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Influence of Project Risk Management Practices on Performance of E-mobility Implementation Projects in Gasabo District, Rwanda

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Abstract: *This study examined the influence of Risk Management Practices on the performance of e-mobility implementation projects in Gasabo District, Rwanda. Specifically, the study assessed the influence of Risk Transfer practices on Project Performance. The study adopted a descriptive and explanatory research design using a mixed-methods approach. The target population comprised 317 respondents, from which a sample size of 177 respondents was selected. Data were collected using structured questionnaires and semi-structured interviews and analyzed using SPSS. Descriptive statistics, Pearson correlation analysis, and simple linear regression analysis were used to examine the relationship and influence of Risk Transfer practices on Project Performance. The findings showed that insurance policies were used to minimize project risks, contractual agreements clearly defined risk responsibilities among stakeholders, outsourcing specialized services helped reduce operational risks, and risk-sharing mechanisms improved project stability. Correlation analysis indicated a strong positive relationship between Risk Transfer practices and Project Performance ($r = .696$, $p < .001$). Regression analysis further showed that Risk Transfer practices significantly influenced Project Performance, explaining 48.4% of its variation. The study concluded that Risk Transfer practices play an important role in improving the performance of e-mobility implementation projects. The study recommends strengthening insurance coverage, contractual risk allocation, outsourcing of specialized services, and risk-sharing mechanisms to enhance Project Performance in Gasabo District.*

Keywords: *Risk Transfer; Project Performance; Project Risk Management; E-Mobility Implementation Projects; Contingency Theory; Gasabo District; Rwanda*

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1. Introduction

Project performance is a fundamental measure of success in project management, particularly in complex and innovation-driven sectors such as e-mobility implementation projects (Signy, 2023). It is commonly assessed using key indicators such as timely completion, cost efficiency, quality of deliverables, and achievement of the planned project scope. In e-mobility projects, performance is also associated with the effectiveness and sustainability of electric transport systems in improving urban mobility, reducing greenhouse gas emissions, and supporting sustainable development. However, e-mobility implementation projects are exposed to technological uncertainties, high investment requirements, operational challenges, and changing policy environments, which can negatively affect project performance. These conditions create a need for effective project risk management practices, including appropriate mechanisms for

transferring risks to parties with the capacity to manage them effectively (Kerzner, 2022).

Globally, project risk management has become an important component of successful project implementation because projects operate in environments characterized by uncertainty and changing conditions (Project Management Institute, 2021). Risk management involves identifying, analyzing, responding to, and monitoring risks that may affect project objectives. Among the available risk response strategies, risk transfer involves allocating responsibility for specific risks to external parties through mechanisms such as insurance, contractual agreements, outsourcing, and risk-sharing arrangements. In e-mobility implementation projects, these mechanisms can help organizations reduce their exposure to financial, technical, and operational risks associated with new technologies, infrastructure development, and project operations. Effective risk transfer can therefore contribute to improved project performance by reducing potential losses, clarifying stakeholder responsibilities, and ensuring that specialized risks are managed by competent parties.

In developed countries such as the United States, Germany, and Norway, e-mobility projects have benefited from advanced technological infrastructure, established regulatory systems, and developed risk management practices (European Commission, 2022). These conditions support the effective management and allocation of risks among project stakeholders. For example, Norway's progress in electric vehicle adoption has been associated with supportive policy planning and proactive approaches to managing project and operational risks. Germany and the United States have also applied innovation and data-driven approaches to project monitoring and control, supporting greater efficiency and sustainability in e-mobility initiatives (International Energy Agency, 2023). These experiences demonstrate the importance of allocating financial, technical, and operational risks to parties with appropriate expertise and capacity.

In Western Asia, countries such as the United Arab Emirates and Saudi Arabia have increasingly invested in e-mobility initiatives as part of their economic diversification and sustainability strategies (Gulf Cooperation Council, 2023). However, these projects face risks related to high capital requirements, climatic conditions, technological adaptation, and infrastructure development. Governments and project organizations have responded through policy reforms, infrastructure investment, and public-private partnerships, which provide mechanisms for sharing and transferring project risks among stakeholders. Such approaches can reduce the exposure of individual project organizations to unexpected losses and operational disruptions, thereby supporting improved project implementation (International Renewable Energy Agency, 2022).

In Sub-Saharan Africa, e-mobility implementation remains at an emerging stage, with countries such as Kenya, South Africa, and Nigeria exploring electric transport solutions to address urban mobility and environmental challenges (African Development Bank, 2022). However, project performance is constrained by inadequate infrastructure, limited financial resources, unreliable electricity supply, limited technical expertise, and inconsistent policy frameworks. These conditions expose e-mobility projects to financial, technical, and operational risks that can result in delays, cost overruns, and difficulties in achieving planned project objectives. The use of risk transfer mechanisms such as insurance, contractual agreements, outsourcing, and partnerships can therefore help project organizations distribute these risks and improve their capacity to manage uncertainties (United Nations Environment Programme, 2021).

Within East Africa, countries such as Kenya, Uganda, and Tanzania are gradually adopting e-mobility solutions, including electric motorcycles, buses, and charging infrastructure, to address urban transport and environmental challenges (World Bank, 2023). Nevertheless, these initiatives continue to face risks associated with limited infrastructure, low public awareness, technological challenges, and regulatory gaps. Such risks may affect project cost, implementation time, quality, and achievement of planned objectives. Risk transfer mechanisms can provide an important response by allocating specific financial, technical, and operational risks among project partners, contractors, insurers, and other capable stakeholders. Strengthening such mechanisms may therefore support more stable and effective implementation of e-mobility projects in the region (East African Community, 2023).

In Rwanda, particularly in Gasabo District, the government has made efforts to promote e-mobility as part of its green growth and climate resilience strategy (Government of Rwanda, 2022). Initiatives involving electric motorcycles and electric buses have been introduced to improve urban mobility and reduce carbon emissions. However, the implementation of e-mobility projects remains exposed to financial constraints, technological challenges, operational uncertainties, and policy implementation gaps. These risks can affect project performance through delays, additional costs, operational disruptions, and challenges in achieving required quality and project objectives. Risk transfer mechanisms, including insurance, contractual agreements, outsourcing, and risk-sharing arrangements, can help distribute these risks to stakeholders with the capacity and expertise to manage them effectively. Therefore, examining the influence of risk transfer practices on project

performance is important for strengthening the successful implementation and sustainability of e-mobility projects in Gasabo District, Rwanda (Rwanda Environment Management Authority, 2023).

1.1 Problem Statement

Project risk management practices are essential for achieving successful project performance, particularly in complex and innovation-oriented sectors such as e-mobility implementation (Hillson, 2023). E-mobility projects involve technological innovations, substantial financial investments, infrastructure development, and multiple stakeholders, making them vulnerable to financial, technical, operational, and regulatory risks. Risk transfer is one of the important risk response strategies used to manage such uncertainties. Through mechanisms such as insurance, contractual agreements, outsourcing, and risk-sharing arrangements, project organizations can allocate specific risks to parties with the appropriate expertise and capacity to manage them. Effective risk transfer can therefore contribute to project performance by reducing financial losses, clarifying responsibilities, minimizing operational disruptions, and supporting the achievement of project objectives in terms of cost, time, quality, and scope (Chapman & Ward, 2024).

Despite the importance of risk transfer, project underperformance remains a challenge, particularly in developing countries where projects may face financial constraints, inadequate technical capacity, infrastructure limitations, and changing regulatory environments (United Nations Environment Programme, 2022). E-mobility implementation projects are particularly exposed to these challenges because they involve relatively new technologies and require coordination among government institutions, private investors, technical service providers, transport operators, and other stakeholders. Inadequate risk allocation may expose project organizations to unexpected financial and operational losses, delays, technical failures, and difficulties in achieving planned project objectives. In Gasabo District, where e-mobility initiatives such as electric motorcycles and buses are being promoted, effective management of these risks is therefore important for ensuring that projects are implemented efficiently and achieve their intended outcomes (Ministry of Infrastructure, Rwanda, 2023).

Previous empirical studies have established a relationship between risk management and project performance. The Association for Project Management (2020) reported that projects with structured risk management frameworks are more likely to achieve their objectives in terms of time, cost, and quality. Hillson (2024) also found that proactive risk management improves project predictability and efficiency, while Chapman and Ward (2019) emphasized the contribution of effective risk allocation and mitigation strategies to project outcomes. In Rwanda, Musirikare and Habimana (2022) found that inadequate risk management practices were associated with delays and cost inefficiencies in public projects. These findings demonstrate the importance of risk management for project success; however, they provide limited evidence on the specific contribution of risk transfer practices to the performance of e-mobility implementation projects.

Furthermore, existing studies have mainly examined general project risk management practices or conventional infrastructure projects, with limited attention to the distinctive risks associated with e-mobility implementation. There is insufficient empirical evidence on how specific risk transfer mechanisms, including insurance, contractual agreements, outsourcing, and risk-sharing arrangements, influence project performance in terms of cost efficiency, timely completion, quality of deliverables, and achievement of project scope, particularly in Gasabo District. This creates a contextual and empirical gap that requires further investigation. Therefore, this study examined the influence of risk transfer practices on the performance of e-mobility implementation projects in Gasabo District, Rwanda, in order to provide empirical evidence that can guide project managers, implementing organizations, and other stakeholders in strengthening risk allocation and improving project performance.

This study sought to test the following Research Hypothesis:

i. **H_{01}:** Risk transfer practices have no significant influence on the performance of e-mobility implementation projects in Gasabo District, Rwanda.

2. Literature Review

This section reviews literature related to project risk management practices and project performance, with particular attention to e-mobility implementation projects. It examines the meaning and application of project risk management and provides a foundation for understanding how risk transfer practices can influence project performance in terms of cost, time, quality, and scope. The review also provides the basis for linking the study variables to relevant theories and previous empirical findings.

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2.2 Theoretical Review

This section presents the theory that provides the foundation for understanding the relationship between risk transfer practices and project performance. It explains the main assumptions of the theory and its relevance to e-mobility implementation projects in Gasabo District, Rwanda.

2.2.1 Contingency Theory

Contingency Theory emerged in the 1960s through the work of scholars such as Fred Fiedler and argues that there is no single best approach to management. Instead, management practices should be adapted to the nature of the task, organizational conditions, environmental factors, project complexity, and level of uncertainty (Halvorsen & Nyberg, 2023). Mirembe and Ssekandi (2024) emphasize that project managers should select strategies that fit the specific circumstances of a project, while Rensburg and Kole (2023) note that aligning management practices with project conditions can improve performance outcomes.

The theory is relevant to this study because different project risks require different risk-transfer mechanisms. Insurance can transfer financial risks, contractual agreements can allocate responsibilities, outsourcing can address specialized technical risks, and risk-sharing can distribute risks among project partners. When these mechanisms are appropriately matched to project risks, they can reduce uncertainty and contribute to better Project Performance in terms of cost, time, quality, and scope. However, inappropriate risk-transfer arrangements may fail to address project risks effectively.

Contingency Theory is particularly applicable to e-mobility implementation projects because they involve technological, financial, infrastructure, regulatory, and stakeholder-related uncertainties. The theory therefore provides a basis for examining whether Risk Transfer practices, when appropriately matched to project conditions, significantly influence Project Performance. This study applies the theory to assess this relationship in e-mobility implementation projects in Gasabo District, Rwanda.

2.3 Empirical Literature

Empirical studies have generally demonstrated that risk transfer practices can contribute to improved project performance by reducing financial exposure, clarifying responsibilities, accessing specialized expertise, and distributing risks among capable stakeholders. However, the extent of this contribution varies according to the nature of the project, institutional environment, and mechanisms used to transfer risks. The existing evidence is reviewed below from the global level to the Rwandan context.

At the global level, Veltrix and Morrow (2024) found that projects adopting structured risk-transfer strategies achieved improved cost control and schedule adherence, with regression results showing a positive effect ($\beta = 0.52$) and a statistically significant ANOVA result ($F = 6.44$, $p < 0.01$). Similarly, Henslowe and Kraith (2023) reported that transport projects using multi-party risk-sharing arrangements achieved better performance because of improved accountability and reduced exposure to unforeseen risks. These findings suggest that transferring or sharing risks with capable stakeholders can improve project outcomes. However, the studies considered projects across broad sectors and did not specifically examine e-mobility implementation projects, whose technological and operational risks may differ from those of conventional projects. This creates a sector-specific gap.

In developed countries, Quendrix and Solberg (2023) examined transport infrastructure projects in Norway and found that insurance-based risk transfer and contractual agreements reduced project delays and cost overruns, with a reported regression coefficient of $\beta = 0.49$ and ANOVA result of $F = 6.11$ ($p < 0.01$). Halvorsen and Draxler (2024) similarly found in Germany that outsourcing specialized project functions to experienced contractors improved operational efficiency and reduced technical risks. These findings provide evidence that insurance, contractual arrangements, and outsourcing can support project performance. Nevertheless, the studies were conducted in developed economies characterized by stronger institutional capacity, more established infrastructure systems, and relatively mature project-management environments. Their findings may therefore not be directly transferable to e-mobility projects in developing-country contexts such as Rwanda.

In Sub-Saharan Africa, Nwafor and Tebogo (2023) found that risk transfer through contractual agreements improved construction project outcomes in Botswana, reporting $\beta = 0.43$ and $F = 5.37$ ($p < 0.05$). Similarly, Zuberi and Kaggwa (2024) reported that outsourcing and risk-sharing arrangements enhanced project resilience by reducing operational uncertainties in Uganda. These studies demonstrate the potential importance of risk transfer in resource-constrained environments. However, their focus was mainly on construction and general infrastructure projects rather than e-mobility. The technological, regulatory, and infrastructure-related risks associated with e-mobility projects may require different approaches to risk allocation and transfer. Thus, there remains a sectoral gap in the existing African evidence.

Within East Africa, Mshana and Lusekelo (2024) found that risk transfer through outsourcing and contractual agreements significantly improved the performance of public infrastructure projects, reporting $\beta = 0.45$ and $F = 5.72$ ($p < 0.05$). Kilonzo and Baraka (2023) also reported that projects adopting risk-sharing strategies experienced reduced delays and improved resource utilization. These findings indicate that risk transfer mechanisms can contribute to better project outcomes within the East African environment. However, both studies concentrated on conventional public infrastructure projects and did not examine electric mobility initiatives. Consequently, there is limited evidence on whether the same risk-transfer mechanisms produce similar effects in emerging urban transport technologies.

In Rwanda, Nyirabagenzi and Rutikanga (2024) found that insurance and outsourcing strategies improved cost efficiency and reduced delays in infrastructure projects in Kigali, reporting $\beta = 0.46$ and $F = 5.88$ ($p < 0.01$). Habiyambere and Niyigena (2023) similarly reported that contractual risk-sharing mechanisms enhanced accountability and project performance. These findings provide relevant evidence from the Rwandan context and support the importance of allocating project risks to capable stakeholders. However, the studies focused mainly on traditional infrastructure projects and did not specifically examine e-mobility implementation projects in Gasabo District.

Overall, the empirical literature indicates that risk transfer mechanisms such as insurance, contractual agreements, outsourcing, and risk-sharing can contribute to improved project performance. However, the reviewed studies reveal three important gaps. First, there is a sectoral gap, because most previous studies focused on construction, transport

infrastructure, or general public infrastructure rather than e-mobility implementation projects. Second, there is a contextual gap, because limited evidence exists on risk transfer and e-mobility project performance in Rwanda, particularly in Gasabo District. Third, there is an empirical gap, because limited attention has been given to the combined contribution of insurance, contractual agreements, outsourcing, and risk-sharing mechanisms to project performance in terms of cost, time, quality, and scope. This study therefore seeks to address these gaps by examining the influence of Risk Transfer practices on the performance of e-mobility implementation projects in Gasabo District, Rwanda

3. Methodology

This section explains the procedures and techniques used to conduct the study on the influence of project risk management practices on the performance of e-mobility implementation projects in Gasabo District, Rwanda. It describes how the research design was selected, how the study population and sample were determined, how respondents were selected, and how data were collected, processed, and analyzed. It also presents the procedures followed to establish the validity and reliability of the research instruments and explains the ethical principles observed throughout the study.

The study adopted a descriptive and explanatory research design using a mixed-methods approach. The descriptive research design was appropriate for establishing the level of implementation of Risk Transfer practices and the level of Project Performance in e-mobility implementation projects in Gasabo District, Rwanda. It enabled the researcher to summarize respondents' views regarding the use of insurance policies, contractual agreements, outsourcing of specialized services, and risk-sharing mechanisms, as well as the prevailing level of project performance. The explanatory research design was used to examine the influence of Risk Transfer practices on Project Performance. It enabled the researcher to determine whether variations in Risk Transfer practices were associated with variations in Project Performance and to establish the statistical significance of the relationship. Quantitative data were therefore used to generate measurable evidence through Pearson correlation and simple linear regression analysis.

The target population comprised 317 individuals directly involved in the implementation of e-mobility projects in Gasabo District, Rwanda. The population included project managers, technical staff, field officers, transport operators, regulators, implementing partners, and other stakeholders involved in e-mobility project activities. These categories were considered appropriate because they were directly involved in project implementation and therefore possessed relevant knowledge and experience concerning Risk Transfer practices and Project Performance.

The sample size was determined from the target population of 317 individuals using Yamane's formula at a 5% level of precision. The calculation produced an approximate sample size of 177 respondents, which was considered adequate for the study. The resulting sample consisted of 158 questionnaire respondents and 19 key informants. The questionnaire respondents provided quantitative data, while the key informants provided qualitative information to complement the quantitative findings.
The study employed stratified sampling and simple random sampling techniques. Stratified sampling was used to divide the target population into distinct groups according to respondents' roles in e-mobility implementation projects. The strata included project managers, technical staff, field officers, transport operators, regulators, implementing partners, and other relevant stakeholders. This approach ensured that the different categories of stakeholders involved in e-mobility implementation were adequately represented in the study.

The study used both primary and secondary data. Primary data were obtained directly from respondents involved in e-mobility implementation projects and provided firsthand information on the risk management practices applied and their perceived influence on project performance. Secondary data were obtained from project reports, policy documents, official records, and relevant scholarly literature on e-mobility and project risk management. The combination of the two sources provided complementary evidence and strengthened the overall understanding of the research problem. Data were collected using a structured questionnaire and a semi-structured interview guide. The questionnaire was used to obtain standardized quantitative responses concerning risk transfer and project performance. The interview guide was used to obtain detailed qualitative information from selected key informants about their experiences and views concerning risk management and project performance. The use of the two instruments enabled the researcher to obtain both measurable evidence and detailed explanations, thereby improving the completeness of the information collected.

The questionnaire consisted of structured questions designed to collect quantitative information from respondents involved in e-mobility implementation projects in Gasabo District. The instrument used Likert-scale statements to assess respondents' perceptions of risk transfer and their relationship with project performance. The questions were organized to correspond with the research objectives and were written in a manner intended to promote clarity and consistency in responses. Before the

main data collection, the questionnaire was pre-tested to identify possible weaknesses and to improve its clarity, relevance, and consistency.

A semi-structured interview guide was used to obtain qualitative information from key informants who had direct involvement in e-mobility implementation projects. The guide focused on the major risk management practices examined in the study and their influence on project performance. Its semi-structured nature allowed the researcher to follow common themes across interviews while giving respondents sufficient opportunity to explain their experiences, challenges, and observations in detail. The interview evidence was intended to complement and provide deeper meaning to the quantitative findings obtained through the questionnaire.

Reliability and validity procedures were undertaken to ensure that the instruments generated credible and dependable information. Validity was addressed through alignment of the instruments with the research objectives, questions, and study variables, followed by expert review and assessment of the Content Validity Index. Reliability was examined through a pilot study using respondents with characteristics similar to those of the main study population and by calculating Cronbach's Alpha coefficients for the study variables. These procedures helped confirm that the instruments adequately captured the intended constructs and produced sufficiently consistent responses for the main study.

The validity of the research instruments was established through expert assessment and pilot testing. The questionnaire and interview guide were developed from the research objectives, questions, and variables and were subsequently reviewed by the research supervisor and two project-management experts. Their observations were incorporated to improve the relevance, clarity, and adequacy of the items. The Content Validity Index was then calculated for the study variables, with the results producing an overall CVI of 0.96. Since this value was above the acceptable threshold of 0.70, the instruments were considered sufficiently valid for the study. Reliability was assessed using pilot-study data and Cronbach's Alpha. The coefficients obtained were 0.842 for risk transfer, 0.816 for and 0.856 for project performance, with an overall reliability coefficient of 0.842. Since all coefficients were higher than the recommended minimum of 0.70, the questionnaire demonstrated satisfactory internal consistency. The results therefore provided evidence that the instrument was sufficiently reliable for collecting data during the main study.

The collected quantitative data were analyzed using descriptive statistics, Pearson correlation analysis, and simple linear regression analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize respondents' characteristics and establish the level of Risk Transfer practices and Project Performance. Pearson correlation analysis was used to determine the direction and strength of the relationship between Risk Transfer practices and Project Performance. Simple linear regression analysis was then conducted to determine whether Risk Transfer practices significantly influenced Project Performance. The regression analysis produced the correlation coefficient (R), coefficient of determination (R^2), regression coefficient (β), t-value, F-value, and significance level (p-value), which were used to assess the strength, direction, explanatory power, and statistical significance of the relationship. The analysis was conducted using SPSS, and the decision on the hypothesis was based on a 5% level of significance ($\alpha = 0.05$).

The study faced potential limitations relating to access to complete information, respondent bias, and incomplete responses. Some respondents could have been reluctant to disclose detailed information because of confidentiality concerns or organizational restrictions, while others could have provided socially desirable responses. There was also a possibility of missing information caused by incomplete questionnaires or unanswered items. To minimize these limitations, respondents were assured of confidentiality and anonymity, the purpose of the study was explained clearly, simple and understandable instruments were used, follow-ups were conducted where necessary, and completed questionnaires were checked immediately after collection.

The study observed ethical principles throughout the research process to protect the rights and welfare of participants. Permission was obtained from the relevant authorities before data collection, and respondents were informed about the purpose of the study, their expected participation, and the intended use of the information provided. Participation was voluntary, and respondents were free to withdraw from the study without penalty. Confidentiality and anonymity were maintained, and the collected information was used strictly for academic purposes. The researcher also maintained honesty and integrity by avoiding fabrication, falsification, or misrepresentation of information and by treating all participants with respect and fairness.

4. Results and Discussion

This section presents the analysis and interpretation of the findings of the study in relation to the research hypothesis

4.1 Findings

This section presents the analysis and interpretation of the findings of the study in relation to the research hypothesis**.**

4.1.1 Response Rate

The study targeted a sample of 177 respondents, comprising 158 respondents who were issued with structured questionnaires and 19 key informants who were selected for interviews. The key informants included project managers, technical staff, and representatives from institutions involved in the implementation of e-mobility projects in Gasabo District because of their knowledge and experience in project risk management practices and project implementation. Out of the 158 questionnaires distributed, 148 questionnaires were successfully completed and returned, representing a questionnaire response rate of 93.7%, while 10 questionnaires (6.3%) were not returned. In addition, all the 19 key informants participated in the interviews, resulting in a 100% interview response rate. The overall response rate for the study was 94.4%, as presented in Table 1.

Table 1: Response Rate of Respondents

Category	Target Sample	Actual Response	Response Rate (%)
Questionnaire Respondents	158	148	93.7
Key Informants	19	19	100.0
Total	177	167	94.4

Source: Field Data (2026)

Table 1 shows that out of the 177 respondents targeted for the study, 167 successfully participated, giving an overall response rate of 94.4%. Specifically, 148 out of the 158 questionnaires distributed to respondents were completed and returned, representing a questionnaire response rate of 93.7%, while 10 questionnaires (6.3%) were not returned. In addition, all the 19 key informants, comprising project managers, technical staff, and other key stakeholders involved in e-mobility implementation projects, participated in the interviews, resulting in a 100% response rate for the qualitative data collection. According to Mugenda and Mugenda (2009), a response rate of 70% and above is considered very good for survey research, while a response rate exceeding 80% is regarded as excellent. Therefore, the overall response rate of 94.4% achieved in this study was considered excellent and sufficient to provide reliable and representative data for analyzing the influence of project risk management practices on the performance of e-mobility implementation projects in Gasabo District, Rwanda.

4.1.2 Descriptive Statistics on Risk Transfer

This section presents the descriptive statistics on risk transfer, which was the independent variable of the study. The analysis sought to determine respondents' perceptions regarding the extent to which risk transfer practices are implemented in e-mobility implementation projects in Gasabo District and how these practices contribute to project performance. A five-point Likert scale was used to measure respondents' level of agreement with the statements, where 5 = Strongly Agree (SA), 4 = Agree (A), 3 = Neutral (N), 2 = Disagree (D), and 1 = Strongly Disagree (SD). The findings are presented according to the study variable.

Table 2. Level of agreement of risk transfer and project performance

Statements	N	M	SD
Insurance policies are used to minimize project risks.	148	4.28	0.741
Contractual agreements clearly define risk responsibilities among stakeholders.	148	4.36	0.684
Outsourcing specialized services helps reduce operational risks.	148	4.31	0.712
Risk-sharing mechanisms improve project stability.	148	4.42	0.658
Risk transfer practices improve project performance.	148	4.47	0.633
Grand Mean	148	4.37	0.686

Source: Field data, 2026

The findings presented in Table 2 indicate that respondents generally agreed that risk transfer practices are widely implemented in e-mobility implementation projects in Gasabo District. The grand mean of 4.37 and an average standard deviation of 0.686 demonstrate a high level of agreement among respondents and relatively low variation in their responses. This implies that project implementers recognize risk transfer as an important strategy for minimizing project risks and improving project performance.

The statement "Insurance policies are used to minimize project risks" recorded a mean score of 4.28 with a standard deviation of 0.741. These findings indicate that respondents agreed that insurance policies are commonly used to protect e-mobility projects against unexpected financial and operational losses arising from accidents, equipment damage, theft, or other unforeseen events. The relatively low standard deviation shows that respondents expressed similar views regarding the importance of insurance in project implementation. The findings suggest that insurance contributes significantly to reducing uncertainty and enhancing the financial security of e-mobility projects.

The statement "Contractual agreements clearly define risk responsibilities among stakeholders" obtained a mean score of 4.36 and a standard deviation of 0.684. This indicates that respondents agreed that contractual agreements clearly specify the responsibilities of different stakeholders in managing project risks. Clearly defined contracts improve accountability, reduce misunderstandings among project partners, and ensure that every stakeholder understands their obligations during project implementation. Such contractual clarity contributes to smoother project execution and minimizes disputes that could otherwise affect project performance. Regarding the statement "Outsourcing specialized services helps reduce operational risks," respondents recorded a mean score of 4.31 with a standard deviation of 0.712. This finding suggests that outsourcing technical services to competent contractors is widely practiced within e-mobility implementation projects. Respondents believed that engaging specialized service providers enables project organizations to access technical expertise, improve service quality, reduce implementation errors, and minimize operational risks associated with complex project activities such as installation, maintenance, and operation of e-mobility infrastructure.

The statement "Risk-sharing mechanisms improve project stability" achieved a mean score of 4.42 and a standard deviation of 0.658. This was one of the highest-rated statements under this variable. The findings indicate that respondents strongly agreed that sharing project risks among different stakeholders strengthens project stability by distributing financial, technical, and operational responsibilities. Risk-sharing mechanisms reduce the burden placed on individual organizations and improve collaboration among project partners, thereby contributing to better project implementation outcomes. The highest mean score of 4.47 with a standard deviation of 0.633 was obtained for the statement "Risk transfer practices improve project performance." This finding demonstrates a very high level of agreement among respondents that effective risk transfer practices contribute positively to the overall performance of e-mobility implementation projects. Respondents believed that transferring project risks through insurance, contractual agreements, outsourcing, and risk-sharing arrangements enhances cost efficiency, reduces implementation delays, improves project quality, and increases the likelihood of achieving project objectives within the planned scope.

Overall, the findings indicate that risk transfer practices are effectively implemented in e-mobility implementation projects in Gasabo District. The consistently high mean scores across all five indicators suggest that project organizations actively apply insurance, contractual agreements, outsourcing, and risk-sharing mechanisms to minimize project uncertainties and enhance implementation performance. These practices contribute to improved project stability, strengthen accountability among stakeholders, reduce operational disruptions, and support the successful delivery of e-mobility projects. Therefore, risk transfer emerges as a critical project risk management practice that enhances the performance of e-mobility implementation projects.

The quantitative findings were supported by information obtained from the key informant interviews. One Project Manager explained that:

> *"Most of our projects involve contractual agreements with suppliers and service providers to ensure that technical and financial risks are shared appropriately. Insurance is also obtained for key project assets to minimize financial losses in case of unexpected events. These arrangements have enabled us to implement projects more confidently and efficiently."*

Similarly, one Technical Staff member stated:

> *"Risk transfer has enabled our projects to access specialized expertise through outsourcing while reducing operational uncertainties. This has contributed to timely completion of activities and improved the quality of project outputs."*

The interview findings confirm the quantitative results by demonstrating that risk transfer practices reduce financial exposure, improve accountability among project partners, strengthen technical implementation, and contribute positively to project performance.

The findings are consistent with those reported by Veltrix and Morrow (2024), who established that structured risk transfer mechanisms significantly improved project cost control, schedule performance, and operational efficiency in infrastructure projects. Similarly, respondents in the present study strongly agreed that insurance, contractual agreements, outsourcing, and risk-sharing mechanisms contribute to improved performance of e-mobility implementation projects. The findings also support those

of Quendrix and Solberg (2023), who found that contractual risk-sharing arrangements reduced project delays and enhanced accountability among stakeholders in transport infrastructure projects. Likewise, the present study demonstrates that clearly defined contractual responsibilities and collaborative risk-sharing mechanisms strengthen project stability and improve implementation outcomes.

From a theoretical perspective, the findings are consistent with Contingency Theory, which emphasizes that there is no single best approach to managing projects and that management practices should be adapted to the specific conditions and uncertainties of each project. The high level of agreement across the Risk Transfer indicators suggests that selecting appropriate risk-transfer mechanisms according to the nature of the risks involved can contribute to improved project outcomes. In e-mobility implementation projects, insurance can address financial exposure, contractual agreements can clarify risk responsibilities, outsourcing can provide specialized technical expertise, and risk-sharing can distribute responsibilities among project stakeholders. Therefore, the findings support the argument of Contingency Theory that project managers should match risk-management responses to the specific circumstances of the project in order to reduce uncertainty and improve Project Performance.

4.1.3 Correlation Analysis

The findings of the correlations between the independent variables and the dependent variables are summarized and presented in Table 3

Table 3: Correlation between independent variable and dependent variable

		Risk Transfer	Project performance
Risk Transfer	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	148	
Project performance	Pearson Correlation	.696**	1
	Sig. (2-tailed)	.000	
	N	148	148

Source: Primary data, 2026

The correlation results presented in Table 3 indicate that risk transfer has a strong positive and statistically significant relationship with project performance, with a Pearson correlation coefficient of $r = 0.696$ and a significance value of $p = 0.000$ ($p < 0.01$). This indicates that higher application of risk transfer practices is associated with better performance of e-mobility implementation projects in Gasabo District. Risk transfer practices such as insurance policies, contractual agreements, outsourcing, and risk-sharing arrangements can help project organizations reduce exposure to financial and operational uncertainties. The positive relationship suggests that projects applying these mechanisms more effectively are more likely to achieve better outcomes in terms of cost efficiency, timely completion, quality standards, and project scope. The analysis was based on 148 respondents.

4.1.4. Regression analysis

Simple linear regression analysis was conducted to determine the influence of risk transfer practices on the performance of e-mobility implementation projects in Gasabo District, Rwanda. The analysis examined whether changes in risk transfer practices could significantly explain variations in project performance. Risk transfer practices constituted the independent variable, while project performance was the dependent variable. The results of the regression analysis are presented in Table 4.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.696[a]	.484	.481	.27804

a. Predictors: (Constant), project performance

Dependent Variable: Project Performance

The model summary in Table 4 shows that the correlation coefficient (R) is 0.696, indicating a strong positive relationship between Risk Transfer and Project Performance. The R Square value of 0.484 indicates that Risk Transfer explains 48.4% of the variation in project performance, while the remaining 51.6% may be explained by other factors not included in the model. The Adjusted R Square of 0.481 indicates that the model retains 48.1% of

its explanatory power after adjustment. The standard error of the estimate is 0.27804, indicating the average difference between the observed and predicted values of project performance. Overall, the results imply that strengthening Risk Transfer practices can make a substantial contribution to improving project performance in e-mobility implementation projects in Gasabo District

Table 5. ANOVA results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.607	1	10.607	137.201	.000b
	Residual	11.287	146	.077		
	Total	21.894	147			

a. Dependent Variable: Project performance

b. Predictors: risk transfer

The ANOVA results in Table 5 show that the regression model is statistically significant, with an F-value of 137.201 and a corresponding significance value of p = 0.000, which is less than the 0.05 significance level. This indicates that Risk Transfer significantly predicts Project Performance. The regression sum of squares of 10.607 represents the variation in project performance explained by Risk Transfer, while the residual sum of squares of 11.287 represents the unexplained variation. The total sum of squares of 21.894 represents the overall variation in project performance. Therefore, the significant ANOVA result implies that strengthening Risk Transfer practices can contribute significantly to improving the performance of e-mobility implementation projects in Gasabo District.

Table 6. Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.906	.214		4.226	.000
	Risk transfer	.671	.057	.696	11.713	.000

a. Dependent Variable: Project performance

Table 6 presents the regression coefficients for the relationship between Risk Transfer and Project Performance. The unstandardized coefficient (B = 0.671) indicates that a one-unit increase in Risk Transfer is associated with a 0.671-unit increase in Project Performance. The standardized coefficient (Beta = 0.696) indicates a strong positive effect of Risk Transfer on Project Performance. The relationship is statistically significant because the t-value is 11.713 and p = 0.000, which is less than the 0.05 significance level. Therefore, the null hypothesis that Risk Transfer has no significant influence on Project Performance is rejected. The constant of 0.906 represents the expected level of Project Performance when Risk Transfer is zero. Overall, the findings imply that strengthening risk transfer practices such as insurance, contractual agreements, outsourcing, and risk-sharing can significantly improve the performance of e-mobility implementation projects in Gasabo District.

Table 7. Hypotheses Testing Results

Hypothesis	β	t-value	Sig. (p-value)	Decision
H_{01}: Risk Transfer has no significant influence on Project Performance.	.696	11.713	.000	Reject H_{01}

Source: Primary data, 2026

The results presented in Table 7 indicate that Risk Transfer has a positive and statistically significant influence on Project Performance. The standardized regression coefficient (β = 0.696) shows a strong positive effect, meaning that an improvement in risk transfer practices is associated with an improvement in the performance of e-mobility implementation projects in Gasabo District. The t-value of 11.713 further indicates that the estimated effect is substantially different from zero. The significance value of p = 0.000 is less than the predetermined significance level of 0.05, providing sufficient statistical evidence to reject the null hypothesis (H_{01}). This finding means that

effective risk transfer practices, including insurance arrangements, contractual agreements, outsourcing, and risk-sharing mechanisms, can significantly contribute to better project performance. The result is consistent with the manuscript, which identifies risk transfer as having the strongest positive relationship with project performance. The implication is that project managers and implementing organizations should strengthen risk transfer mechanisms to reduce exposure to financial, operational, and technical uncertainties and improve the likelihood of achieving project objectives in terms of cost, time, quality, and scope.

4.2 Discussion of Findings

The objective of this study was to assess the influence of risk transfer practices on the performance of e-mobility implementation projects in Gasabo District, Rwanda. The findings indicate that risk transfer plays an important role in improving project performance. Respondents generally agreed that risk transfer practices are widely applied in e-mobility implementation projects, particularly through insurance, contractual agreements, outsourcing, and risk-sharing mechanisms. The correlation analysis established a strong positive relationship between risk transfer and project performance, while the regression results showed that risk transfer significantly predicts project performance. These findings suggest that effective allocation of project risks to competent parties can help minimize uncertainty and support the achievement of project objectives.

The findings further demonstrate that insurance policies are important in minimizing potential financial and operational losses arising from accidents, equipment damage, theft, and other unexpected events. Contractual agreements also play an important role by clearly defining the responsibilities of different stakeholders in managing project risks. In addition, outsourcing specialized services allows project organizations to obtain technical expertise required for complex activities such as installation, maintenance, and operation of e-mobility infrastructure. These practices can reduce operational uncertainty, improve accountability, and support smoother project implementation.

The findings were also supported by the qualitative evidence obtained from key informants. The Project Manager explained that contractual arrangements with suppliers and service providers helped to share technical and financial risks, while insurance protected important project assets against unexpected losses. Similarly, the Technical Staff member indicated that outsourcing enabled the projects to access specialized expertise while reducing operational uncertainties, which contributed to timely completion and improved quality of project outputs. These views provide practical support for the quantitative findings by showing how risk transfer is applied during actual project implementation.

The findings are consistent with previous empirical studies reviewed in the manuscript. Veltrix and Morrow (2024) found that structured risk transfer mechanisms improved cost control, schedule performance, and operational efficiency in infrastructure projects. Similarly, Quendrix and Solberg (2023) reported that contractual risk-sharing arrangements reduced project delays and improved accountability among stakeholders in transport infrastructure projects. The present study therefore supports the existing evidence that insurance, contractual arrangements, outsourcing, and risk-sharing mechanisms can contribute to improved project performance.

The findings are also consistent with Contingency Theory, which proposes that there is no single best approach to managing projects and that management practices should be adapted to the specific conditions and uncertainties of a project. E-mobility implementation projects face technological, financial, operational, and environmental uncertainties, making it necessary for project managers to select appropriate risk transfer mechanisms according to the nature of the risks involved. The findings therefore demonstrate that applying context-specific risk transfer practices can reduce uncertainty, improve stakeholder accountability, and support better project outcomes in terms of cost, time, quality, and scope.

Overall, the findings confirm that risk transfer is an important project risk management practice in improving the performance of e-mobility implementation projects in Gasabo District. Effective insurance arrangements, contractual risk allocation, outsourcing, and risk-sharing can strengthen project stability, reduce exposure to unexpected losses, and improve the likelihood of successful project completion. The practical implication is that project managers and implementing organizations should strengthen these mechanisms and ensure that risks are allocated to parties with the appropriate capacity and expertise to manage them effectively.

5. Conclusion and Recommendations

5.1 Conclusion

The study concludes that risk transfer practices have a positive and statistically significant influence on the performance of e-mobility implementation projects in Gasabo District, Rwanda. The findings demonstrated that the use of insurance policies, contractual agreements, outsourcing of specialized services, and risk-sharing mechanisms contributes to improved project performance. The strong positive relationship between risk transfer and

project performance, together with the significant regression result, indicates that effective transfer of financial, technical, and operational risks to capable parties can help projects achieve better cost efficiency, timely completion, quality standards, and project scope. The study therefore concludes that strengthening risk transfer practices is important for improving the successful implementation of e-mobility projects in Gasabo District.

5.2 Recommendations

Based on the study findings, the following recommendations are made:

1. Project managers should strengthen insurance arrangements for e-mobility projects to minimize financial and operational losses associated with accidents, equipment damage, theft, and other unexpected events. This recommendation is based on the finding that respondents agreed that insurance policies are used to minimize project risks.
2. Project managers and implementing organizations should strengthen contractual risk allocation by ensuring that agreements with suppliers, contractors, and service providers clearly define responsibilities for managing project risks. This can improve accountability and reduce disputes during implementation.
3. Implementing organizations should strengthen the appropriate use of outsourcing for specialized activities such as installation and maintenance of e-mobility infrastructure. Engaging competent service providers can improve access to technical expertise and reduce operational risks.
4. Project organizations should strengthen risk-sharing mechanisms among project stakeholders by clearly allocating financial, technical, and operational risks according to the capacity of each party. This can improve project stability and support better project performance

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