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RISK MANAGEMENT PRACTICES AND PERFORMANCE OF MINING PROJECTS IN KWALE COUNTY, KENYA

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ABSTRACT

The purpose of this research was to examine the influence of risk management practices on the performance of mining projects in Kwale County, Kenya. Specifically, the research examined the influence of risk identification practice and risk analysis practice on the performance of mining projects in Kwale County, Kenya. The theoretical framework consisted of the enterprise risk management theory, systems theory, contingency theory and complexity theory. Drawing on the positivist research philosophy, the research utilized the quantitative non-experimental research methodology. The research employed the correlational cross-sectional survey design for testing noncausal relationships among variables. The proportionate stratified random sampling technique was used to select a sample size of 128 project management staff from a target population of 188 project management staff in charge of the mining projects of the 7 mining companies in Kwale County, Kenya. A pilot study was conducted to test the validity and reliability of the constructed survey questionnaire. A self-administered structured questionnaires was used to collect primary data. The research utilized the cross-sectional survey-based approach. Through the drop and pick method, the survey questionnaires were hand delivered to the project management staff of the mining companies. The collected data was processed and entered into the statistical package for social sciences (SPSS) version 26 to create a data sheet used for statistical analysis. The Pearson's correlation results indicated that risk identification practice and risk analysis practice had positive and significant relationship with performance of mining projects in Kwale County, Kenya. The multiple regression results showed that risk identification practice and risk analysis practice had positive and significant influence on performance of mining projects in Kwale County, Kenya. The mining project managers should recognize the importance of risk management practices and apply them to their projects to minimize risks for successful projects in the mining industry. The policy makers should initiate policy review to motivate project managers recognize the importance of risk management practices.

Key words: *Firm performance, Risk analysis capability, Risk identification capability, Kenya*

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INTRODUCTION

The mining industry is one of the most important large-scale industries in developed and developing countries. The mining-dependent economies heavily rely on the minerals sector to extract revenue for socio-economic development (Banda, 2023). The mining industry is one of the significant contributors to global economic development (Abuya, 2023; Jin, 2023; Kanyumba, 2023), contributing billions of dollars to the economies of countries and the world (Ren *et al.*, 2022). However, the mining industry is one of the most controversial industries in the sense that, at the same time that it is beneficial to society, it can be a threat to it (Yousefian, Bascompta, Sanmiquel, & Vintró, 2023). The mining industry faces a complex dilemma as an economic development agent through social upliftment in places where mining corporations operate (Rajiani & Normuslim, 2023). The relationship between large-scale mining and development is contentious, especially considering that the benefits usually only go to a few people, with adverse social, environmental and economic impacts for the many (Kowszyk, Vanclay, & Maher, 2023; Melin, 2021).

The mining industry is a critical part of the global economy. However, the mining industry faces many challenges, including increasing competition, rising costs, and changing regulations (Basuki, Rajiani, & Widyanti, 2021; Verrier *et al.*, 2022). The mining industry is a very risky activity involving very high capital investment (Kamel, Elwageeh, Bonduà, & Elkarmoty, 2023). High risk is a main characteristic of the mining industry (Senses & Kumral, 2023). The high-risk operations frequently fail to meet ore quality requirements, lowering the value of mineral resources (Kloeckner *et al.*, 2021). Existent literature posits that to remain competitive, mining companies need to find new ways to improve their performance (Kashan, Lay, Wiewiora, & Bradley, 2022). However, the comprehensive performance level of the mining companies has gradually declined from 2017 to 2022, but has gradually recovered after 2022 (Wang, 2023).

The mining industry is anticipated to be the main engine of industrial expansion in low-income countries, particularly in Africa. However, the output in the mining industry remains poor (Kiprono *et al.*, 2023). In recent years, mining in Kenya and Africa at large is considered one of the main pillars of socio-economic benefits. Nevertheless, the performance of projects in the mining industry has not been given enough consideration in Kenya (Opondo, 2023). Although Kenya seeks to diversify its mining practices, the mining industry is underexplored and remains a relatively small industry in Kenya (Nalule, 2023).

Risk management is an important exercise in order to achieve better performance of projects (Chepkoech & Wairimu, 2023). Project risk management is the art and science of identifying, analyzing, and responding to risk throughout the life of a project and in the best interests of meeting project objectives (Obondi, 2022). As an integral part of project management, project risk management strives to detect and priorities risks in advance of their occurrence in the project, and to give project management staff with actionable information (Shafiuddin, Durrani, Al-Bulushi, Al-Farsi, & Al-Hosni, 2022).

Project risk management is recognized to be of vital importance as it significantly affects the project success rate (Ahmad, Hussain, Khan, & Huraira, 2022; Senses & Kumral, 2023). The key to any mining project's success is the identification and control of the risks (Banda, 2023). Understanding risk management practices that influence project performance is vital for success (Kallow, Bodla, Ejaz, & Ishaq, 2022). However, effective implementation of risk management practices has been overlooked in developing nations (Shayan, Pyung Kim, & Tam, 2022).

Risk management is one of the nine knowledge areas of project management (Abdulai & De-graft, 2022). The risk management practices are the practices used by the project management staff in identifying and assessing the risks to the project and managing those risks to minimize the impact on the project (Kabutiei, Nyang'au, & Muchelule, 2022). The goal of project risk management is to decrease the probability and effect of negative risks and increase the probability and effect of positive risks (Senses & Kumral, 2023; Yeung, Chan, Chan, & Lok, 2022). Risk management is an important exercise in order to achieve better performance of projects (Chepkoech & Wairimu, 2023). However, many a times, projects fail to keep up with the planned schedules and budgeted costs to meet their goals (Shafiuddin *et al.*, 2022; Safaeian, Fathollahi-Fard, Kabirifar, Yazdani, & Shapouri, 2022). The existing literature suggests that there is a consensus between academia and industry that project risk management is critical to project success (Aramali, Sanboskani, Gibson Jr, El Asmar, & Cho, 2022; Ahmad *et al.*, 2022). However, the link between project risk management and project performance is rarely addressed in the existing literature (Jahan *et al.*, 2022).

Statement of the Problem

Despite mining being pivotal to the world's economy, the mining industry is currently confronted with a multitude of challenges that impede its operations, resulting in suboptimal performance when considering the entire value chain (Shimaponda-Nawa & Nwaila, 2024). The mining industry faces many challenges, including increasing competition, rising costs, and changing regulations (Basuki *et al.*, 2021; Verrier *et al.*, 2022). The comprehensive performance level of the mining companies has gradually declined from 2017 to 2022, but has gradually recovered after 2022 (Wang, 2023). The failure of many projects in meeting deadlines, cost and quality targets is continuously on the rise (ALSaadi & Norhayatizakuan, 2021).

The mining industry is anticipated to be the main engine of industrial expansion in low-income countries, particularly in Africa. However, the output in the mining industry remains poor (Kiprono *et al.*, 2023). The mining industry is underexplored and remains a relatively small industry in Kenya (Nalule, 2023). The performance of projects in the mining industry has not been given enough consideration in Kenya (Opondo, 2023). Majority of the studies have focused on risk management and project performance in developed countries with a paucity of studies within the developing countries (Yeung *et al.*, 2022). The empirical literature has produced inconclusive results on relationship between risk management practices and project performance (Khisa & Mutiso, 2022; Safaeian *et al.*, 2022). The general business problem was that unmanaged risks continue to adversely affect project performance. The specific business problem was that some project managers do not understand the relationship between risk identification practice, risk analysis practice and performance of mining projects.

Research Objectives

The general objective of the study was to examine the influence of risk management practices on the performance of mining projects in Kwale County, Kenya. The specific research objectives of the study were:

- To determine the influence of risk identification practice on performance of mining projects in Kwale County, Kenya.
- To assess the influence of risk analysis practice on performance of mining projects in Kwale County, Kenya.

The two null hypotheses that were tested included;

- $H_0 1$: Risk identification practice has no significant influence on performance of mining projects in Kwale County, Kenya.
- $H_0 2$: Risk analysis practice has no significant influence on performance of mining projects in Kwale County, Kenya.

LITERATURE REVIEW

Theoretical Framework

Theoretical framework is the lens through which the researcher uses to connect the literature with the study results and methodology (Bingham, Mitchell, & Carter, 2024). The theoretical framework consisted of the resource-based view theory, dynamic capabilities theory and dynamic managerial capabilities theory.

Enterprise Risk Management Theory

The enterprise risk management (ERM) theory (Hillson, 1997; Lam, 2014; Larson &Gray 2014) advocates for the identification and management of all risks facing a given project environment holistically instead of dealing with each risk independently (Yang, Lou, & Zhao, 2021). Based on the ERM theory, the project risk management frameworks provide a systematic approach for the management of risk by following a risk identification-analysis-response-monitor loop (Obondi, 2022). The ERM theory of managing project risk emphasizes the active involvement of all project stakeholders in the risk management process of identifying, assessing, analyzing and responding to a wide range of project risks (Kabutiei *et al.*, 2022). Therefore, the ERM theory provides a relevant underpinning theoretical framework to examine the influence of risk management practices on the performance of mining projects in Kwale County, Kenya. The ERM theory provides a framework to distinguish new risks, monitor the already identified risks, and manage those risks with the various response strategies such as avoidance, accepting the risks, or mitigating them using third parties (Tarjo, Vidyantha, Anggono, Yuliana, & Musyarofah, 2022).

The ERM theory facilitates the risk monitoring process since it involves the use of a risk assessment process to evaluate the probability and impacts of certain risks (Jia & Wu, 2022; Obondi, 2022). The ERM theory helps in the risk audits which should be done regularly as the project progresses to have the capacity to monitor and evaluate their effect on the project (Mahama, Elbashir, Sutton, & Arnold, 2022). The ERM theory facilitates the use of technical performance measurement process will enables the project manager to be able to track the project progress and come up with ways of responding to any risks that may occur (Yahaya & Yakubu, 2022). The ERM theory of managing project risk emphasizes the active involvement of all project stakeholders in the risk management process of identifying, assessing, analyzing and responding to a wide range of project risks (Fehrenbacher, Sutton, & Weisner, 2022). The ERM theory also emphasize the need for all project organizations to have clear policies and well documented process for managing project risks (Hopkinson (Dvorski Lacković, Kurnoga, & Miloš Sprčić, 2022). The ERM theory emphasizes the creation of a risk management culture where all stakeholders are mutually accountable and empowered to manage risks (Pecina, Miloš Sprčić, & Dvorski Lacković, 2022).

System Theory

The systems theory (Boulding, 1956; von Bertalanffy, 1951) sought to explain the need for a collection of systemic theoretical constructs to address the empirical world prompted the development of systems theory (Dooley, 2022). The systems theory helps in understanding the influence of risk management practices on the performance of mining projects in Kwale County, Kenya. The systems theory is a theoretical framework for understanding how organizations work (També Bearpark, 2022). The systems theory is an interdisciplinary study of systems as they relate to one another within a larger, more complex system (Devereaux, 2022; Swanson, 2022). The systems thinking approach helps to consider the entire enterprise while implementing risk management (Rozengard, 2022). Therefore, the systems theory provides a relevant underpinning theoretical framework to examine the influence of risk management practices on the performance of mining projects in Kwale County, Kenya.

The systems theory tries to explain the dynamics of complex and dynamic systems (Petriglieri & Louise Petriglieri, 2022; Reinhard, Sorensen, & Yaeger, 2022). The systems theory posits that many of the systems where humans are involved can be classified as (or rather will inevitably become) complex and dynamic systems (Fagan & Maienschein, 2022; Courgeau, 2022). The systems theory assumes certain underlying concepts and principles can be applied universally in different fields, even if these fields evolved separately (Dooley, 2022; Rozengard, 2022). The systems theory suggests that the study of culture as a dynamic arrangement of objects, including individuals and their values, as they relate to one another, is known as systems theory in social science (Courgeau, 2022; També Bearpark, 2022). The interdisciplinary analysis of systems is known as system theory (Petriglieri & Louise Petriglieri, 2022). Therefore, the systems theory helps in understanding the influence of risk identification and risk analysis practices on the performance of mining projects in Kwale County, Kenya.

Contingency Theory

The contingency theory (Fiedler, 1958; Sahal, 1979; Singh, Bohra, & Dalal, 1979) proposes that leaders adopt styles that best suit the situation (Sugianto, Pujawan, & Purnomo, 2023). The contingency theory is a major theoretical lens used to view organizations and support organizations to see the relation between risk management and project performance (Otieno, Ogutu, Ndemo, & Pokhariyal, 2020; Xing, Cao, & Cao, 2023). Therefore, the contingency theory helps in understanding the influence of risk management practices on the performance of mining projects in Kwale County, Kenya. The contingency theory predicts that a leader's effectiveness lies in a "match" situation (Huang, Zhang, Wang, Bodla, & Zhu, 2023; Okong'o, 2022). The contingency theory of leadership tailors a leader's performance to the circumstances (Cheng & Fisk, 2022).

The contingency theory of leadership is based on the idea that the proper type of leadership is determined by an environmental circumstance that manifests itself in the form of a specific event or behavior (Monehin & Diers-Lawson, 2022; Fragapane, Hvolby, Sgarbossa, & Strandhagen, 2023). The contingency theory of leadership was advanced to explain how certain personal characteristics made a leader effective in certain situations (Cheng & Fisk, 2022; Shonhadji & Maulidi, 2022). Despite the project organization's very best effort to a void, prevent, mitigate and control them, uncertainty still do occur (Thakur & Hale, 2022). The main fundamental base of the contingency theory of leadership is that since all risks in a project environment cannot be totally eliminated, residual risks always remain (Amegayibor, 2022; Shenkar & Ellis, 2022). The contingency theory of leadership suggests that contingency buffers are set up to cover for project risk that may hinder project performance especially in situations of diverse events or anticipated threats (Zheng, Feng, Xie, Zhao, & Wu, 2023). The contingency theory posits that there is a need to create a linkage between risk management and performance management, moving towards integrated risk management (Castellini & Riso, 2023). Therefore, the contingency theory helps in understanding the influence of risk identification and risk analysis practices on the performance of mining projects in Kwale County, Kenya.

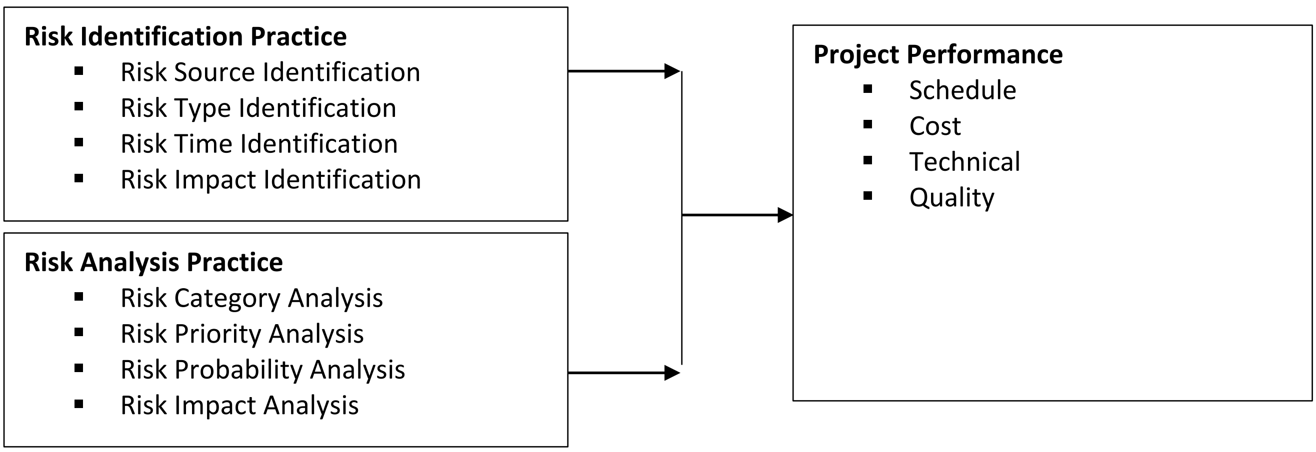
Complexity Theory

The complexity theory (Arthur, 2010; Lorenz, 1963; Curzio & Fortis, 2012) provides an understanding of how systems, such as the economy and global corporations, grow, adapt, and evolve (Frolov, 2022). The complexity theory (Byrne & Callaghan, 2013; Davies, 2014; Dubin, 1978; Lam, 2014; Sammut-Bonnici, 2014) posits that the systemic risks are characterized by high complexity, multiple uncertainties, major ambiguities, and transgressive effects on other systems outside of the system of origin (Renn *et al.*, 2022). Therefore, the complexity theory helps in understanding the influence of risk management practices on the performance of mining projects in Kwale County, Kenya. The complexity theory partly explains how organized systems emerge out of chaotic situations (Dubrin, 2022). The complexity theory emphasizes interactions and the accompanying feedback loops that constantly change systems (Karademas, 2022). The complexity theory has been used in the fields of strategic management and organizational studies (Minto & Trincanato, 2022). The complexity theory was first developed in the physical sciences influencing the development of scientific concepts and methods for better understanding of unstable and difficult to predict systems such as meteorology (Haynes & Alemna, 2022; Spannring & Hawke, 2022).

The complexity theory is concerned with identifying and characterizing common design elements that are observed across diverse natural, technological and social complex systems (He, Wang, Wang, Xie, & Chen, 2022; Phattharapornjaroen, Carlström, & Khorram-Manesh, 2022). The complexity theory recognizes that economic and organizational phenomena are similar to those observed in science and in nature (Karademas, 2022; Swab, Javadian, Gupta, & Pierce, 2022). The complexity theory recognizes that in the context of risk management and revealed that the complexity theory was relevant for managing complex risks (Lopes, Vetromille-Castro, & Leffa, 2022; Minto & Trincanato, 2022). Therefore, the complexity theory helps in understanding the influence of risk identification and risk analysis practices on the performance of mining projects in Kwale County, Kenya.

Conceptual Framework

The conceptual framework illustrates that project performance is conceptualized as the dependent variable. In addition, the conceptual framework depicts that risk identification practice and risk analysis practice are conceptualized as the independent variables. Figure 1 presents the conceptual framework.



Independent Variables **Dependent Variable**

Figure 1: Conceptual Framework

Review of Literature on Variables

Risk Identification Practice

Risk identification is a critical step in the risk management process for construction projects (Bahamid, Doh, Khoiry, Kassem, & Al-Sharafi, 2022). Extant literature posits that project risk identification is the process of finding, recognizing, and describing risks including deciding on the important values and risks to those values (Kabutiei *et al*, 2022). Risk identification, which identifies and documents related risks, is the first and the most important stage in project risk management (Obondi, 2022). Project risk identification is the process of identifying project risks, their sources, and documenting their characteristics (Portny & Portny, 2022). The project risk identification addresses need of appreciation of risks (Obondi, 2022), by identifying what might happen considering all possible causes and scenes that indicate potential consequences (Sarkar & Singh, 2022). However, despite the various definitions of project risk identification, it is surprising that there is no unanimous definition that all researchers agree on (Safaeian *et al.*, 2022).

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Project risk identification includes the identification of the sources and timing of risk, potential mitigating and managing mechanisms could be developed (Richard & Pascal, 2022). The project risk identification involves identifying the consequences of the risks, irrespective of whether the cause is evident or is controllable (Aboutorab, Hussain, Saberi, Hussain & Chang, 2021). After identifying risks, project risks must be prioritized for further analysis or action by assessing their probability of occurrence and potential impacts (Portny & Portny, 2022). The prioritization is an essential task as it both reduces and optimizes the risk involved in projects (Kabutiei *et al.*, 2022). Therefore, project risk identification involves generating a comprehensive list of risks based on those events that might create, enhance, prevent, degrade, accelerate or delay the achievement of objectives (Shafiuddin *et al.*, 2022). Extant research posits that proper risk identification ensures risk management effectiveness (Aboutorab *et al.*, 2021). The project risk identification seeks to identify the source and type of risks in a project and serves as the basis for the next steps of risk management, including analysis, risk response, risk monitoring and control (Obondi, 2022).

Project risk identification can be one of the most critical tools to reduce, time line issue or over budget issue (Kabutiei *et al.*, 2022). However, the project risk identification for complex mega infrastructure projects has become an integral part of the present-day project management process (Sarkar & Singh, 2022). The effectiveness of project risk management is defined by the thoroughness of the project risk identification (AlMarzooqi, Kasdirin, & Mansor, 2022; Richard & Pascal, 2022). As a result, it is crucial to identify the risks and prioritize them before developing effective risk mitigation strategies so that the team's attention could be focused on mitigating the greatest challenges first (Shafiuddin *et al.*, 2022). In the risk identification process, based on the nature of risks, project risks can be grouped into four main categories: technical, external, organizational, and project management (Kasperson, Kasperson, Turner, Hsieh, & Schiller, 2022). However, project risks can also be grouped into two main categories: external, and internal (Portny & Portny, 2022). Project risks can also be grouped into six subsets: local, global, economic, physical, political, and technological changes (Wang, Qian, & Goh, 2022). Therefore, the risk identification process should be performed continuously throughout a construction project and should address both internal and external risks.

In the project risk identification, several methods can be used to identify risks. The project risk identification methods include checklists, documentation review, brainstorming, surveys, interviews, strength-weakness opportunity threat (SWOT) analysis, nominal group technique, and the Delphi technique (Portny & Portny, 2022). However, most contractors use the brainstorming method to identify risks associated with construction projects (Obondi, 2022). Risk identification is a compulsory initial step before risks can be analyzed, because an unknown risk cannot be controlled, transferred, or otherwise managed (Kabutiei *et al.*, 2022). After risk identification, an appropriate response can be determined (Aboutorab *et al.*, 2021). The project management staff must identify construction project risks, because unidentified risk may be detrimental to one or more project objectives (Kabutiei *et al.*, 2022). Therefore, the project risk identification process is beneficial in monitoring and controlling risks, as it focuses the attention of the project management team to those areas where further work is needed.

In some cases, risk identification may lead to either project cancellation or significant modifications during the initial planning stage. As a result, it is necessary to identify and monitor risks in the early stages of a project to attain construction project success (Kabutiei *et al.*, 2022). Generally, if risks are recognized and managed early on, then their impacts on project objectives will be low, because the cost of implementing changes in the project is also low at this stage (Sarkar & Singh, 2022). To act against risks implies identification, analysis, prioritization, mitigation, monitoring, and controlling of risks during project execution (Obondi, 2022). Nevertheless, identifying and assessing risks alone in construction firms cannot help in achieving project objectives (Portny & Portny, 2022). The additional steps, such as monitoring and controlling risks, should be applied to manage risks in a construction firm adequately (Alsalem *et al.*, 2022).

The benefit of the risk identification process is that it documents the existing risks and provides knowledge to project teams to anticipate events (Hassanen & Abdelalim, 2022). The project risk identification plays an important role in project performance by determining which risks are likely affect the project and documenting the characteristics of each (Shafiuddin *et al.*, 2022). Existing research shows that project risk identification positively and significantly predicts success of construction project (Rizwan, 2021). Some literature suggests that project risk identification has a positive and significant influence on project performance (Kabutiei *et al.*, 2022). However, in developing countries in developing countries, inadequate project identification is one of the major causes of project failures which has emerged a great concern to citizens and governments (Safaeian *et al.*, 2022).

Risk Analysis Practice

Project risk analysis, which is the second stage in project risk management, is considered one of the most important (Safaeian *et al.*, 2022). The project risk analysis is the process where risks prioritization and numerical measurement or evaluation of risks are carried out (Bukar, 2022). Project risk analysis involves a determination or estimation of the frequency or possibility of risk occurrence and the degree of consequences (Akbar & Shahid, 2022) or impact on the objectives of a project and how it can be managed (Chattapadhyay & Putta, 2021). The project risk analysis identifies the high-risk activities of the baseline schedule in order to improve the reliability of responses during project control (Song, Martens, & Vanhoucke, 2022). Therefore, project risk analysis is one of the most critical risk management practices that forms a reliable basis for decision making (Hickson & Owen, 2022).

Project risk analysis is a multi-tasking process in the risk management (Akbar & Shahid, 2022) since it includes assessing the likelihood of the risks and their impacts on the objectives of the project (Moorhead, Armitage, & Skitmore, 2022). The project risk analysis techniques used to determine which projects should proceed beyond the pre-commitment stages of the development process (Song *et al.*, 2022). Project risk analysis enables professionals to quantify and analyze risks that may pose potential threats to project performance in terms of various parameters (Hickson & Owen, 2022). Thus, firms should incorporate more modern and sophisticated models of risk analysis to determine the uncertainty of, and risk in, a change of input variables in their financial viability appraisals (Moorhead, Armitage, & Skitmore, 2021).

During the project risk analysis, the identified risks were analyzed for likelihood, impact, severity, detection, occurrence and risk priority numbers (Sarkar & Singh, 2022). Project risk analysis can be important input for project team to revisit the proposals and do the fine tune to avoid risk (Obondi, 2022). The project risk analysis can be one of the most critical tools to reduce, time line issue or over budget issue (Portny & Portny, 2022). The risk analysis for complex mega infrastructure projects has become an integral part of the present-day project risk management process (Wang *et al.*, 2022). Project risk analysis is a critical investigation field for many sectors and organizations to maintain the information management reliable (Moorhead *et al.*, 2022).

Project risk analysis involves qualitative and quantitative analysis (Alkaissy, Arashpour, Li, Alaghmand, & Nezamian, 2022). The qualitative risk analysis process is the process of integrating and implementing (Nakayama *et al.*, 2022), while the quantitative risk analysis is the process of numerically analyzing the combined effect of identified project risks on overall project objectives (Alkaissy *et al.*, 2022). The qualitative risk analysis is the process performed to prioritize project risks for further analysis or action by assessing their probability of occurrence and impact in a project (Hickson & Owen, 2022). However, the quantitative risk analysis tries to calculate the frequency of risks and the magnitude of their consequences in a project (Wang *et al.*, 2022). The qualitative risk analysis attempts to rank risks into high, medium, and low categories, depending on the severity of impact and the probability of an event occurring in a project (Nakayama *et al.*, 2022). The qualitative risk analysis provides a quick initial review of project risks as well as a quick assessment of project risk importance (Nakayama *et al.*, 2022). Nevertheless, the quantitative risk analysis provides an in-depth analysis of the risks' effects identified and prioritized through qualitative analysis (Safaeian *et al.*, 2022). Therefore, one benefit of the quantitative risk analysis is that it produces quantitative risk information to support decision making that reduces project uncertainty (Portny & Portny, 2022).

In analyzing risks, construction practitioners apply tools such as decision trees, Delphi techniques, expert judgment, influence diagrams, Monte Carlo Simulations, probabilistic analysis, and sensitivity analysis (Chattapadhyay & Putta, 2021). Scholars opine that the integration of qualitative and quantitative risk analysis methods approach also enables the efficient use of resources by relating the relative impact of risks on schedule and cost overruns (Hickson & Owen, 2022). The project risks must be properly controlled, monitored, and handled to ensure successful project delivery, because risks impact project performance (Safaeian *et al.*, 2022). The failure of a project is harmful to the bottom-line performance, reputation of a construction organization, its share price, the confidence of stakeholders, and the achievement of an organization's strategic objectives (Chapman, 2019). Extant literature posits that unmonitored or uncontrolled risks could cause cost overruns, scheduling delays, inferior project performance, and, ultimately, project failure (Portny & Portny, 2022).

Project Performance

Project performance is the overall measurement of whether a project has met objectives and requirements of scope, cost, and schedule (Kerzner, 2022). Although there are other performance areas which are important in modern project management (Okong'o, 2022), that time, cost and quality are performance areas which most of the researchers have acknowledged (Rehman, Shafiq, & Afzal, 2021). Generally, time, cost and quality are the performance areas which most of the researchers have acknowledged (Ingle & Mahesh, 2022). Extant literature posits that a project may not be regarded as successful until it satisfies the cost, time and quality limitations applied to it (Sami *et al.*, 2022). Besides, a successful project has to accomplish its technical performance, maintain its schedule, and remain within budget (Safaeian *et al.*, 2022).

Generally, profitability is one of the most important goals, and an essential element of satisfaction for the project stakeholders (Jahan *et al.*, 2022). However, the projects fail to achieve good profitability, due to issues related to time, cost, and scope (Muthukrishnan & Ganapathi, 2021). The profitability levels of projects vary due to their complexities and challenging objectives, often constrained by time and money (Sami *et al.*, 2022). In the context of project management, project risk management would enhance project performance (Okong'o, 2022) by ensuring that project objectives are met and by seeking chances to maximize positive effects on goals (Safaeian *et al.*, 2022). Due to the growing design difficulties and numerous stakeholders, a project must meet specific criteria to accomplish its performance and objective within a budget and schedule (Muneer *et al.*, 2022). Therefore, understanding risk management practices that influence project performance is vital for success (Kallow *et al.*, 2022). However, the lack of adequate risk management methods results in substandard performance (Bahamid *et al.*, 2022).

Empirical Review

Risk Identification Practice and Project Performance

In the Kenyan context, Kabutiei *et al.* (2022) investigated the relationship between project risk identification and the performance of national irrigation authority projects. The results showed that there was a strong positive relationship between project risk identification had a positive significant effect on project performance. The regression results indicated that project risk identification had a positive significant effect on project performance.

In the Pakistan context, Rizwan (2021) examined the relationship between project risk monitoring, control practices, and project success in construction projects. Based on data from 69 construction companies, the regression results indicated that project risk identification had positive significant effect on project success. From the results, project risk identification had a 34% effect on project success. The researchers opine that project risk identification positively and significantly predict success of construction project.

In the Kenyan context, Mutunga and Ondara, (2021) examined the effect of risk identification practice and project performance at Kenya Airports Authority. The research adopted the descriptive survey design. The regression results indicated that risk identification practice had a positive and significant effect on project performance at Kenya Airport Authority.

In the context of South Sudan, Olobo, Karyeija, Sande, and Khoch (2021) investigated credit risk identification practice and the performance of commercial banks. A total of 124 valid responses were received from 7 sampled banks in Juba. The research findings revealed that there was a strong positive correlation between credit risk identification practice and the performance of commercial banks. From the results, credit risk identification practice positively and significantly predicted the performance of commercial banks.

In the Kenyan context, Nyarangi and Ngali (2021) examined risk identification practice and financial performance of insurance companies listed in Nairobi Securities Exchange. The multiple regression results indicated that risk identification practice had a positive and significant effect on financial performance of insurance companies listed in Nairobi Securities Exchange, Kenya.

In the context of Rwanda, Igihozo and Irechukwu (2022) examined project risk identification and performance of Mpazi channel construction projects in Nyabugogo, Kigali. The results showed that project risk identification positively and significantly influences performance of mining projects.

In the Kenyan context, Nzioki and Mwenda (2020) examined the influence of risk identification practice on the performance of exchequer funded building construction projects in Machakos County, Kenya. The findings showed that risk identification positively and significantly predict the performance of exchequer funded building construction Projects.

In the context of Oman, Alsaadi and Norhayatizakuan (2021) examined project risk identification and performance of construction projects. The research findings showed that project risk management identification practice had a positive and significant influence on performance of mining projects.

In the Kenyan context, Chilumo *et al.* (2020) examined the effect of risk management practices on performance of building construction projects. The study revealed that practicing risk management in the construction industry increased the probability of positive project performance. The key finding of the study was that risk management practices had positive and significant influence on the performance of building construction projects.

In the Kenyan context, Kirira *et al.* (2019) examined the influence of risk identification on road construction project performance with a specific focus on KeNHA Coast Region. The results showed that risk identification had a positive and significant influence on the performance of KeNHA road construction projects in the Coast Region.

Risk Analysis Practice and Project Performance

In the Kenyan context, Mutunga and Ondara (2021) examined the effect of risk analysis practice and project performance at Kenya Airports Authority. A cross-sectional survey approach was used to collect primary data. The regression results indicated that risk analysis practice had a positive and significant effect on project performance at Kenya Airport Authority.

In the Oman context, Alsaadi and Norhayatizakuan (2021) examined risk analysis practice and performance of construction projects. The quantitative research method and a correlation cross-sectional survey research design were applied to examine the relationship. The research findings showed that project risk management analysis practice had a positive and significant influence on performance of mining projects.

In the Nigerian context, Bukar (2022) investigated the impact of project risk analysis on project performance in building construction industry in Abuja. The research was anchored on the descriptive research design. The results revealed that project risk analysis had a positive and significant influence on project performance in the building construction industry in Abuja in Nigeria.

In the Kenyan context, Nyarangi and Ngali (2021) examined risk analysis practice and financial performance of insurance companies listed in Nairobi Securities Exchange. The target population comprised of the 6 insurance companies listed in the Nairobi Securities Exchange under the Insurance Regulatory Agency. The multiple regression results indicated that risk analysis practice had a positive and significant effect on financial performance of insurance companies listed in Nairobi Securities Exchange, Kenya.

In the Pakistan context, Rizwan (2021) examined the impact of project risk analysis on project success of construction companies. From the results, project risk analysis had a 47.1% effect on project success. The researchers conclude that project risk analysis positively and significantly predict success of construction project.

In the Kenyan context, Kirira *et al.* (2019) examined the influence of risk appraisal on road construction project performance with a specific focus on KeNHA Coast Region. The results showed that risk appraisal had a positive and significant influence on the performance of KeNHA road construction projects in the Coast Region.

In the Nigerian context, Bukar (2022) examined the impact of project risk analysis on project cost performance in the building construction industry in Abuja in Nigeria. The researcher adopted the descriptive research design. The data was analyzed using the content analysis approach. The study revealed that project risk analysis positively and significantly influences project performance in the building construction industry.

METHODOLOGY

Research Philosophy: The research was guided by the positivist research philosophy which regards the world as made up of observable and measurable facts and assumes that there is an objective reality out there. The positivist research philosophy regards the world as made up of observable and measurable facts and assumes that there is an objective reality out there (Ma & Xie, 2023).

Research Design: Drawing on a quantitative non-experimental research methodology, the research utilized a correlational cross-sectional survey research design to examine the non-causal relationship between study variables. The design was appropriate for collecting data once from many individuals at a single point in time to test statistical relationships between two or more variables without the researcher controlling or manipulating any of them (Aryuwat *et al.*, 2024).

Target Population: The target population for this study consisted of 188 project management staff in charge of the mining projects of the 7 mining companies in Kwale County, Kenya. The choice of the 7 mining companies is due to their massive contributions to the mining industry in the Kenya.

Sampling Frame: The sampling frame for this study consisted of the list of the 7 mining companies in Kwale County, Kenya.

Sample Size and Sampling Technique: This section presents the sample size and sampling techniques for this study.

Sample Size: The Yamane (1967) formula was used to calculate sample size at 95% confidence level and 5% significance level to ensure that the sample size was truly reflective of the target population.

$$n = \frac{N}{1 + Ne^2)}$$

Where:
n = Sample Size;
N = Target Population;
e = Margin of Error = 0.05.

With a target population of 188 project management staff in charge of the mining projects of the 7 mining companies in Kwale County, Kenya, the minimum recommended sample size for the study was calculated as:

$$n = \frac{188}{1 + 188(0.05)^2} \qquad = 128$$

Therefore, the sample size consisted of 128 project management staff in charge of the mining projects of the 7 mining companies in Kwale County, Kenya. Table 1 presents the sample size.

Table 1: Sample Size

Strata	Target Population			Sample Size		
	Top Management	Middle Management	Total	Top Management	Middle Management	Total
Base Titanium Limited	13	75	88	9	51	60
Coast Calcium Limited	5	19	24	3	13	16
Pacific Wildcat Resources Corps (PAW)	3	11	14	2	8	10
Cortec Mining Kenya (CMK)	3	9	12	2	6	8
Milli Glass Limited	4	17	21	3	11	14
Kenya Breweries Glass Limited	4	15	19	3	10	13
Eastern Chemicals Limited	3	7	10	2	5	7
Total	**35**	**153**	**188**	**24**	**104**	**128**

Sampling Techniques: The proportionate stratified random sampling technique was used to select a sample size of 128 project management staff from a target population of 188 project management staff in charge of the mining projects of the 7 mining companies in Kwale County, Kenya. The choice of the proportionate stratified random sampling technique was justified by the heterogeneous target population.

Data Collection Methods: A self-administered structured questionnaire was the means for collecting primary data. The data collection method was appropriate, because of its ability to collect a large amount of information in a reasonably quick span of time (Saunders & Kulchitsky, 2021).

Data Collection Procedures: A cross-sectional survey-based approach was used to collect primary data. Through the drop and pick method, the researcher and three research assistants hand delivered the survey questionnaire to a random sample of the project management staff in charge of the mining projects of the 7 mining companies in Kwale County, Kenya. A continuous follow up on responses was made by the researcher and research assistants.

Pilot Study: A pilot study was conducted to test the validity and reliability of the constructed survey questionnaire. The pilot study involved a pilot trial sample size of 32 project management staff in charge of the mining projects of the 7 mining companies in Kwale County, Kenya. Generally, at least 30 representative participants from the target population provides a reasonable minimum recommendation for a pilot study (Ramezani, Bhati, Murphy, Routh, & Taxman, 2022; Saunders & Kulchitsky, 2021; Snell *et al.*, 2021).

Data Processing and Analysis: The collected data was checked for accuracy, completeness and consistency. The data was coded, edited, and entered into the Statistical Package for Social Sciences (SPSS) version 26 to create a data sheet that was used for analysis. The descriptive statistics and inferential statistics were used for data analysis. The descriptive statistics were used to compute, summarize the data in respect to each of the study variables and describe the sample's characteristics. The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. A multiple linear analysis was performed with project performance as the dependent variable and risk identification practice and risk analysis practice as the predictor variables.

Model Specification: The multiple linear regressions model was specified as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \quad \text{………………………. Model 1}$$

Where:
Y = Performance of Mining Projects
β_0 = Constant Term
X_1 = Risk Identification Practice
X_2 = Risk Analysis Practice
$\beta_1 - \beta_2$ = Regression Coefficients to be estimated
ε = Stochastic Error Term

Hypotheses Testing: In this research, two null hypotheses were tested at 5% level of significance ($\alpha = 0.05$; $t = 1.960$) at a 95% confidence level to statistically help draw acceptable and realistic inferences. Therefore, the decision rule was to reject the H0i if the $P \le 0.05$, and otherwise fail to reject the H0i if the $P > 0.05$. Table 2 presents the hypotheses testing procedure.

Table 2: Hypotheses Testing

Hypotheses		Model	Hypotheses Testing	Decision Rule
H_01:	Risk identification practice has no significant influence on performance of mining projects in Kwale County, Kenya.	$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$ …… Model 3.1	Standard Multiple regression analysis	$H_01: \beta_1 = 0$ $H_11: \beta_1 \neq 0$ If the $P \le 0.05$ reject the H_01. If the $P > 0.05$ fail to reject the H_01.
H_02:	Risk analysis practice has no significant influence on performance of mining projects in Kwale County, Kenya.			$H_02: \beta_2 = 0$ $H_12: \beta_2 \neq 0$ If the $P \le 0.05$ reject the H_02. If the $P > 0.05$ fail to reject the H_02.

FINDINGS

Response Rate

Out of the 128 survey questionnaires distributed for the main study, only 102 valid responses were obtained, translating to a valid response rate of 79.69% which was adequate for data processing and analysis. Generally, survey response rates of 70% or higher are needed if findings are to be considered generalizable (Ericson *et al.*, 2023). Table 3 presents the response rate results.

Table 3: Response Rate

Strata	Frequency	Response Rate
Response	102	79.69%
Non-Response	26	20.31%
Total	**128**	**100.00%**

Descriptive Results

This section presents the descriptive results for the study variables. On a 5-point Likert scale ranging from 1 = strongly disagree to 5= strongly agree, the respondents were required to indicate their level of agreement or disagreement on risk management practices and performance of mining projects in Kwale County, Kenya. From the results, risk identification practice had a mean score of 3.95 and standard deviation of 0.327, suggesting an agreement among the respondents. The results showed that risk analysis practice had a mean score of 3.94 and standard deviation of 0.326, signifying an agreement among the respondents. Table 4 presents the descriptive results for the study variables.

Table 4: Descriptive Results

Variable	n	Mean	Standard Deviation
Risk Identification Practice (X1)	102	3.95	.327
Risk Analysis Practice (X2)	102	3.94	.326
Performance of Mining Projects (Y)	102	3.95	.319

Correlation Results

The Pearson's product moment correlation analysis was performed to confirm or deny the relationships between the study variables. The correlation results indicated that risk identification practice had a moderately strong positive and significant relationship with performance of mining projects ($r = 0.578$, $p \leq 0.05$) in Kwale County, Kenya. However, the correlation results showed that risk analysis practice had a strong positive and significant relationship with performance of mining projects ($r = 0.742$, $p \leq 0.05$) in Kwale County, Kenya. Table 5 presents the Pearson's product moment correlation results.

Table 5: The Pearson's Product Moment Correlation Results

Variable		X_1	X_2	Y
Risk Identification Practice (X_1)	Pearson Correlation	1		
	Sig. (2-tailed)			
	n	102		
Risk Analysis Practice (X_2)	Pearson Correlation	.487**	1	
	Sig. (2-tailed)	.000		
	n	102	102	
Performance of Mining Projects (Y)	Pearson Correlation	.578**	.742**	1
	Sig. (2-tailed)	.000	.000	
	n	102	102	102

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

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Standard Multiple Regression Results

A standard multiple linear analysis was performed with performance of mining projects as the dependent variable and risk identification practice and risk analysis practice as the predictor variables. The multiple regression analysis was performed to test to what extent, if any, the two risk management practices significantly predict the performance of mining projects in Kwale County, Kenya.

Model Summary

From the model summary in table, it is clear that the value of coefficient of correlation (R) was 0.782, while the value of coefficient of determination (R^2) was 0.612, while the value of the adjusted R^2 was 0.604. Additionally, the value of the std. error of the estimate was 0.236 and the value of the Durbin-Watson test was 2.200. The R value of 0.782 suggest that there was a strong positive correlation between the strategic intelligence capabilities and the performance of mining projects in Kwale County, Kenya. The R^2 value of 0.612 suggest that the overall model as a whole (the model involving constant, risk identification practice and risk analysis practice) was able to significantly predict and explain approximately 61.2% of the variance in the performance of mining projects in Kwale County, Kenya.

The Adjusted R Square value of 0.604 suggest that the overall model as a whole (the model involving constant, risk identification practice and risk analysis practice) significantly predicted and explained 60.4% of the variance in the performance of mining projects in Kwale County, Kenya. The std. error of the estimate value of 0.236 suggest that there could be other factors not included in the model in the current study that could also predict and explain the remaining 39.6% of the variance in the performance of mining projects in Kwale County, Kenya. Therefore, there is in need for future research to discover the other variables not included in the model in the current study that also predict the remaining variance in the performance of mining projects in Kwale County, Kenya.

From the model summary table, the Durbin-Watson test statistic had a value of 2.460, falling within the optimum range of 1.5 to 2.5, suggesting that there was no severe autocorrelation detected in the in the residual values in the datasets. Generally, Durbin-Watson statistics falling within the optimum range of 1.5 to 2.5 indicates that there is no severe autocorrelation detected in the in the residual values in the datasets (Hair *et al.*, 2021). Table 6 presents the model summary results.

Table 6: Model Summary[b] Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.782[a]	.612	.604	.236	2.460

a. Predictors: (Constant), Risk Analysis Practice (X_2), Risk Identification Practice (X_1)

b. Dependent Variable: Performance of mining projects (Y)

Analysis of Variance

From the Analysis of Variance (ANOVA) table, the overall model as a whole (the model involving constant, risk identification practice and risk analysis practice), achieved a high degree of fit, as reflected by $R^2 = 0.612$, adj. $R^2 = 0.604$, $F(2, 101) = 77.998$, $p < 0.05$. The null hypothesis was that the linear combination of predictor variables (risk identification practice and risk analysis practice) was not able to significantly predict the performance of mining projects in Kwale County, Kenya. However, the alternative hypothesis was that the linear combination of predictor variables (risk identification practice and risk analysis practice) was able to significantly predict the performance of mining projects in Kwale County, Kenya. The standard multiple linear regression results showed that the linear combination of predictor variables (risk identification practice and risk analysis practice) significantly predicted the performance of mining projects in Kwale County, Kenya. The null hypothesis was rejected in favor of the alternative hypothesis. Therefore, the decision was that the linear combination of predictor variables (risk identification practice and risk analysis practice) significantly predict the performance of mining projects in Kwale County, Kenya. Table 7 presents the ANOVA results.

Table 7: ANOVA[a] Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.674	2	4.337	77.998	.000[b]
	Residual	5.505	99	.056		
	Total	**14.179**	**101**			

a. Dependent Variable: Performance of mining projects (Y)
b. Predictors: (Constant), Risk Analysis Practice (X_2), Risk Identification Practice (X_1)

Multiple Regression Coefficients

From the coefficients table, when the unstandardized regression coefficients (B) were substituted to the multiple regression model specified for the study, the final predictive equation was:

$Y = 1.900 + 0.168X_1 + 0.353X_2$

The final predictive equation suggested that holding all factors in to account constant (risk identification practice and risk analysis practice), constant at zero, the performance of mining projects in Kwale County, Kenya would be 1.900. Additionally, the final predictive equation postulated that with all other factors held constant, a unit increase in risk identification practice would lead to 0.168 unit increase in the performance of mining projects in Kwale County, Kenya. Moreover, the final predictive equation suggested that with all other factors held constant, a unit increase in risk analysis practice would lead to 0.353 unit increase in the performance of mining projects in Kwale County, Kenya. Based on the magnitude of the unstandardized regression coefficients (B) of the independent variables, risk analysis practice was the best predictor of the variance in the performance of mining projects in Kwale County, Kenya.

The multiple regression results indicated that risk identification practice had a positive and significant influence on the performance of mining projects ($\beta_1 = 0.284$; $t = 3.964$; $p \leq 0.05$) in Kwale County, Kenya. The regression results indicated that risk analysis practice had a positive and significant influence on the performance of mining projects ($\beta_2 = 0.603$; $t = 8.418$; $p \leq 0.05$) in Kwale County, Kenya. Table 8 presents the multiple regressions coefficients results.

Table 8: Multiple Regression Coefficients[a] Results

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.900	.162		11.704	.000		
	Risk Identification Practice (X_1)	.168	.042	.284	3.964	.000	.763	1.310
	Risk Analysis Practice (X_2)	.353	.042	.603	8.418	.000	.737	1.357

a. Dependent Variable: Performance of mining projects (Y)

Hypotheses Test Results

In this research, 4 null hypotheses were tested. The hypotheses were tested at 5% level of significance, $\alpha = 0.05$, $t = 1.960$, and 95% confidence level to statistically help draw acceptable and realistic inferences. Therefore, the decision rule was to reject the null hypothesis H_0i if the $P \leq 0.05$, and otherwise fail to reject the null hypothesis H_0i if the $P > 0.05$.

Hypothesis One Test Results

The first null hypothesis (H_01) predicted that risk identification practice has no significant influence on performance of mining projects in Kwale County, Kenya. The decision rule was to reject the null hypothesis H_01 if the $\beta_1 \neq 0$, $t \geq 1.960$, $P \leq 0.05$, and otherwise fail to reject the null hypothesis H_01 if the $\beta_1 = 0$, $t < 1.960$, $P > 0.05$. The standard multiple regression results showed that risk identification practice had a positive and significant influence on the performance of mining projects ($\beta_1 = 0.284$; $t = 3.964$; $p \leq 0.05$) in Kwale County, Kenya. Consequently, the H_01 was rejected, providing the empirical support for H_11. Therefore, deduction was made that risk identification practice has a significant influence on performance of mining projects in Kwale County, Kenya.

Hypothesis Two Test Results

The second null hypothesis (H_02) predicted that risk analysis practice has no significant influence on performance of mining projects in Kwale County, Kenya. The decision rule was to reject the null hypothesis H_01 if the $\beta_1 \neq 0$, $t \geq 1.960$, $P \leq 0.05$, and otherwise fail to reject the null hypothesis H_01 if the $\beta_1 = 0$, $t < 1.960$, $P > 0.05$. The standard multiple regression results showed that risk analysis practice had a positive and significant influence on the performance of mining projects ($\beta_2 = 0.603$; $t = 8.418$; $p \leq 0.05$) in Kwale County, Kenya. Consequently, the H_02 was rejected, providing the empirical support for H_12. Therefore, deduction was made that risk analysis practice has a significant influence on performance of mining projects in Kwale County, Kenya. Table 9 presents the hypotheses test results.

Table 9: Hypotheses Test Results

Hypothesis	β	t	Sig.	Decision
H_01: Risk identification practice has no significant influence on performance of mining projects in Kwale County, Kenya.	.284	3.964	.000	Reject the H_01
H_02: Risk analysis practice has no significant influence on performance of mining projects in Kwale County, Kenya.	.603	8.418	.000	Reject the H_02

Discussions

The purpose of this quantitative correlational research was to examine the influence of risk management practices on the performance of mining projects in Kwale County, Kenya. Specifically, the research sought to examine the influence of risk identification practice and risk analysis practice on the performance of mining projects in Kwale County, Kenya. The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The correlation results indicated that the risk management practices had positive and significant relationship with performance of mining projects in Kwale County, Kenya. A standard multiple linear analysis was performed with performance of mining projects as the dependent variable and risk identification practice and risk analysis practice as the predictor variables. The regression results showed that the risk management practices had positive and significant influence on the performance of mining projects in Kwale County, Kenya. The findings were consistent with the results of previous studies (Alkhlaifat, 2021; Alsaadi & Norhayatizakuan, 2021; Abdulai & De-graft, 2022; Omondi & Muchelule, 2022). The findings were also consistent with the results of prior studies (Igihozo & Irechukwu, 2022; Bukar & Ibrahim, 2021; Kabutiei *et al.*, 2022).

The first specific objective was to determine the influence of risk identification practice on the performance of mining projects in Kwale County, Kenya. The first null hypothesis (H_01) predicted that risk identification practice has no significant influence on performance of mining projects in Kwale County, Kenya. The Pearson's correlation results indicated that risk identification practice had a moderately strong positive and significant relationship with the performance of mining projects in Kwale County, Kenya. The regression results showed that risk identification practice had a positive and significant influence on performance of mining projects in Kwale County, Kenya. The $H_0 1$ was rejected, providing the empirical support for $H_1 1$. Therefore, the decision was that risk identification practice has a significant influence on performance of mining projects in Kwale County, Kenya. The findings were in harmony with the results of previous studies (Alsaadi & Norhayatizakuan, 2021; Chilumo *et al.*, 2020; Kabutiei *et al.*, 2022). The findings were also consistent with the results of prior studies (Mutunga & Ondara, 2021; Nyarangi & Ngali, 2021; Nzioki & Mwenda, 2020; Rizwan, 2021).

The second specific objective was to assess the influence of risk analysis practice on performance of mining projects in Kwale County, Kenya. The second null hypothesis ($H_0 2$) predicted that risk analysis practice has no significant influence on performance of mining projects in Kwale County, Kenya. The Pearson's correlation results indicated that risk analysis practice had a strong positive and significant relationship with performance of mining projects in Kwale County, Kenya. The regression results showed that risk analysis practice had a positive and significant influence on performance of mining projects in Kwale County, Kenya. The $H_0 2$ was rejected, providing the empirical support for $H_1 2$. Therefore, the decision was that risk analysis practice has a significant influence on performance of mining projects in Kwale County, Kenya. The findings were consistent with the results of past studies (Alsaadi & Norhayatizakuan, 2021; Bukar (2022; Mutunga & Ondara, 2021; Rizwan, 2021).

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this quantitative correlational research was to examine the influence of risk management practices on performance of mining projects in Kwale County, Kenya. The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The correlation results indicated that the risk management practices had positive and significant relationship with performance of mining projects in Kwale County, Kenya. A standard multiple linear analysis was performed with performance of mining projects as the dependent variable and risk identification practice and risk analysis practice as the predictor variables. The regression results showed that the risk management practices had positive and significant influence on the performance of mining projects in Kwale County, Kenya.

The first specific objective was to determine the influence of risk identification practice on the performance of mining projects in Kwale County, Kenya. The first null hypothesis ($H_0 1$) predicted that risk identification practice has no significant influence on performance of mining projects in Kwale County, Kenya. The Pearson's correlation results indicated that risk identification practice had a moderately strong positive and significant relationship with the performance of mining projects in Kwale County, Kenya. The regression results showed that risk identification practice had a positive and significant influence on performance of mining projects in Kwale County, Kenya. The $H_0 1$ was rejected, providing the empirical support for $H_1 1$. Therefore, the decision was that risk identification practice has a significant influence on performance of mining projects in Kwale County, Kenya.

The second specific objective was to assess the influence of risk analysis practice on performance of mining projects in Kwale County, Kenya. The second null hypothesis ($H_0 2$) predicted that risk analysis practice has no significant influence on performance of mining projects in Kwale County, Kenya. The Pearson's correlation results indicated that risk analysis practice had a strong positive and significant relationship with performance of mining projects in Kwale County, Kenya. The regression results showed that risk analysis practice had a positive and significant influence on performance of mining projects in Kwale County, Kenya. The $H_0 2$ was rejected, providing the empirical support for $H_1 2$. Therefore, the decision was that risk analysis practice has a significant influence on performance of mining projects in Kwale County, Kenya.

Conclusion

The purpose of this quantitative correlational research was to examine the influence of risk management practices on performance of mining projects in Kwale County, Kenya. The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The correlation results indicated that the risk management practices had positive and significant relationship with performance of mining projects in Kwale County, Kenya. A standard multiple linear analysis was performed with performance of mining projects as the dependent variable and risk identification practice and risk analysis practice as the predictor variables. The regression results showed that the risk management practices had positive and significant influence on the performance of mining projects in Kwale County, Kenya. Therefore, the conclusion was that risk management practices have significant influence on performance of mining projects in Kwale County, Kenya.

The first specific objective was to determine the influence of risk identification practice on the performance of mining projects in Kwale County, Kenya. The first null hypothesis ($H_0 1$) predicted that risk identification practice has no significant influence on performance of mining projects in Kwale County, Kenya. The Pearson's correlation results indicated that risk identification practice had a moderately strong positive and significant relationship with the performance of mining projects in Kwale County, Kenya. The regression results showed that risk identification practice had a positive and significant influence on performance of mining projects in Kwale County, Kenya. The $H_0 1$ was rejected, providing the empirical support for $H_1 1$. Therefore, the first conclusion was that risk identification practice has a significant influence on performance of mining projects in Kwale County, Kenya.

The second specific objective was to assess the influence of risk analysis practice on performance of mining projects in Kwale County, Kenya. The second null hypothesis ($H_0 2$) predicted that risk analysis practice has no significant influence on performance of mining projects in Kwale County, Kenya. The Pearson's correlation results indicated that risk analysis practice had a strong positive and significant relationship with performance of mining projects in Kwale County, Kenya. The regression results showed that risk analysis practice had a positive and significant influence on performance of mining projects in Kwale County, Kenya. The $H_0 2$ was rejected, providing the empirical support for $H_1 2$. Therefore, the second conclusion was that risk analysis practice has a significant influence on performance of mining projects in Kwale County, Kenya.

Recommendations

Managerial Implications: From the findings of this research, the research recommends that managers implement risk management practices to foster the performance of mining projects.

Policy Implications: From the findings of this research, the research recommends that policy makers within mining industry should to review the policy framework to encourage project managers to implement risk management practices to foster the performance of mining projects.

Limitations and Future Research

This research paper generates novel insights into how risk management practices predict the performance of mining projects. However, the current research has a number of limitations, that need to be taken into consideration. First, the research was limited to the influence of risk management practices on performance of mining projects in Kwale County, Kenya. Subsequently, caution should be taken when attempting to generalize the results beyond the mining industry.

Future research could examine the influence of risk management practices on project performance in other sectors or in other regions. Second, the research was contextually limited to only two risk management practices, namely risk identification practice and risk analysis practice. Future research should examine the influence of other risk management practices on performance of mining projects. Third, as the research paper relied on a cross-sectional survey design, no inferences about the causality of relationships can be made. Therefore, future researchers should consider conducting a longitudinal study on the influence of risk management practices on performance of mining projects.

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