project risk control had a tolerance of 0.767 and a VIF of 1.283. Because the tolerance for all variables was greater than 0.1 and the VIF was less than 10, there was no need for additional analysis.

4.6.2 Test for Normality

The study conducted a normality test determine whether the data was normally distributed. Normality test results are presented in Table 4.13

Table 4. 13: Tests of Normality

| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|---|---------------------------------|----|-------|--------------|----|------|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Successive completion on road construction projects | .117 | 93 | .200* | .967 | 93 | .561 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 14 shows that the p-value was 0.561. For normally distributed data, the p-value is greater than 5% significance level. 0.561 is greater than 0.05 thus the data was normally distributed.

4.6.3 Linearity test results

Linearity tests were undertaken to establish the linear relation between project risk identification, project risk analysis, project risk response, Project risk control. Results are presented in Tables 4.14, 4.15, 4.16 and 4.17.

Table 4. 14: Linearity between project risk identification and successive completion on road construction projects

| | Sum of Squares | df | Mean Square | F | Sig. |
|--|----------------|----|-------------|---|------|
| | | | | | |

| | | | | | | | |
|--------------------|----------------|------------|-------|----|-------|--------|------|
| successive | | (Combined) | 3.657 | 13 | .366 | 3.471 | .014 |
| completion on road | | | | | | | |
| construction | Between Groups | Linearity | 2.052 | 7 | 2.042 | 19.325 | .001 |
| projects* | | Deviation | | | | | |
| | | from | 1.626 | 33 | .181 | 1.709 | .173 |
| project risk | | Linearity | | | | | |
| identification | Within Groups | | 1.575 | 55 | .106 | | |
| | Total | | 5.262 | 92 | | | |

Results shows that the p-value for the deviation from linearity was 0.173. For linear relationship to exist, the deviation from linearity should be greater than 0.05. $0.173 > 0.05$ implies that project risk identification and successive completion on road construction projects are linearly related. This linear relationship will support inferential statistical analysis particularly in determining the causal relationship between project risk identification and successive completion on road construction projects in Nakuru county.

Table 4. 15: Linearity between project risk analysis, and successive completion on road construction projects

| | | | Sum of | df | Mean | F | Sig. |
|---------------|---------|------------|---------|----|--------|-------|------|
| | | | Squares | | Square | | |
| successive | Between | (Combined) | 2.012 | 13 | .202 | .931 | .531 |
| completion on | Groups | Linearity | 1.187 | 7 | 1.187 | 5.488 | .032 |

| | | | | | | |
|-----------------------------|----------------|-------|----|------|------|------|
| road construction projects* | Deviation from | .826 | 4 | .093 | .425 | .901 |
| | Linearity | | | | | |
| project risk analysis | Within Groups | 3.243 | 33 | .217 | | |
| | Total | 5.253 | 92 | | | |

The results in Table 16 demonstrate that the divergence from linearity between project risk assessments and sequential completion of road building projects was 0.901. This implies that there was a linear link between project risk analysis and subsequent completion of road construction projects, as 0.901 is more than the 0.05 level of significance.

Table 4. 16: Linearity between project risk response and successive completion on road construction projects

| | | Sum of Squares | df | Mean Square | F | Sig. |
|--|----------------|----------------|----|-------------|-------|------|
| successive completion on road construction projects* | (Combined) | 2.639 | 13 | .229 | 1.266 | .319 |
| | Linearity | 1.522 | 7 | 1.532 | 8.223 | .002 |
| | Deviation from | 1.077 | 4 | .107 | .570 | .800 |
| | Linearity | | | | | |
| | Within Groups | 2.613 | 33 | .177 | | |
| project risk response | Total | 5.242 | 92 | | | |

The results in table 17 demonstrate that the p-value for the departure from linearity between project risk analysis and successive completion on road construction projects was 0.800. The variation from linearity was more than 0.05 ($0.800 > 0.05$). Thus, there existed a linear link between project risk analysis and sequential completion of road construction projects in Nakuru county.

Table 4. 17: Linearity between project risk control and successive completion on road construction projects.

| | | Sum of | df | Mean | F | Sig. |
|--------------|---------------|---------|----|--------|--------|------|
| | | Squares | | Square | | |
| successive | (Combined) | 3.856 | 13 | .375 | 4.102 | .005 |
| completion | Linearity | 2.845 | 7 | 2.836 | 30.362 | .000 |
| on road | Between | | | | | |
| construction | Groups | | | | | |
| projects* | Deviation | | | | | |
| | from | 1.010 | 4 | .101 | 1.184 | .361 |
| | Linearity | | | | | |
| | Within Groups | 1.405 | 33 | .093 | | |
| project risk | Total | 5.251 | 92 | | | |
| control | | | | | | |

The findings show that the deviation from linearity between was 0.361. This implies that there was a linear relationship between project risk control and successive completion on road construction since 0.361 is greater than 0.05 level of significance.

4.6.4 Homoscedasticity test results

Homoscedasticity refers to the homogeneity of disturbance between independent and dependent

variables across different independent variable values. It expresses the same residual terms across observations. In contrast, unequal errors result in a heteroscedasticity problem. Heteroscedasticity can lead to inefficient parameter estimates and erroneous confidence ranges. When the value of the dependent variable changes, the error term should not fluctuate much. For homoscedastic data, the p-value is bigger than .05. Table 4.18 shows the results of the homoscedasticity test.

Table 4. 18: Homoscedasticity Test Results

| Model | Unstandardized | | Standardized | t | Sig. |
|-----------------------------|----------------|------------|--------------|-------|------|
| | Coefficients | | Coefficients | | |
| | B | Std. Error | Beta | | |
| (Constant) | .030 | .228 | | .130 | .896 |
| project risk identification | -.007 | .051 | -.036 | -.162 | .871 |
| project risk analysis | .055 | .055 | .250 | 1.010 | .327 |
| 1 project risk response | .006 | .031 | .049 | .215 | .830 |
| project risk control | -.015 | .042 | -.092 | -.362 | .721 |

a. Dependent Variable: Successive completion on road construction projects

The results in Table 19 reveal that project risk identification, analysis, response, and control had p-values of 0.871, 0.327, 0.830, and 0.721, respectively. All of these values are greater than 0.05, indicating that the data was homoscedastic and had no heteroscedasticity issues. The results assisted the researcher in validating the suitability of the linear regression analysis.

4.7 Inferential Statistics

4.7.1 Correlation Analysis

The researcher conducted a correlation analysis to determine the type and degree of the links between the study's independent and dependent variables.

4.7.2 Project risk identification on successive completion on road construction projects

Table 4. 19: Correlation between project risk identification successive completions on road construction projects

| | | project risk identification |
|----------------------------|---------------------|-----------------------------|
| successive completion on | Pearson Correlation | .533** |
| road construction projects | Sig. (2-tailed) | .000 |
| | N | 93 |

** . Correlation is significant at the 0.01 level (2-tailed).

The study examined the relationship between project risk identification and subsequent completion of road building projects. The data revealed that project risk identification leads to sequential completion of road construction projects in Nakuru county ($r=0.533$, $p=0.000$). This demonstrated that there is a moderately favorable and substantial association between project risk identification and subsequent completion of road building projects in Nakuru County. As a result, the data suggest that project risk identification influences the subsequent completion of road construction projects in Nakuru County.

4.7.3 Project risk analysis on successive completion on road construction projects

Table 4. 20: Correlation between Project risk analysis on successive completion on road

construction projects

| | | Project risk analysis |
|--|---------------------|-----------------------|
| successive completion on road construction projects | Pearson Correlation | .531** |
| | Sig. (2-tailed) | .000 |
| | N | 93 |

** . Correlation is significant at the 0.01 level (2-tailed).

In addition, the study examined the relationship between project risk analysis and sequential completion of road construction projects in Nakuru County. The results showed that $r = 0.531$ and $p = 0.000$. This demonstrates that there is a positive and significant association between project risk analysis and subsequent completion of road construction projects in Nakuru County. The findings indicated that project risk analysis effects successive completion of road development projects in Nakuru County.

4.7.4 Project risk response on successive completion of road construction projects

Table 4. 21: Correlation between Project risk response on successive completion on road construction projects

| | | Project risk response |
|--|---------------------|-----------------------|
| Successive completion on road construction projects | Pearson Correlation | .219** |
| | Sig. (2-tailed) | .002 |
| | N | 93 |

** . Correlation is significant at the 0.01 level (2-tailed).

The study also intended to determine the nature of the relationship between project risk responses and the

sequential completion of road construction projects in Nakuru County. The results showed that $r = 0.219$ and $p = 0.002$. The p value was below than the significance level of 0.01, indicating a positive statistically significant link between project risk responses and subsequent completion of road construction projects in Nakuru County. This implies that project risk responses influence the completion of road development projects in Nakuru County, Kenya.

4.7.5 Project risk control on successive completion of road construction projects

Table 4. 22: Correlation between project risk control on successive completion of road construction projects

| | | Financial Skills |
|--|---------------------|------------------|
| Successive completion on road construction projects | Pearson Correlation | .269** |
| | Sig. (2-tailed) | .004 |
| | N | 93 |

** . Correlation is significant at the 0.01 level (2-tailed).

The study also intended to determine the nature of the relationship between project risk control and the subsequent completion of road construction projects in Nakuru County. The results showed that $r=0.269$ and $p=0.004$. The p value was below than the significance level of 0.01, indicating a statistically significant association between project risk control and subsequent completion of road construction projects in Nakuru County. This suggests that project risk management effects the subsequent completion of road development projects in Nakuru County.

4.7.6 Regression Model Summary

The researcher employed adjusted R Squared to determine the strength of the association between

independent and dependent variables. The researcher chose the value of Adjusted R-squared over R Squared because it provides the proportion of variation explained by only the independent factors that affect the dependent variable. The findings are presented in Table 17. The findings are presented in Table 4.23.

Table 4. 23: Regression Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .878 ^a | .770 | .797 | .28371 |

a. Predictors: (Constant), project risk identification, project risk analysis, project risk response, Project risk control

b. Dependent Variable: successive completion on road construction projects

The study used regression analysis to determine the strength of the link between the independent and dependent variables, as shown in Table 17. The data suggest that the successive completion rate on road construction projects in Nakuru County is 79.7%, as explained by the independent variables under this study, while the remaining 20.3% is due to other factors not addressed in this study.

4.7.7 ANOVA test

The F statistic in the ANOVA table above is 60.9150, as shown in table 18. The fact that the estimated f is bigger than the f statistic indicates that the model is statistically significant. As a result, there is strong evidence that the regression findings are statistically significant, and the variation in the results is small, implying that a change in the study units (population) will not result in a meaningful difference, as the model did for the data.

4.7.8 Multiple Regression Coefficients

Table 4. 24: Regression Coefficients

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|---------|-------------------|
| 1 | Regression | 28.720 | 4 | 7.2865 | 60.9150 | .000 ^b |
| | Residual | 6.860 | 88 | 0.1288 | | |
| | Total | 35.780 | 92 | | | |

a. Predictors: (Constant), project risk identification, project risk analysis, project risk response, Project risk control

b. Dependent Variable: successive completion on road construction projects

| Model | Unstandardized | | Standardized | | t | Sig. |
|-----------------------------|----------------|------------|--------------|--|-------|------|
| | B | Std. Error | Beta | | | |
| 1(Constant) | .193 | .147 | | | 4.035 | .000 |
| project risk identification | .248 | .040 | .125 | | 2.482 | .001 |
| project risk analysis | .260 | .076 | .685 | | 7.344 | .003 |
| project risk response. | .351 | .072 | .191 | | 2.095 | .004 |
| Project risk control | .225 | .040 | .304 | | 6.375 | .006 |

Dependent Variable: successive completion on road construction projects

in Nakuru County

The study also conducted a regression analysis to establish the regression coefficients connecting

the independent and dependent variables as illustrated by the equation illustrated below:

$$PS = \beta_0 + \beta_1RIP + \beta_2RAP + \beta_3RRPP + \beta_3RCP + \varepsilon$$

Were.

PS = Successive implementation of road construction projects

RIP = Risk Identification Practice

RAP = Risk Analysis Practice

RRPP = Risk Response Planning Practice

RCP = Risk Control Practice

ε is the error term

β is the regression beta coefficient

From the results in Table 25 the given equation was answered by the values of Unstandardized Coefficients (β). The results indicate that project risk identification, project risk analysis, project risk response, Project risk control have a positive relationship with successive completion on road construction projects in Nakuru County. Thus,

$$Y = 0.193 + 0.248 \text{ RIP} + 0.260 \text{ RAP} + 0.351 \text{ RRPP} + 0.225 \text{ RCP} + \varepsilon$$

The baseline value for the successful implementation of road construction projects in Nakuru County, without considering the predictor variables, is 0.193. This indicates that, at any given time, the success rate of road construction projects in Nakuru County is 0.193, assuming all other factors are held constant. Additionally, the results show that a unit change in risk identification practice would lead to a 0.248 increase in the success rate of road construction projects. Similarly, a unit increase in risk analysis practice would result in a 0.260 increase in the success rate. Furthermore, a unit increase in risk response planning practice would lead to a 0.351 increase in the success rate, and a unit increase in risk control practice would result in a 0.225 increase in the successful

implementation of road construction projects in Nakuru County, Kenya.

4.8 Answers to research questions

The study attempted to address the following questions: what is the impact of project risk identification practice on subsequent completion of road construction projects in the county government of Nakuru, Kenya? The data revealed that project risk identification leads to sequential completion of road construction projects in Nakuru county ($r=0.533$, $p=0.000$). This showed that there is a somewhat favorable and significant association between. Project risk identification and subsequent completion of road building projects in Nakuru County.

The study attempted to answer the following questions: how does project risk analysis practice effect subsequent completion of road construction projects in the county government of Nakuru, Kenya? The results showed that $r = 0.531$ and $p=0.000$. This demonstrates that there is a positive and significant association between project risk analysis and subsequent completion of road construction projects in Nakuru County.

The study attempted to answer the following questions: how does risk response planning practice effect successive completion of road construction projects in the county government of Nakuru, Kenya? The results showed that $r = 0.219$ and $p = 0.002$. The p-value was less than 0.01, indicating a positive statistically significant link between project risk responses and sequential completion of road construction projects in Nakuru County.

The study aimed to answer the questions. How does risk control practice affect the sequential completion of road building projects in the county government of Nakuru, Kenya? The results showed that $r=0.269$ and $p=0.004$. The p value was below than the significance level of 0.01, indicating a statistically significant association between project risk control and subsequent completion of road construction projects in Nakuru County.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a detailed description of the study's major findings before drawing conclusions and discussing the ramifications of those findings. Finally, it provides recommendations and proposals for future research. This study aimed to determine the impact of project risk management strategies on the completion of road construction projects in Nakuru County, Kenya.

5.2 Summary of Findings

The study intended to determine a summary of the study's primary findings. The summary was organized into categories based on specific aims.

5.2.1 Influence of project risk identification practice on successive completion on road construction projects in county government of Nakuru, Kenya.

From the analysis the study findings revealed document review is used to identify risks in the road construction projects. Risks in road construction projects identified through Delphi technique had an influence on project risk identification. The results also revealed that brainstorming is a technique used to identify risks in the road construction projects. A technique known as SWOT analysis was also used to find risks that could have an impact on road construction projects. The results also showed that all the identified risks in the road construction projects were documented in a register for reference. All identified risks in road construction projects were classified into types, and finally, the sources of risk inform risk identification in road construction projects had an impact on project risk verification and the successful completion of road construction initiatives in Nakuru County, Kenya.

5.2.2 Influence of project risk analysis practice on successive completion on road construction projects in county government of Nakuru, Kenya

According to the study's findings, risk analysis in road construction projects is carried out utilizing qualitative approaches. Furthermore, the study discovered that during the qualitative analysis of risks, rankings are made based on the severity of the risk impact on road building projects. The study also indicated that a qualitative examination of risks in road construction projects was conducted to determine the likelihood of occurrence. Furthermore, the study found that quantitative methodologies were used to assess hazards in road construction projects. The study also found that risk allocation in road construction projects is done to supplement the analysis process.

5.2.3 Influence of project risk response risk practice on successive completion on road construction initiatives in county government of Nakuru, Kenya

From the analysis the study revealed that the identified negative risky events in the road construction projects are avoided through elimination of the cause. Moreover, the study revealed that risks in the road construction projects are avoided through reduction of the specific threat. The study further revealed that the identified risks in the road construction projects are mitigated through transfer to insurance firms. The study also revealed that positive risky events in the road construction projects are responded to through exploitation. In addition, the study revealed that road construction projects responded to the identified positive risks through enhancement. The study also revealed that sharing is a response strategy to the identified risks in road construction projects.

5.2.4 Influence of project risk control practice on successive completion on road construction projects in county government of Nakuru, Kenya

The study findings on project risk control revealed that there is continuous tracking of all the

identified risky events in the road construction projects. The study also revealed that risk tracking observes the risk status of the road construction projects so that any deviation from the desired level of performance of the project can be identified. Furthermore, the study found that risk status meetings are held during road construction projects. Furthermore, the study found that risk assessments are conducted to uncover new sources of risk in road construction projects. The survey also indicated that risk audits are carried out in road construction projects to determine the extent to which contingency plans are followed. The survey also indicated that risk assessments are undertaken in road construction projects to determine the amount of adherence to the contingency plan. The survey also found that dangers in road construction projects are periodically reported. Finally, the study findings demonstrated that there is monitoring of the execution of the contingency plans to perform an appropriate corrective action.

5.3 Conclusion

The study concludes the following based on the summaries.

5.3.1 Influence of project risk identification practice successive completion on road construction projects

Based on the findings, the study indicated that project risk identification leads to sequential completion of road construction projects in Nakuru county ($r=0.533$, $p=0.000$). As a result, the data suggest that project risk identification has an impact on the subsequent completion of road construction projects in Nakuru county, Kenya.

5.3.2 Influence of project risk analysis practice on successive completion on road construction projects

Based on the findings, the study found that $r=0.531$ and $p=0.000$. This demonstrates that there is a positive and significant association between project risk analysis and subsequent completion of road construction projects in Nakuru County. The findings suggested that project risk analysis effects

subsequent completion of road development projects in Nakuru County, Kenya.

5.2.3 Influence of project risk response risk practice on successive completion on road construction projects

Based on the findings, the study found that $r=0.219$ and $p=0.002$. The p-value was less than 0.01, indicating a positive statistically significant link between project risk responses and sequential completion of road construction projects in Nakuru County. This means that project risk responses influence the completion of road development projects in Nakuru County.

5.3.4 Influence of project risk control practice on successive completion on road construction projects

Based on the findings, the study found that $r=0.269$ and $p=0.004$. The p value was below than the significance level of 0.01, indicating a statistically significant association between project risk control and subsequent completion of road construction projects in Nakuru County. This suggests that project risk management effects the subsequent completion of road development projects in Nakuru County.

5.4 Recommendations

The report proposes identifying project risks to ensure effective completion of road construction. Document review should be used to identify risks in the road construction projects. Risks in road construction projects should be identified through Delphi technique. Brainstorming technique should use to identify risks in the road construction projects. SWOT analysis should be used to find risks that could have an impact on road construction projects. All identified risks in the road construction projects should be documented in a register for reference. All the identified risks in the road construction projects should be categorized into their respective types and finally the sources of risk should well know in risk identification in the road

construction

Regarding project risk analysis practice on successive completion on road construction project the following should be put into consideration. Risk analysis in road construction projects should be undertaken qualitatively. During qualitative risk analysis, hazards should be ranked according to the severity of their influence on road construction projects. A qualitative analysis of risks in road construction projects should be conducted to determine the likelihood of occurrence. Quantitative methods should be used to assess risks in road construction. Risk allocation in road building projects should be undertaken to supplement the project analysis process.

Regarding project risk response on successful completion of road construction projects, the study recommended that identified negative risky events in the road construction projects should be avoided through elimination of the cause. Risks in the road construction projects should be avoided through reduction of the specific threat. Identified risks in the road construction projects should be mitigated through transfer to insurance firms. Positive risky events in the road construction projects should be responded to through exploitation. Road construction projects should respond to the identified positive risks through enhancement. Risk sharing response strategy should be identified risks in the road construction projects.

In terms of project risk control practice on successive completion of road building projects, the study suggests that project risk control be ongoing to follow all recognized risky occurrences. Risk tracking should monitor the risk status of road construction projects to identify any deviations from the project's targeted level of performance. Risk status meetings should be held for road building projects. A risk audit should be conducted to detect new sources of risk in road construction projects. A risk audit should be done to determine the extent to which road construction projects

conform to the contingency plan. Risk audit be conducted to establish the extent of adherence to the contingency plan in the road construction projects. There should be periodic reporting of risks in the road construction projects and there should be monitoring of the execution of the contingency plans to undertake a relevant corrective course to enhance successful completion of road construction projects.

5.5 Suggestion for Further Studies

The researcher proposed that another study be undertaken on project risk management strategies, how they are employed in capital projects, and how they influence project success.

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APPENDICES

Appendix I: Informed consent form

RE: REQUEST FOR YOUR CONSENT TO PARTICIPATE IN A RESEARCH

I kindly write to request for you to participation in a research project. The study title is: INFLUENCE OF PROJECT RISK MANAGEMENT PRACTICES ON CONSTRUCTION OF ROAD PROJECTS IN COUNTY GOVERNMENT OF NAKURU, KENYA

The potential risks and discomforts of the study are minimal. This is because you will only be expected to participate in the questionnaire. Before filling the questionnaire, all respondents will be reminded and requested to keep what is discussed to be confidential. There are no potential benefits for you as a person for participating in this study. I am requesting you to volunteer and share your opinions. No payments will be made for the information that you give or for the time that you will spend with us. Confidentiality of any information that you provide will be maintained. Data collected will only be used for the purpose of this study and will be destroyed when the findings are published.

PARTICIPATION IN THIS STUDY IS COMPLETELY VOLUNTARY. YOU MAY REFUSE TO FILL THE QUESTIONNAIRE AND YOU MAY WITHDRAW AT ANY STAGE IF YOU SO WISH.

If you accept to participate in this study, please append your signature:

Signature of participant..... Date:

If you have any query, please contact the following:

Mobile phone: +254726008705 or by email: ericng'etich23@gmail.com

Sincerely,

**ERIC KIPKOECH NGE'TICH
RESEARCHER**

Appendix II: Questionnaire

SECTION A: GENERAL INFORMATION

1. Gender

Male Female

2. Age (Years)

18-30 30-40 40-50 above 50

3. Work experience (Years)

Less than 5 5-10 10-20 Above 20

4. Highest Level of education

Primary Secondary school Diploma Degree Masters
 [] Doctorate

Section B: Risk Identification Risk Practice

4. Given are statements on Risk Identification Practice and Successful completion of road construction projects. Which of the following assertions are you most in agreement with? Please tick (✓) in the space corresponding to the correct answer. SA- Strongly Agree to SD- Strongly Disagree

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| Document review is used to identify risks in the road construction projects | | | | | |
| Risks in road construction projects are identified through Delphi technique | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| Brainstorming is a technique used to identify risks in the road construction projects | | | | | |
| A technique known as SWOT analysis is used to find risks that could have an impact on road construction projects | | | | | |
| All the identified risks in the road construction projects are documented in a register for reference | | | | | |
| All the identified risks in the road construction projects are categorized into their respective types | | | | | |
| The sources of risk inform risk identification in the road construction projects | | | | | |

Section C: Risk Analysis Risk Practice

5. Given are statements on Risk Analysis Practice and successful completion of road Construction Projects. Which of the following assertions are you most in agreement with? Please tick (✓) in the space corresponding to the correct answer. SA- Strongly Agree to SD- Strongly Disagree

| | S D | D | N | A | S A |
|--|----------------------|----------|----------|----------|----------------------|
| The analysis of risks in the road construction projects is conducted using qualitative methods | | | | | |
| During qualitative analysis of risks, ranking is done based on severity of the risk impact to the road construction projects | | | | | |
| Qualitative analysis of risks in the road construction projects is done to establish probability of occurrence | | | | | |
| Quantitative methods are utilized to analyze risks in the road | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| construction projects | | | | | |
| Quantitative risk analysis helps calculation of the degree of the impact of risks on the road construction projects | | | | | |
| The analyzed risks in the road construction projects are assessed to predict their frequency of occurrence | | | | | |
| Risk allocation in the road construction projects is conducted to complement analysis process | | | | | |

Section D: Risk Response Planning Risk Practice

6. Given are statements on Risk Response Planning Practice and successful completion of road construction projects. Which of the following assertions are you most in agreement with? Please tick (✓) in the space corresponding to the correct answer. SA- Strongly Agree to SD- Strongly Disagree

| | S D | D | N | A | S A |
|---|----------------|----------|----------|----------|----------------|
| The identified negative risky events in the road construction projects are avoided through elimination of the cause | | | | | |
| Risks in the road construction projects are avoided through reduction of the specific threat | | | | | |
| The identified risks in the road construction projects are mitigated through transfer to insurance firms | | | | | |
| Positive risky events in the road construction projects are responded to through exploitation | | | | | |
| Road construction projects respond to the identified positive risks | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| through enhancement | | | | | |
| Sharing is a response strategy to the identified risks in the road construction projects | | | | | |

Section E: Risk Control Practice

7. Given are statements on Risk Control Practice and Successful completion of road construction Projects. Which of the following assertions are you most in agreement with? Please tick (✓) in the space corresponding to the correct answer SA- Strongly Agree to SD- Strongly Disagree

| | S D | D | N | A | S A |
|---|----------------|----------|----------|----------|----------------|
| There is continuous tracking of all the identified risky events in the road construction projects | | | | | |
| Risk tracking observes the risk status of the road construction projects so that any deviation from the desired level of performance of the project can be identified | | | | | |
| Risk status meetings are convened in the road construction Projects | | | | | |
| Risk audit is done to identify new sources of risks in the road construction projects | | | | | |
| Risk audit is conducted to establish the extent of adherence to the contingency plan in the road construction projects | | | | | |
| There is periodic reporting of risks in the road construction Projects | | | | | |
| There is monitoring of the execution of the contingency plans to | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| undertake a relevant corrective course | | | | | |
|--|--|--|--|--|--|

SECTION F: Successful completion of road construction projects

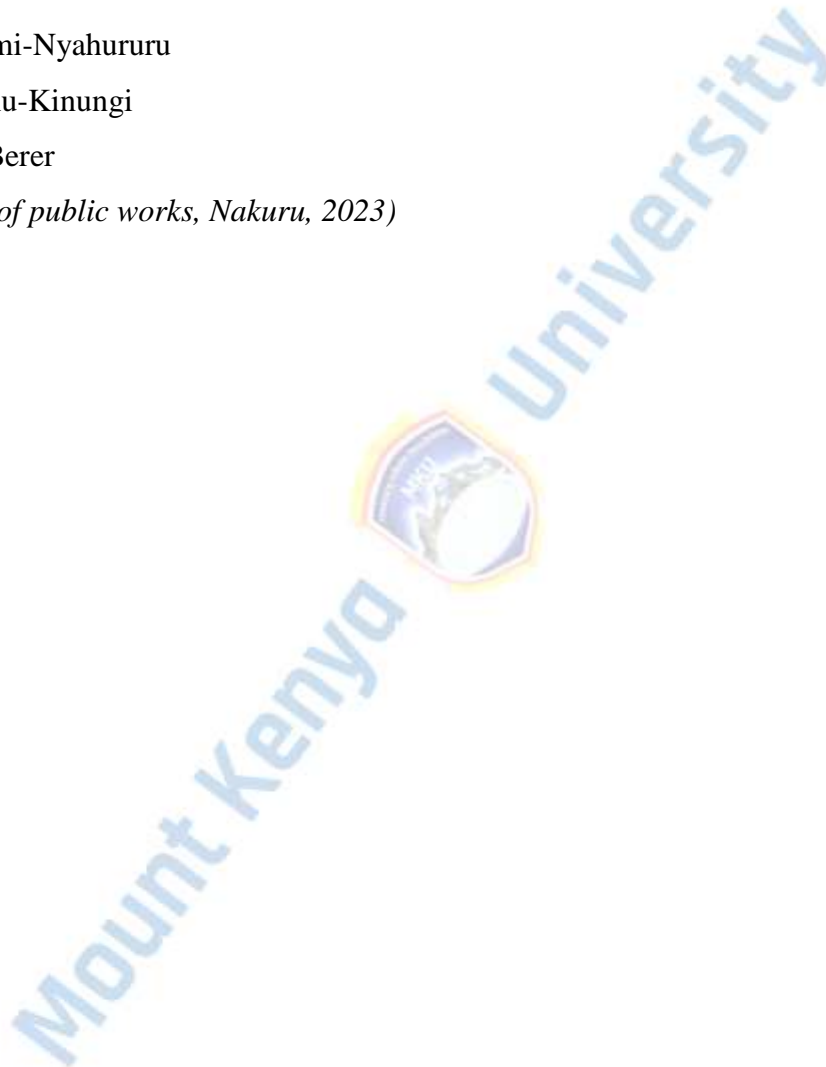
Given are statements on road projects. Which of the following assertions are you most in agreement with? Please tick (√) in the space corresponding to the correct answer. SA- Strongly Agree to SD- Strongly Disagree

| | S D | D | N | A | S A |
|--|----------------|----------|----------|----------|----------------|
| There has been adherence to time when implementing road construction projects in county government of Nakuru, Kenya | | | | | |
| Infrastructure construction projects in county government of Nakuru, Kenya, have been completed in the established costs | | | | | |
| The execution of infrastructure construction projects in county government of Nakuru, Kenya has been done based on established quality standards | | | | | |
| The completed road construction projects have been accepted by clients in county government of Nakuru, Kenya | | | | | |

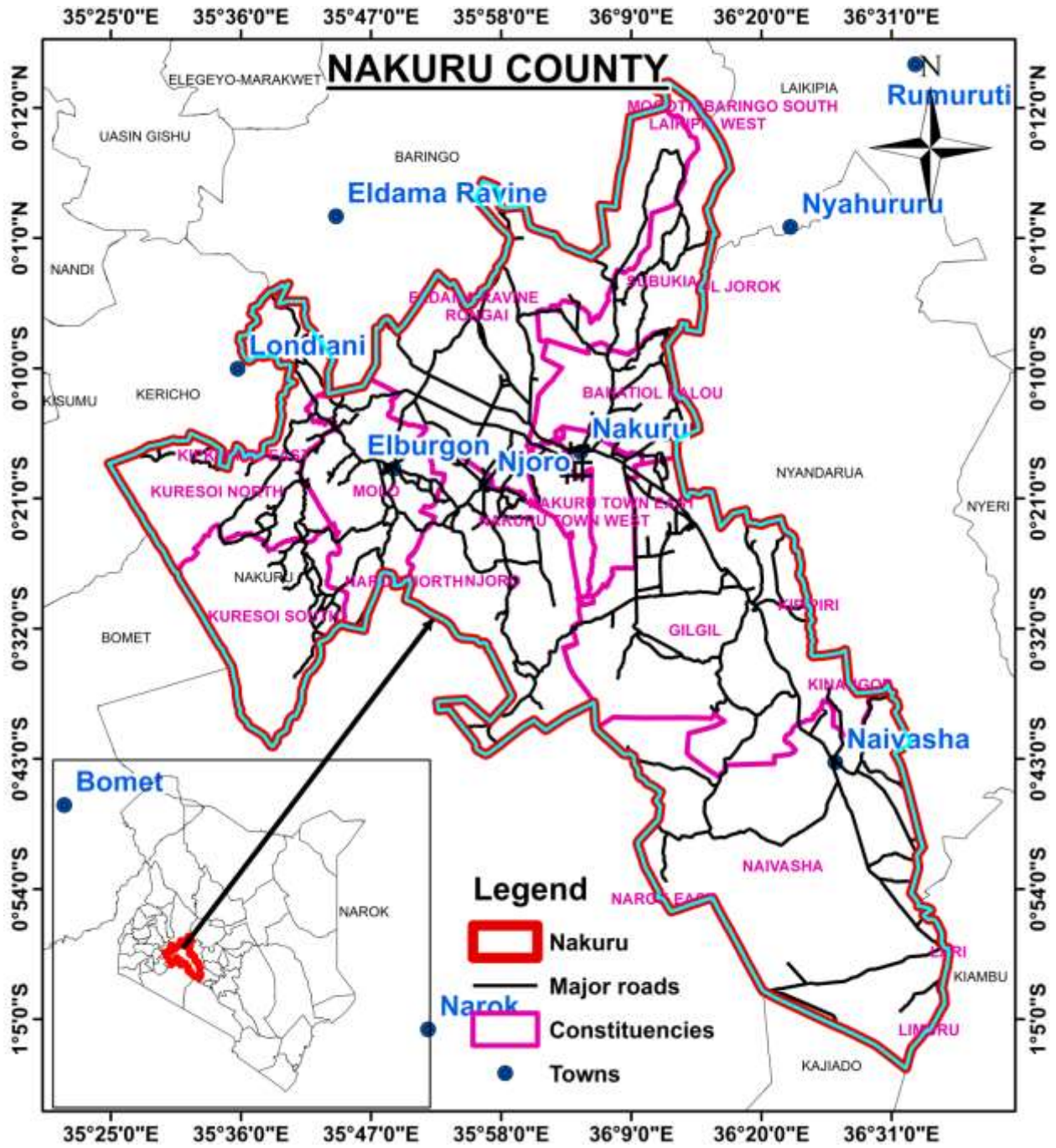
Appendix III: List of Road Projects in county government of Nakuru, Kenya.

1. Molo-Kibunja
2. Salgaa-Rongai
3. Subukia-Shrine
4. Mau-Summit – Junction
5. Maili Kumi-Nyahururu
6. Maraigishu-Kinungi
7. Mang’u-Berer

Source (ministry of public works, Nakuru, 2023)



Appendix IV: Area of study map



Appendix V: Budget

| BUDGET LINE ITEMS | Description | COST (Ksh) |
|---|--|-------------------|
| Proposal Development Photocopying, Printing and stationery and binding the research proposal and thesis | Two copies each for the thesis and the research proposal | Sh. 20,000 |
| Data Collection Transport and communication, printing and photocopying during the collection of data. | | Sh. 50,000 |
| Data Analysis and Interpretation Data Analysis and SPSS | | Sh. 40,000 |
| Report Writing and Dissemination Report writing and binding and dissemination | | Sh. 20,000 |
| Total | | 130,000 |

Appendix Vi: Workplan

| ACTIVITY | Nov 2023 - March 2024 | April 2024- May 2024 | May 2024 - July 2024 | July 2024 – August 2024 | Sep 2024 - Oct 2024 |
|--|----------------------------------|---------------------------------|---------------------------------|------------------------------------|--------------------------------|
| Proposal Development | | | | | |
| Application for research permits and Data Collection (Field Work) | | | | | |
| Data Analysis and Interpretation | | | | | |
| Thesis and Report Writing | | | | | |
| Corrections and Report Dissemination | | | | | |
| Postgraduate school thesis defence | | | | | |

Appendix Vii: NACOSTI Approval


REPUBLIC OF KENYA


NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **581466** Date of Issue: **19/March/2024**

RESEARCH LICENSE



This is to Certify that Mr., Eric Kipkoroh Ngetich of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: **INFLUENCE OF PROJECT RISK MANAGEMENT PRACTICES ON COMPLETION OF ROAD PROJECTS IN NAKURU COUNTY, KENYA** for the period ending : **19/March/2025**.

License No: **NACOSTI/P/24/33980**


Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

Applicant Identification Number: **581466**

Verification QR Code



NOTE: This is a computer generated License. To verify the authenticity of this document,
Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix VIII: University Approval



REF: MKU/ISERC/3516
TO: ERIC KIPKOECH NGETICH

Date: 12 March 2024

REG: MSCPM/2022/58597

Dear Sir/Madam,

RE: INFLUENCE OF PROJECT RISK MANAGEMENT PRACTICES ON COMPLETION OF ROAD PROJECTS IN NAKURU COUNTY, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2560**. The approval period is **12/03/2024 - 11/03/2025**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including informed consents, study instruments, MTA will be used
- ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
- vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 01000, Thika