



Effect of Project Risk Management Practices on Performance of Saving and Credit Cooperative: A Case of Indongozi Sacco Nyamasheke Karambi Branch in Nyamasheke District, Rwanda

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Abstract: This study aimed to assess the effect of project risk management practices on the performance of Indongozi SACCO Nyamasheke Karambi Branch. Data was collected using structured questionnaires for quantitative insights and semi-structured interviews for qualitative perspectives, complemented by secondary data from SACCO reports and documents. Using descriptive statistics to summarize trends and inferential statistics, specifically regression analysis, to test hypotheses the collected data was analyzed using SPSS version 27. The regression results indicate that all components of project risk management have a statistically significant positive effect on performance at Indongozi SACCO Nyamasheke Karambi Branch. Specifically, project risk identification ($B = 0.214$, $t = 2.649$, $p = 0.008$), project risk analysis ($B = 0.505$, $t = 7.081$, $p = 0.000$), project risk response planning ($B = 0.311$, $t = 4.325$, $p = 0.000$), and project risk monitoring and control ($B = 0.329$, $t = 4.736$, $p = 0.000$). Among these, project risk analysis has the strongest effect, followed by risk response planning, risk monitoring and control, and risk identification. In conclusion, Since the p -value is less than 0.05, all null hypotheses were rejected confirming that project risk management practices have significant effects on performance of Indongozi SACCO Nyamasheke Karambi Branch. It is recommended that Indongozi SACCO Nyamasheke Karambi Branch further strengthens and standardizes these practices to enhance project efficiency and sustainability. Future studies should explore other influencing factors such as leadership, technology use, and financial management to broaden understanding of SACCO performance.

Keywords: Project Risk Management, Project Risk Identification, Project Risk Analysis, Project Risk Response Planning, Project Risk Monitoring and Control, Project Performance, Saving and Credit Cooperative

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1. Introduction

Kenya's SACCO sector is a regional leader, with over 14 million members and assets exceeding \$12 billion, driving projects like digital savings platforms and affordable housing loans (Savings and Credit Cooperative Societies Regulatory Authority [SASRA], 2024). However, risks such as loan defaults (with NPLs

at 6.5% in 2023) and technological disruptions threaten project success. Studies show that PRM, particularly credit risk management, explains 42% of variance in SACCO project performance, with tools like loan monitoring systems boosting repayment rates (Mutua & Kariuki, 2023). Member education on risk awareness further enhances project outcomes, aligning with Kenya's Vision 2030 goals (Ochieng & Wanjiku, 2025).

Additionally, operational inefficiencies, such as manual record-keeping and limited digital tool adoption, exacerbate vulnerabilities, with 30% of Rwandan SACCOs lacking robust risk monitoring systems (National Bank of Rwanda, 2023).

A study by Bizimungu *et al.* (2022) highlights that SACCOs in Rwanda struggle with inadequate capital management, poor asset quality, and weak governance, leading to diminished profitability and liquidity issues. These challenges are compounded by overreliance on debt financing and limited use of reserves to settle debts at maturity, as observed in Gakenke District (Ndayisaba & Mulyungi, 2022). Consequently, Indongozi SACCO Nyamasheke Karambi Branch's financial performance, with an average return on assets (ROA) of 2.5% compared to the 5% benchmark for sustainable microfinance institutions, is at risk, limiting its capacity to support Nyamasheke's agrarian economy and Rwanda's National Strategy for Transformation (NST2) goals (World Bank, 2021).

The impact of ineffective risk management is further evident in the operational and financial challenges faced by SACCOs like Indongozi SACCO Nyamasheke Karambi Branch. A study in Kayonza District found that effective loan risk management significantly enhances profitability, underscoring the critical Effect of credit risk practices (Munyemana & Mulyungi, 2022).

However, issues such as loan project deviations, fluctuations in the business climate, and poor entrepreneurial skills among clients hinder effective credit risk management, contributing to a 15% annual increase in NPLs in rural SACCOs, with Nyamasheke-based institutions reporting delinquency rates as high as 20% in 2022 (Bizimungu *et al.*, 2022; Munyemana & Mulyungi, 2022). Strategic risks, including failure to integrate digital banking solutions, expose SACCOs to fraud and errors, with 40% of rural Rwandan SACCOs citing operational losses due to outdated systems (National Bank of Rwanda, 2023). These unmanaged risks diminish member confidence, reduce loan recovery rates, and threaten the SACCO's Effect in poverty alleviation. The lack of comprehensive risk management practices, coupled with limited staff training on enterprise risk management, leaves Indongozi SACCO Nyamasheke Karambi Branch ill-equipped to handle external shocks like floods near Lake Kivu or market fluctuations, necessitating an urgent assessment to strengthen its performance and sustainability.

The general objective of the study was to assess the effect of project risk management practices on the performance of Indongozi SACCO Nyamasheke Karambi Branch.

The specific objectives were:

1. To examine the effect of project risk identification on the performance of Indongozi SACCO Nyamasheke Karambi Branch.
2. To investigate the effect of project risk analysis on the performance of Indongozi SACCO Nyamasheke Karambi Branch.
3. To evaluate the effect of project risk response planning on the performance of Indongozi SACCO Nyamasheke Karambi Branch.

2. Literature Review

2.1 Theoretical Review

This study is guided by four main theories; Contingency theory, Expected utility theory and Resource-Based view theory and System theory.

2.1.1 Contingency Theory

According to Fiedler's 1964 Contingency Theory, an organization's ability to function effectively depends on how well its internal structures and tactics match the external environment (Fiedler, 1964). The theory's main concepts in evaluating the impact of project risk management (PRM) on Indongozi SACCO Nyamasheke Karambi Branch are organizational performance, situational control, and leadership style. Leadership style (task-oriented or relationship-oriented) influences how SACCO managers identify and mitigate risks, while situational control encompasses task structure (e.g., clarity of loan disbursement processes), leader-member relations (e.g., trust between SACCO staff and members), and position power (e.g., authority to enforce loan recovery). The study variables risk identification (e.g., assessing borrower creditworthiness using the 5 Cs: Character, Capacity, Capital, Collateral, Conditions) and SACCO performance (measured by Return on Assets [ROA], Return on Equity [ROE], and non-performing loan [NPL] ratios) interact within this framework. Effective risk identification, guided by adaptive leadership, enhances performance by aligning risk strategies with external factors like Nyamasheke's agricultural volatility. The theory relates to the research objectives by suggesting that SACCO performance depends on tailoring PRM practices to contextual risks (e.g., seasonal income fluctuations). Other authors, such as Muriithi and Mburu (2022), affirm that Contingency Theory explains SACCO resilience through adaptive risk identification, noting a 30% improvement in loan portfolio quality when managers adjust strategies to local economic conditions.

Similarly, Nkurunziza and Uwamahoro (2021) highlight that contingency-based risk management in Rwandan SACCOs correlates with a 15-20% increase in ROA by addressing credit default risks dynamically.

While Contingency Theory provides a robust framework for understanding adaptive risk management, it has limitations that create a theoretical gap in the SACCO context.

The theory assumes a clear delineation of situational variables and leadership styles, but it lacks specificity in addressing complex, micro-level financial risks like those in SACCOs, such as high NPLs due to informal borrower profiles or cultural repayment attitudes in rural settings like Nyamasheke.

In the context of Indongozi SACCO Nyamasheke Karambi Branch, Contingency Theory frames risk identification as a leadership-driven process influenced by situational factors, directly impacting SACCO performance.

Effective risk identification (e.g., using the 5 Cs to assess borrower reliability) depends on leaders adapting to Nyamasheke's context unpredictable agricultural incomes and limited collateral.

The theory posits that when leaders align risk strategies with these conditions (e.g., flexible repayment schedules during low harvest seasons), performance metrics like ROA and NPL ratios improve. For example, if Indongozi SACCO Nyamasheke Karambi Branch implements contingency-based risk identification, such as stricter collateral requirements during economic downturns, it could reduce NPLs by 15-20%, as seen in Kayonza SACCOs (Muriithi & Mburu, 2022). Conversely, misalignment such as rigid loan policies ignoring seasonal risks can exacerbate defaults, lowering ROE. The theory thus underscores a dynamic interplay where risk identification mediates the relationship between situational contingencies and financial outcomes.

2.1.2 Expected Utility Theory

According to von Neumann and Morgenstern's 1944 proposal, expected benefit Theory (EUT) is a paradigm for making decisions that presumes people make logical decisions by maximizing expected benefit in the face of uncertainty. When evaluating how project risk management (PRM) affects Indongozi SACCO Nyamasheke Karambi Branch performance in Nyamasheke District, decision-making under risk, expected utility, and risk preferences are important concepts. Making decisions when faced with risk entails weighing the pros and cons of various possibilities, such as loan approvals. Risk preferences (risk-averse, risk-neutral, or risk-seeking behaviors) are taken into account when calculating expected utility, which measures the expected gain or loss. Within this framework, the study variables interact: risk analysis (e.g., evaluating loan default probabilities using quantitative tools like credit scoring or qualitative factors like borrower reliability) and SACCO performance (measured by Return on Assets [ROA], Return on Equity [ROE], and non-

performing loan [NPL] ratios). EUT suggests that effective risk analysis in SACCOs involves calculating the expected utility of lending decisions to minimize NPLs and optimize financial performance. The theory aligns with the research objectives by explaining how structured risk analysis can enhance SACCO performance in Nyamasheke's volatile agricultural economy. Authors like Nkurunziza and Uwamahoro (2021) argue that EUT guides SACCOs in prioritizing low-risk borrowers, reducing NPLs by 15-20% in Musanze District.

Similarly, Mukamana and Kimani (2022) note that EUT-based risk analysis improved ROA by 10% in Nyamagabe SACCOs by weighting loan decisions against seasonal income uncertainties.

Recent studies highlight the significance of this theoretical gap. Kagaba and Ndagijimana (2023) found that in Rusizi District SACCOs, EUT's assumption of complete information failed to address data gaps in borrower profiles, leading to a 20% overestimation of loan repayment probabilities and a subsequent 18% increase in NPLs.

In Indongozi SACCO Nyamasheke Karambi Branch, EUT frames risk analysis as a process of evaluating loan decisions based on their expected utility, directly influencing SACCO performance. Risk analysis involves calculating the probability-weighted outcomes of lending (e.g., 80% repayment likelihood yielding 5% ROA vs. 20% default risk causing losses). EUT posits that SACCO managers, acting as rational decision-makers, should select options that maximize utility (e.g., lending to borrowers with high repayment capacity), thereby reducing NPLs and boosting ROA. For instance, applying EUT to assess Nyamasheke's coffee farmers could involve assigning higher default probabilities during low-yield seasons, leading to stricter loan criteria and a projected 15% NPL reduction, as seen in Kayonza SACCOs (Muriithi & Mburu, 2022). However, if risk analysis ignores local uncertainties (e.g., weather impacts on harvests), expected utility miscalculations could increase NPLs, lowering ROE. Thus, EUT underscores a causal link where robust risk analysis enhances SACCO performance by aligning lending decisions with probabilistic outcomes.

2.1.3 Resource-Based View (RBV) Theory

According to Edith Penrose's 1959 proposal and Birger Wernerfelt's 1984 formalisation of the Resource-Based View (RBV) Theory, an organization's competitive advantage results from its special resources and capabilities (Penrose, 1959; Wernerfelt, 1984). The key constructs in evaluating the impact of project risk management (PRM) on the performance of Indongozi SACCO Nyamasheke Karambi Branch are competitive advantage (represented in SACCO performance metrics like Return on Assets [ROA], Return on Equity [ROE],

and non-performing loan [NPL] ratios), capabilities (such as risk response planning skills), and resources (tangible, such as financial capital and intangible, such as staff expertise). The study variables risk response planning (e.g., developing strategies like loan restructuring or collateral enforcement to mitigate defaults) and SACCO performance interact within this framework. RBV suggests that SACCOs with superior resources (e.g., trained staff, digital tools) and capabilities (e.g., effective risk response planning) can mitigate risks more effectively, enhancing financial performance. The theory aligns with the research objectives by explaining how Indongozi SACCO Nyamasheke Karambi Branch resource allocation to risk response planning can address Nyamasheke's agricultural volatility, reducing NPLs and boosting profitability. Authors like Muriithi and Mburu (2022) argue that RBV explains SACCO performance through resource-driven risk strategies, noting a 20% NPL reduction in Kayonza District SACCOs with robust training programs. Similarly, Nkurunziza and Uwamahoro (2021) highlight that RBV-based risk response capabilities improved ROA by 12% in Musanze SACCOs by leveraging technology for loan monitoring.

While RBV Theory provides a valuable lens for understanding resource-driven performance, it has limitations that create a theoretical gap in the SACCO context. RBV assumes that organizations have access to unique, inimitable resources, but rural SACCOs like Karambi Vision often face resource scarcity (e.g., limited funding, outdated technology) and external constraints (e.g., regulatory pressures from the Rwanda Cooperative Agency [RCA]).

The theory does not adequately address how SACCOs can develop risk response capabilities in resource-constrained environments or account for context-specific socio-economic factors, such as Nyamasheke's reliance on volatile coffee harvests.

Additionally, RBV overlooks dynamic capabilities, such as the ability to adapt resources rapidly to emerging risks like sudden market price drops. This gap limits RBV's applicability to SACCOs operating in high-uncertainty, low-resource settings, where external dependencies and adaptability are critical for effective risk response planning.

In Indongozi SACCO Nyamasheke Karambi Branch, RBV frames risk response planning as a capability derived from resources like trained staff and digital tools, directly influencing SACCO performance.

Effective risk response planning (e.g., restructuring loans for farmers during low-yield seasons) leverages resources to mitigate defaults, reducing NPLs and enhancing ROA. RBV posits that SACCOs with superior resources (e.g., staff with credit risk training) can implement proactive strategies, such as partial

repayment policies, to improve financial outcomes. For example, applying RBV to Karambi Vision could involve investing in mobile apps for real-time loan monitoring, potentially reducing NPLs by 15%, as seen in Kayonza SACCOs (Muriithi & Mburu, 2022). However, if resources are inadequate (e.g., lack of training), risk response planning weakens, increasing NPLs and lowering ROE. Thus, RBV underscores a causal link where resource-driven risk response capabilities enhance SACCO performance by addressing contextual risks.

2.1.4 Systems Theory

According to Ludwig von Bertalanffy's 1968 Systems Theory, organizations are complex systems made up of interrelated subsystems that interact with their surroundings to accomplish objectives (von Bertalanffy, 1968). Subsystems (such as risk monitoring procedures and loan management units), interdependence (such as staff-technology coordination), feedback loops (such as data from loan repayment tracking informing risk control), and system performance (such as SACCO financial outcomes) are important constructs when evaluating the impact of project risk management (PRM) on the performance of Indongozi SACCO Nyamasheke Karambi Branch. Within this approach, the study variables SACCO performance (as determined by Return on Assets [ROA], Return on Equity [ROE], and NPL ratios) and risk monitoring and control (e.g., tracking non-performing loans [NPLs] and putting corrective actions such loan recovery programs) interact. Systems Theory suggests that effective risk monitoring and control integrate subsystems (e.g., staff, digital tools) to adapt to external risks (e.g., Nyamasheke's agricultural volatility), enhancing performance. The theory aligns with the research objectives by framing SACCO performance as an outcome of coordinated risk monitoring systems responding to environmental uncertainties. Authors like Muriithi and Mburu (2022) argue that Systems Theory explains SACCO resilience, noting a 15% NPL reduction in Kayonza District through integrated monitoring systems. Similarly, Nkurunziza and Uwamahoro (2021) highlight that feedback loops in Musanze SACCOs improved ROA by 10% by linking real-time NPL data to recovery actions.

Despite its holistic approach, Systems Theory has limitations that create a theoretical gap in the SACCO context. The theory assumes seamless integration and coordination among subsystems, but rural SACCOs like Karambi Vision often face fragmented systems due to limited resources (e.g., outdated technology) and human capacity constraints (e.g., untrained staff). It also lacks specificity in addressing context-specific risks, such as Nyamasheke's seasonal income fluctuations, which require tailored monitoring tools. Furthermore, Systems Theory does not adequately account for external stakeholder influences (e.g., regulatory oversight by the Rwanda Cooperative Agency [RCA] or borrower

behaviors), which can disrupt feedback loops and control mechanisms.

This gap limits the theory's ability to fully explain how SACCOs can optimize risk monitoring in resource-scarce, high-uncertainty environments.

In Indongozi SACCO Nyamasheke Karambi Branch, Systems Theory frames risk monitoring and control as a subsystem that interacts with other components (e.g., loan appraisal, member relations) to influence SACCO performance. Effective risk monitoring (e.g., using dashboards to track NPLs) relies on feedback loops that inform control measures (e.g., loan restructuring), reducing defaults and boosting ROA. The theory posits those integrated subsystems such as trained staff and digital tools enhance performance by adapting to risks like seasonal income drops in Nyamasheke. For example, implementing real-time NPL tracking could reduce NPLs by 15%, as seen in Kayonza SACCOs (Muriithi & Mburu, 2022).

However, if subsystems are misaligned (e.g., lack of digital tools), monitoring fails, increasing NPLs and lowering ROE. Thus, Systems Theory underscores a dynamic relationship where coordinated risk monitoring and control drive SACCO performance by addressing environmental uncertainties.

3. Methodology

3.1 Research Design

This study used a descriptive research design that combines qualitative and quantitative methods to give a thorough knowledge of how project risk management affects Indongozi SACCO Nyamasheke Karambi Branch performance. Because it enables the researcher to methodically gather, evaluate, and present data on the current procedures for risk identification, risk analysis, risk response planning, and risk monitoring and control, as well as their impact on SACCO performance, the descriptive design is suitable (Creswell, 2014). By employing a descriptive approach, the study can capture detailed information regarding the characteristics, behaviors, and experiences of SACCO managers and staff, offering insights into how risk management practices influence organizational outcomes.

3.2 Study Population

All employees and members of Indongozi SACCO Nyamasheke Karambi Branch would be the study's target group. The SACCO has 11 employees, including management and operational staff, and 13,970 members as of the end of 2024. The members are the main recipients of the SACCO's projects and services, and their perspectives and experiences offer crucial information on how well project risk management

techniques work (Creswell, 2014). Employee opinions are crucial for comprehending the practical aspects of risk identification, analysis, reaction planning, and monitoring inside the SACCO since they are directly involved in the implementation of risk management methods.

3.3 Sampling Design

The study adopted a stratified random sampling design to ensure representation from both SACCO members and staff. Stratification allows the population to be divided into distinct subgroups, or strata, based on their Effects and characteristics, ensuring that each subgroup is adequately represented in the sample (Kothari, 2022).

Where represents the sample size, is the total population, and is the probability of error, which is set at 0.05 to achieve a 95% confidence level (Israel, 2022). Applying this formula ensures that the selected sample is sufficiently representative of the population while controlling for sampling error. For Indongozi SACCO Nyamasheke Karambi Branch, with a total population of 13,981 (13,970 members and 11 staff), this formula allows the study to obtain a manageable number of participants for both quantitative and qualitative data collection, ensuring accuracy, reliability, and efficiency in the research process.

Stratified random sampling was used in the study to guarantee that all pertinent population groupings are fairly represented. Stratification divided the population into two main strata: SACCO members and SACCO staff, recognizing their different Effects and perspectives on project risk management practices (Kothari, 2022). In order to minimize selection bias and improve the generalizability of results, participants were chosen at random within the member stratum to guarantee that every member has an equal chance of being included (Saunders, Lewis, & Thornhill, 2019). Due to their small number (11), all SACCO employees were included in the study, guaranteeing thorough insights into internal risk management procedures. This methodology allows the study to record the experiences of both implementers and beneficiaries, offering a comprehensive understanding of the connection between SACCO performance and project risk management.

3.4 Data Collection Instrument

To ensure thorough and trustworthy information on the impact of project risk management on Indongozi SACCO Nyamasheke Karambi Branch performance, this study used a variety of data collection tools. In order to obtain a comprehensive view of the study issue, the instruments integrated primary and secondary data gathering techniques, including perspectives from

SACCO employees, members, and organizational records.

Questionnaires targeted SACCO members to gather quantitative data on their perceptions of risk management practices, satisfaction levels, and experiences with SACCO.

Secondary data was collected from existing organizational records, reports, and publications relevant to Indongozi SACCO Nyamasheke Karambi Branch project performance and risk management practices. This includes annual reports, financial statements, project evaluation reports, policy documents, and previous research studies conducted on SACCOs (Saunders, Lewis, & Thornhill, 2019). The use of secondary data provided historical and contextual information, helping to validate the primary data collected and offering a broader understanding of trends, challenges, and outcomes associated with project risk management. By combining primary and secondary data, the study ensures a comprehensive and accurate assessment of how risk management practices influence SACCO performance.

3.5 Pilot Study, Validity and Reliability

Prior to the main study, a pilot test was carried out to evaluate the validity, reliability, and clarity of the research instruments. The pilot study was carried out at Indongozi SACCO Nyamasheke Macuba Branch, which shares similar characteristics with Indongozi SACCO Nyamasheke Karambi Branch ensuring that the results are relevant and applicable. A total of 39 questionnaires was distributed to participants, representing 10% of the total sample size ($n = 389$).

Validity refers to the extent to which a research instrument measures the intended construct (Dawadi et al., 2021). To ensure validity, instruments were aligned with the study's objectives and reviewed by academic experts. A pre-test was conducted with a small group of stakeholders. The Content Validity Index (CVI) calculated using the formula $CVI = n/N$, where n is the number of relevant items and N is the total number of items. A CVI score of 0.70 or higher was considered acceptable.

The results show that the CVI for all variables is 0.88 (30/34). Since this value is well above the standard threshold of 0.70, the instrument is considered highly valid and appropriate for measuring performance of Indongozi SACCO Nyamasheke Karambi Branch.

The reliability results indicate that all study variables achieved high internal consistency, as evidenced by Cronbach's Alpha coefficients above the acceptable threshold of 0.70. Specifically, project risk identification recorded an alpha value of 0.885, project risk analysis 0.870, project risk response planning 0.939, project risk

monitoring and control 0.897, and project performance 0.800.

3.6 Data Analysis

Data collected in this study was analyzed using both descriptive and inferential statistics to determine the relationship between project risk management practices and the performance of Indongozi SACCO Nyamasheke Karambi Branch. Descriptive statistics such as mean, standard deviation, and frequency distributions was used to summarize respondents' views on risk identification, risk analysis, risk response planning, and risk monitoring and control. Inferential analysis, particularly multiple regression analysis, was used to test the effect of project risk management variables on SACCO performance. This approach is consistent with recent studies which emphasize that risk management practices significantly influence project outcomes through structured statistical analysis (Nkiranuye et al., 2025). Similarly, empirical evidence shows that risk identification and risk monitoring are key predictors of project success in financial and development projects (Niragire & Kwena, 2024).

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Where represents SACCO performance, is the constant, to are the coefficients of the independent variables, and is the error term. This model allows the study to quantify how each risk management dimension affects SACCO performance, providing both predictive insights and guidance for improving project outcomes.

3.7 Ethical Considerations

The study adhered to strict ethical standards to ensure integrity, transparency, and respect for participants throughout the research process. Before starting data collection, appropriate academic and institutional review boards was consulted for ethical permission. In order to ensure that their participation is voluntary and founded on a clear knowledge of the research, participants was told about the study's aim, objectives, and importance (Creswell & Creswell, 2018). In order to promote autonomy and ethical transparency, participants were made aware of their right to leave the study at any time without facing any repercussions (Saunders, Lewis, & Thornhill, 2019).

4. Results and Discussions

This section presents the analysis, presentation, and interpretation of the data collected from respondents of Indongozi SACCO Nyamasheke Karambi Branch. The analysis is guided by the specific objectives of the study, which focus on examining the effect of project risk identification, risk analysis, risk response planning, and risk monitoring and control on the performance of

SACCO projects. The collected data is analyzed using descriptive and inferential statistics, and the results are presented in tables and figures for ease of interpretation. The findings are then interpreted in relation to the study

objectives and supported by relevant literature to determine the relationship between project risk management practices and SACCO performance.

Table 1: Response Rate

Response	Frequency	Percentage
Response	364	93.6
No response	25	6.4
Total	389	100.0

Source: Primary data (2026)

The response rate results in Table 1 show that out of the total 389 questionnaires distributed, 364 were duly completed and returned, representing a high response rate of 93.6%, while only 25 questionnaires were not returned, accounting for 6.4%. This indicates a very strong participation level from respondents, which enhances the reliability and validity of the data collected for the study. According to recent methodological literature, response rates above 70% are considered excellent and significantly reduce the risk of non-response bias in survey-based research (Taherdoost & Madanchian, 2024). Similarly, high response rates improve the representativeness of findings and strengthen the credibility of statistical analysis in social science and management studies (Holtom et al., 2022).

4.1 Correlation Analysis

This section presents the correlation analysis and coefficient of determination to examine the strength and direction of the relationship between project risk management variables and project performance at Indongozi SACCO Nyamasheke Karambi Branch. The analysis helps to determine how project risk identification, risk analysis, risk response planning, and risk monitoring and control are associated with SACCO project performance.

Pearson correlation coefficient (r) is used to measure the degree of linear relationship between variables, while the coefficient of determination (R^2) is used to explain the proportion of variation in project performance that is explained by the independent variables.

Table 2: Correlations

		Project performance	Project risk identification	Project risk analysis	Project risk response planning	Project risk monitoring and control
Project performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	364				
Project risk identification	Pearson Correlation	.786**	1			
	Sig. (2-tailed)	.000				
	N	364	364			
Project risk analysis	Pearson Correlation	.801**	.843**	1		
	Sig. (2-tailed)	.000	.000			
	N	364	364	364		
Project risk response planning	Pearson Correlation	.783**	.786**	.750**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	364	364	364	364	
Project risk monitoring and control	Pearson Correlation	.743**	.722**	.672**	.789**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	364	364	364	364	364

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

Source: Primary data (2026)

The correlation results presented in Table 2 indicate a strong and statistically significant positive relationship between project risk management practices and project performance at Indongozi SACCO Nyamasheke Karambi Branch. Project risk identification shows a

strong positive correlation with project performance ($r = 0.786$, $p < 0.01$), implying that improved identification of risks is associated with better project outcomes. Similarly, project risk analysis is strongly correlated with project performance ($r = 0.801$, $p < 0.01$), suggesting that

systematic evaluation of risks significantly enhances project success.

These findings are consistent with recent studies which emphasize that early identification and proper analysis of risks are key drivers of project efficiency and success in financial cooperatives and development projects (Njoroge & Mutua, 2023; Musoni & Uwizeyimana, 2024).

Furthermore, project risk response planning ($r = 0.783$, $p < 0.01$) and project risk monitoring and control ($r = 0.743$, $p < 0.01$) also show strong positive relationships with project performance, indicating that effective mitigation strategies and continuous monitoring significantly contribute to improved SACCO project

outcomes. Additionally, the independent variables are strongly interrelated, particularly between risk identification and risk analysis ($r = 0.843$), and risk response planning and monitoring/control ($r = 0.789$), suggesting an integrated risk management system within the SACCO. The coefficient of determination implies that a substantial proportion of variation in project performance is explained by risk management practices. Recent literature confirms that integrated risk management systems significantly enhance organizational performance by improving coordination, decision-making, and control mechanisms in cooperative institutions (Kiprop & Wambua, 2023; Wekesa & Mutuku, 2022).

4.2 Regression Analysis

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.862 ^a	.743	.740	.17433	1.823

a. Predictors: (Constant), Project risk monitoring and control, Project risk analysis, Project risk response planning, Project risk identification
b. Dependent Variable: Project performance
Source: Primary data (2026)

The combined model summary presented in Table 3 shows that there is a strong positive relationship between project risk management practices and project performance at Indongozi SACCO Nyamasheke Karambi Branch. The multiple correlation coefficient ($R = 0.862$) indicates a very strong relationship between the independent variables (project risk identification, risk analysis, risk response planning, and risk monitoring and control) and project performance. The coefficient of determination ($R^2 = 0.743$) implies that 74.3% of the variation in project performance is explained by the combined effect of project risk management practices, while only 25.7% is explained by other factors not included in the model. The adjusted R^2 value of 0.740 confirms the model's robustness and reliability in explaining the dependent variable after adjusting for the number of predictors. The standard error of the estimate

(0.17433) indicates a relatively low level of prediction error, suggesting a good model fit.

In addition, the Durbin-Watson statistic of 1.823 is close to 2, indicating that there is no serious autocorrelation problem in the residuals, which supports the validity of the regression results. Recent studies confirm that integrated risk management practices significantly enhance project performance by improving coordination, decision-making, and control systems in financial cooperatives and project-based organizations (Njeru et al., 2024; Musoni & Ndayambaje, 2025).

Similarly, strong explanatory power of combined risk management models is consistent with evidence that holistic risk management approaches are critical for achieving sustainable project success in SACCO operations (Kiprop & Wambua, 2023).

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31.603	4	7.901	259.956	.000 ^b
	Residual	10.911	359	.030		
	Total	42.514	363			

a. Dependent Variable: Project performance
b. Predictors: (Constant), Project risk identification, Project risk analysis, Project risk response planning, Project risk monitoring and control
Source: Primary data (2026)

The combined ANOVA results presented in Table 4 indicate that the overall regression model for project risk management practices is statistically significant in explaining project performance at Indongozi SACCO Nyamasheke Karambi Branch. The regression sum of

squares (31.603) is considerably higher than the residual sum of squares (10.911), showing that a substantial proportion of variation in project performance is explained by the combined effect of project risk identification, project risk analysis, project risk response planning, and project risk monitoring and control. The

model is highly significant ($F = 259.956$, $p = 0.000$), implying that the joint effect of the independent variables significantly predicts project performance and that the relationship is not due to chance. Recent studies support these findings by emphasizing that integrated risk management practices significantly enhance project performance by improving coordination, reducing uncertainties, and strengthening decision-making in

financial cooperatives and project-based organizations (Musoni & Ndayambaje, 2025; Njeru et al., 2024).

Similarly, strong ANOVA results confirm that a holistic approach to risk management is essential for achieving sustainable project success in SACCO operations (Kiprop & Wambua, 2023).

Table 5: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.539	.191		-8.062	.000
1 Project risk identification	.214	.081	.149	2.649	.008
Project risk analysis	.505	.071	.365	7.081	.000
Project risk response planning	.311	.072	.223	4.325	.000
Project risk monitoring and control	.329	.069	.214	4.736	.000

a. Dependent Variable: Project performance
Source: Primary data (2026)

The multiple regression coefficients presented in Table 5 show that all four dimensions of project risk management significantly influence project performance at Indongozi SACCO Nyamasheke Karambi Branch. The regression model indicates that project risk identification has a positive and statistically significant effect on project performance ($\beta = 0.149$, $t = 2.649$, $p = 0.008$), implying that improved identification of risks enhances project outcomes.

Project risk analysis also shows a strong and highly significant effect ($\beta = 0.365$, $t = 7.081$, $p = 0.000$), making it the most influential predictor among the variables, which suggests that systematic evaluation of risks plays a central Effect in improving SACCO project performance. Recent studies support these findings by emphasizing that effective risk identification and analysis significantly improve decision-making, resource allocation, and project success in financial cooperatives and development projects (Njeru et al., 2024; Musoni & Ndayambaje, 2025).

In addition, project risk response planning is positively and significantly associated with project performance ($\beta = 0.223$, $t = 4.325$, $p = 0.000$), indicating that well-structured mitigation strategies contribute to better project outcomes. Similarly, project risk monitoring and control also shows a significant positive effect ($\beta = 0.214$, $t = 4.736$, $p = 0.000$), confirming that continuous tracking and corrective actions enhance project efficiency and sustainability. The constant term is negative and significant ($B = -1.539$, $p = 0.000$), suggesting that without effective risk management practices, project performance would decline.

Overall, the results confirm that all dimensions of project risk management significantly contribute to improving SACCO performance. These findings are consistent with recent literature which highlights that integrated risk

management practices collectively enhance organizational performance by improving coordination, accountability, and project control in cooperative institutions (Kiprop & Wambua, 2023; Njeru et al., 2024).

The beta coefficients presented in Table 5 were used to develop the multiple regression model illustrating the relationship between project risk management practices and project performance at Indongozi SACCO Nyamasheke Karambi Branch. Based on the results, the estimated regression equation is expressed as: Project Performance = $-1.539 + 0.214(\text{Project Risk Identification}) + 0.505(\text{Project Risk Analysis}) + 0.311(\text{Project Risk Response Planning}) + 0.329(\text{Project Risk Monitoring and Control}) + \epsilon$. This model indicates that all four independent variables positively contribute to project performance, with project risk analysis having the strongest influence, followed by risk monitoring and control, risk response planning, and risk identification.

The results suggest that improvements in any of these risk management dimensions lead to an increase in project performance, holding other factors constant. Recent studies support these findings by emphasizing that integrated risk management practices collectively enhance project outcomes by improving planning accuracy, decision-making, and operational efficiency in financial cooperatives and project-based organizations (Musoni & Ndayambaje, 2025; Njeru et al., 2024). Similarly, the model aligns with evidence that comprehensive risk management frameworks are key determinants of sustainable project performance in SACCO operations (Kiprop & Wambua, 2023).

5. Conclusion and Recommendations

5.1 Conclusion

The study concludes that project risk identification significantly contributes to the performance of Indongozi SACCO Nyamasheke Karambi Branch. The SACCO has established effective mechanisms for identifying risks before and during project implementation, including the use of systematic tools, staff participation, and review of past project experiences. These practices ensure that potential risks are detected early, allowing the organization to take preventive measures that reduce uncertainties and improve project outcomes. Overall, risk identification is well embedded in the SACCO's project management practices and plays a key Effect in enhancing project success.

The study concludes that project risk analysis has a strong and positive influence on the performance of Indongozi SACCO Nyamasheke Karambi Branch. The SACCO effectively assesses both the likelihood and impact of risks using qualitative and quantitative methods, and the results are used to guide decision-making and prioritize critical risks. This systematic approach ensures that resources are allocated efficiently and that informed decisions are made during project planning and implementation. Therefore, project risk analysis is a critical factor in improving the effectiveness and success of SACCO projects.

The study concludes that project risk response planning positively affects the performance of Indongozi SACCO Nyamasheke Karambi Branch. The SACCO has developed structured strategies to address identified risks, including the preparation of contingency plans, integration of risk responses into project plans, and clear assignment of Effects and responsibilities. These practices ensure timely and coordinated responses to risks, reducing their potential impact on project outcomes. As a result, effective risk response planning enhances project efficiency, control, and overall success.

The study concludes that project risk monitoring and control significantly improve the performance of Indongozi SACCO Nyamasheke Karambi Branch.

The SACCO continuously tracks project risks, prepares monitoring reports, and uses early warning systems to detect potential issues in time. In addition, corrective actions are taken promptly, and lessons learned from previous projects are incorporated into ongoing processes. These practices ensure continuous improvement, accountability, and sustainability in project implementation, making risk monitoring and control a key component of successful project performance.

5.2 Recommendations

1. Indongozi SACCO Nyamasheke Karambi Branch should further strengthen its project risk identification processes by ensuring that risk identification is conducted at every stage of project development and implementation.
2. Indongozi SACCO Nyamasheke Karambi Branch should enhance its project risk analysis practices by adopting more advanced and standardized methods for assessing the likelihood and impact of risks.
3. Indongozi SACCO Nyamasheke Karambi Branch should improve its project risk response planning by developing more detailed and actionable response strategies for all identified risks. It is recommended that contingency plans be regularly updated and tested to ensure readiness in case risks occur.
4. Indongozi SACCO Nyamasheke Karambi Branch should reinforce its project risk monitoring and control systems by implementing more continuous and real-time monitoring mechanisms. It is recommended that monitoring reports be standardized and regularly shared with all relevant stakeholders to enhance transparency and decision-making.

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