EFFECTS OF PROJECT RISK MANAGEMENT ON THE PERFORMANCE OF GEOTHERMAL PROJECTS AT KENGEN COMPANY PLC

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A Research Project Submitted in Partial Fulfilment Of The Requirements For The Award Of The Degree Of Master Of Business Administration, School Of Business, University Of Nairobi

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DECLARATION

This research project is entirely my own original work; it has not been presented or utilized at any other institution.

Signed ..... Date.....**December 4, 2023**.....

ISAAC KITHUMA NZAINGA

This research project has been submitted for examination with my approval as the appointed supervisor.

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DEDICATION

This project is a heartfelt tribute to the divine Creator, the unwavering foundation of my strength, the wellspring of my inspiration, wisdom, knowledge, and understanding. On His divine wings alone have I found the fortitude to navigate this journey. My profound dedication extends to my beloved wife, Lesley Choge, and my cherished mother, Hellen Nzainga. Their continuous support has been the driving force propelling me to see this endeavor through to completion. May the blessings of the Almighty encompass them both, now and for all time. "Amen."

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I extend my heartfelt appreciation for the unwavering support I received throughout the culmination of this project. Foremost, my gratitude goes to Onserio Nyamwange, my supervisor, whose guidance, mentorship, and encouragement were instrumental in bringing this work to fruition. His dedicated review and constructive criticism significantly contributed to the completion of this research. Nyamwange's extensive knowledge, profound experience, and professional expertise in Project Risk Management played a pivotal role in the successful conclusion of this study. Without his invaluable support, this project would have been an insurmountable challenge. I am truly fortunate to have had such an exceptional supervisor.

Their moral encouragement was a constant source of strength, contributing significantly to the successful completion of this endeavor.

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ABSTRACT

Objective of this inquiry was on the influence of project risk management practices on the performance of projects undertaken by KenGen. Utilizing a questionnaire-based survey, data was gathered from managers within KenGen to gain insights into the organization's risk management processes. The theoretical framework guiding the study included contingency theory and agency theory of management. The research findings revealed that KenGen demonstrated strengths in certain aspects of project risk management, particularly in risk identification and assessment, contributing to positive perceptions of project scope and management plans. However, areas for improvement were identified, such as the integration of systematic risk occurrence mechanisms and the explicit communication of risk acceptance and avoidance strategies within the risk response framework. Drawing on regression analysis and ANOVA, the study noted that risk management improved the firm success. . These results underscored the critical role of robust risk management practices in influencing various dimensions of organizational success within the energy sector. The study's recommended the need for managers within the energy industry and policymakers to focus on enhancing specific aspects of risk management, formalizing evacuation strategies, and tailoring practices to the industry's unique characteristics. Policymakers should foster a supportive regulatory environment that promotes best practices and collaboration within the sector.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Risk management in project management is crucial for mitigating potential risks. According to Thamhain (2013), several key elements need to be considered for effective project risk management, firstly, it is essential to determine the feasibility of the projects. Secondly, a thorough evaluation and analysis of potential risks should be conducted to minimize the likelihood of incurring losses. Thirdly, meticulous planning strategies should be implemented to minimize risks. Lastly, measures should be implemented to address customer dissatisfaction with the projects. Project performance, however, depicts the overall output in the project and with effective project risk management, firms are able to enjoy effective project performance. This is because project risk management includes various steps that firms can employ to manage risks in their major projects.

In Kenya, companies like KenGen encounter various risks that can hinder the accomplishment of both operational and strategic goals. These risks arise due to uncertainty and are inherent in all activities, regardless of their complexity, size, sector, or industry (Mcnaull & Loy, 2008). KenGen specifically faces risks in the form of threats, which are detrimental events that often result in the failure to meet objectives, as well as opportunities that, if capitalized on, could provide a better means of achieving desired outcomes.

KenGen's primary goal is to promote power management. This is evident in its major operations. To provide value to stakeholders and accomplish this objective, a comprehensive risk management framework is essential. This framework should encompass the adoption of the ISO 31000 risk

management standard, which assists organizations in systematically addressing risks by identifying them, assessing their likelihood and potential impact, and evaluating the severity of the resulting issues.

1.1.1 Project Risk Management

This is an ongoing process that involves evaluating risks, minimizing the likelihood of adverse events, and implementing measures to address any occurrences (Gao, 2006). Risk management is a continuous practice that involves taking proactive actions throughout the organization to manage and mitigate risks (Berg, 2010). It entails identifying potential risks that an organization may face and devising suitable strategies to mitigate the exposure to these risks.

Project risk management, as defined by Vaughan (1997), is a systematic approach aimed at eliminating or reducing risks faced by businesses. The key elements are implementing controls, and monitoring the risks (Berg, 2010). In many utility organizations, project risk management has primarily focused on areas such as insurance.

In the past, organizations primarily focused on managing insurable financial risks and hazards risks. However, modern risk management practices have evolved to encompass a broader range of risks, including reputational, financial, strategic, and operational risks. This includes enterprise risk management which is noted as ERM and provide effective risks framework. It is a strategic discipline that seeks to help businesses attain their goals by effectively addressing various types of risks and understanding their interconnected impact as a collective risk portfolio. ERM integrates the management of speculative risks, which involve pursuing opportunities, as well as pure risks, which involve potential losses. This holistic process involves the organization's board of directors, personnel, and management, and is embedded within strategic decision-making

throughout the entire enterprise. By identifying potential events that could affect the organization and managing risks within acceptable limits, ERM aims to provide reasonable assurance of achieving organizational objectives, ensuring the organization's long-term success and resilience (COSO, 2004).

1.1.2 Project Performance

The primary objective of organizations is to achieve project performance. When project performance falls short of expectations, it serves as feedback that motivates organizational members to seek new strategies. Project performance gaps often arise in response to environmental changes, such as significant shifts in competition, regulations, or technology. These changes create new opportunities for organizations, but also introduce new threats that organizations need to address (Newman, 2010).

The presence of transformation practices and organizational practices has a positive impact on project performance by fostering innovation and enhancing organizational competencies (Anantharaman, 2003). Horngren (2000) emphasize the connection between implementing change management practices and maximizing project performance. Project performance is a comprehensive evaluation of whether a project has achieved its objectives and fulfilled requirements in terms of schedule, cost, and scope. The process of performance management ensures that projects are not only strategically beneficial, but also technically successful contributing to organizational improvement.

1.1.3 Kenya Electricity Generating Company Limited (KENGEN)

It was established on February 1, 1954, under the Companies Act of Kenya with a specific focus on developing geothermal and other power generation facilities within the country. This

restructuring aimed to enhance operational efficiency and provide a distinct identity for the power generation sector. Further transformation took place in 2006 when KenGen became a publicly listed company on the Nairobi Securities Exchange. At this point, the ownership structure was adjusted, with 70% of the company owned by the Kenyan government and the remaining 30% made available for public ownership. This move aimed to promote transparency, accountability, and public participation in the power generation industry, enabling KenGen to access capital markets and attract investments for its growth and expansion.

KenGen plants utilize different energy sources, including wind, geothermal, thermal, and hydro enabling the company to generate power. KenGen employs 2,209 staff members who possess diverse expertise in various disciplines. The company faces a range of risks, including management control, reputational, environmental risks, natural disasters, political, commercial, legal, health and safety, financial, technology and operational.

The Board of Directors holds the ultimate responsibility for implementing the Risk Management policy; nevertheless, they have entrusted this task to various bodies. This delegation empowers the management team to take charge of maintaining internal controls and ensuring that risk management practices are effectively implemented throughout the organization. By doing so, the management team becomes primarily accountable for overseeing risk management activities and integrating them into the day-to-day operations.

The Audit committee performs regular evaluations of the management team to ensure their compliance with the risk management policy. KenGen has established a comprehensive risk management policy that serves as a guide for decision-making processes. The policy aims to capitalize on new opportunities, enhance the management of uncertainties, and minimize potential

losses. It applies to the company's projects, various KenGen business locations, and all divisions at the head office.

KenGen possesses a total installed generation capacity of 1,904 MW, with more than 86% derived from renewable sources. This includes wind power (25.5 MW), geothermal energy (799 MW), and hydroelectric power (826 MW). The remaining portion (253 MW) is generated from fossil fuels through KenGen's thermal power plants.

The study will draw focus on renewable energy specifically in the performance of geothermal projects that KenGen operate. Furthermore, KenGen aims to harness the significant geothermal energy potential in the Rift Valley region, which is estimated to be around 10,000 MW. This renewable and clean energy source will play a crucial role in ensuring a stable energy supply for Kenya, primarily relying on green renewable energy.

1.2 Research Problem

The power policies ensures certain practices are followed in financial reporting and record keeping, aiming to enhance the reliability and accuracy of corporate disclosures for the benefit of overall corporate transparency and investors. The presence of risks poses significant challenges for organizations, necessitating the implementation of effective risk management programs to ensure the successful accomplishment of their objectives and mission and their survival. With effective project risks management, firms find it easy to improve their performance.

Kenya heavily relies on a single monopoly, producing 80% of the country's electricity, making companies like KenGen crucial in promoting electricity production. However, the country faces challenges due to unpredictable weather patterns, which contribute to power shortages. Additionally, KenGen operates aging power plants with outdated technology, leading to frequent

breakdowns and geothermal risks. Although KenGen has a risk management policy in place to address plant breakdowns and hydrology risks, its full implementation remains incomplete. Furthermore, the emergence of extreme weather events in recent years has heightened concerns about risk control and management.

Several investigations have delved into the correlation between project risk management and project performance on a global scale. In Kenya, the research focus has predominantly centered on the banking and insurance sectors. Waweru (2012) delved into how risk management practices impact the financial performance of commercial banks. Kamau (2010) explored the adoption of risk management in commercial banks, and Aum (2014) scrutinized operational risk management practices at Jubilee Insurance Company Ltd. Nderi (2013) examined strategic risk management practices at AAR Insurance Kenya, and Acharyya (2012) conducted research on operational risk management practices within the insurance industry. Notably, none of these studies have specifically probed into the effects of project risk management on project performance in KenGen projects.

Hence, there exists a notable gap pertaining to the understanding of how project risk management affects the performance of projects undertaken by KenGen. This research aims to address this gap by exploring and answering the following research question: What are the specific impacts of project risk management on the overall performance of projects carried out by KenGen?

1.4 Research Objectives

This study objective aimed at investigating how project risk management impacts the performance of KenGen Projects.

1.5 Value of the Study

By examining risk exposures and proposing mitigation measures, this study aims to identify weaknesses and gaps in KenGen's current risk mitigation practices. It will provide recommendations for improving and revising these measures. Additionally, the study will explore alternative approaches for managing risks, involving decision-making processes. This aligns with decision theory, which focuses on rational decision-making in uncertain conditions. The insights gained from this study will not only benefit KenGen but also support other power management halls or plants in the country.

The study will offer suggestions for implementing efficient risk management practices, which will serve as a foundation for the development of policies by the Government and the Energy Regulatory Commission (ERC). These recommendations will be based on the findings and insights obtained from the research, providing valuable guidance for policymakers in formulating comprehensive strategies to address risk management in the energy sector. This will contribute to the provision of reliable and affordable power supply in the country and safeguard the significant investments made in the power sector.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The section includes the study literature relevant to the study objectives and incorporates relevant theories such as agency theory, decision theory, and contingency theory. It also identifies research gaps based on the reviewed literature.

2.2 Theoretical Framework

This study is guided by contingency theory and agency theory of management.

2.2.1 Contingency Theory

This research is based on the contingency theory, which emphasizes the importance of identifying and addressing potential risks that can affect project performance. Burns and Stalker (1961) argue that all identified risks must be effectively managed to enhance project success. The contingency theory's key principle is that outcomes depend on specific circumstances, making it highly relevant in project risk management across organizations.

Contingency theory, aligns with the objective of the study as it suggests that there is no one-size-fits-all approach to managing project risks. Kast and Rosenzweig (1973) support this idea by stating that the theory emphasizes the need for tailored actions to address each identified project risk. This complexity in risk management aligns with the study's goal of enhancing project performance. Furthermore, Emilia Vasile and Ion Croitoru (2021) emphasize the importance of risk management for a financial integrity and organization's safety, highlighting the significance of risk assessment in strategic development.

2.2.2 Agency Theory

Smith and Stulz (1985) define agency theory as the examination of the motivational mechanisms that incentivize employees to achieve their assigned tasks. In the context of risk management, the theory suggests that managers' attitudes towards addressing identified risks may be influenced by factors related to agency relationships.

When agents and managers' interests and concerns are not properly addressed, it can create obstacles that increase the likelihood of adverse risks and hinder the success of projects. To mitigate this, organizations should establish a project management team that can provide valuable support throughout the project lifecycle.

The theory's relevance to the study lies in emphasizing the importance of teamwork and collaboration among all stakeholders, including employees, project teams, and managers to ensure the successful completion of projects. It highlights the need for addressing any conflicting concerns or opinions throughout the project lifecycle to enhance project success and foster a harmonious working environment. By promoting effective cooperation and communication, the theory supports the goal of the current study in investigating the impact of stakeholder collaboration on project performance.

2.2.3 Decision Theory

Decision Theory is an integral part of the risk management process as it provides the framework for making informed decisions based on general principles and knowledge. Once a risk has been assessed, decisions need to be made regarding the appropriate actions to take. Different approaches to risk management decisions can be adopted, drawing upon the guidelines and principles derived

from Decision Theory. Thus, Decision Theory plays a crucial role in shaping the risk management process by guiding the decision-making process.

Cost Benefit Analysis (CBA) is a widely recognized approach for rational decision making. Williams and Giardina (1993) highlighted that rational decision makers aim to maximize their net benefit when evaluating different solutions. In the context of our study, decision makers would assess the potential effects of adopting a particular choice by quantifying and defining them. This allows them to determine the disadvantages or advantages associated with the decision under consideration.

2.3 Project Risk Management Practices

According to Omondi and Muchelule (2022), project risk management practices involve finding, evaluating, and responding to risks that may affect the success of a project. It should also be noted that project risk management involves the identify risks. According to Kimotho (2015), the initial phase of project risk management involves the identification of all potential risks that could affect the project. This step can be accomplished through activities such as brainstorming sessions with the project team and stakeholders, reviewing past projects, and analyzing historical data.

Risk management also involves assessment of risks. It is true that once potential risks have been identified, they should be assessed based on their likelihood and impact. This helps prioritize risks and focus resources on the most critical ones. This is followed by development of response strategies. From the views of Low, Li and He (2009), after risks have been recognized and evaluated, response strategies should be developed to address each risk. These may include avoiding, mitigating, transferring, or accepting the risk.

However, Njoroge (2013) argued that risk management must covers risk monitoring. It is important to consistently monitor risks during the project's lifespan to verify the effectiveness of response strategies and recognize and address any new risks that arise. There is also need for communication and documentations of risks. Effective communication is critical in project risk management. All stakeholders should be kept informed of potential risks, response strategies, and risk mitigation efforts. In addition, one should document all aspects of project risk management, including risk identification, assessment, response strategies, and monitoring. This helps ensure that risks are effectively managed and can be reviewed and learned from in future projects. There is also need for regular reviews of the project risk management plan and its implementation; this ensures that it remains relevant and effective throughout the project. By following these practices, organizations can effectively manage project risks and increase the likelihood of project success.

2.4 Project Performance Measurement

Project performance measurement is a critical process that helps organizations assess the effectiveness of their projects and determine whether they are meeting their objectives. According to Sleimi and Emeagwali (2017), the main project performance measurement metrics include schedule performance and it is true that this metric measures how well a project is progressing against its schedule. It compares the actual project completion time with the planned schedule and identifies any deviations from the original plan.

There is also the cost performance that involves metric measures the actual cost of the project against the planned budget. It helps to recognize any cost overruns or savings during the project's execution. Other measures include quality performance and this is the metric that measures the

project's ability to meet its quality objectives. It assesses the quality of the project's outputs and identifies any defects or errors.

Peter et al (2018) noted that scope performance is important since it is the metric measures that view whether the project is meeting its objectives as defined in the project scope. It identifies any deviations from the original project scope and assesses the impact on the project's success. Other considerations include stakeholder satisfaction and risk management. Stakeholder satisfaction measures how satisfied stakeholders are with the project's outcomes. It assesses the project's ability to fulfill its stakeholders' demands and identify any areas of improvement. However, risk management measures how well the project team has identified, assessed, and managed risks throughout the project's lifecycle. It assesses the project's ability to mitigate risks and minimize their impact on the project's success.

Paape and Speklé (2012) also argued that team performance is need and this metric measures how well the project team is working together to achieve project objectives. It assesses team dynamics, communication, and collaboration to identify any areas of improvement. Effective project performance measurement requires the use of relevant and meaningful metrics that align with the project's objectives. By measuring project performance regularly, organizations can identify areas for improvement and make informed decisions to ensure project success.

2.5 Empirical Review and Research Gaps

This subsection provides a comprehensive examination of the literature relevant to the research questions. It explores the dependent and independent variables that guided the study, presenting a thorough analysis of the existing literature concerning these variables. The subsequent section

offers a restructured and condensed version of the literature review, while also paraphrasing the content.

2.5.1 Risk Identification

The emphasis of a research by Yuswan (2008) in the Klang Valley of Malaysia was on building projects and the methods used to manage the risks and exposures related to such projects. The purpose of the study was to pinpoint problems with risk management and consider alternative fixes. The study comprised 27 Klang Valley-based businesses, both public and private, as a sample. Data was collected through questionnaires, and it was found that 51.9% of the participants thought risk management may improve their day-to-day job. The study found a strong correlation between risk management, productivity, and financial performance.

Pourquery and Moulder (2009) looked at the importance of operational risk management in firms in their study. They found that operational risk management techniques are becoming more widely acknowledged as being an essential component of corporate operations. The operational hazards that influence different business units are being aggressively addressed by various companies. The study included 60 selected banks from around the world, and it was found that 70% of the Chief Executive Officers (CEOs) considered operational risk management to be essential. The researchers emphasized the importance of fostering a strong risk culture in order to effectively recognize, evaluate, and manage operational risks.

In a research by Siba (2012) in Kenya, the financial performance of commercial banks and their risk management procedures were investigated for a sample population of forty (40) institutions. The study used questionnaires to gather primary data, while secondary data was taken from different non-field reports. The research showed that these institutions have set up reliable risk

management processes and an environment. They also had internal control measures in the form of procedures and policies to ensure effective risk monitoring. However, there were variations among the banks in terms of their risk monitoring schedules, as well as management, control of risks and disparities in the recognition.

The CAMEL framework supported risk management and a study by Ogilo (2012) noted that risk must be managed in all sectors including where money is exchange in the world. In his study in Kenya, multiple regression analysis was used in the study using secondary data taken from CBK reports. According to the data, there is a considerable correlation between the CAMEL components and the success of the commercial banks. In particular, compared to the other components, the profits component showed a greater correlation with the institutions' financial success.

2.5.2 Risk assessment

In a study conducted by McShane (2013) in the United States, the impact of Enterprise Risk Management (ERM) on the performance of 523 insurers between 2004 and 2006 was assessed. Depending on the extent of ERM activity, the effectiveness of costs and revenues was monitored as a performance indicator. The study employed linear regression analysis and found a positive influence of ERM on both revenue efficiency and cost, contingent upon the level of ERM activity. In a separate study by Nyandaya (2012) focusing on firms in Kenya, key risks were identified, where regulatory risk was found to be at 89%, market risk at 83%, while operational risk at 95%.

The impact of financial risk management measures on the expansion of the microfinance business in Kenya was examined in a research undertaken by Njuguna (2013). The study used a correlation survey research design with interviews and questionnaires as the main data sources, and it sampled 17 microfinance institutions from a population of 57 institutions. While descriptive regression was

used to evaluate quantitative data, content analysis was used on qualitative data. The results showed that the development of microfinance organizations is significantly influenced by financial risk management measures.

The amount of Enterprise Risk Management (ERM) application and its effect on the performance of 19 pension management organizations in Kenya were investigated at in a research done by Nyagah (2014). The study utilized both secondary and primary data. Financial performance was assessed based on cost and revenue efficiency while ERM activity was used as an indicator of ERM implementation. Through regression analysis, the data was analyzed, and the findings revealed a significant positive relationship between the financial performance of pension fund management firms and ERM implementation.

2.5.3 Risk Mitigation

Enterprise Risk Management (ERM) and the performance of Kenya's commercial state enterprises were evaluated in a research carried out by Kimotho in (2015). The study examined data from 55 state corporations during the period of 2010 to 2014. ERM practices were measured based on the strategic risk management practices and the implementation levels of operational, while Return on Assets (ROA) served as a measure of financial risk management practices. The findings revealed a positive.

Yegon (2015) looked into how management factors related to Enterprise Risk Management (ERM) affected the performance of companies listed on the Nairobi Securities Exchange (NSE). 44 publicly listed companies that submitted audited financial accounts between 2008 and 2012 were the subject of the investigation. The findings revealed that most of the NSE listed firms lacked

established regulations and policies related to ERM. However, the financial performance of the small number of corporations who had adopted ERM rules was significantly improved.

The impact of enterprise risk management (ERM) on the performance of SACCOs in Kenya was examined in a research carried out by Kiunyu in 2017. The study used secondary data from six publications and a sample of 41 SACCOs. The study used of statistical software (STATA) and panel data analysis. ERM techniques were shown to significantly improve the financial performance of the SACCOs.

Alawattegama did a research in 2018 that looked at how Enterprise Risk Management (ERM) adoption affected the performance of Sri Lanka's different sectors. The study included data from a sample of 17 businesses, both primary and secondary. Contrary to earlier study findings, the results showed that ERM had no appreciable influence on the performance of the businesses. On the other hand, Oyegbile (2018) evaluated the connection between ERM and the performance of 20 chosen registered consumer products firms in Nigeria using an ex post facto study technique.

2.5.4 Risk Evaluation

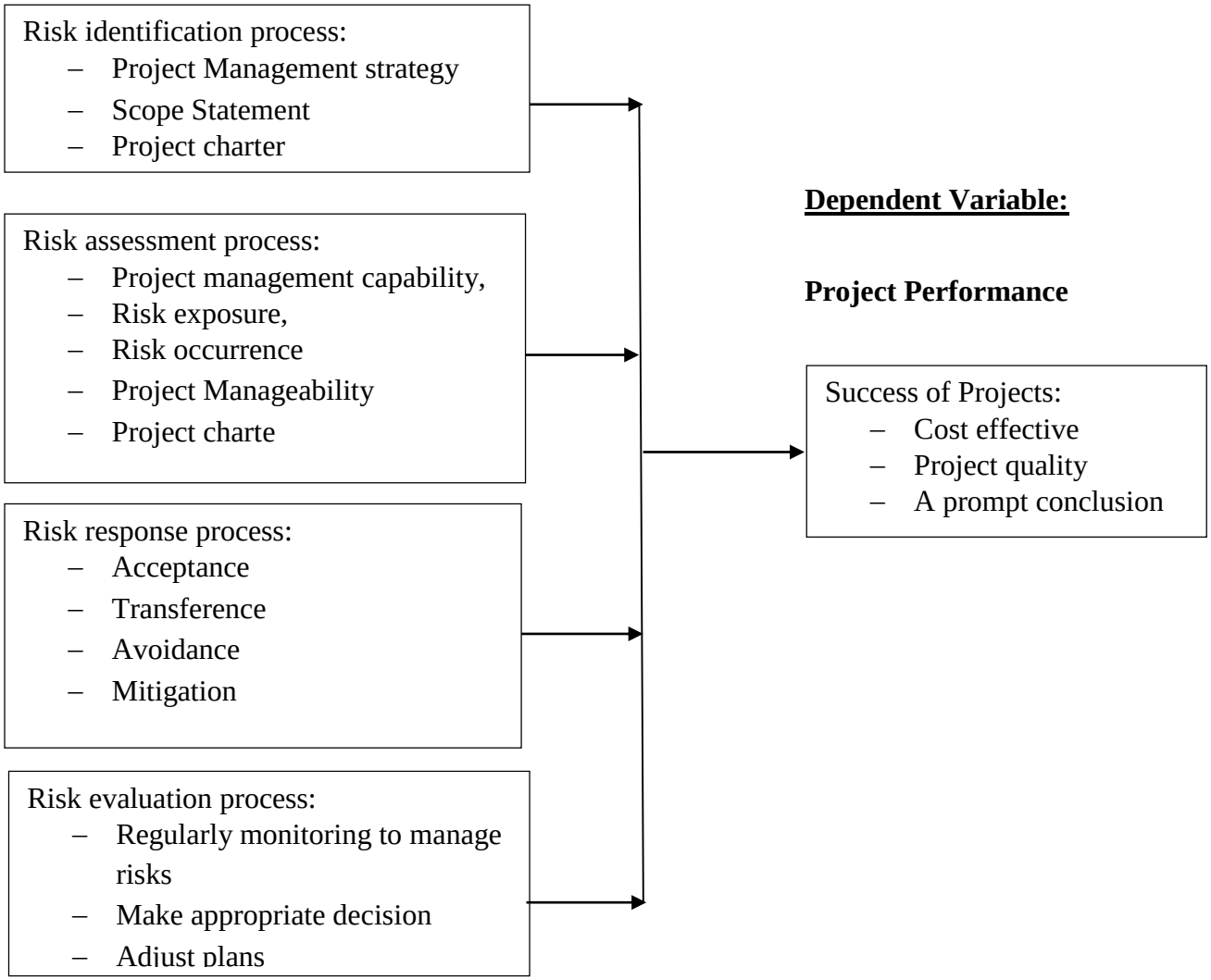
According to Brown and Chong (2016), this stage involves identifying new risks, controlling identified risks in a timely manner, measuring them, and devising risk mitigation measures to improve the success of commissioned projects.

2.6 Conceptual Framework

This is well illustrated below.

Independent Variable:

Project risk management Practices



CHAPTER THREE: METHODOLOGY

3.1 Introduction

Different plans are outlined here. The analysis involved analyzing relevant data related to this relationship. This will help guide the study goal and objective.

3.2 Research Design

Case study was used since it is a qualitative research approach employed to acquire a comprehensive understanding of a complex scenario or specific phenomenon. It involves a detailed examination of a specific case, which could be an individual, group, organization, or event, to explore and analyze various aspects of the case.

Using this model it was simple to provide rich and detailed data since case study research design allows for the collection of rich and detailed data on the case being studied. This provided an in-depth understanding of the phenomenon, which may not be possible with other research designs. The case study in this study was KenGen Company. The model allowed the researcher to explore multiple variables and their interrelationships, as well as the context in which the phenomenon occurs.

3.3 Data Collection

This research collected data primarily through quantitative methods. Specifically, the study adopted questionnaire method of data collection, as the collection of data was from risk management managers from KenGen Company. Data from primary sources was used in the study and the information was gathered through the use of survey-style questions. The questionnaire was

provided to the employees as well as directors and senior risks managers of KenGen Company. The questionnaire will be delivered through drop and pick method. The researcher also shared some questions through emails of the respondents. This helped to gain he amount of data. Different areas of the questionnaire will be covered in the study.

In the questionnaire, the demographic information included in Section A while section B was about the project risk management. Measures of project performance for KenGen Company was covered in the final section C. This is important in understanding and gaining information on the topic of the study.

3.4 Data Analysis

To analyze the data for this research, quantitative approaches were used aligned with the study objectives which are assessing how project risk management has affected KenGen Project performance. The research specifically looked to assess how project risks management promote project success. Both inferential and descriptive statistics will be used in this research, where then SPSS software was used to analyze the data to make the results of the study simpler to grasp, graphs, charts, and tables will be produced to represent them. The model to show the links is shown below;

$Y = a + \beta x_1 + \beta x_{2+} \beta x_{3+} \beta x_4 \ldots\ldots\ldots + c + B_6$

Where Y= Performance of the projects.

X_1=Risk Identification Process

X_2= Risk Assessment Process

X_3= Risk Response Process

X_4= Risk Evaluation Process

B_6=Error Factors

CHAPETER FOUR: DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

4.1 Introduction

This section seeks to analyze data collected in the study as a way to come up with findings, which help to arrive at logical conclusions regarding the topic under study. The analysis of data will be aided by descriptive and inferential statistics, accompanied by tables and figures based on responses derived from the participants of the study.

4.2 Questionnaire Response Rate

Of the 23 questionnaires administered to employees of KENGEN, 20 questionnaires were duly filled and submitted within the required timeframe. This return represents a response rate of 87%, which is adequate to present valuable findings and conclusions related to the study. The 87% response percentage conforms to observations of Muganda and Muganda (2003) that reiterate that a response percentage of 50% is adequate to arrive at well-informed conclusions in scholarly research. The table below highlighted the response rate from the data collection exercise.

Table: Response Rate

Response	**Frequency**	**Percent**
Responded	20	87
Un-responded	3	13
Total	**23**	**100.0**

4.3 Background Information

This section presents the characteristics of participants in terms of gender/sex, age, level of education, position in the company, and years served in the company.

4.3.1 Position in the Company

Responses from persons occupying different positions in an organization are crucial since they provide varying perspectives. For instance, the outlook of a manager is very different from that of a clerk in the same organization because of their different job specifications. The table below presented the background information based on position occupied at KENGEN.

Table: Background Information on Position Occupied at KENGEN

Position	Frequency	Percent
Board member	2	10
Top-level management	4	20
Middle-level management	6	30
General staff	8	40
Total	**20**	**100.0**

Board members who took part in the study were 10% while 20% of top-level managers were involved. On the other hand, 30% of middle-level managers participated whereas the remaining 40% of respondents were members of the general staff. From the table, the respondents are balanced effectively. Also, the numbers are based on availability, which shows that persons who occupy lower positions in an organization are likely to be more available than their counterparts

in higher positions. The balanced nature of the participation also helps to get diverse perspectives since every department or level has its unique features.

4.3.2 Age

Age is crucial because it is believed to have a direct relationship to intellectual maturity. The table below outlines the distribution of respondents' ages as of the time of data collection.

Table: Age of Respondents

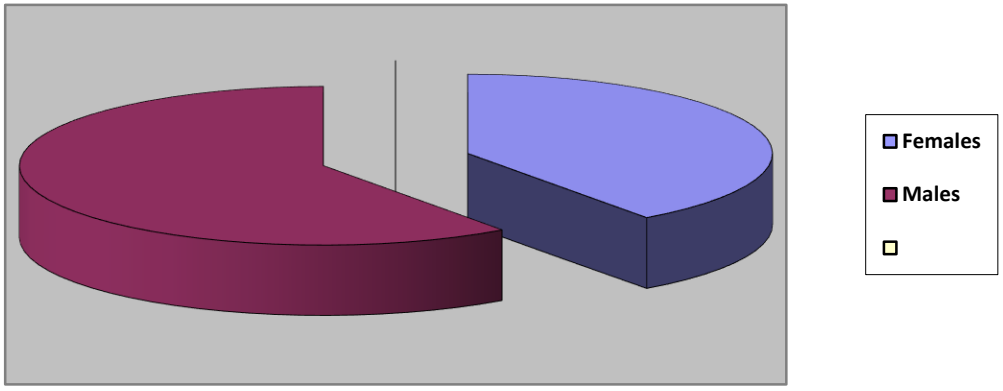
Age Bracket	Frequency	Percent
Between 20 and 25 Years	4	20
Between 26 and 30 Years	4	20
Between 31 and 35 Years	6	30
Above 36 Years	6	30
Total	**20**	**100.0**

Of the 20 participants, 20% were between 20 and 25 years, another 20% were between 26 and 30 years, while those between 31 and 35 years consisted of 30%. In the meantime, the remaining 30% comprised respondents above 36 years. The age distribution is balanced, which increases the reliability of the test considering that older persons tend to occupy higher positions in organizations, especially public or government entities.

4.3.3 Gender

Gender is another important parameter in any organization, more so in this epoch that is characterized by calls for fair representation in all spheres of life. The chart below showed participants in the research on the basis of their gender.

Figure: Gender of Respondents



Based on gender, males were the majority as they accounted for 60% as compared to the female counterparts who made up 40% of the participants. The ratio is just as it falls within the provisions of fair representation.

4.3.4 Level of Education

Education is always correlated to competence as highly educated individuals are expected to be more valuable and occupy higher positions to oversee the long-term sustainability of organizations. The table below shows the respondents' levels of education.

Table: Respondents' Level of Education

Education	Frequency	Percent
Doctorate	3	15
Master's Degree	6	30
Bachelor's Degree	8	40
Diploma	2	10
Other	1	05
Total	**20**	**100.0**

The table shows that the majority of participants have a bachelor's degree with a proportion of 40%, followed by holders of master's degree, who accounted for 30% of the respondents. Diploma holder made up 10% of the participants while doctorate holders comprised were 15%. Respondents with other qualifications such as certificate and high school diploma accounted for just 5% of the total.

4.3.5 Years Spent at the Company

Years spent in an organization is valuable as they translate to competence. The table below represents years participants have spent at KENGEN.

Table: Years Spent at KENGEN

Years	Frequency	Percent
More than 10 years	8	40
6-10 years	6	30
3-5 years	4	20
Less than 3 years	2	10
Total	**20**	**100.0**

Of the participants, 40% were those who had served at the company for more than 10 years while 30% had been there between 6 and 10 years. On the other hand, 20% of the respondents had been at the company between 3 and 5 years whereas those that had stayed at KENGEN for less than 3 years were 10% of the total participants.

4.4 Project Risk Management

Project risk management entails the identification, analysis, and response to any threat that may hinder the smooth running of a project. In a way, risk management ensures that projects achieve their short-term and long-term objectives. It was noted that the firm has engaged in various risk management practices including risk identification, risk assessment process, risk response and risk evaluation. This is discussed below.

4.4.1 Risk Identification Process

This was done and the results are shown in the table below.

Statement	Mean	Standard Deviation
The firm adequately identifies project scope	4.011	0.719
The firm considers a project management plans	4.000	0.891
Risk occurrence systems are part of the projects in the firm	3.091	0.451
The firm engages in risk assessment to identify risks	4.022	0.824

The Table 4.4.1, reveal positive assessments of the firm's practices. The mean scores indicate that the firm is perceived to adequately identify project scope and consider project management plans, with scores of 4.011 and 4.000, respectively. However, the lower score of 3.091 for the statement -Risk occurrence systems are part of the projects in the firm- suggests a potential area for improvement in integrating systematic risk occurrence mechanisms into project processes. Despite this, the mean score of 4.022 for engaging in risk assessment indicates a robust practice of identifying risks within the firm. The standard deviations across all statements imply a relatively low level of variability in respondents' perceptions, indicating a degree of consensus on the firm's risk identification process.

4.4.2 Risk Response Process

This was done and the results are shown in the table below.

Statement	Mean	Standard Deviation
The firm engages in risk acceptance and avoidance	0.476	0.651
The firm engages in risk transfer	4.190	0.811
The firm engages in risk response	3.167	0.721
The firm engages in risk mitigations	4.880	0.910

In the table above, which outlines the risk response process, the findings suggest a mixed picture. While the firm is highly rated in terms of engaging in risk transfer and risk mitigation, with mean scores of 4.190 and 4.880, respectively, there is a notably low mean score of 0.476 for the statement -The firm engages in risk acceptance and avoidance. This may suggest that there is room for improvement in the explicit consideration and communication of risk acceptance and avoidance strategies within the risk response framework. The standard deviations reveal a moderate level of variability in respondents' perceptions, indicating some divergence in opinions regarding the firm's risk response practices.

4.4.3 Risk Evaluation Process

This was done and the results are shown in the table below.

Statement	Mean	Standard Deviation
The firm engages in risk evaluation	3.167	0.319
The firm engages in risk control	4.101	0.853
The firm has a risk evacuation plan	3.990	0.456
The firm monitors risks regularly	4.780	0.871

In the context of risk evaluation processes, as presented in Table above, the findings indicate relatively positive assessments. The firm's engagement in risk evaluation, risk control, and regular risk monitoring receives mean scores of 3.167, 4.101, and 4.780, respectively. These scores suggest that KenGen Company has established effective processes for evaluating and controlling risks, with a strong emphasis on regular monitoring. The mean score of 3.990 for the statement "The firm has a risk evacuation plan" indicates a positive but slightly lower assessment, suggesting a potential area for enhancement in terms of formalizing and communicating risk evacuation strategies. The standard deviations in this table indicate a moderate level of variability in perceptions, suggesting some diversity in opinions regarding the firm's risk evaluation practices.

4.5. Firm Performance

The analysis on firm performance was done and the results are shown below.

Statement	Mean	Standard Deviation
The firm is flexible in operations	4.171	0.963
Projects are done within the required time limit	4.189	0.876
The costs of projects are low	4.014	0.771
Customers get services at low costs	3.190	0.456
The firm projects are based on high quality	4.110	0.673
The firm projects are free from errors	3.102	0.451

From the table, the firm performs exceptionally in the quality dimension given that all participants concur that all projects it undertakes are not only of high quality but also free from errors. Conversely, the company performs averagely in cost effectiveness based on the participants observing that the consumers are unlikely to get services at low costs. Concerning timeliness, KENGEN performs moderately since a few of the respondent believes that its projects are usually not completed within the required time limit.

Moreover, the analysis of firm performance, as reflected in the mean scores and standard deviations presented in Table 4.5, provides insights into how the risk management practices of KenGen Company may be influencing various aspects of its operations. The high mean scores for statements such as -The firm is flexible in operations (4.171) and Projects are done within the

required time limit (4.189) suggest that the firm's risk management strategies may contribute positively to operational flexibility and project timeliness. The relatively low standard deviations in these scores indicate a relatively high level of agreement among respondents, supporting the consistency of perceptions regarding these aspects of firm performance.

Conversely, the mean score of 3.190 for the statement Customers get services at low costs suggests a more moderate assessment of the firm's performance in cost-related aspects. The higher standard deviation of 0.456 implies a greater diversity in opinions regarding the firm's ability to offer services at low costs, indicating a potential area for further investigation and improvement. This means that the data indicates a positive association between the perceived effectiveness of the firm's risk management practices and its operational flexibility and project timeliness, but there may be opportunities for enhancing cost-related aspects to further improve overall firm performance.

Furthermore, the mean scores for "The costs of projects are low" (4.014)-The firm projects are based on high quality (4.110), and-The firm projects are free from errors (3.102) provide a comprehensive view of performance in cost, quality, and error-related dimensions. While the mean scores for cost and quality are relatively high, suggesting positive perceptions, the lower mean score for project error-freeness and the lower standard deviation indicate a higher degree of consensus among respondents regarding the firm's ability to maintain high-quality projects with low errors. These findings collectively underscore the interplay between risk management practices and firm performance, offering valuable insights for KenGen Company to refine its strategies for continued success.

4.6 Regression Results

This was done to show the link among the variables. The model summary is shown below;

Table: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.876(a)	0.767	0.706	0.03567

Source, Author (2023)

The summary presented in the table above delves into the interconnection between project risk management and KenGen's performance, uncovering insights into how changes in the dependent variable (firm performance) can be elucidated by the independent variable (project risk management). With a correlation coefficient (R) of 0.876, a robust and positive association between project risk management and firm performance is evident. This implies that a significant portion of the fluctuations in firm performance can be ascribed to the efficacy of KenGen's project risk management practices.

The R Square value, standing at 0.767, highlights that approximately 76.7% of the variations in firm performance find explanation in the adopted project risk management practices, underscoring the pivotal role of risk management in shaping overall performance. Considering the number of predictors in the model, the Adjusted R Square value of 0.706 offers a more cautious estimation of the proportion of variability clarified. The relatively low standard error of the estimate (0.03567) indicates that the model aligns precisely with the data, reinforcing the robust nature of the relationship between project risk management and KenGen's performance outlined in the model

summary. These statistical findings affirm a compelling and positive correlation between effective project risk management and enhanced firm performance within KenGen.

ANOVA was also done and the table below depict the findings.

Table: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.722	4	0.133	3.112	0.010[b]
	Residual	3.451	16	0.047		
	Total	4. 173	20			

Source, Author (2023)

The Analysis of Variance (ANOVA) table, presented above, assesses the statistical significance of the regression model, providing insights into whether the relationship between project risk management and firm performance is statistically significant. The regression sum of squares (0.722) represents the variability in the dependent variable (firm performance) explained by the independent variable (project risk management). The degrees of freedom for the regression model (4) and the residual (16) are utilized to calculate the mean square values. The F-statistic (3.112) is computed by dividing the mean square of the regression by the mean square of the residual. The associated significance level (Sig.) is 0.010, denoted as 'b'.

The small p-value (0.010) is below the conventional significance threshold of 0.05, indicating that the regression model is statistically significant. Therefore, the relationship between project risk management and firm performance is not likely due to random chance. In practical terms, this implies that the project risk management practices employed by KenGen significantly contribute to variations in firm performance. The findings from the ANOVA support the conclusions drawn

from the model summary, reinforcing the significance of project risk management as a predictor of firm performance at KenGen.

Table: Regression Coefficients

Model	Unstandardized Coefficients		Standardize Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	0.414	0.177		2.171	0.003
Risk Identification	0.471	0.216	0.133	2.267	0.015
Risk assessment	0.390	0.161	0.045	1.156	0.022
Risk Response	0.245	0.319	0.067	0.798	0.034
Risk evaluation	0.457	0.176	0.082	0.232	0.019

Source, Author (2023)

From the finding in table, the established regression equation was:

Firm Performance = 0.414+(0.471×Risk Identification)+(0.390×Risk Assessment)+(0.245×Risk Response)+(0.457×Risk Evaluation)

The regression coefficients presented in the above table offer insights into the specific contributions of different components of project risk management to the overall model predicting firm performance at KenGen. Each coefficient represents the change in the dependent variable (firm performance) associated with a one-unit change in the respective independent variable, while holding other variables constant. The constant term, with a coefficient of 0.414 and a significance level of 0.003, represents the estimated firm performance when all the predictor variables are zero. The positive coefficient for risk identification (0.471) suggests that an improvement in the firm's

risk identification process is associated with an increase in firm performance. Similarly, the positive coefficient for risk assessment (0.390) indicates that a more robust risk assessment process is linked to enhanced firm performance. The coefficient for risk response (0.245) is positive but less pronounced, suggesting a comparatively smaller impact on firm performance. The coefficient for risk evaluation (0.457) is also positive, indicating that a more effective risk evaluation process is associated with higher firm performance.

These findings imply that, among the components of project risk management, risk identification and risk assessment play more substantial roles in influencing firm performance at KenGen. The statistically significant coefficients for each component, coupled with their positive values, support the hypothesis that improvements in project risk management practices contribute positively to overall firm performance in the context of KenGen.

4.7 Discussion of Findings

The study on project risk management at KenGen reveals positive assessments of the firm's practices in various dimensions. In the risk identification process, the mean scores indicate that the firm is perceived to adequately identify project scope and consider project management plans, with scores of 4.011 and 4.000, respectively. However, there is room for improvement in integrating systematic risk occurrence mechanisms into project processes, as reflected in the lower score of 3.091 for the statement "Risk occurrence systems are part of the projects in the firm." Despite this, the firm excels in engaging in risk assessment, with a mean score of 4.022, indicating a robust practice of identifying risks.

In the risk response process, there is a mixed picture. While the firm is highly rated in terms of engaging in risk transfer and risk mitigation, with mean scores of 4.190 and 4.880, respectively,

there is a notably low mean score of 0.476 for the statement "The firm engages in risk acceptance and avoidance." This suggests that there is room for improvement in explicitly considering and communicating risk acceptance and avoidance strategies within the risk response framework. In the risk evaluation process, the findings indicate relatively positive assessments, with mean scores of 3.167, 4.101, and 4.780 for engagement in risk evaluation, risk control, and regular risk monitoring, respectively. The slightly lower mean score of 3.990 for the statement "The firm has a risk evacuation plan" suggests a potential area for enhancement in formalizing and communicating risk evacuation strategies.

The analysis of firm performance reveals strengths in operational flexibility and project timeliness, with mean scores of 4.171 and 4.189, respectively, suggesting positive contributions from the firm's risk management strategies. However, there are areas for improvement, particularly in cost-related aspects, as reflected in the moderate mean score of 3.190 for the statement "Customers get services at low costs." The overall positive association between the perceived effectiveness of the firm's risk management practices and operational flexibility and project timeliness indicates a need to enhance cost-related aspects for continued improvement in overall firm performance. The regression results further support these findings, emphasizing the significant link between effective project risk management and improved firm performance at KenGen.

It was noted that project risk management has a positive correlation to various projects undertaken by KENGEN, including geothermal developments. Effective management of risks determine the ability of the company to complete its projects within the required timeframe. In addition, it ensures that projects are completed with respects to the costs allocated. Furthermore, sound risk management is critical in overseeing the overall quality of projects through aspects such as the detection, prevention, and removal of errors.

CHAPTER FIVE: SUMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Summary is provided here. It also covers detailed conclusions. The summary is shown below.

5.2 Summary of the Findings of the Study

The research delved into the correlation between project risk management practices and the performance of KenGen in the energy industry. The results indicate that KenGen excels in risk identification and assessment, reflecting effective practices in delineating project scope and formulating project management plans. However, there is room for improvement in incorporating systematic risk occurrence mechanisms into projects. The risk response process exhibits mixed outcomes, with high ratings for risk transfer and mitigation, but a notably lower score for risk acceptance and avoidance. The study underscores the importance of explicit communication and consideration of these strategies within the risk response framework. In the risk evaluation process, the firm receives positive assessments for engagement in risk evaluation, control, and regular monitoring, although there is a slightly lower score for having a formalized risk evacuation plan. The findings suggest that refining project risk management practices, especially in risk identification, response, and evacuation, could enhance performance in the energy sector.

The assessment of firm performance highlights KenGen's strengths in operational flexibility, project timeliness, and project quality. However, there are moderate ratings for providing services at low costs, indicating room for improvement in cost-related aspects. Regression analysis establishes a robust and positive relationship between effective project risk management and improved firm performance, signifying that variations in firm performance are significantly

explained by the efficacy of project risk management practices. ANOVA results further affirm the statistical significance of this relationship. Regression coefficients suggest that enhancements in risk identification and assessment have more substantial impacts on firm performance, underscoring the need for tailored risk management practices in the energy industry. The study highlights the intricate interplay between risk management practices and various dimensions of firm performance, offering valuable insights for refining strategies to ensure sustained success.

The research underscores the importance of enhancing systematic risk occurrence mechanisms, improving the communication of risk acceptance and avoidance strategies, formalizing risk evacuation plans, tailoring risk management practices to the industry, and emphasizing cost-effective measures for firms. Continuous monitoring, improvement, and the cultivation of a positive organizational culture are also emphasized as crucial for long-term success. The study contributes valuable insights for both industry practitioners and policymakers aiming to optimize project risk management in the energy sector.

5.3 Conclusions

The research conducted a thorough investigation into the correlation between project risk management practices and the performance of KenGen within the energy industry. In a world marked by dynamic and intricate operational environments, effective risk management is crucial for organizations, especially those in critical sectors like energy. The study found that KenGen demonstrates strengths in certain aspects of its risk management practices, such as risk identification and assessment, contributing to positive perceptions of its project scope and management plans. However, there are areas identified for enhancement, particularly in integrating

systematic risk occurrence mechanisms and explicitly communicating risk acceptance and avoidance strategies within the risk response framework.

Additionally, the research emphasizes the substantial impact of project risk management on firm performance within the energy sector. The positive and robust relationship established through regression analysis and supported by ANOVA results underscores the pivotal role of effective risk management in influencing various dimensions of organizational success. The inquiry concludes that risk management practices are effective in ensuring a more resilient and adaptive approach to the challenges and uncertainties inherent in the sector.

The study also concludes that, as organizations globally navigate an increasingly uncertain business landscape, it highlights the importance of continual improvement, industry-specific tailoring, and fostering a positive organizational culture to optimize project risk management practices. By leveraging these insights, organizations can elevate their overall performance, encourage innovation, and maintain a competitive edge in today's rapidly changing business environment. This is imperative for their long-term risk management strategies.

5.4 Recommendations of the Study

Based on the study's conclusions, there is a pressing need for managers, especially those at KenGen, to enhance the incorporation of systematic risk occurrence mechanisms into their project processes. This enhancement in identifying risks will strengthen the organization's proactive capacity to address potential threats, ultimately contributing to more robust and effective risk management practices. Additionally, managers should prioritize refining the explicit communication and consideration of strategies related to risk acceptance and avoidance within the risk response framework. The clear and effective communication of approaches for dealing with

identified risks is crucial for well-informed decision-making and better-prepared responses, leading to improved overall project outcomes.

Furthermore, it is advisable for companies like KenGen to formalize and communicate distinct strategies for risk evacuation, addressing the slightly lower assessment in the existence of a risk evacuation plan. This formalization is particularly critical in the energy sector, where unforeseen events can have substantial consequences. A well-defined plan for risk evacuation contributes to a more resilient and adaptive approach to risk management. Managers should also acknowledge the industry-specific nature of risk profiles and project management approaches in the energy sector. Customizing risk management practices to address the unique characteristics and challenges within the industry, coupled with conducting comparative analyses with other energy companies or sectors, will provide opportunities for benchmarking and valuable insights for optimization.

Moreover, policymakers in the energy sector should play a role in these efforts by establishing a supportive regulatory environment that encourages best practices in project risk management. Policymakers may also contemplate implementing incentives or initiatives that foster knowledge sharing and collaboration within the industry, promoting a collective improvement of risk management capabilities across organizations. This collaborative approach will contribute to the overall success of firms in the energy sector.

5.5 Limitations of the Study

One significant drawback in the investigation of project risk management and performance at Kenya Electricity Generating Company (KenGen) is the potential limitation imposed by the retrospective nature of data collection and the exclusive focus on a single company. Relying on

respondent data introduces the possibility of biases and restricts the capacity to capture real-time dynamics and the evolving landscape of risks within the organization. Consequently, the study's findings may be confined by the availability and perspectives of the respondents. This limitation underscores the difficulty of evaluating the dynamic and evolving nature of project risks, as it may not adequately consider contemporary contextual factors influencing KenGen's present risk management practices and their effects on firm performance. Subsequent research endeavors could gain from adopting a longitudinal approach or employing real-time data collection methods to offer a more comprehensive understanding of the dynamic interplay between project risk management and organizational performance at KenGen.

5.6 Suggestions Further Studies

One possible direction for future research involves examining how the connection between project risk management practices and firm performance is influenced by specific industry contexts. Given the distinct characteristics, risk profiles, and project management strategies in different industries, there is potential to gain valuable insights by investigating the varying effectiveness of risk management practices across sectors. Researchers might undertake comparative studies spanning diverse fields like manufacturing, energy, technology, or healthcare to uncover industry-specific factors that shape the interplay between project risk management and firm performance. This approach could contribute to the development of more customized recommendations for enhancing risk management strategies, taking into account the unique requirements and obstacles faced by individual industries.

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APPENDIX

Appendix I: Questionnaire

SECTION A: BACKGROUND DETAILS

1. What is your position in the Company?

a. Member of the Board [ ]
b. Middle-level Management [ ]
c. General Staff [ ]
d. Top-level Management [ ]

2. What is your Age?

a. Between 20 to 25 [ ]
b. Between 26 to 30 [ ]
c. Between 31 to 35 [ ]
d. Above 36years [ ]

3. Indicate the Gender, where M stands for Male and F Female

a. M [ ]
b. F [ ]

4. Indicate the highest level of education you have attained?

a. Diploma [ ]
b. Bachelors [ ]
c. Masters [ ]
d. Doctorate [ ]
e. Other (Please specify)___ ……..

5. For how many years have you been working in this Company? (Years of experience)

a. Less than3years [ ]
b. 3 –5years [ ]
c. 6 –10years [ ]
d. More than10years [ ]

SECTION B: PROJECT RISK MANAGEMENT

6. Tick the only one most appropriate response from the options provided below.

1 = Strongly Disagree

2 = Disagree

3 = Uncertain

4 = Agree and

5 = Strongly Agree

To what level do you concur that your company has adopted the below project risks management principles in their major operations?

Statement	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
The firm adequately identify project scope					
The firm considers project management plan					
The firm has project risk charter					
The firm engage in risks assessment					
Risk occurrence systems are part of the projects in the firm					
The firm engage in risks transfer					
The firm engage in risks response					
The firm engage in risks mitigations					
The firm engage in risks avoidance					
The firm engage in risks acceptance					
The firm has risk evaluation plan					
The firm monitor risks regularly					

SECTION C: FIRM PERFORMANCE

7. How is the firm's project performance when compared with other entities based on each of the following aspect?

Scale

1= Far below average, 2= A little below average, 3= Average, 4= A little above average, 5= Far above average.

	Fair below average	**Below average**	**Average**	**Little Above average**	**Far above average**
Timely					
There are flexible operations					
Projects and operations are done within time.					
Costs Effective					
The cost of projects are low					
Customers get services at low costs					
Quality					
The firm projects are based on high quality					
The firm processes are free from errors					