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Examining the Effectiveness of Risk Management Processes on Project Performance: A Case Study of Lumwana Mining PLC

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Abstract

This study examined the effectiveness of risk management processes on project performance using Lumwana Mining PLC as a case study. The study focused on three specific objectives: to evaluate the current risk management processes adopted by Lumwana Mining PLC, to identify the most common risks affecting project performance, and to determine the effectiveness of existing risk management processes in improving performance outcomes. A descriptive research design was applied to gather data from a total of 75 respondents drawn from different departments including engineering, operations, finance, health and safety, and risk compliance. The respondents were selected through purposive and simple random sampling to ensure that both technical and administrative perspectives were represented. Data was collected using structured questionnaires which allowed for consistency and clarity in responses. Quantitative data were analyzed using descriptive statistics such as frequencies and percentages, while inferential analysis using Chi-square tests was conducted to assess relationships between key variables. The findings showed that Lumwana Mining PLC has established formal risk management processes, though their effectiveness varies across departments. About 53.33% of respondents stated that project risks are reviewed quarterly, while 77.33% confirmed that they have been directly involved in risk management activities. The most common risks identified were technical failures, safety incidents, and compliance-related risks, which frequently affect project timelines and cost control. The Chi-square results further revealed significant relationships between familiarity with the risk management framework and the perceived effectiveness of risk control. The study concluded that while risk management practices are in place, there is a need for improved communication, regular training, and stronger monitoring systems. It is recommended that Lumwana Mining PLC enhance cross-departmental coordination and increase employee involvement in risk assessment to achieve more consistent project performance.

Keywords: Risk Management, Project Performance, Lumwana Mining PLC, Risk Assessment

1. Introduction

This chapter highlights the background of the study, statement of the problem, objectives of the study, research questions, significance of the study, limitations of the study and definition of terms.

1.1 Background

Risk refers to the possibility that events or conditions will occur and affect project objectives in unpredictable ways. In all high-impact industries risk has become central to project management as projects grow more complex and costly the need for systems that forecast and handle delivery threats rises. Globally, Risk management provides a structured way to spot what might go wrong and prepare responses before issues materialize. In high-risk industries, not dealing with uncertainty early on can slow down progress, hurt your reputation, or raise costs to the point where they can not be recovered. Companies can figure out what could go wrong and how to deal with it before it happens by using risk management. Kerzner (2017) [14] says that the success of a project depends more and more on how strong these systems are and how well they are used at every stage of the project's life. In places where every choice has big financial or safety risks, moving from reactive to proactive planning is not an option.

At the regional level particularly in sub-Saharan Africa the need for more effective risk processes is becoming urgent. Infrastructure and resource-based projects face growing exposure to political and supply chain risks. According to Musyoka

(2022) all entities are faced with risk however the challenge of the management is the determination of how much risk it is prepared to accept so as it to strives to grow the value of the stakeholders. However, these uncertainties present both values and 12 risk with the potential; of enhancing or eroding value. Risk management practices enable them to identify, examine and manage risks associated with the uncertainty.

Locally, in Zambia's mining sector risk management remains a major concern for large-scale operators. Many organizations rely still on traditional tools like risk registers often updated only during pre-set reviews. According to Hillson (2016) [12], risk processes will eventually become obsolete if they are not designed to adapt to change. Both projects and their risks are ever-changing. By the time construction starts, a risk that was identified during the planning phase may have changed significantly. Blind spots are created when these changes are ignored or when real-time reassessment is not performed, which undermines the entire plan. In order to be effective, a framework must actively monitor risks, send out alerts when thresholds are exceeded, and provide updated recommendations based on actual events.

Project teams in the local setting maintain formal risk registers and hold periodic reviews. Musyoka (2022) points out that field staff rarely link those records to daily planning and decision-making. Risks sit in documents and fail to shape choices about maintenance schedules or procurement timing. This disconnect undermines the practical value of risk registers. The problem is usually not in identification but in execution. According to Chileshe and Kikwasi (2018) [5], a lot of risk failures happen because the right people did not learn about the issue in a timely manner, not because they did not see it. When departments work independently, when reporting systems are not clear, or when risk language is not standardised, risk communication breaks down.

1.2 Statement of the problem

Many large-scale projects still fail due to poor risk management techniques, even with major advancements in project management methodologies. According to recent studies, poorly managed risks cause cost overruns and delays in about 70% of mining projects worldwide (Flyvbjerg, 2018) [11]. In Zambia's mining industry these problems are especially evident. Chileshe and Kikwasi (2018) [5] report that 65% of mining projects in the country go over budget, while 55% miss delivery timelines. This has serious implications for both project viability and investor confidence. Lumwana Mining PLC operates in a high-risk environment with complex logistics shifting regulatory demands and variable geological conditions. While the company has formal processes for managing project risks there is still limited evidence that these processes are consistently effective in reducing disruptions or improving delivery performance.

One major issue is the weak execution of risk response strategies. Kutsch and Hall (2017) estimate that about 40% of identified risks in large-scale projects are never fully addressed. This often stems from poor resource allocation, unclear roles, or internal delays in acting on known threats. even well-documented risks remain unresolved and continue to affect project outcomes. Without a clear understanding of how risk management is currently applied and where gaps exist, companies like Lumwana risk repeating the same costly failures across multiple projects. This study aims to investigate those gaps in detail.

1.3 General Objective

The main objective of this study is to examine the effectiveness of risk management processes on project performance. A case study of Lumwana mining PLC.

1.4 Specific Objectives

1. To evaluate the current risk management processes adopted by Lumwana Mining PLC in managing project risks.
2. To identify the most common risks affecting project performance at Lumwana Mining PLC.
3. To determine the effectiveness of current risk management processes on project performance.

1.5 Research Questions

1. What risk management processes are currently in place at Lumwana Mining PLC?
2. What are the most common risks affecting project performance?
3. How effective are the current risk management processes on project performance?

1.6 Significance of the study

To improve the performance of large projects, it is important to know how well risk management processes work, especially in industries where project failure can lead to big financial and operational losses. this study will help us understand if the risk management systems we have now are actually helping projects do better. For project managers and operational leaders findings of this research can support better decision-making. in practice, managers often operate under pressure balancing delivery timelines with cost controls and safety requirements. in such contexts, risk management is either treated as a reactive function or overlooked altogether when project demands escalate. this research will highlight practical challenges faced on the ground such as resource constraints communication gaps and execution delays, and will propose interventions to overcome these barriers. policy-makers and regulatory bodies will also benefit from the study's findings. in many resource-driven economies as mining and infrastructure projects are critical to national development. by identifying systemic weaknesses in how risks are managed, this research can support the development of stronger industry guidelines, compliance standards, and institutional oversight frameworks these professionals can use the study's recommendations to refine training content, enhance diagnostic tools and develop custom frameworks tailored to complex project environments. In short the research aims to help a variety of people by providing useful evidence-based information that makes risk management and performance protection better.

1.7 Theoretical framework

This study is grounded in enterprise risk management (erm) theory. erm treats risk as a strategic issue that an organisation manages as one system. it avoids silo thinking and links risk work to objectives, performance targets and stakeholder expectations. Fraser and Simkins (2021) [10] show that erm strengthens decision making and supports long term value. Fontaine (2018) adds that risk appetite and

risk tolerance guide priorities. when these limits are clear, mitigation stays consistent and resources go where they matter. in projects that alignment supports schedule control, cost control and quality assurance.

The study also applies the risk breakdown structure (rbs) model to classify risks by source. typical categories include technical risks, external risks, organisational risks, and project management risks. Hillson and Simon (2020) [13] argue that rbs supports complete identification and clearer analysis. contingency theory adds that risk practices must fit the project context. Donaldson (2020) [8] notes that size, complexity, and uncertainty shape what works. using these perspectives together helps the study explain differences in project outcomes and draw practical recommendations for stronger risk management.

2. Literature Review

2.1 Overview

Risk management should be a part of project life cycle (PLC) and an on-going activity because prerequisites of a project and its environment will vary throughout its duration. Chapman and Ward (2017) [4] believe that risk management should be considered as an „add in" process to the project management process as a whole, not an „add-on". They argue that the risk management process should be addressed in all phases of the project life cycle and they have considered the planning phase as the initiation point of this process. This is in contrast with what was discussed earlier in this chapter about the risk and phases in the construction project. There is usually a feasibility phase before planning which is considered as one of the risky phases in any construction project. therefore, risk management process (rmp) must address all phases of a project including the feasibility phase in order to manage the risks associated with a new project which is about to start. feasibility phase is where a go/no-go decision is taken for starting a new project. hence, significance of rmp in this phase can never be ignored because it may result in a no-go decision in case of a very risky project that leads to failure.

Brown and Chong (2020); and Skorupka (2023); have described risk management as a group of techniques and actions for decreasing disturbances which may 26 occur during the project life cycle and ensuring the realization of the project objectives. they have assumed the aim of this process at identifying and analysing risks and then applying proper mitigating actions. likewise, Flanagan and Norman (2023) have referred to risk management as a discipline for living with the possibility of adverse effects that may get caused by future events.

In a research carried out by Hassanein and Afify (2017), they aimed at investigating contractors" perceptions of construction risks and their attitude toward risk identification and management based on a case study of power station projects in egypt. the results show a lack of consistency in contractors" risk identification behaviour and also point out 39 previous experience with the same owner as a factor having significant effect on the contractor"s risk identification effort. Liu *et al*. (2017) have studied key issues and challenges of risk management and insurance in chinese construction industry. according to the results of their research, managers" knowledge and understanding about risk management is very little in chinese construction projects. great percentage of the respondents who had participated in this research believe that risk management skills are essential for project management activities but have not developed in China as much as project management. Unsupportive culture was identified as the biggest barrier in development of risk management in China"s construction industry, followed by other factors such as attitude and perception of the contractors.

According to Turner and Zolin (2022), the incapacity to anticipate and plan for delivery-affecting disruptions frequently compromises project performance rather than a lack of effort. There are many risks that can affect a project, but the most harmful ones are those that affect time, money, and quality. Inadequate cost estimation is among the most prevalent internal risks. Projects encounter financial gaps that impede or stop their execution when budgets are based on erroneous information or overly optimistic assumptions. Scope uncertainty is closely related to this. Decision-making delays, resource strain, and frequent revisions are common in projects with an unclear scope. These problems are not always technical. They frequently show organisational planning flaws and a failure to get important stakeholders to agree early on.

2.2 Personal critique of the literature review

Although Kerzner (2017) [14] and Hillson (2016) [12] offer fundamental structured models, their frameworks frequently presume stability in project environments, which is uncommon, particularly in mining. the literature's strong focus on risk planning up front leaves out important details about how teams should react when low-priority risks suddenly become more serious in the middle of a project. this suggests a theoretical inflexibility: many models do not account for continuous risk recalibration and real-time feedback. although writers like Aven (2018) [1] try to address this by presenting adaptive models and probabilistic reasoning, the use of these ideas in unstable environments is still lacking.

2.3 Establishment of research gaps

Although this work offers helpful benchmarks, when used in local contexts, it runs the risk of skewing expectations. Studies by Fraser and Simkins (2021) [10] and Power (2017), for instance, suggest enterprise-wide strategies that depend on integrated data systems and risk committees—features that are not always practical in settings with limited resources. On the other hand, research with an African focus, such as Chileshe and Kikwasi's (2018) [5], frequently identifies informal processes, fragmented structures, and capacity constraints. However, the mainstream literature still underrepresents these regional insights, resulting in models that are beautiful in theory but challenging to put into practice.

3. Research Methodology

This study adopts a descriptive research design to examine current risk management practices and their influence on project performance. The approach suits the study because it captures real conditions and supports measuring links between risk processes and performance outcomes (Saunders *et al*., 2019) [16]. The design is non experimental. It does not manipulate variables. It gathers factual data from participants involved in project execution through a standardised process (Bryman, 2021) [3].

Purposive sampling selects participants with direct knowledge of project risks and decision making. it targets

project managers, engineers, risk officers, senior supervisors and technical leads so the findings reflect informed operational experience. the sample size is 50 participants. this size fits a small population and supports detailed descriptive insight while keeping data collection manageable (Creswell & Creswell, 2018) [6]. the target population includes staff who plan projects, identify risks, implement controls, and monitor performance because they hold the most relevant insights.

Data collection relies on structured questionnaires to ensure consistency and comparability across respondents (Rowley, 2014; Taherdoost, 2017) [15, 17]. The questionnaire uses mainly closed ended items with a few open ended prompts. It is pretested to improve clarity and reliability (Creswell & Creswell, 2018) [6]. Data analysis uses descriptive statistics such as frequencies, percentages, and mean scores. SPSS supports accurate handling and clear reporting through tables and charts. Ethical practice is maintained through voluntary participation, informed consent, anonymity through coding, secure storage, and formal approvals from relevant ethics bodies and organisational management (Bryman, 2021) [3].

4. Research Findings and Discussions

4.1 Presentation of results based on the Background Characteristics of Respondents

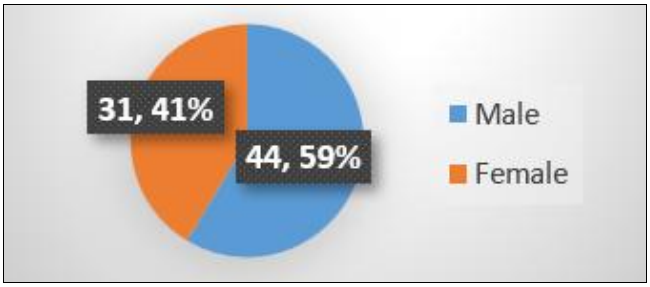


Fig 1: Gender of Respondents

Fig 1 presents the gender distribution of participants in the study. The results indicate that the majority of respondents were male, accounting for 58.67% (44 participants), while 41.33% (31 participants) were female.

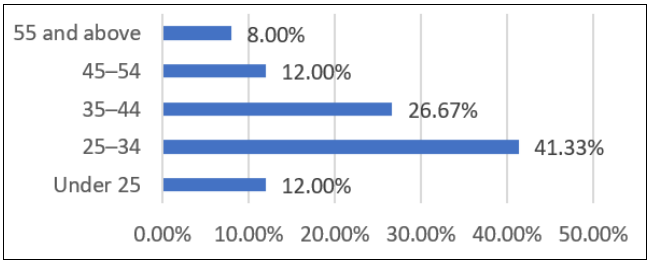


Fig 2: Age Group of Respondents

As indicated in Fig 2, respondents were drawn from a variety of age groups. The largest proportion 41.33%, fell within the 25–34 years age group, followed by 26.67% in the 35–44 years category. Those aged 45–54 years and under 25 years each constituted 12%, while only 8% were aged 55 and above.

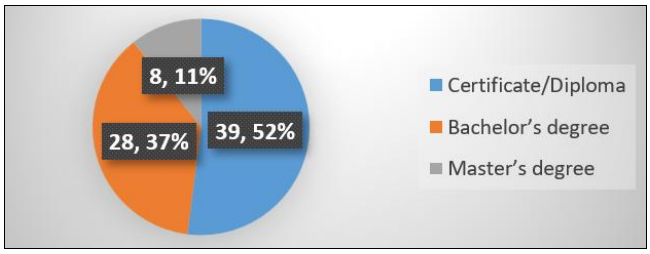


Fig 3: Educational Qualification

The educational qualification of respondents as shown in Fig 3, reveals that 52% (39 respondents) held Certificate or Diploma qualifications, 37.33% (28 respondents) possessed a Bachelor's degree, and 10.67% (8 respondents) had Master's degrees.

Table 1: Department or Unit of Respondents

Department/Unit	Frequency (Freq.)	Percent (%)	Cumulative (%)
Engineering	21	28.00	28.00
Finance	9	12.00	40.00
Health, Safety & Environment (HSE)	8	10.67	50.67
Operations	22	29.33	80.00
Procurement and Supply Chain *(Other)*	2	2.67	82.67
Human Resources / Administration *(Other)*	2	2.67	85.33
Risk & Compliance	11	14.67	100.00
Total	**75**	**100.00**	—

Table 1 displays the departmental distribution of respondents. The Operations Department had the highest representation at 29.33% (22 respondents), followed closely by the Engineering Department at 28% (21 respondents). The Risk and Compliance Department contributed 14.67% (11 respondents), while the Finance Department accounted for 12% (9 respondents).

Table 2: Current job position

Job Position	Frequency (Freq.)	Percent (%)	Cumulative (%)
Analyst	11	14.67	14.67
Controller	7	9.33	24.00
Coordinator	9	12.00	36.00
Engineer	8	10.67	46.67
Operator	8	10.67	57.33
Planner	12	16.00	73.33
Supervisor	6	8.00	81.33
Technician	14	18.67	100.00
Total	**75**	**100.00**	—

Table 2 shows the distribution of respondents according to their current job positions at Lumwana Mining PLC. The largest proportion of respondents were Technicians, accounting for 18.67% (14 participants), followed by Planners at 16% (12 participants) and Analysts at 14.67% (11 participants). Other notable groups included Coordinators (12%, 9 respondents), Engineers (10.67%, 8 respondents), and Operators (10.67%, 8 respondents). Smaller proportions were recorded for Controllers (9.33%, 7 respondents) and Supervisors (8%, 6 respondents).

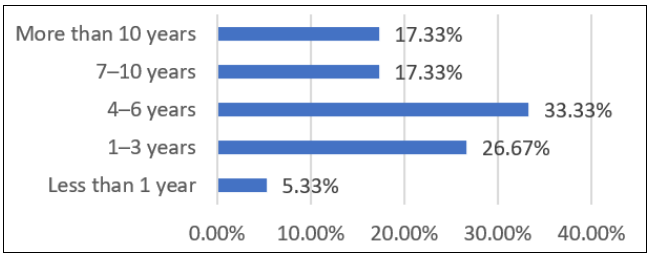


Fig 4: Years of experience

Fig 4 illustrates the distribution of respondents according to their years of experience in the mining sector. The results show that the majority of respondents, 33.33% (25 participants), had worked in the sector for 4–6 years, followed by 26.67% (20 participants) who had 1–3 years of experience. Respondents with 7–10 years and more than 10 years of experience each accounted for 17.33% (13 participants), while only 5.33% (4 participants) had less than 1 year of experience.

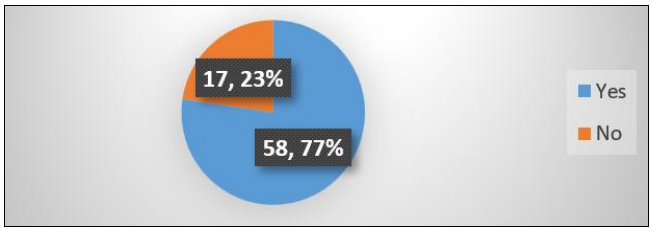


Fig 5: Direct Involvement in Risk Management Activities

As shown in Fig 5, a majority of respondents, 77.33% (58 participants), reported that they had been directly involved in risk management activities at Lumwana Mining PLC, while 22.67% (17 participants) indicated that they had not participated directly.

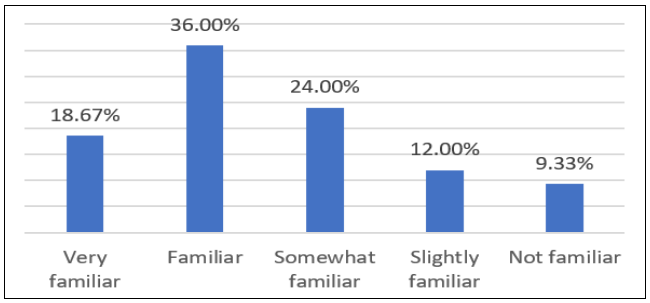


Fig 6: Familiarity with the Company's Risk Management Framework

Fig 6 presents the level of familiarity respondents had with Lumwana Mining PLC's risk management framework. The findings show that 36% (27 respondents) indicated they were familiar, 24% (18 respondents) were somewhat familiar, and 18.67% (14 respondents) were very familiar with the framework.

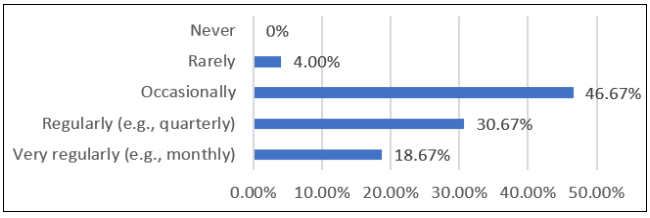


Fig 7: Frequency of Project Risk Assessments

As shown in Fig 7, respondents were asked how often Lumwana Mining PLC conducts risk assessments for projects. The largest proportion, 46.67% (35 respondents), stated that risk assessments are conducted occasionally, while 30.67% (23 respondents) indicated that they occur regularly, such as on a quarterly basis. A smaller proportion, 18.67% (14 respondents), reported that assessments are conducted very regularly, such as monthly, and only 4% (3 respondents) said they occur rarely.

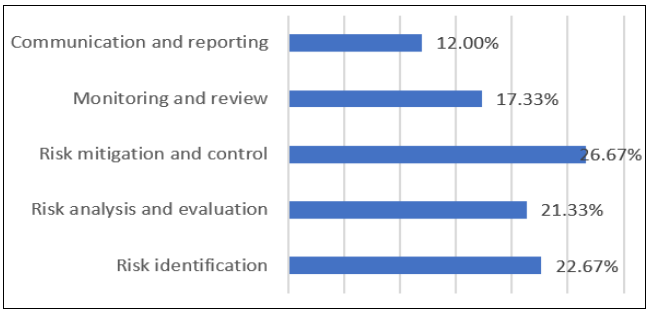


Fig 8: Most Commonly Applied Risk Management Processes

Fig 8 highlights the risk management processes most commonly applied in projects at Lumwana Mining PLC. The most frequent process reported was risk mitigation and control, cited by 26.67% (20 respondents).

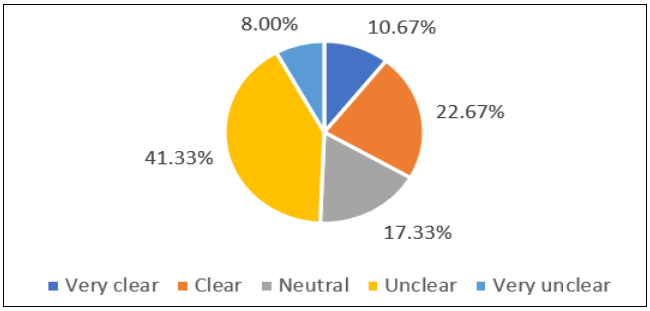


Fig 9: Clarity of Risk Management Policies and Guidelines

The results in Fig 9 show how respondents perceived the clarity of Lumwana's risk management policies and guidelines. The majority, 41.33% (31 respondents), rated the policies as unclear, while 22.67% (17 respondents) found them clear and 10.67% (8 respondents) described them as very clear. A smaller portion, 17.33% (13 respondents), were neutral, and 8% (6 respondents) found the guidelines very unclear.

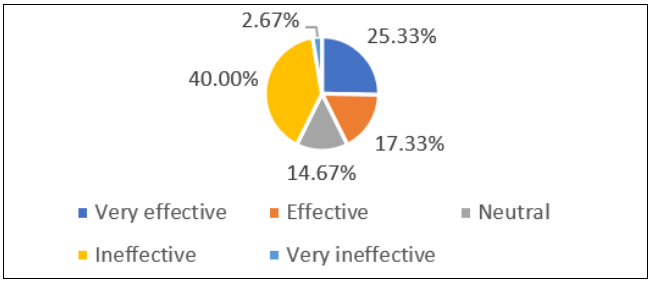


Fig 10: Effectiveness of Communication Channels for Risk Reporting

As reflected in Fig 10, respondents were asked to rate the effectiveness of communication channels used for risk reporting within their departments.

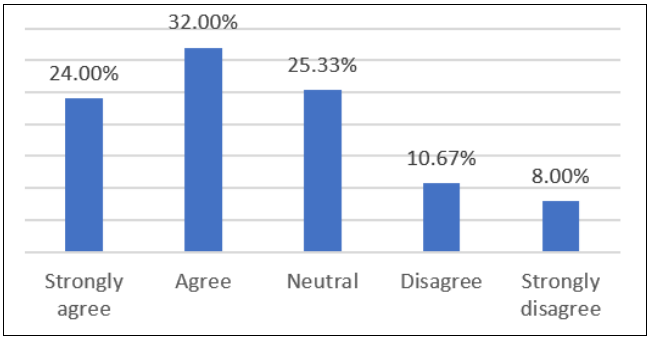


Fig 11: Adequacy of Employee Training

Fig 11 presents respondents' views on whether employees at Lumwana Mining PLC are adequately trained in risk management procedures. The results show that 32% (24 respondents) agreed, while 24% (18 respondents) strongly agreed that employees are adequately trained. Meanwhile, 25.33% (19 respondents) remained neutral, 10.67% (8 respondents) disagreed, and 8% (6 respondents) strongly disagreed. These findings suggest that a significant majority representing over half of the respondents, believe the company provides sufficient training in risk management procedures. This is a positive indication that Lumwana Mining PLC recognizes the importance of building staff competence in managing operational and project risks.

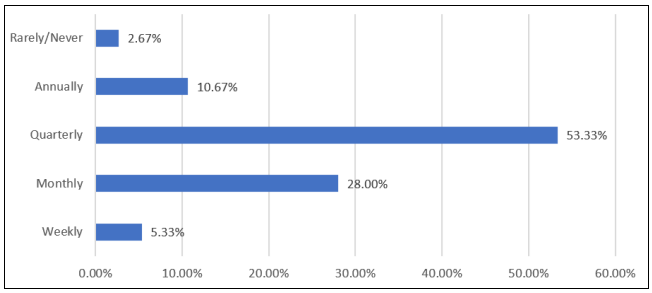


Fig 12: Frequency of Project Risk Reviews and Updates

As shown in Fig 12 the majority of respondents 53.33% (40 participants), indicated that project risks are reviewed and updated on a quarterly basis. This was followed by 28% (21 participants) who reported monthly reviews, and 10.67% (8 participants) who stated that updates occur annually.

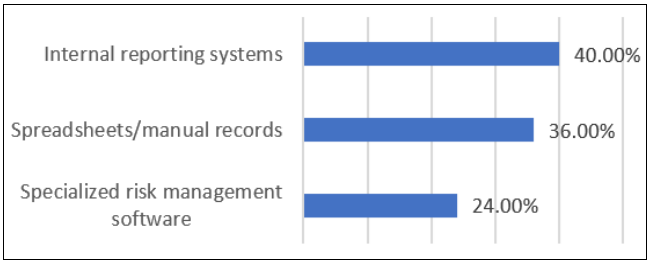


Fig 13: Primary Tools or Systems Used to Manage Risks

Fig 13 reveals the tools and systems used at Lumwana Mining PLC to manage risks. The most commonly used approach was internal reporting systems, mentioned by 40% (30 respondents). Spreadsheets or manual records followed at 36% (27 respondents), while specialized risk management software was identified by 24% (18 respondents).

Table 3: Areas of the Risk Management Process

Area of the Risk Management Process	Frequency (Freq.)	Percent (%)
Clearer policy guidance	15	20.00
More frequent risk updates	14	18.67
Closer follow-up on mitigations	11	14.67
Better link with project schedule	10	13.33
Upgrade reporting templates	8	10.67
Stronger monitoring and review	7	9.33
Improved communication across departments	6	8.00
Integration of digital risk management systems	4	5.33
Total	**75**	**100.00**

Table 3 presents respondents' views on areas of Lumwana Mining PLC's risk management process that require improvement.

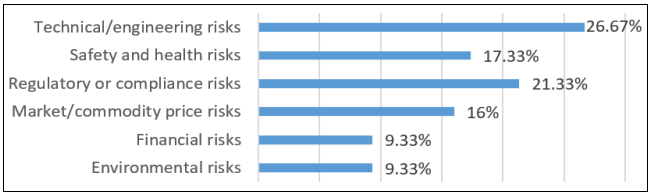


Fig 14: Common Risks Affecting Project Performance

Fig 14 presents the findings on the types of risks that most frequently affect projects at Lumwana Mining PLC. The results show that technical or engineering risks were identified by the largest proportion of respondents, accounting for 26.67% (20 participants).

Table 4: Relationship Between Years of Experience and Type of Risk

A6. Years of experience in the mining sector	C1. Type of risk most frequently affecting projects (single choice)						
	Environ..	Financi..	Market/..	Regulat..	Safety ..	Technic..	Total
1-3 years	1	3	4	5	2	5	20
4-6 years	2	3	4	4	4	8	25
7-10 years	2	0	2	3	3	3	13
Less than 1 year	1	0	1	0	0	2	4
More than 10 years	1	1	1	4	4	2	13
Total	7	7	12	16	13	20	75

Pearson chi2(20) = 12.1207 Pr = 0.0192

Table 4 presents the Chi-square test results that examined the relationship between employees' years of experience and the type of risk most frequently affecting projects at Lumwana Mining PLC. The test produced a Chi-square value of 12.1207 with 4 degrees of freedom (df) and a p-value of 0.0192, which is below the 0.05 level of significance.

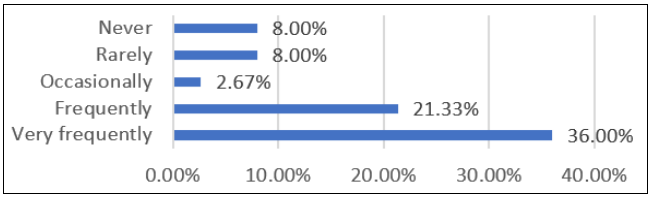


Fig 15: Frequency of Risk Occurrence

As indicated in Fig 15, respondents were asked how often these risks occur in their projects. The largest share, 36% (27 respondents), stated that risks occur very frequently,

followed by 21.33% (16 respondents) who indicated that risks occur frequently.

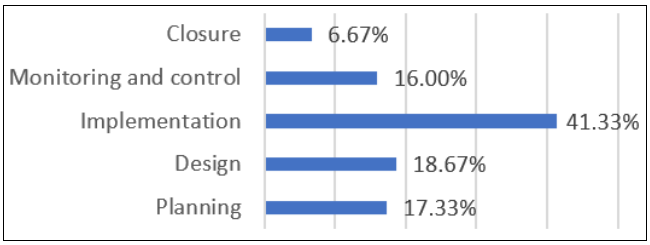


Fig 16: Project Stages Most Vulnerable to Risk

Fig 16 shows which project stages are most vulnerable to risk. The implementation stage recorded the highest frequency, with 41.33% (31 respondents) indicating that most risks occur during execution.

Table 5: Relationship Between Department and Project Stage Most Vulnerable to Risk

A4. Department/Unit	C3. Project stage most vulnerable to risk					
	Closure	Design	Impleme..	Monitor..	Planning	Total
Engineering	3	4	8	4	2	21
Finance	1	2	4	1	1	9
Health, Safety & En..	0	1	3	3	1	8
Operations	0	6	9	2	5	22
Other	1	1	1	0	1	4
Risk & Compliance	0	0	6	2	3	11
Total	5	14	31	12	13	75

Pearson chi2(20) = 16.9858 Pr = 0.0654

Table 5 presents the Chi-square test results showing the relationship between respondents' department or unit and the project stage most vulnerable to risk at Lumwana Mining PLC. The analysis yielded a Pearson Chi-square value of 16.9858 with 20 degrees of freedom (df) and a p-value of 0.0654, which is slightly above the 0.05 significance threshold.

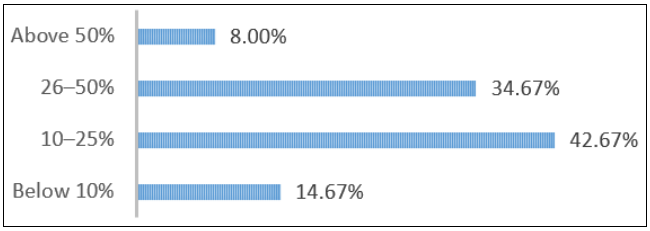


Fig 17: Projects Affected by Risk-Related Delays

Fig 17 shows the percentage of projects affected by risk-related delays. The largest portion 42.67% (32 respondents), estimated that 10–25% of their projects experience delays linked to risk factors. Another 34.67% (26 respondents) indicated that 26–50% of projects are affected, while 14.67% (11 respondents) reported below 10%, and 8% (6 respondents) stated that above 50% of projects suffer risk-induced delays.

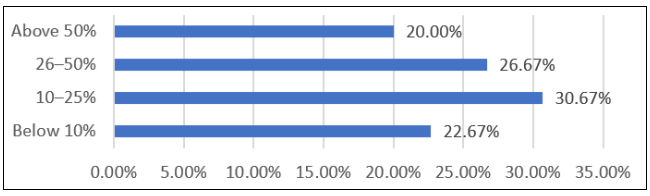


Fig 18: Projects Affected by Risk-Related Cost Overruns

As shown in Fig 18 respondents were also asked to estimate the percentage of projects affected by cost overruns resulting from risks. The majority, 30.67% (23 respondents), stated that 10–25% of projects are affected, while 26.67% (20 respondents) reported 26–50%.

Table 6: Risks with the Most Severe Impact on Project Performance

Type of Risk with the Most Severe Impact	Frequency (Freq.)	Percent (%)
Commodity price shocks	14	18.67
Critical equipment breakdowns	16	21.33
Geotechnical failures in pits	10	13.33
Health, Safety, and Environmental (HSE) incidents	23	30.67
Regulatory stoppages	7	9.33
Supply chain delays	5	6.67
Total	**75**	**100.00**

Table 6 presents the types of risks that have the most severe impact on project performance at Lumwana Mining PLC. The findings reveal that Health, Safety, and Environmental (HSE) incidents were ranked highest by 30.67% (23 respondents), followed by critical equipment breakdowns at 21.33% (16 respondents) and commodity price shocks at 18.67% (14 respondents).

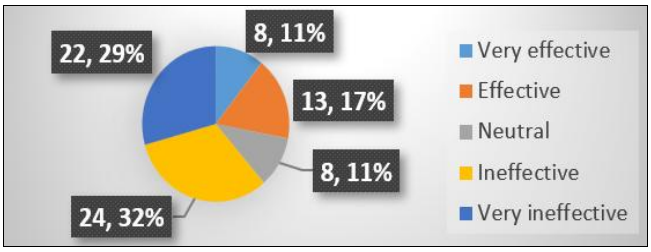


Fig 19: Effectiveness in Identifying Potential Risks Before they Occur

As indicated in Fig 19, respondents were asked to evaluate how effective the current system is at identifying potential risks before they occur.

Table 7: Chi-Square on Effectiveness of Risk Management

B1. Familiarity with the company's risk management framework	D1. Overall effectiveness of risk management processes in enhancing performance					
	Effective	Ineffec..	Neutral	Very ef..	Very in..	Total
Familiar	5	9	6	2	5	27
Not familiar	1	3	1	0	2	7
Slightly familiar	2	5	0	2	0	9
Somewhat familiar	5	5	1	2	5	18
Very familiar	3	6	1	0	4	14
Total	16	28	9	6	16	75

Pearson chi2(16) = 13.5765 Pr = 0.043

Table 7 presents the Chi-square test results assessing the relationship between employees' familiarity with the company's risk management framework and their perception of the overall effectiveness of risk management processes in enhancing project performance at Lumwana Mining PLC. The analysis produced a Pearson Chi-square value of 13.5765 with 16 degrees of freedom (df) and a p-value of 0.043, which is below the standard significance threshold of 0.05.

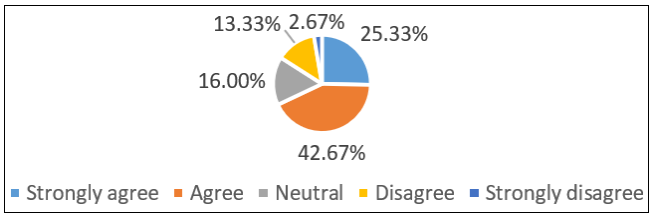


Fig 20: Perceptions on External Risks Compared to Internal Risks

As shown in Fig 20, respondents were asked to indicate the extent to which they agree with the statement, *"External risks such as market prices and regulations are harder to manage than internal risks."* The results reveal that 42.67% (32 respondents) agreed, while 25.33% (19 respondents) strongly agreed.

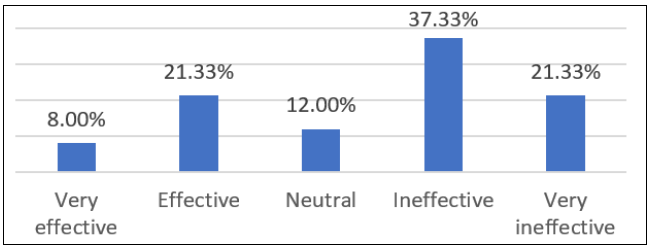


Fig 21: Effectiveness of Risk Management Processes

Fig 21 presents respondents' perceptions of the overall effectiveness of Lumwana Mining PLC's risk management processes in enhancing project performance. The results show that 37.33% (28 respondents) rated the processes as ineffective, while 21.33% (16 respondents) considered them effective and another 21.33% (16 respondents) described them as very ineffective.

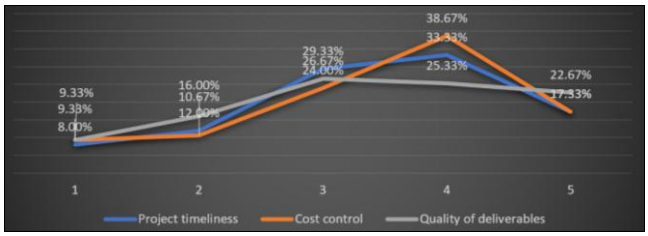


Fig 22: Impact of Risk Management on Project Timeliness

Fig 22 illustrates respondents' views on the impact of risk management on project timeliness, cost control, and quality of deliverables, using a five-point scale.

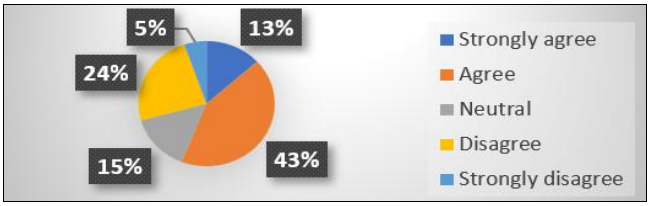


Fig 23: Risk Management and Decision-Making

Fig 23 presents responses regarding whether risk management improves decision-making within Lumwana Mining PLC. The majority, 42.67% (32 respondents), agreed and 13.33% (10 respondents) strongly agreed. On the other hand, 24% (18 respondents) disagreed, 14.67% (11 respondents) were neutral, and 5.33% (4 respondents) strongly disagreed.

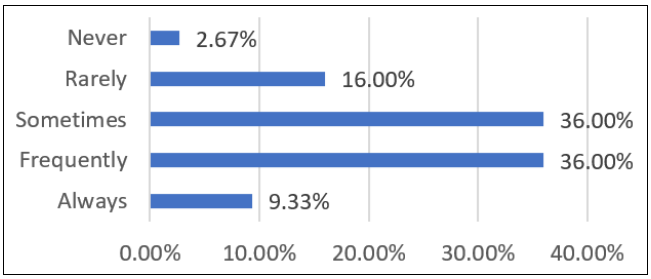


Fig 24: Integration of Lessons Learned into Future Risk Management

Fig 24 presents findings on how often lessons learned from past projects are integrated into future risk management processes at Lumwana Mining PLC. The results reveal that 36% (27 respondents) indicated lessons are integrated frequently, while another 36% (27 respondents) stated this occurs sometimes.

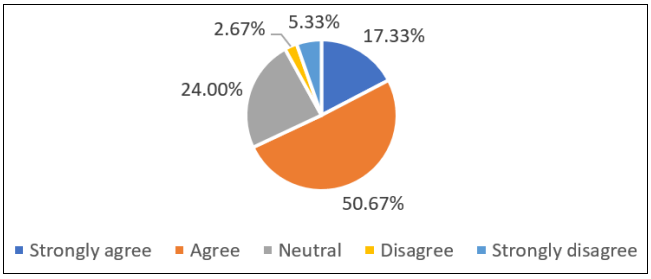


Fig 25: Employee Productivity and Morale

As shown in Fig 25, a majority of respondents, 50.67% (38 participants), agreed that effective risk management improves employee productivity and morale, while 17.33% (13 participants) strongly agreed. 24% (18 participants) were neutral, and only 2.67% (2 participants) disagreed, with 5.33% (4 participants) strongly disagreeing.

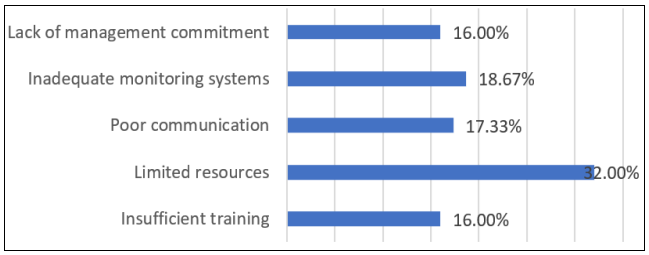


Fig 26: Main Challenges Limiting

Fig 26 identifies the main challenges limiting the effectiveness of risk management processes at Lumwana Mining PLC.

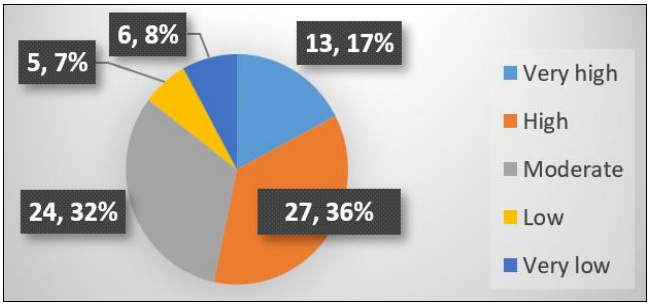


Fig 27: Main Challenges Limiting the Effectiveness of Risk Management Processes

Fig 27 identifies the main challenges limiting the effectiveness of risk management processes at Lumwana Mining PLC. The most cited challenge was limited resources, reported by 32% (24 respondents). This was followed by inadequate monitoring systems (18.67%, 14 respondents), poor communication (17.33%, 13 respondents), insufficient training and low management commitment (each 16%, 12 respondents). These findings show that while risk management structures exist their implementation is constrained by operational and institutional limitations. Limited resources reduce the company's ability to conduct frequent assessments, adopt advanced softwaren and implement mitigation strategies. Inadequate monitoring systems and communication weaknesses hinder timely detection and reporting of emerging risks. The presence of training and management commitment issues points to the need for stronger leadership and continuous staff capacity development. Addressing these barriers is essential to improving consistency, accountability, and the overall impact of risk management practices at Lumwana.

Table 8: Improving risk management practices

No.	Respondent's View
1	Top management should lead by example by participating in risk review meetings.
2	They should allocate adequate funds specifically for risk mitigation and monitoring activities.
3	Management needs to ensure that risk management is included in performance appraisals.
4	They should promote a strong safety culture and reward departments that manage risks effectively.
5	Senior leaders must provide regular feedback and follow-up on identified project risks.
6	They should ensure that communication channels for risk reporting are open and transparent.
7	Top management should set clear risk appetite levels and performance indicators for all projects.
8	They should make risk management part of strategic planning, not just a compliance exercise.
9	Top management must provide training opportunities to enhance staff awareness of risk control.
10	Management should empower middle managers with decision-making authority to respond to emerging risks quickly.

Respondents were asked to describe the role that top management should play in improving risk management practices at Lumwana Mining PLC. Out of the 75 participants, 29 provided valid responses, highlighting several recurring themes.

4.2 Discussion of Research Findings

The demographic profile provides context for interpreting risk management effectiveness at Lumwana mining plc. the sample shows 58.67% male and 41.33% female, which reflects mining workforce patterns and suggests a mix of perspectives that can support risk communication and decision making (armstrong & taylor, 2020). most respondents are 25–34 years (41.33%) and 35–44 years (26.67%), indicating a blend of adaptive staff and experienced personnel who support both innovation and practical risk mitigation (Kothari, 2018). education levels show 52% with certificates or diplomas, 37.33% with bachelor's degrees, and 10.67% with master's degrees which supports technical competence but also signals a need for continuous training.

Current risk management processes exist but are unevenly understood and applied. familiarity with the framework is moderate, with 36% familiar and 18.67% very familiar while a minority report limited awareness. risk assessments occur sometimes for 46.67% and regularly for 30.67%, which suggests reviews are not consistently embedded across projects. mitigation and control is the most common activity at 26.67%, followed by risk identification at 22.67% and analysis at 21.33%. policy clarity is a concern since 41.33% rate guidelines as unclear. staff readiness is mixed, and tools rely heavily on internal reporting systems at 40% and spreadsheets at 36%, with 24% using specialised software (Hillson & Murray-Webster, 2017).

Common risks affecting performance are mainly technical and engineering risks at 26.67%, followed by regulatory and compliance risks at 21.33% and safety and health risks at 17.33% (Aven, 2016). Market and commodity price risks account for 16%, while financial and environmental risks are lower but still present. Risks are frequent, with 36% reporting very often and 21.33% often. The implementation stage is the most risk prone at 41.33%. Risk impacts are substantial, with 42.67% reporting delays of 10–25% and 34.67% reporting delays of 26–50%. Cost overruns follow a similar pattern.

Risk management contributes to performance but with inconsistent effectiveness. Overall ratings show 37.33% view processes as not very effective, 21.33% as very ineffective, and only 8% as very effective, which suggests uneven implementation across departments (Kerzner, 2018). Ratings indicate positive effects on timeliness and cost control, with many respondents placing impact at level 4 and a smaller share at level 5. Quality impacts are also moderate to strong, with scores clustered around levels 3 to 5 (Hillson & Murray-Webster, 2017).

5. Conclusion and Recommendation

5.1 Conclusion

This study evaluates how risk management processes influence project performance at lumwana mining plc. it focuses on three objectives. it reviews existing risk processes. it identifies the most common risks affecting performance. it assesses how far current practices improve cost control, quality, and operational efficiency. the findings show that lumwana has a formal risk management framework. use and understanding vary across departments. risk assessments occur irregularly. many respondents find policies unclear. risk tracking still depends on spreadsheets and internal reports. limited use of specialised software slows monitoring and increases error risk.

Technical and engineering risks emerge as the most common. regulatory and compliance risks follow. health and safety risks remain significant. market and commodity price changes also threaten budgets and scheduling. the implementation stage shows the highest exposure because it concentrates procurement, operations, and supervision. risk management supports better timeliness, cost control, and quality by helping teams identify issues early and plan responses. overall effectiveness remains moderate due to weak monitoring, limited resources, uneven training, and inconsistent use of lessons learned.

5.2 Recommendation

Lumwana Mining PLC should strengthen staff training and awareness so employees can apply risk identification, assessment, and mitigation in daily work. Regular workshops and refresher sessions should target all departments and build a risk aware culture where early reporting becomes routine. The company should also improve coordination by setting clear risk reporting channels and holding joint meetings across operations, engineering, finance, and safety so information moves quickly and responses stay aligned.

Lumwana should invest in digital risk monitoring tools to reduce reliance on spreadsheets and support real time reporting, alerts, and dashboards for management oversight. It should also institutionalise lessons learned by documenting outcomes from completed projects and using them to update procedures and training. This continuous improvement approach will reduce repeat failures and strengthen project performance over time.

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