

**PROJECT MANAGER'S SKILLS AND PERFORMANCE OF CONSTRUCTION PROJECTS: A CASE OF RUKARARA HYDRO POWER PLANT PROJECT IN NYAMAGABE DISTRICT, RWANDA.**

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**ABSTRACT**

*The general objective of this research was to assess the effect of project manager's skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District, Rwanda. This study was guided by Human Capital Theory, Resource-Based View Theory, Theory of Change and Control Theory. This study used descriptive and correlational design with quantitative and qualitative approach to describe and correlate variables. The study population was 188 participants, who consisted of Project Managers, Project Team Members and Project consultants. The study used a census method to obtain data as the population was manageable. In order to analyze quantitative data, the researcher used SPSS version 25 to calculate descriptive statistics, correlations, and regression analysis. Findings from Resource Planning Skills revealed unstandardized coefficient ( $\beta_1$ ) of 0.355, indicating that for each unit increase in resource planning skills, project performance increased by 0.355 units, significant at  $p = 0.000$  with  $t=4.128$ . Leadership Skills showed a coefficient ( $\beta_2$ ) of 0.187, with a  $p$ -value of 0.010 with  $t=2.597$ , indicating that improvements in leadership skills were also positively and significantly associated with project performance. Communication Skills had a coefficient ( $\beta_3$ ) of 0.158 and was significant at  $p = 0.016$  with  $t=2.431$ , reflecting a significant positive effect on project performance. Finally, results from Monitoring and Evaluation Skills had a coefficient ( $\beta_4$ ) of 0.177, significant at  $p = 0.001$  with  $t=3.340$ , indicating its positive effect on project performance. Overall, the coefficients demonstrated that all four independent variables significantly affected performance of Rukarara Hydro Power Plant project in Nyamagabe District. This study concluded that project manager's skills specifically in resource planning, leadership, communication, and monitoring and evaluation have a significant and positive impact on the performance of the Rukarara Hydro Power Plant project in Rwanda. This research recommended that Rukarara Hydro Power Plant project should strengthen a structured communication protocols that encourage open dialogue and regular feedback among team members and stakeholders.*

**Key Words:** Project Manager's Skills, Performance of construction project, Resource planning skills, Leadership skills, Communication skills, Monitoring and evaluation skills

## 1. INTRODUCTION

In Rwanda, project manager skills practices are vital for the successful performance of construction projects, especially as the country focuses on infrastructure development to drive economic growth. With a growing emphasis on quality and sustainability, effective management practices, including leadership, planning, and stakeholder engagement, are essential for overcoming challenges and ensuring project success (Mbonabihama, 2022).

According to Ishimwe and Irechukwu (2022) project manager skills are essential for enhancing the performance of public construction projects, as the government focuses on improving education through science and technology. Effective project management practices play a significant function in resource acquisition, organization, and risk mitigation, which are crucial for successful implementation. Many stakeholders engage in construction projects to sustain their living standards, yet a significant portion does not create written project plans, indicating a gap in planning skills. Ishimwe and Irechukwu (2022) also highlighted that strong monitoring and evaluation skills are also necessary to ensure that project performance meets established goals. Therefore, strengthening project management competencies, such as strategic planning, resource management, and continuous assessment, is crucial for improving project outcomes in the district.

Kigali Golf Club and Kigali ARENA exemplify the importance of project manager skills in Rwanda's construction industry. Effective monitoring and evaluation skills are vital for tracking progress and adjusting timelines as needed (Gatsinzi & Kamande, 2023). Project risk management skills allow managers to identify potential issues, such as budget overruns or construction delays, and address them promptly. Strong leadership skills are crucial for motivating teams and ensuring effective collaboration among diverse stakeholders, leading to improved project performance. These competencies are evident in the successful execution of both projects, underscoring their role in achieving project goals and enhancing overall outcomes (Gatsinzi & Kamande, 2023).

Vision Umurenge Program (VUP) in Burera District, Rwanda indicates the importance of project manager skills for ensuring project sustainability. In the words of Niyonkuru et al. (2024), effective leadership is crucial for guiding project teams through challenges, motivating team members, and fostering a shared vision for success. Strong communication skills are essential for enhancing collaboration and information sharing, which is vital for project alignment and stakeholder engagement. Additionally, proficient problem-solving skills enable project managers to proactively identify and address challenges, ensuring smoother project execution. By investing in these skills, the government of Rwanda can significantly improve project sustainability and achieve long-term positive outcomes for the VUP program (Niyonkuru *et al.*, 2024).

### 1.1 Statement of the problem

Despite investments in energy access and sustainability, energy infrastructure performance has suffered. For instance, the 100,000-digester home biogas project failed in Rwanda in the recent past. Decentralization was supposed to increase local engagement and production, however many biogas plants failed (Ndahimana, 2023). Reports indicate that up to 10% of completed digesters produce no gas at all, while 25% of users' express dissatisfaction with the volume of biogas

generated. This under performance can be attributed to inadequate local capacity for construction and maintenance, as well as a lack of community ownership and investment in the initiative (Ndahimana, 2023).

Habiyambere and Gitahi (2023), found that over half of energy infrastructure projects had bad evaluations, suggesting inefficiencies driven by poor stakeholder participation during monitoring and assessment. Gakwaya et al. (2020), identified cost overruns in 72% of Kigali City development projects. The analysis blamed overruns on poor communication, project scope, and risk management. Effective stakeholder involvement, especially with clients and project designers, may assist clarify project objectives and expectations, improving budgeting and cost management. Another issue for Rwandan building projects is delays. Mukiza et al. (2021), observed timetable delays in 68% of Rwandan public building projects. The analysis ascribed these delays to material shortages, project scope modifications, and stakeholder miscommunication. Early stakeholder participation, including important stakeholders in planning and scheduling choices, may assist detect possible concerns and propose mitigation methods, reducing delays. Similarly, Rwandan building projects struggle with quality. Uwiringiyimana et al. (2022), surveyed Rwandan construction professionals and found 82% had quality difficulties. The research blamed these shortcomings on a lack of competent personnel, oversight, and contractor-subcontractor communication.

Previously mentioned researches including Ndahimana (2023), Habiyambere and Gitahi (2023), Gakwaya et al. (2020), Mukiza et al. (2021) and Uwiringiyimana et al. (2022) did not concentrate on the effect of project manager's skills on performance of Hydro Power Plant project in Nyamagabe District. This current study was therefore required to examine effect of project manager's skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District. In this regard, this present research sought to bridge information gaps.

## **1.2. Research hypotheses**

**H<sub>01</sub>:** There is no significant effect of project manager's resource planning skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District.

**H<sub>02</sub>:** There is no significant effect of project manager's leadership skills on the performance of Rukarara Hydro Power Plant project in Nyamagabe District.

**H<sub>03</sub>:** There is no significant effect of project manager's communication skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District.

**H<sub>04</sub>:** There is no significant effect of project manager's monitoring and evaluation skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District.

## **II. LITERATURE REVIEW**

### **2.1 Theoretical review**

This study was guided by Human Capital Theory, Resource-Based View Theory, Theory of Change and Control Theory.

### **2.1.1 Human Capital Theory**

Human capital theory, originally developed by Becker (1962) and Rosen (1976), suggests that individuals possess skills and capabilities that can be enhanced or expanded through education and training. This theory posits that investments in education, training, and skill development enhance an individual's productivity, leading to better performance and economic returns. In various fields, including project management, human capital is seen as a critical factor influencing organizational success (Griffen, 2024).

Human Capital theory was adopted to explore how the project manager's skills, seen as a form of human capital, impact the overall performance of the Rukarara Hydro Power Plant project. This study focused on evaluating the effect of investing in these competencies, particularly planning, leadership, and communication, and how such investment enhances the efficiency, productivity, and success of the construction project.

### **2.1.2 Resource-Based View (RBV) Theory**

The Resource-Based View (RBV) theory was formally introduced by Jay Barney in 1991. This theory posits that an organization's unique resources and capabilities are fundamental to achieving a competitive advantage and superior performance. Unlike traditional views that emphasize external market conditions, RBV focuses on the internal strengths of an organization, highlighting the importance of leveraging distinct resources to drive success (Alm & Chiu Falck, 2024).

Resource-Based View (RBV) Theory helped to explain how the project manager's skills are valuable resources that contribute to the competitive performance of the Rukarara Hydro Power Plant project. The study investigated how the unique capabilities of the project manager, such as leadership and communication, are leveraged to enhance project execution, resulting in improved outcomes and long-term project success.

### **2.1.3 Theory of Change (ToC)**

Theory of Change (ToC) was popularized in 1995 by Carol Weiss. It has undergone evolution, particularly in the domains of social change and program assessment (Jones et al., 2023). The Theory of Change challenges businesses to critically examine their assumptions, explain their aims, and define the precise actions required for successful change. It encourages thorough assessment and flexible management techniques, utilizing stakeholder feedback to enhance strategy progressively. In project management, especially for sustainable agriculture initiatives, the Theory of Change (ToC) is an essential instrument for planning, execution, and evaluation (Varzakas & Smaoui, 2024).

Theory of Change (ToC) helped to identify the desired outcomes of hydro power projects in Nyamagabe District and outlines the necessary preconditions, activities, and processes needed to achieve these outcomes.

### 2.1.4 Control Theory

Control Theory, specifically in the context of sociology and criminology, was developed by Travis Hirschi in 1969. This theory assists practitioners in conceptualizing how their initiatives will achieve desired goals while considering external elements and hazards that may affect success. It encourages thorough assessment and flexible management techniques, utilizing stakeholder feedback to enhance strategy progressively. (Proskurina & Nikitina, 2023).

Control theory was relevant to studying the effect of a project manager's leadership skills on project performance as it emphasizes the importance of feedback mechanisms in guiding and adjusting team behaviors and project outcomes. Project managers utilized their leadership skills to establish clear objectives, provide direction, and engage in continuous monitoring of team performance.

## 2.2 Empirical Review

Kirmizi and Kocaoglu, (2022) explored the factors impacting ERP project success, focusing on the project manager's role during the preparation stage. Data were collected from ERP project managers in Turkey in 2019, using principal component analysis and multiple regression analysis. The results indicated that four components: change management, employee buy-in, project planning, and project management, explained 65.179% of the variance in ERP project success. Regression analysis revealed significant relationships between ERP project success and change management ( $R^2 = 0.611$ ), employee buy-in ( $R^2 = 0.506$ ), and project planning ( $R^2 = 0.431$ ). However, no significant correlation was found between top-level management support and project success ( $P = 0.694$ ). The study concluded that focusing on the project life cycle phases can better address issues in lengthy ERP projects.

Tahir (2020) examined the impact of project managers' soft skills on project success, particularly in planning, execution, and evaluation phases. A quantitative approach with a cross-sectional design was used, and data were collected through convenience non-random sampling. The findings indicated that key soft skills, such as communication ( $\alpha = 0.394$ ,  $P < 0.05$ ), team development ( $\alpha = 0.618$ ,  $P < 0.05$ ), and problem-solving ( $\alpha = 0.424$ ,  $P < 0.05$ ), had the most significant influence on project success. However, the hypothesis linking coordination abilities with interpersonal skills was not supported. According to the  $R^2$  value, interpersonal skills accounted for 78.3% of the variance in project outcomes. The results highlight the importance of soft skills in determining project success, suggesting that organizations should focus on enhancing communication, teamwork, and problem-solving abilities in project managers to improve project performance and outcomes.

Rehan *et al.* (2024) examined the behavioral practices of project managers as leaders within the Australian construction industry, aiming to address gaps in empirical literature. Data were quantitatively collected from 66 project managers using a survey questionnaire, leading to the identification of four critical success factors among thirteen leadership practices: Relationship Management, Leading by example, Self-Management, and Interpersonal Sensitivity. These practices emphasize the significance of inclusivity, relationship building, objective self-feedback,

information sharing, and emotional regulation. The synthesis of data indicated a tendency towards adopting creative behaviors that foster positive change, along with transformational, transactional, and authentic leadership styles, all of which are essential for project success.

Natif and Irechukwu (2022) explored the impact of monitoring and evaluation (M&E) on the effectiveness of the Strengthening School Readiness (SSR) project, supported by Voluntary Services Overseas (VSO). The research utilized a mixed-methods approach, combining quantitative and qualitative data from 145 participants through surveys, interviews, and document analysis. The findings revealed that M&E played a critical role in the success of the SSR project, showing significant improvements in key areas. The project experienced a 139.5% rise in funding, a 125% increase in the number of assisted children, and an 84% improvement in reading rates. Pearson correlation results demonstrated strong positive relationships between formative evaluation ( $r=.601$ ,  $p<.01$ ), process evaluation ( $r=.718$ ,  $p<.01$ ), and participatory evaluation ( $r=.852$ ,  $p<.01$ ) with project performance. These findings suggest that M&E processes should be strengthened to further boost performance, providing valuable insights for future research and NGO project implementation.

### **III. METHODOLOGY**

#### **3.1 Study Design**

Descriptive research design was adopted for this study. It was chosen as it quantified and evaluated many components of the project while also using quantitative research approaches. This entailed numerical measurements in data collecting and analysis procedures. This research similarly conducted correlational research design to look at the connections between the four variables.

#### **3.2 Study population and sampling**

The study population was 188 participants, consisting of Project managerial staff (Managing Director, Country Director and 2 Division managers), Project Team members (coordinators, supervisors and skilled field officers,) and Project consultants (Financial Advisory, Strategic consultants and Management Consultants).

The study used a census inquiry method and this decision was based on the small size of the target population. Therefore, data was collected from every single individual or unit within the entire target population of 188.

#### **3.3 Data Collection Methods**

Primary data was obtained by use of questionnaires which were sent to each participant. There were closed-ended questions on the survey. In order to answer a closed question, respondents selected one response from a predefined list of possibilities.

Documentation was used by the researcher to collect secondary data. In order to put together the materials for this study, the researcher analyzed and evaluated the texts' relevance to the study using documents, categorized them on manuscripts, and finally typed them into a computer.

### 3.4 Data Analysis

Bivariate correlation analysis was used to examine the validity of hypotheses, ensuring that one dependent variable was tested against one independent variable. It is one of the most basic types of statistical analysis used to determine whether there is a link between two sets of numbers. It usually involves two variables: X and Y. Bivariate analysis examines exactly two variables. Pearson Correlation (r) ranges between  $\pm 1$  and can be positive, negative, strong, or weak based on test findings, with a range of [-1; +1]. It also considers Sig. (2-Tailed) to assess statistical significance of tested variables. This value should be less than or equal to 0.05 to be considered statistically significant.

The researcher presented the findings in the form of figures and statistics, which provided the reader with a more comprehensive knowledge of the findings. For descriptive statistics, respondents were asked to rate their level of agreement or disagreement on a 5-point scale, with 1 indicating Strongly Disagree and 5 indicating Strongly Agree.

The adopted model was presented as follow:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

Y = Project performance

$\alpha$  = Constant term

X<sub>1</sub> = Resource Planning Skills

X<sub>2</sub> = Leadership Skills

X<sub>3</sub> = Communication Skills

X<sub>4</sub> = Monitoring and Evaluation Skills

$\beta$  = Beta coefficient

### 3.5 Ethical consideration

The researcher respected the right to free expression by keeping responders' identities secret. Informed permission was sought and respondents were requested to participate in this study. The selected participants were politely requested for their time when answering questions. The researcher promised to utilize information provided for the reasons indicated in the survey, and to keep any other responses completely private. Respondents' identities were not requested by researcher on the survey in any way to ensure their privacy.

## IV. FINDINGS & DISCUSSIONS

### 4.1 Response Rate

The response rate was determined by calculating the percentage of completed surveys relative to the total number of participants. This was achieved by dividing the number of completed surveys by the number of participants.

**Table 1: Response rate**

	Frequency	Percent
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Filled questionnaire	177	94.15
Incomplete questionnaire	11	5.85
<b>Total</b>	<b>188</b>	<b>100.00</b>

**Source: Research Findings, 2024**

Table 1 illustrates the response rate for the surveys distributed, showing that a total of 188 questionnaires were administered. Out of these, 177 were fully completed, accounting for 94.15% of the total responses. Conversely, only 11 questionnaires were incomplete, representing 5.85% of the total. This high completion rate indicated strong engagement from participants and indicates that the gathered data was likely to be reliable for further analysis.

**4.2 Correlation Analysis**

Correlation analysis is a statistical method used to assess the degree of association between two or more variables. This type of analysis helped in identifying the strength and direction of the relationships present in the data. In the context of this study, correlation analysis played a crucial role in examining how various skills of project managers skills such as resource planning, leadership, communication, and monitoring and evaluation related to project performance.

**Table 2: Correlations**

		<b>Resource Planning Skills</b>	<b>Leadership Skills</b>	<b>Communication Skills</b>	<b>Monitoring and Evaluation Skills</b>	<b>Project performanc e</b>
Resource	Pearson	1	.729**	.715**	.634**	.752**
	Correlation					
Planning	Sig. (2-		.000	.000	.000	.000
g Skills	tailed)					
	N	177	177	177	177	177
Leadership	Pearson	.729**	1	.664**	.370**	.643**
	Correlation					
Skills	Sig. (2-	.000	.000	.000	.000	.000
	tailed)					
	N	177	177	177	177	177
Communication	Pearson	.715**	.664**	1	.509**	.660**
	Correlation					
Skills	Sig. (2-	.000	.000	.000	.000	.000
	tailed)					
	N	177	177	177	177	177
Monitoring and	Pearson	.634**	.370**	.509**	1	.592**
	Correlation					
Evaluation	Sig. (2-	.000	.000	.000	.000	.000
	tailed)					

on	N	177	177	177	177	177
Skills						
Project	Pearson	.752**	.643**	.660**	.592**	1
perform	Correlation					
ance	Sig. (2-tailed)	.000	.000	.000	.000	
	N	177	177	177	177	177

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

**Source: Research Findings, 2024**

Table 2 presents the correlation coefficients among the project manager's skills (resource planning, leadership, communication, and monitoring and evaluation) and performance of Rukarara Hydro Power Plant project. The results indicated significant positive correlations denoted by \*\* with the p value less than significance level of 0.05 across all variables. Specifically, resource planning skills showed a significant and strong correlation with project performance ( $r = 0.752$ ,  $p < 0.05$ ). Leadership skills also showed a significant moderate correlation with project performance ( $r = 0.643$ ,  $p < 0.05$ ). Furthermore, communication skills ( $r = 0.660$ ,  $p < 0.05$ ) and monitoring and evaluation skills ( $r = 0.592$ ,  $p < 0.05$ ) demonstrated significant moderate correlation with project performance as well. Overall, these correlations provided a strong evidence that each of the project manager's skills positively correlated performance of Rukarara Hydro Power Plant project in Nyamagabe District.

The findings are in line with Tahir (2020) who examined the impact of project managers' soft skills on project success, particularly in planning, execution, and evaluation phases. According to the  $R^2$  value, interpersonal skills accounted for 78.3% of the variance in project outcomes. The results highlight the importance of soft skills in determining project success, suggesting that organizations should focus on enhancing communication, teamwork, and problem-solving abilities in project managers to improve project performance and outcomes.

### 4.3 Regression Analysis

Regression analysis is a powerful statistical technique used to understand the relationship between one dependent variable and one or more independent variables. The model summary provides essential metrics, such as the R-squared value, which indicates the proportion of variance in the dependent variable that can be explained by the independent variables. In the ANOVA table, the significant p-value (typically less than 0.05) confirms that at all combined variables significantly influence the dependent variable. The coefficients table offers detailed information on each independent variable's influence to the model and corresponding p-values, which signify their individual significance.

**Table 3: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.793 <sup>a</sup>	.628	.619	.31292

a. Predictors: (Constant), Monitoring and Evaluation Skills, Leadership Skills, Communication Skills, Resource Planning Skills

**Source: Research Findings, 2024**

The Model Summary Table 3 indicated the regression model in predicting project performance based on the four independent variables: Monitoring and Evaluation Skills, Leadership Skills, Communication Skills, and Resource Planning Skills. The R value of 0.793 signified a strong and positive correlation between the independent variables and project performance. The R-squared value of 0.628 indicated that approximately 62.8% of the variance in performance of Rukarara Hydro Power Plant project in Nyamagabe District was explained by the independent variables in the model. Since 62.8% of the variance was explained by the model, 37.2% was not explained by the predictors in this model.

This unexplained variance might have been due to other factors not included in the model or measurement error. In their study Kirmizi and Kocaoglu, (2022) explored the factors impacting ERP project success, focusing on the project manager's role during the preparation stage. The results indicated that four components: change management, employee buy-in, project planning, and project management, explained 65.179% of the variance in ERP project success. Regression analysis revealed significant relationships between ERP project success and change management ( $R^2 = 0.611$ ), employee buy-in ( $R^2 = 0.506$ ), and project planning ( $R^2 = 0.431$ ). The study concluded that focusing on the project life cycle phases can better address issues in lengthy ERP projects.

**Table 4: ANOVA**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	28.445	4	7.111	72.561	.000 <sup>b</sup>
Residual	16.842	172	.098		
Total	45.287	176			

a. Dependent Variable: Project performance

b. Predictors: (Constant), Monitoring and Evaluation Skills, Leadership Skills, Communication Skills, Resource Planning Skills

**Source: Research Findings, 2024**

The ANOVA findings in table 4 assessed the overall significance of the regression model. The F-statistic was 72.561, with a corresponding significance level (p-value) of .000. This p-value was well below the standard threshold of 0.05, indicating that the regression model significantly predicted performance of Rukarara Hydro Power Plant project in Nyamagabe District. This is in accordance with Rehan et al. (2024) who examined the behavioral practices of project managers

as leaders within the Australian construction industry. Data were quantitatively collected from 66 project managers using a survey questionnaire, leading to the identification of four critical success factors among thirteen leadership practices: Relationship Management, Leading by Example, Self-Management, and Interpersonal Sensitivity. The synthesis of data indicated a tendency towards adopting creative behaviors that foster positive change, along with transformational, transactional, and authentic leadership styles, all of which are essential for project success.

**Table 5: Coefficients**

Model	Unstandardized		Standardized		
	Coefficients		Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	.441	.203		2.172	.031
Resource Planning Skills	.355	.086	.360	4.128	.000
Leadership Skills	.187	.072	.190	2.597	.010
Communication Skills	.158	.065	.172	2.431	.016
Monitoring and Evaluation Skills	.177	.053	.205	3.340	.001

a. Dependent Variable: Project performance

**Source: Research Findings, 2024**

The adopted model was presented as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Whereby:

$$Y = 0.441 + 0.355 (\text{Resource Planning Skills}) + 0.187 (\text{Leadership Skills}) + 0.158 (\text{Communication Skills}) + 0.177 (\text{Monitoring and Evaluation Skills}) + 0.203$$

The Coefficients Table 5 provided specific influence of each independent variable on project performance. Resource Planning Skills had an unstandardized coefficient of 0.355, indicating that for each unit increase in resource planning skills, project performance increased by 0.355 units, significant at  $p = 0.000$  with  $t = 4.128$ . Leadership Skills showed a coefficient of 0.187, with a  $p$ -value of 0.010 with  $t = 2.597$ , indicating that improvements in leadership skills were also positively and significantly associated with project performance. Communication Skills had a coefficient of 0.158 and is significant at  $p = 0.016$  with  $t = 2.431$ , reflecting a significant positive effect on project performance.

Finally, Monitoring and Evaluation Skills had a coefficient of 0.177, significant at  $p = 0.001$  with  $t = 3.340$ , indicating its positive effect on project performance. Natif and Irechukwu (2022) explored the impact of monitoring and evaluation (M&E) on the effectiveness of the Strengthening School Readiness (SSR) project, supported by Voluntary Services Overseas (VSO). The project experienced a 139.5% rise in funding, a 125% increase in the number of assisted children, and an 84% improvement in reading rates. Pearson correlation results demonstrated strong positive relationships between formative evaluation ( $r = .601$ ,  $p < .01$ ), process evaluation ( $r = .718$ ,  $p < .01$ ), and participatory evaluation ( $r = .852$ ,  $p < .01$ ) with project performance. Overall,

the coefficients demonstrated that all four independent variables significantly affected performance of Rukarara Hydro Power Plant project in Nyamagabe District.

#### **4.4 Hypotheses Results**

The results of the null hypotheses testing indicated whether there were no significant effects of project manager skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District.

For  $H_{01}$ : There was no significant effect of project manager's resource planning skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District, the p-value of 0.000 was less than the 0.05 threshold, leading to the rejection of the null hypothesis. Similarly,  $H_{02}$ : There was no significant effect of project manager's leadership skills on the performance of Rukarara Hydro Power Plant project in Nyamagabe District was also rejected, as the p-value of 0.010 indicated a significant effect. In the case of  $H_{03}$ : There was no significant effect of project manager's communication skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District, the p-value of 0.016 also resulted in the rejection of the null hypothesis, affirming a positive influence on project performance. Lastly,  $H_{04}$ : There was no significant effect of project manager's monitoring and evaluation skills on performance of Rukarara Hydro Power Plant project in Nyamagabe District showed a p-value of 0.001, leading to the rejection of the null hypothesis as well. In conclusion, the analysis indicated that all four skills: resource planning, leadership, communication, and monitoring and evaluation significantly enhanced the performance of Rukarara Hydro Power Plant project in Nyamagabe District.

## **V. CONCLUSION AND RECOMMENDATIONS**

### **5.1 Conclusion**

This study concluded that project manager's skills specifically in resource planning, leadership, communication, and monitoring and evaluation have a significant and positive impact on the performance of the Rukarara Hydro Power Plant project in Rwanda. The rejection of all null hypotheses ( $H_{01}$ - $H_{04}$ ) confirms that each of these skill areas plays a critical role in enhancing project outcomes, fostering effective teamwork, stakeholder collaboration, and proactive problem-solving.

### **5.2 Recommendations**

This study recommended that Rukarara Hydro Power Plant project should strengthen structured communication protocols that encourage open dialogue and regular feedback among team members and stakeholders. At the same time, Rukarara Hydro Power Plant project should encourage a culture of collaboration and teamwork among project staff. To this end, regular team-building activities and collaborative planning sessions can help build rapport and trust among team members, enhancing overall productivity and project performance.

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