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Effect of Project Planning Strategies on Performance of Wetland Restoration Project: A Case of Kigali Wetlands Restoration Project in Gasabo District, Rwanda

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Abstract: *This study examined the effect of project planning strategies on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. Specifically, the study examined the effect of risk planning, evaluated the effect of strategic planning, and assessed the effect of resource planning on project performance. The study was guided by Contingency Theory, Stakeholder Theory, and the Theory of Constraints (TOC). A descriptive and correlational research design employing both quantitative and qualitative approaches was adopted. The target population comprised 477 stakeholders involved in the implementation of the Kigali Wetlands Restoration Project. A sample size of 218 respondents was determined using Yamane's formula. The findings revealed that risk planning had a positive and statistically significant effect on project performance ($\beta = .389$, $p < 0.05$). Strategic planning had a positive but statistically insignificant effect on project performance ($\beta = .078$, $p > 0.05$). Resource planning had a positive and statistically significant effect on project performance ($\beta = .505$, $p < 0.05$) and emerged as the strongest predictor of project performance. The study concluded that effective resource planning and risk planning significantly enhance the performance of wetland restoration projects, while strategic planning requires stronger implementation mechanisms to achieve a significant contribution to project performance. The study recommended strengthening project risk management frameworks, improving resource planning and allocation practices, and enhancing the implementation of strategic planning through measurable action plans and continuous stakeholder engagement to improve the performance and sustainability of wetland restoration projects in Rwanda.*

Keywords: *Project Planning Strategies, Risk Planning, Strategic Planning, Resource Planning, Project Performance, Wetland Restoration*

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1. Introduction

Wetland restoration projects aim to rehabilitate degraded wetlands so they can recover their natural functions, including water purification, flood control, biodiversity support, and carbon storage (Ramsar Convention Secretariat, 2022). Successful projects generally require comprehensive planning strategies, such as clear goal setting, stakeholder engagement, environmental assessment, feasibility studies, adaptive monitoring, and resource allocation for implementation and long-term maintenance. Planning is essential because wetlands are complex ecological systems where hydrology, soil, vegetation, and human activities intersect; without strengthened planning, restoration can fail to achieve desired ecological or social outcomes. International agencies, such as the Environmental Protection Agency (EPA) and Ramsar Convention, emphasize establishing explicit, measurable goals and ecosystem-based plans

that account for entire watersheds, multidisciplinary teams, and monitoring frameworks to adapt as needed (EPA, 2023).

In Rwanda, wetlands cover a significant portion of the country and provide critical ecological services, but many have faced degradation due to urban expansion, agriculture, and pollution (Uwizeyimana et al., 2022). National and city-level planning, such as the Rwanda Urban Development Project II (RUDP II) and Kigali's integrated wetland revitalization plans, illustrates a strategic shift toward viewing wetlands as essential "nature-based infrastructure" for flood control, biodiversity, and community well-being. The Nyandungu Eco-Park and broader wetland restoration initiatives demonstrate how planned interventions, including hydrological reconfiguration, vegetation planting, stakeholder engagement, and alignment with city master plans, can improve ecosystem function and resilience while also delivering recreational and economic opportunities. Research in the Nyabarongo Basin further confirms that restoration practices can significantly enhance water quality and related performance outcomes. These examples show that effective planning strategies tailored to local ecological and social contexts help ensure restoration projects deliver desired environmental and development impacts (World Bank, 2025).

Wetland restoration projects are increasingly recognized as vital for sustaining ecosystem services such as flood regulation, water purification, carbon sequestration, and biodiversity conservation (Ramsar Convention Secretariat, 2022). These projects depend heavily on effective planning strategies, which encompass environmental assessments, stakeholder involvement, resource allocation, risk analysis, and clear performance benchmarks. Ideal planning should integrate ecological, social, and economic considerations to ensure restoration interventions achieve long-term benefits and resilience. Without robust planning, restoration projects risk being fragmented, poorly sequenced, or misaligned with broader land-use and development policies, reducing their potential to strengthen natural infrastructure and community well-being (Wetlands International, 2023).

one-quarter of remaining wetlands are degraded, threatening their ability to provide essential services (Reuters, 2025). In Rwanda's capital Kigali, at least 50 % of the city's wetlands are reported to have lost their ecological character significantly diminishing their capacity to absorb stormwater and regulate floods a situation that has contributed to costly flooding events and environmental stress (PreventionWeb, 2026). These disturbances carry socioeconomic consequences, including damage to infrastructure, impaired water quality, reduced agricultural productivity, and increased vulnerability to climate extremes, demonstrating that poor planning and degradation have tangible human and economic costs (Yale E360, 2025).

Although several studies have examined aspects of wetland loss, ecological impacts, and restoration outcomes, the role of specific planning strategies in shaping project performance has received limited attention in empirical literature (Duku et al., 2023). Research on Rwanda's Nyandungu Eco-Park shows that restoration significantly reduced flood–susceptible areas and improved vegetation health, but such studies tend to focus on ecological indicators rather than the planning processes that enabled these successes (Mwizerwa, 2025). Other regional literature highlights wetland degradation trends and broader ecosystem risks in Sub-Saharan Africa and East Africa, but often does not explicitly connect planning interventions with quantifiable performance outcomes (Frontiers in Environmental Science, 2024). This makes it difficult to identify which planning strategies contribute most meaningfully to project success across different restoration contexts.

These limitations reveal an important research gap: while the importance of restoration is widely acknowledged, few studies systematically assess how project planning strategies influence the overall performance of wetland restoration projects especially in East African settings like Rwanda. Most existing work either describes ecological change or outlines restoration activities without evaluating the planning dimensions (e.g., stakeholder engagement, risk mitigation, resource scheduling) that preface implementation. Thus, there is a critical need for research that links planning practices directly to performance measures, providing evidence for better planning frameworks and policy recommendations in Rwanda and beyond.

The main purpose of this study was to assess the effect of project planning strategies on the performance of Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

The specific objectives were:

1. To examine the effect of risk planning on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

2. To evaluate the effect of strategic planning on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

3. To assess the effect of resource planning on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

2. Literature Review

2.1 Theoretical Review

Theoretical frameworks provide the foundation for understanding the relationship between project planning strategies and project performance. This study is guided by three relevant theories that correspond to the specific objectives: Contingency Theory for risk planning, Stakeholder Theory for strategic planning, and Theory of Constraints (TOC) for resource planning.

2.1.1 Contingency Theory

Contingency Theory emphasizes that the success of a project is contingent upon how well management practices, including risk planning, are adapted to situational factors like project complexity, stakeholder involvement, environmental uncertainty, and resource availability (Donaldson, 2021).

The project operates in a dynamic environment with seasonal rainfall patterns, fluctuating community participation, and regulatory requirements that can affect restoration activities. Applying contingency-based risk planning allows project managers to anticipate potential obstacles such as flooding, delays in material delivery, or stakeholder conflicts and implement mitigation measures that enhance performance (Project Management Institute, 2021). By aligning risk management strategies with these local contingencies, the project can minimize disruptions, optimize the use of resources, and achieve its ecological restoration objectives efficiently and sustainably

2.1.2 Stakeholder Theory

In the context of this study, Stakeholder Theory is highly relevant because strategic planning must involve local communities, government agencies, and environmental organizations to achieve sustainable outcomes (Bourne, 2022). Engaging stakeholders in planning and implementation ensures that ecological restoration goals align with community needs, legal regulations, and resource availability. By applying stakeholder-informed strategic planning, the project can improve coordination, encourage community participation, and enhance overall project performance. Effective stakeholder engagement also increases the likelihood that restoration interventions such as wetland reforestation, erosion control, and water management are maintained long-term, ensuring sustainability of the project outcomes (Project Management Institute, 2021).

2.1.3 Theory of Constraints (ToC)

In the context of this study, ToC is particularly relevant for resource planning, as wetland restoration projects often operate under limited financial, human, and technical resources (Hillson, 2022). Activities such as reforestation, water flow regulation, and community engagement require careful prioritization of scarce resources to prevent delays and ensure project objectives are met. By applying TOC principles, project managers can identify critical constraints for example, a shortage of seedlings, insufficient labor for planting, or delays in funding disbursement and focus attention on these key areas to optimize resource utilization. Effective resource planning guided by TOC ensures that restoration activities are implemented efficiently, timelines are maintained and ecological and social benefits are achieved sustainably. Moreover, TOC provides a framework for continuous monitoring and adaptation, which is essential in dynamic environmental projects where resource availability and ecological conditions may change unpredictably.

2.2 Empirical Review

The empirical review examines existing studies on project planning strategies risk planning, strategic planning, and resource planning and their influence on project performance.

2.2.1 Risk Planning and Project Performance

Song et al. (2025) investigated the impact of risk management practices including risk identification, risk assessment, and mitigation on sustainable project performance in the construction industry across emerging economies. The study used a survey methodology involving construction project managers and applied inferential analysis to determine the effects of risk practices on performance indicators like environmental, economic, and social outcomes. The findings confirmed that all three risk management practices significantly enhanced sustainable project performance, demonstrating that proactive risk planning contributes to broader project success beyond traditional cost and time metrics. The study concluded that effective risk planning improves sustainability outcomes and recommended integrating stakeholder engagement into risk processes to strengthen performance. A research gap was identified in understanding how specific risk planning tools directly affect measurable performance outcomes across different types of projects.

2.2.2 Strategic Planning and Project Performance

Adewale and Nguyen (2023) conducted a comprehensive study on strategic planning practices and project performance in multinational infrastructure projects. Using a mixed-methods design, they surveyed 250 project managers and conducted follow-up interviews with 30 senior planners across five continents. Regression analysis revealed that strategic planning had a significant positive effect on cost performance ($\beta = 0.48$, $p < 0.01$), schedule performance ($\beta = 0.52$, $p < 0.01$), and quality outcomes ($\beta = 0.44$, $p < 0.05$). The

study concluded that projects with well-defined strategic plans, clear goals, and aligned stakeholder expectations were more likely to be completed on time and within budget. The authors recommended that organizations develop strategic planning guidelines as part of standard project procedures. A research gap identified was the need to explore context-specific strategic planning tools and their direct effects on niche sectors such as environmental or social projects.

2.2.3 Resource Planning and Project Performance

Uwizeyimana and Habumuremyi (2025) investigated resource planning and project performance in public and environmental projects, including wetlands and urban greening initiatives. Using a quantitative survey of 220 project coordinators and multiple regression analysis, results showed that effective resource planning explained 70% of project performance variation ($R^2 = 0.70$), with a positive significant coefficient ($\beta = 0.41$, $p < 0.01$). The study concluded that well-planned allocation of financial, human, and technical resources enhances project success, reduces delays, and improves ecological outcomes. Recommendations included establishing standardized resource allocation guidelines and monitoring frameworks. A research gap identified was the need for detailed studies linking resource planning to specific ecological outcomes, such as wetland restoration and community-based environmental projects.3. Methodology

3.1 Research Design

The correlational research design complements the descriptive approach by examining the relationships and associations between the independent variables (risk planning, strategic planning, and resource planning) and the dependent variable (project performance). This design enables the researcher to determine the strength and direction of these relationships, providing evidence on how variations in planning strategies affect the outcomes of wetland restoration projects. Combining descriptive and correlational designs ensures that the study not only documents current practices but also evaluates their impact on project performance in a meaningful and analytical way.

3.2 Study Population

The target population refers to the complete set of individuals or elements that the researcher intends to study and draw conclusions from (Creswell, 2014). In this study, it comprises 477 stakeholders who are directly or indirectly involved in the planning, implementation, and monitoring of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

3.3 Sample Size and Sampling

Sample size refers to the number of respondents selected from the target population to participate in a study (Kate, 2023). Determining an appropriate sample size ensures that the findings are statistically reliable and representative of the population (Yamane, 1967). For this study, the sample size was calculated using Yamane's formula, which is suitable for finite populations:

Thus, the final sample size for this study is approximately 218 respondents. This sample was drawn from all stakeholder categories involved in the Kigali Wetlands Restoration Project, including project managers, technical staff, field officers, local government officials, and community representatives. The sample size ensures sufficient representation to analyze the effect of risk planning, strategic planning, and resource planning on project performance.

Sampling techniques refer to the methods used to select a portion of the population that is representative of the whole (Winnie, 2023). The choice of sampling technique is critical to ensure that the data collected is reliable, valid, and reflects the perspectives of all relevant stakeholders. Within each stratum, respondents were selected proportionally to their population size to achieve the calculated sample of 218 participants. This approach ensures that the sample reflects the actual distribution of stakeholders in the project and that insights from each category contribute to understanding the influence of risk planning, strategic planning, and resource planning on project performance. Stratified sampling also improves the accuracy of findings and reduces potential bias compared to simple random sampling, particularly in heterogeneous populations.

3.4 Data Collection Methods and Instruments

Primary data were obtained directly from individuals who are actively involved in or affected by the Kigali Wetlands Restoration Project. The study targeted project managers, technical staff, field officers, local government officials, and community representatives as key informants. Structured questionnaires were administered to selected respondents to gather quantitative data on the implementation of risk planning, strategic planning, and resource planning, and their perceived effect on project performance. The questionnaires included closed-ended questions measured on a Likert scale to facilitate statistical analysis.

Secondary data were collected from existing sources and documents that provide background, context, and historical insights into wetland restoration projects and project management practices. Sources included project reports and records from the Kigali Wetlands Restoration Project, detailing project schedules, budgets, risk

assessments, and strategic plans. Government publications from institutions such as the Rwanda Environment Management Authority (REMA) and Gasabo District authorities were consulted to provide regulatory and policy guidance on wetland restoration. Environmental impact assessments and technical reports related to the ecological outcomes of the project were also examined. Additionally, academic literature and previous studies on project planning strategies, risk management, and resource planning in environmental and development projects were reviewed.

3.5 Pilot Study, Validity and Reliability

A pilot study was conducted to determine the reliability and clarity of the research instruments before the actual data collection. According to Mugenda and Mugenda (2003), piloting with 5–10% of the target population was appropriate. In this study, 10 participants drawn from stakeholders not included in the main study sample, such as project assistants and field officers from other wetland initiatives in Kigali, were involved in the pilot. The questionnaire was tested to identify ambiguous or misleading questions and to estimate the time required for completion. Feedback from respondents was used to refine the instruments, ensuring that the questions were clear, concise, and capable of generating the required data. The responses collected during the pilot study were excluded from the final analysis to prevent bias and maintain the integrity of the main study findings.

Validity refers to the extent to which a research instrument accurately measures what it is intended to measure, ensuring that the data collected were meaningful and relevant to the study objectives (Creswell & Creswell, 2017). In this study, validity was ensured through multiple approaches, covering content validity, construct validity, and face validity, which together enhanced the accuracy and credibility of the research instruments for assessing the effect of project planning strategies on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

The pilot study involved 10 respondents who were not included in the main study. The findings indicated that the Cronbach's Alpha coefficients ranged from 0.806 to 0.845, while the overall reliability coefficient was 0.826. Since all the coefficients exceeded the acceptable threshold of 0.70, the research instruments were considered reliable and suitable for the main data collection.

3.6 Data Analysis

Inferential statistics were used to generalize findings from the sample to the broader population involved in the Kigali Wetlands Restoration Project. This involved testing whether the independent variables (risk planning, strategic planning, resource planning) had a statistically significant effect on the dependent variable (project performance, measured in scope, schedule, quality, and cost). Techniques such as correlation and regression analysis were applied to determine the strength and direction of relationships. Pearson's correlation coefficient (r) assessed associations between each planning strategy and project performance, while multiple regression analysis examined the relative contribution of each independent variable in explaining variations in project performance. The study used the following regression model: Where: Y = Project performance a = Constant term X_1 = Risk Planning X_2 = Strategic Planning X_3 = Resource Planning ε = Error term β_1, β_2, β_3 = Regression coefficients representing the influence of each independent variable

3.7 Ethical Considerations

Before data collection, informed consent was obtained from all respondents, clearly explaining the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time without any consequences. Participants were also assured that the information they provided would be used solely for research purposes and would not be shared with unauthorized persons. Finally, the study adhered to professional research ethics, including honesty, transparency, and respect for participants' cultural and social norms. Permission was sought from relevant authorities, including project managers, local government offices, and community leaders, to conduct research activities within project sites.

4. Results and Discussions

4.1 Response Rate

The study targeted a total sample size of 218 respondents. Of these respondents, 200 questionnaires were administered to community representatives involved in the Kigali Wetlands Restoration Project in Gasabo District, representing 91.7% of the total sample. Out of the 200 questionnaires distributed, 167 questionnaires were successfully completed and returned, yielding a response rate of 83.5%. However, 33 questionnaires were not returned, representing 16.5% of the questionnaires distributed.

The response rate achieved in this study indicates satisfactory participation among the respondents and provided sufficient data for meaningful analysis and interpretation. According to Mugenda and Mugenda (2003), a response rate of 70% and above is considered adequate for research analysis. Therefore, the response rate of 83.5% obtained in this study was considered very good and sufficient for drawing reliable conclusions regarding the effect of project planning strategies on the

performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

4.2 Correlation Analysis

This section presents the results of the Pearson Product Moment Correlation analysis conducted to determine the relationship between the independent variables (risk planning, strategic planning, and resource planning) and the dependent variable (project performance). Pearson correlation analysis was considered appropriate because it measures the strength and direction of the linear relationship between variables. The correlation coefficient (r) ranges from -1 to +1, where values close to +1 indicate a strong positive relationship, values close to -1 indicate a strong negative relationship, and values close to 0 indicate little or no relationship. A significance level of 0.05 was adopted to determine whether the relationships between the study variables were statistically significant.

Table 1: Correlation Analysis between Independent and Dependent Variables

		X1	X2	X3	Y
Risk Planning (X1)	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	167			
Strategic Planning (X2)	Pearson Correlation	.721**	1		
	Sig. (2-tailed)	.000			
	N	167	167		
Resource Planning (X3)	Pearson Correlation	.294**	.381**	1	
	Sig. (2-tailed)	.000	.000		
	N	167	167	167	
Project Performance (Y)	Pearson Correlation	.675**	.590**	.567**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	167	167	167	167

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

The Pearson correlation analysis presented in Table 1 examined the relationship between the independent variables (risk planning, strategic planning, and resource planning) and the dependent variable (project performance). The findings indicate that all the independent variables have positive and statistically significant relationships with project performance at the 0.01 significance level (2-tailed). Specifically, risk planning has a strong positive relationship with project performance ($r = .675$, $p = .000$), implying that improvements in risk identification, assessment, mitigation, and monitoring are associated with improved project performance. Similarly, strategic planning has a moderate positive and statistically significant relationship with project performance ($r = .590$, $p = .000$), indicating that clearly defined objectives, stakeholder participation, and strategic coordination contribute positively to the successful implementation of the Kigali Wetlands Restoration Project. In addition, resource planning is positively and significantly related to project performance ($r = .567$, $p = .000$), suggesting that effective planning and allocation of financial, human, and material resources enhance project implementation and overall performance.

The correlation matrix further shows significant positive relationships among the independent variables. Risk planning is strongly correlated with strategic planning ($r = .721$, $p = .000$), indicating that projects with effective risk planning are also likely to exhibit effective strategic planning practices. Likewise, resource planning has positive and significant relationships with risk planning ($r = .294$, $p = .000$) and strategic planning ($r = .381$, $p = .000$), suggesting that the three planning strategies complement one another during project implementation. Song *et al.* (2025) confirmed that all three risk management practices significantly enhanced sustainable project performance, demonstrating that proactive risk planning contributes to broader project success beyond traditional cost and time metrics. The study concluded that effective risk planning improves sustainability outcomes and recommended integrating stakeholder engagement into risk processes to strengthen performance.

Since none of the correlation coefficients among the independent variables exceeds 0.80, the results indicate that multicollinearity is not a concern. Overall, the findings confirm that strengthening project planning strategies is associated with improved performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

4.3 Multiple Regression Analysis

Multiple regression analysis was conducted to determine the combined effect of risk planning, strategic planning, and resource planning on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. The analysis was also undertaken to establish the extent to which each independent variable predicts project performance while controlling the influence of the other variables. The regression results are presented

using the Model Summary, ANOVA, and Regression Coefficients tables.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.780[a]	.608	.601	.23853

Predictors: (Constant), Resource Planning, Strategic Planning, Risk Planning

Table 2 presents the model summary of the multiple regression analysis conducted to determine the combined effect of risk planning, strategic planning, and resource planning on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. The results indicate that the correlation coefficient (R = 0.780) demonstrates a strong positive relationship between the independent variables and project performance. This implies that the three project planning strategies collectively have a strong association with the performance of the Kigali Wetlands Restoration Project. Uwizeyimana and Habumuremyi (2025) investigated resource planning and project performance in public and environmental projects, including wetlands and urban greening initiatives. Using a quantitative survey of 220 project coordinators and multiple regression analysis, results showed that effective resource planning explained 70% of project performance variation ($R^2 = 0.70$), with a positive significant coefficient ($\beta = 0.41$, $p < 0.01$).

The coefficient of determination ($R^2 = 0.608$) indicates that 60.8% of the variation in project performance is explained jointly by risk planning, strategic planning, and resource planning, while the remaining 39.2% is attributed to other factors not included in the regression model. Furthermore, the Adjusted R Square of 0.601 confirms that, after adjusting for the number of predictors in the model, approximately 60.1% of the variation in project performance is explained by the three independent variables. The relatively low standard error of the estimate (0.23853) indicates that the regression model provides a good fit and reliably predicts the performance of the Kigali Wetlands Restoration Project.

Table 3: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.371	3	4.790	84.190	.000[b]
	Residual	9.274	163	.057		
	Total	23.645	166			

Dependent Variable: Project Performance (Y) Predictors: (Constant), Planning, Strategic Planning, Risk Planning

Table 3 presents the Analysis of Variance (ANOVA) results used to determine the overall significance of the regression model. The findings indicate that the regression model is statistically significant with an F-value of 84.190 and a significance value of 0.000. Since the probability value (p = 0.000) is less than the conventional significance level of 0.05, the regression model is considered statistically significant. This implies that the independent variables jointly provide a significant explanation of the variation in the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. Theory of Constraints is particularly relevant for resource planning, as wetland restoration projects often operate under limited financial, human, and technical resources (Hillson, 2022).

The ANOVA results therefore confirm that risk planning, strategic planning, and resource planning collectively has a statistically significant effect on project performance. Consequently, the regression model is appropriate for predicting project performance and for examining the individual contribution of each project planning strategy. The next section presents the regression coefficients to determine the magnitude and statistical significance of the effect of each independent variable on project performance.

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.441	.249		-1.768	.079
	Resource Planning (X1)	.498	.070	.505	7.125	.000
	Strategic Planning (X2)	.067	.063	.078	1.064	.289
	Risk Planning (X3)	.450	.061	.389	7.333	.000

Dependent Variable: Project Performance (Y)

Table 4 presents the regression coefficients showing the individual contribution of each independent variable to the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. The findings indicate that resource planning (X1) has a positive and statistically significant effect on project performance ($\beta = .505$, $t = 7.125$, $p = .000$). Since the significance value is less than 0.05, the effect is statistically significant. This implies that effective planning and allocation of financial, human, and material resources significantly improve project performance. The findings suggest that adequate resource planning enhances implementation efficiency, minimizes project delays, and contributes to the successful achievement of project objectives.

The results further reveal that strategic planning (X2) has a positive but statistically insignificant effect on project performance ($\beta = .078$, $t = 1.064$, $p = .289$). Since the significance value is greater than 0.05, the effect is not statistically significant. Although strategic planning exhibited a positive relationship with project performance, its contribution was not significant when analyzed together with the other independent variables. This suggests that strategic planning alone did not significantly predict the performance of the Kigali Wetlands Restoration Project within the regression model.

The findings also indicate that risk planning (X3) has a positive and statistically significant effect on project performance ($\beta = .389$, $t = 7.333$, $p = .000$). Since the significance value is less than 0.05, the effect is statistically significant. This finding implies that effective risk identification, assessment, mitigation, and continuous monitoring significantly improve project performance by reducing uncertainties and enhancing the successful implementation of restoration activities. Adewale and Nguyen (2023) revealed that strategic planning had a significant positive effect on cost performance ($\beta = 0.48$, $p < 0.01$), schedule performance ($\beta = 0.52$, $p < 0.01$), and quality outcomes ($\beta = 0.44$, $p < 0.05$). The study concluded that projects with well-defined strategic plans, clear goals, and aligned stakeholder expectations were more likely to be completed on time and within budget.

The regression analysis demonstrates that resource planning is the strongest predictor of project performance, followed by risk planning, both of which have statistically significant positive effects on the performance of the Kigali Wetlands Restoration Project. Although strategic planning showed a positive relationship with project performance, its effect was not statistically significant. Therefore, the findings indicate that improving resource planning and risk planning is more likely to enhance the successful implementation and overall performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

4.4 Hypotheses Testing

This section presents the results of hypothesis testing based on the multiple regression analysis conducted to determine the effect of risk planning, strategic planning, and resource planning on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda.

The hypotheses were tested at a 5% level of significance ($\alpha = 0.05$). The decision criterion was that the null hypothesis (H_0) would be rejected if the p-value was less than 0.05, indicating that the independent variable had a statistically significant effect on project performance. Conversely, the null hypothesis would be accepted if the p-value was greater than 0.05, indicating that the independent variable did not have a statistically significant effect on project performance.

The first hypothesis (H01) stated that risk planning has no statistically significant effect on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. The regression analysis revealed that risk planning had a positive and statistically significant effect on project performance ($\beta = .389$, $t = 7.333$, $p = .000$). Since the significance value was less than 0.05, the null hypothesis was rejected. The study therefore

concludes that risk planning significantly influences the performance of the Kigali Wetlands Restoration Project. This implies that effective risk identification, risk assessment, risk mitigation, and continuous monitoring contribute to improved project implementation and the successful achievement of project objectives.

The second hypothesis (H02) stated that strategic planning has no statistically significant effect on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. The regression results indicated that strategic planning had a positive but statistically insignificant effect on project performance ($\beta = .078$, $t = 1.064$, $p = .289$). Since the significance value was greater than 0.05, the null hypothesis was accepted. This finding indicates that although strategic planning demonstrated a positive relationship with project performance, its contribution was not statistically significant when analyzed together with risk planning and resource planning. Therefore, strategic planning alone did not significantly predict the performance of the Kigali Wetlands Restoration Project.

The third hypothesis (H03) stated that resource planning has no statistically significant effect on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. The findings revealed that resource planning had a positive and statistically significant effect on project performance ($\beta = .505$, $t = 7.125$, $p = .000$). Since the significance value was below 0.05, the null hypothesis was rejected. The study therefore concludes that resource planning significantly influences project performance. This finding suggests that effective planning and allocation of financial, human, and material resources enhance project implementation, improve operational efficiency, minimize delays, and contribute to the successful achievement of restoration objectives.

5. Conclusions and Recommendations

5.1 Conclusion

The study examined the effect of project planning strategies on the performance of the Kigali Wetlands Restoration Project in Gasabo District, Rwanda. The conclusions are presented according to the specific objectives of the study.

The study concludes that risk planning significantly influences the performance of the Kigali Wetlands Restoration Project. The findings demonstrated that effective risk identification, risk assessment, risk mitigation, and continuous risk monitoring improved project implementation by minimizing uncertainties and reducing operational disruptions. The regression analysis confirmed that risk planning had a statistically significant positive effect on project performance.

The study concludes that strategic planning did not have a statistically significant effect on the performance of the Kigali Wetlands Restoration Project. Although respondents acknowledged that project objectives were clearly defined, stakeholders participated in planning, and strategic plans guided project implementation, the regression analysis showed that these practices did not significantly predict project performance when considered alongside risk planning and resource planning.

The study concludes that resource planning significantly influences the performance of the Kigali Wetlands Restoration Project and is the strongest predictor of project performance. Effective planning and allocation of financial resources, human resources, materials, and equipment enhanced project efficiency, reduced implementation delays, improved coordination of restoration activities, and supported achievement of project objectives.

5.2 Recommendations

The recommendations are based on the findings and conclusions of the study and are presented according to the specific objectives.

1. The management of the Kigali Wetlands Restoration Project should establish a comprehensive risk management framework that requires regular identification, assessment, mitigation, and monitoring of project risks throughout the project lifecycle. Periodic risk review meetings should be conducted to identify emerging environmental, financial, and operational risks and implement timely mitigation measures.
2. The project management team should strengthen the implementation of strategic planning by translating strategic objectives into measurable operational plans with clearly defined responsibilities, timelines, and performance indicators. Stakeholder consultations should be conducted more regularly to ensure that strategic decisions are effectively implemented and monitored throughout the project lifecycle.
3. The management of the Kigali Wetlands Restoration Project should prioritize effective resource planning by ensuring adequate budget allocation, timely procurement of project materials and equipment, and deployment of qualified technical personnel before project implementation begins. Regular resource utilization reviews should also be conducted to minimize wastage, avoid implementation delays, and improve overall project efficiency.
4. The Rwanda Environment Management Authority (REMA), and development partners supporting wetland restoration projects should

provide adequate financial support, technical expertise, and continuous capacity-building programs on project planning, particularly in risk management and resource planning.

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