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THE INFLUENCE OF PROJECT MONITORING AND EVALUATION PRACTICES ON THE SUSTAINABILITY OF WATER SUPPLY PROJECT IN RWANDA: A CASE OF RUBONA WATER SUPPLY PROJECT (2021-2024)

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ABSTRACT

With an emphasis on the Rubona Water Supply Project in Kirehe District from 2021 to 2024, this study investigates how project monitoring and evaluation (M&E) procedures support the sustainability of water supply projects in Rwanda. The study's objectives were to appraise the project's M&E practices, gauge its degree of sustainability, and investigate the relationship between M&E practices and project sustainability. Using a descriptive and causal research strategy, 16,936 stakeholders including 16,858 recipients and 78 project staff were targeted. 391 participants made up the sample, which was chosen using suitable sampling techniques. Questionnaires, interviews, and document analysis were used to collect data, and descriptive and inferential statistical tools were used for analysis. Results indicate that the Rubona Water Supply Project uses M&E techniques that work. Important M&E components received high ratings, including M&E budgeting (mean = 4.55), partnerships in the M&E framework (mean = 4.07), communication in M&E (mean = 4.17), human resource capability in M&E (mean = 4.45), and M&E information exchange and utilisation (mean = 4.32). With an overall high sustainability score (mean = 4.36), project sustainability also shown a notable improvement over the study period. Interestingly, 89.5% of respondents affirmed that the project could complete significant repairs on schedule (mean = 4.76), and 82.6% strongly agreed that infrastructure such as water pipelines and tanks remained in good shape (mean = 4.55). The study found that M&E techniques and sustainability had a strong positive correlation. Strong relationships between sustainability and M&E components were found through correlation analysis. These included M&E budgeting ($r = 0.722^{**}$, $p = 0.000$), human resource capacity in M&E ($r = 0.510^{**}$, $p = 0.000$), M&E partnerships ($r = 0.615^{**}$, $p = 0.002$), communication advocacy ($r = 0.378^{**}$, $p = 0.000$), and M&E information sharing and utilisation ($r = 0.707^{**}$, $p = 0.000$). M&E budgeting has the biggest impact on

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sustainability, according to regression analysis, which also showed that M&E practices considerably contribute to sustainability ($\beta 5 = 0.579$, $p = 0.000$). The study comes to the conclusion that M&E initiatives, specifically those related to budgeting, communication, collaborations, information sharing, and human resource capability, are responsible for 63.1% of the changes in project sustainability.

In light of these findings, the study suggests that in order to support the long-term viability of water supply projects in Rwanda, project management improve M&E frameworks by placing a strong emphasis on budget planning, teamwork, and information-sharing mechanisms.

Keywords: Project monitoring and evaluation practices, sustainability, water supply projects, Rwanda.

1. INTRODUCTION

In order to improve their sustainability results, public sector organisations all over the world have integrated Monitoring and Evaluation (M&E) responsibilities over the last fifty years. The growing awareness of M&E as an essential element has prompted numerous projects to include these practices into their operations. In recent years, government-led initiatives have continued to be important service providers, and sustainability criteria and indicators are crucial instruments for directing project management and influencing legislative choices (Mbiti & Kiruja, 2015).

In project management, sustainability guarantees that a project's fundamental goals, tenets, and effects endure after its first phase of implementation. By providing managers and stakeholders with insights for improvement and decision-making, the appropriate use of M&E tools greatly increases project success (Bell & Morse, 2014). Tracking progress, assessing impact, and encouraging responsibility are all made possible by efficient monitoring and feedback systems, which in turn affect project performance and long-term viability (Abeyrama & Karl, 2018; Aden, 2018). According to the World Bank (2016), it is impossible to tell whether initiatives are moving in the correct direction, producing the desired results, or needing to be adjusted for increased efficiency without adequate planning, monitoring, and evaluation.

M&E systems have been around for centuries and have changed to satisfy the modern expectations for accountability and openness. M&E is used by a number of organisations, such as governments, non-governmental organisations, and development organisations, to evaluate the efficacy of development and improve operational transparency (Mulwa, 2018; Agaba & Mulyungi, 2018). As a strategic approach to accountability and results-based management, nations such as Canada have made significant investments in M&E. These systems have changed throughout time, giving the implementation process top priority in order to foster an organisational culture of performance monitoring and evaluation (Zvoushe & Gideon, 2013).

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In Spain, M&E is essential to reaching sustainability objectives in the social, environmental, and economic spheres. Over time, France's M&E systems have undergone a systematic change that reflects shifting expectations and growing evaluation frameworks (Roger & Tim, 2018). However, the lack of sustainable M&E frameworks has hampered project effectiveness in many African regions, especially rural ones. For example, just 47% of rural residents in sub-Saharan Africa have access to improved water sources, a problem that is frequently attributed to insufficient monitoring and evaluation procedures (UN, 2010). Research conducted in Tanzania, Ghana, and Nigeria shows that many development projects, especially those pertaining to water delivery, fail because of inadequate M&E planning (Paulinus & Iyenemi, 2014; Gine & Perez-Foguet, 2008).

Although Kenya has made great progress in putting national M&E systems into place, enduring issues such as limited funding and dispersed sectoral data continue to impede efficacy. Improved institutional capacity and improved coordination among current M&E procedures are required to address these problems (World Bank, 2016; Phiri, 2015).

Concerns about sustainable water supply projects are comparable in Rwanda. Assuring successful project sustainability continues to be a national issue, with an estimated renewable water resource of 692m^3 per capita year below the suggested minimum of 1,000m^3 (UNDP, 2019). Despite having official M&E systems, Rwanda's project control procedures do not fully incorporate them (Abdulkadir, 2018). In line with the National Sanitation Policy Implementation Strategy, the National Strategy for Transformation (NST1) aims to provide universal access to water and better sanitation by 2024 (MININFRA, 2016). However, local communities must be involved in monitoring and evaluation if these goals are to be successfully achieved.

Through an analysis of the Rubona Water Supply Project, this study aims to assess how M&E practices affect the sustainability of water supply projects in Rwanda. This study offers insights on enhancing the sustainability of the nation's water infrastructure by investigating the ways in which M&E affects project effectiveness.

1.1. Problem statement

Project managers work to improve project performance by ensuring timely completion, adherence to budget constraints, and fulfilment of key objectives such as meeting product specifications, addressing customer needs, fostering community ownership, and ensuring financial and technical sustainability (Respicius, 2018). Monitoring and evaluation (M&E) are widely acknowledged as critical factors in ensuring the sustainability of projects, contributing to their long-term success (Kamalesh & Shashi, 2018).

Notwithstanding these anticipations, a number of water supply projects in Rwanda have encountered enduring difficulties, such as budget overruns, design standards not being reached,

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management goals not being met, and project delays (Auditor General's Report, 2008). The lack of participation of important stakeholders in project operations has been one of the main causes of these failures. Despite significant financial investments in their implementation, a number of development initiatives in Kirehe District, like those in many other places, have not been able to continue after donor assistance has ended. Consequently, communities are deprived of the anticipated advantages of these water delivery projects due to subpar project performance and limited sustainability.

In order to provide clean and accessible water to all Rwandans, significant investments have been made in the country's water and sanitation sector; however, there are still issues, as 43% of the population lacks access to safe drinking water within 30 minutes of their homes, 45% report that there is a lack of community ownership over water supply projects (MININFRA, 2020), approximately 30% of installed water schemes are either inoperative or fail to provide clean water, 32.6% of the population expresses concerns about the affordability of potable water, and 56.7% of water projects suffer from poor technical sustainability, including inadequate equipment, such as water pumps that are necessary to ensure that water reaches all intended beneficiaries.

As a result, a lot of people in the community still walk great distances to find water, which undermines the main goal of these projects and reduces their overall efficacy (MININFRA, 2020). A number of factors contribute to Rwanda's water projects' sustainability issues, such as low community involvement in M&E initiatives, inadequate project management capacity building, low revenue mobilisation by water service providers, high operating costs, and poor upkeep of current water systems. The absence of adequate management structures has led to uncertainties surrounding project viability, with many projects ceasing to function quickly after external financing and technical support are withdrawn (MININFRA, 2020).

Using the Rubona Water Supply Project in Kirehe District as a case study, this study aims to evaluate the degree to which M&E practices impact the sustainability of water supply projects in Rwanda. This study intends to offer insights into enhancing the long-term viability of the nation's water infrastructure by examining important M&E components and their effects on project outcomes.

1.2. Specific objectives

1. To assess monitoring and evaluation practices used by management of Rubona water supply project in Kirehe District.
2. To determine the level of sustainability of Rubona water supply project in Kirehe District during the period of 2018-2021.
3. To find out the relationship between monitoring and evaluation practices and sustainability of Rubona water supply project in Kirehe District.

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1.3. Hypotheses

Ho: There is no significant relationship between monitoring and evaluation practices and sustainability of Rubona water supply project in Kirehe District.

H_1: There is significant relationship between monitoring and evaluation practices and sustainability of Rubona water supply project in Kirehe District.

2. LITERATURE REVIEW

2.1. Theoretical Framework

The Theory of Change, Stakeholder Theory, Results-Based Management (RBM) Theory, Resource Allocation Theory, and Organisational Learning Theory are some of the important theories that form the basis of this investigation. These ideas offer a fundamental comprehension of how Monitoring and Evaluation (M&E) procedures impact water delivery projects' sustainability.

2.1.1. Theory of Change

Weiss (1995) established the Theory of Change, which describes how actions made in a project, program, or policy result in a sequence of outcomes that help achieve the desired or observed impacts. Although this idea is frequently used during the planning phase, it is also useful for monitoring and assessment. Effectively applied M&E procedures act as vital inputs that facilitate data processing that eventually yields quantifiable results.

This research argues that adopting the right M&E practices is crucial for project success and sustainability. The Theory of Change helps understand how M&E partnerships and work plan processes influence sustainability. By evaluating project information over time, this theory helps measure the outcomes of the Rubona Water Supply Project in Kirehe District against its original objectives. In order for change to occur, stakeholders must be trained, and the right environment for capacity building mu

2.1.2. Stakeholder Theory

Stakeholders are defined by Freeman (1984) as people or groups that influence or are influenced by an organization's goals. This idea highlights how crucial moral principles and values are to organisational management. The Project Management Institute (PMI, 2004) asserts that project stakeholders actively engage in or are impacted by the implementation and results of a project. Furthermore, Chinyio and Olomolaiye (2010) contend that stakeholders have the power to positively or negatively affect an organization's operations, objectives, and sustainability.

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Although this theory has been criticised, Blattberg (2004) argues that it assumes stakeholder interests can only be compromised or balanced rather than harmonised through open dialogue, and Mansell (2014) further criticises the theory for excluding non-human entities, such as the environment, from stakeholder considerations. Nevertheless, effective stakeholder management is essential for successful project implementation, as a lack of commitment from stakeholders can lead to project failure.

This theory offers a critical perspective for comprehending the function of stakeholder participation in M&E, notwithstanding these objections. The success and sustainability of water projects can be improved by guaranteeing efficient stakeholder participation in planning, management involvement, baseline surveys, and technical competence. Khwaja (2004) asserts that collaboration between implementing agencies and project beneficiaries maximises the effectiveness of participation. Additionally, Braithwaite et al. (2002) stress that improved project outcomes result from the coordinated mobilisation of all stakeholders.

Yang et al. (2009) examined important aspects of project success, including dispute resolution, managing stakeholder qualities (power, urgency, and closeness), and adjusting stakeholder impact over the course of the project. This notion is in line with the study's emphasis on guaranteeing sustainable project outcomes because M&E partnerships involve a variety of stakeholders.

2.1.3. Results-Based Management (RBM) Theory

Originating in Australia in the middle of the 1980s, the Results-Based Management (RBM) Theory rose to prominence in the 1990s thanks to the Organisation for Economic Co-operation and Development (OECD). According to Crawford and Bryce (2013), RBM is a strategic management method that guarantees all parties involved in development projects, whether directly or indirectly, contribute to attaining sustainable results.

RBM incorporates systematic planning, vision setting, and structured execution, with monitoring playing a crucial role in achieving sustainable results. Feedback mechanisms within RBM facilitate learning and adaptation, enabling adjustments based on lessons learnt from ongoing projects. Hwang and Lim (2013) emphasise the importance of monitoring as an integral aspect of project execution. Effective monitoring involves organised data collection, performance analysis using indicators, and periodic reporting. Valadez and Bamberger (2012) note that baseline data collection at the project's inception is crucial for tracking progress. RBM is centred on accountability and performance monitoring, requiring clearly defined responsibilities, continuous self-assessment, and documentation of progress (UNDP, 2012).

Evaluation under RBM is independent and externally validated, in contrast to monitoring, which is essentially an internal management function. Credible, trustworthy, and practical assessments

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ought to offer evidence-based conclusions that guide decision-making, according to Robert (2010). Stakeholder participation in assessments improves accountability and project success, according to Clarke (2011).

By guaranteeing performance-based monitoring and reporting systems, RBM makes a substantial contribution to project sustainability. It closely corresponds with important M&E components like stakeholder partnerships, capacity building, and planning procedures, all of which are essential for long-term project results. This theory emphasises how crucial organised planning and knowledgeable workers are to the long-term success of a project.

In conclusion, this study's examination of how M&E practices affect the sustainability of water supply projects is informed by these ideas taken together. This study intends to create a thorough framework for improving the long-term viability of water infrastructure projects in Rwanda by combining components from the Theory of Change, Stakeholder Theory, and RBM.

2.2. Empirical Evidence

2.2.1. Integrated Monitoring and Evaluation Flow for Sustainable Investment Projects in Romania.

Developing an Integrated Monitoring and Evaluation Flow for Sustainable Investment Projects in Romania was the title of a study conducted by Tache (2011). For investment projects with economic goals and intersecting social and environmental ambitions, the study's goal was to create a general integrated flow that included both a project monitoring system and a project evaluation system. The method was shown as a flowchart, which offered a formal framework for logical monitoring and assessment while emphasising the connection between the processes of monitoring and evaluation. Using critical analysis, the study discovered that monitoring and evaluation have a favourable impact on Romanian initiatives' sustainability.

2.2.2. Influence of Monitoring and Evaluation on Implementation of WASH Projects in Kenya.

The Impact of Monitoring and Evaluation Procedures on the Execution of Water, Sanitation, and Hygiene (WASH) Initiatives in Kenya: An Analysis of the UNICEF Program in Kajiado County was the subject of a study by Ndegwa (2020). The stakeholder theory and the theory of change served as the study's guiding principles as it examined how the M&E process affected the execution of the WASH project. The study focused on program recipients and UNICEF Kenya staff using a descriptive survey research design. Using SPSS, data analysis revealed a significant positive connection (0.736) between M&E leadership and project implementation efficiency. Additionally, there were favourable correlations between M&E funding and stakeholder

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participation (0.565 and 0.489, respectively), demonstrating the crucial role that M&E plays in project success.

2.2.3. Influence of Monitoring Practices on Project Performance at the Water Sector Trust Fund.

Yussuf (2018) conducted research at the Water Sector Trust Fund on the impact of monitoring practices on project performance. The study looked at how project performance is affected by monitoring planning, tools, methodologies, and the adoption of M&E practices. The study used regression analysis to evaluate associations using a descriptive research approach and primary data gathered via semi-structured questionnaires. The results showed a strong and favourable correlation between project performance and M&E practices. According to the study's findings, carefully thought-out M&E improves project comprehension, establishes goals, and guarantees that the desired outcomes match project objectives.

2.2.4. Monitoring and Evaluation Influence on Water Project Performance in Migori County, Kenya.

The impact of monitoring and evaluation on the performance of water projects in Migori County, Kenya, was examined by Minyiri and Muchelule (2018). The study examined the effects of technology, communication, management abilities, community involvement, and M&E on the performance of water projects. A descriptive survey approach was used to analyse the data from 145 participants. M&E has a statistically significant effect on project performance, according to the study (β=0.152, $p<0.05$). Among the suggestions were strengthening planning for project sustainability and giving project managers more authority.

2.2.5. Influence of M&E Practices on Sustainable Projects – A Case Study of the National AIDS Control Council.

The Impact of Monitoring and Evaluation Practices on Sustainable Projects: A Case Study of the National AIDS Control Council was the subject of a 2019 study by Njeri and Omwenga. Structured questionnaires were used to gather data from 90 respondents as part of a descriptive research strategy. The results showed a substantial relationship between project sustainability and M&E organisational elements, human capacity for M&E, partnerships in M&E, and communication in M&E. The report suggested comparing hiring practices with those of industry leaders in order to increase human capacity for M&E.

2.2.6. Role of Monitoring and Evaluation on Sustainability of Road Construction Projects in Tanzania.

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A study on the impact of monitoring and evaluation on the sustainability of road construction projects in Tanzania's Bagamoyo District was carried out by Respicius (2018). The study discovered a statistically significant positive association between sustainable road construction projects, time management, and resource allocation through the use of regression and correlation analysis. To evaluate M&E's wider impact, additional research in other Tanzanian regions was one of the recommendations.

2.2.7. Role of Monitoring and Evaluation on Project Sustainability in Rwanda

The impact of monitoring and evaluation on project sustainability in Rwanda was examined by Umugwaneza and Warren (2016) in their case study of the Electricity Access Scale-Up and Sector-Wide Approach Development Project (EASSDP). Using data from 104 respondents and a descriptive research design, the study discovered that project sustainability is significantly influenced by supportive supervision ($r=0.612$, $p<0.01$), accountability ($r=0.347$, $p<0.01$), effective communication ($r=0.466$, $p<0.01$), and partnership for planning ($r=0.506$, $p<0.01$). Strong managerial commitment to M&E was suggested by the study as a means of improving project outcomes.

2.2.8. Contribution of Stakeholders' Involvement in M&E Planning to Project Sustainability.

The Rwanda Health System Strengthening Project (RSSP) was the subject of a 2017 study by Tuyiramye and Mulyungi on the role that stakeholder participation in monitoring and evaluation planning plays in fostering the sustainability of funded projects. The study came to the conclusion that stakeholders' participation in different M&E components significantly helps to project sustainability ($R=0.953$) using a descriptive survey design and a target sample of 109 respondents. The results emphasised how crucial stakeholder participation, communication, and contributions are to project sustainability.

2.2.9. Monitoring and Evaluation and Sustainability of Health Projects in Rwanda.

Kwizera (2018) studied Monitoring and Evaluation and Sustainability of Health Projects in Rwanda: A Case Study of Sustainable Health Enterprise Project in Kimironko Sector, Gasabo District, Kigali. The research, using both qualitative and quantitative methods, found that M&E significantly contributes to project sustainability. Findings indicated that regular M&E practices allow project managers to rectify challenges promptly, ensuring the project remains sustainable over time.

2.3. Conceptual Framework

The components of a building or other item that sustain its weight and shape are referred to as the conceptual framework. It can also refer to a system of principles, norms, or beliefs that serve as

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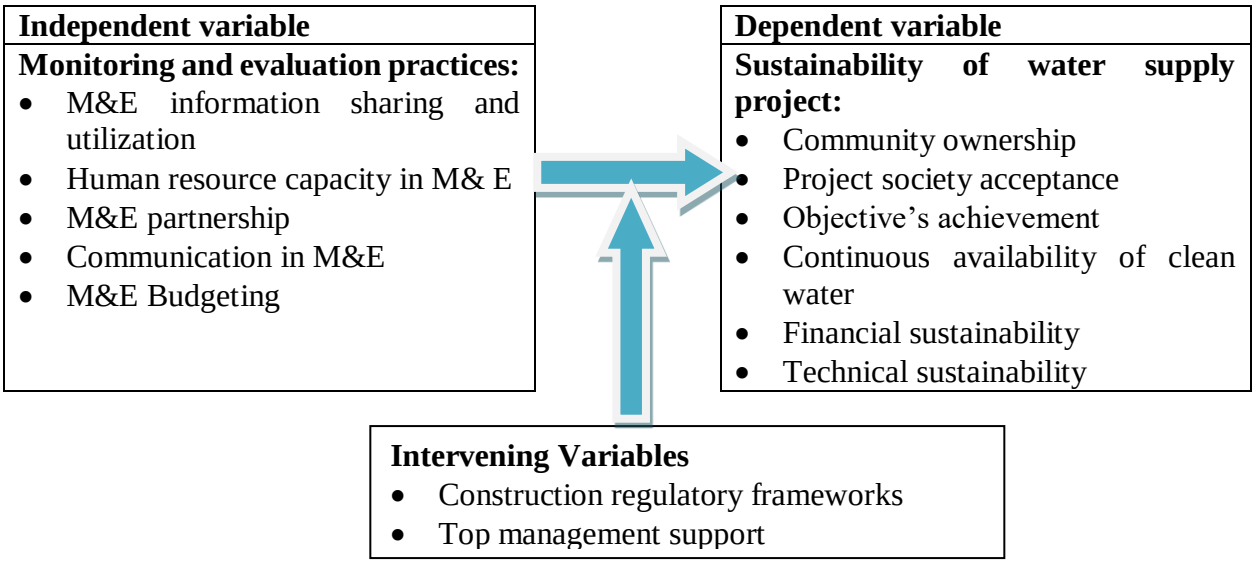
the foundation for decisions and judgements. The planning process in M&E, human resource capacity in M&E, partnerships in the M&E systems, M&E budgeting, and communication in M&E are the independent variables in this study. The dependent variables are project sustainability as measured by regular maintenance, goal achievement, community project ownership, and financial sustainability as accepted by society. Figure 1.1 below summarises the relationship between the independent and dependent variables.

Figure 1: Conceptual Framework



Source: Researcher compilation, 2021

3. METHODOLOGY

3.1. Research Design

A descriptive research design was employed in the study. Silverman (2011) asserts that a successful research design is defined by its capacity to identify correlations between variables, its appropriateness in terms of research questions, its low error rate, and its capacity to offer a thorough understanding of an issue. Both descriptive and correlational research designs were employed because of the nature of the investigation.

To determine the impact of community involvement on the sustainability of the Rubona water supply project in Kirehe District, a descriptive research methodology was used. This design was selected because it made it possible to gather and report data without manipulating it. The description of monitoring and evaluation (M&E) methods, including budgeting, communication, partnerships in the M&E system, information exchange and utilisation, and human resource capabilities in M&E, was quite helpful. The sustainability of the water supply projects was

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regarded as the dependent variable, and these aspects were investigated as independent variables. In order to ascertain if the previously indicated M&E practices had a statistically significant impact on the sustainability of the Rubona water supply project, a correlational research approach was employed.

3.2. Study Area

The Rubona water supply project in Kirehe District's Gahara Sector was the study's main focus. MAGNIFICA Construction Company Limited oversaw the project's supervision, while Strong Constructions Limited built it. At the moment, AYATEKE STAR COMPANY Ltd. is in charge of its management. Since 2004, the Rwandan government has been implementing a water and sanitation policy that has shifted the management of rural water service provision from community-based management to greater private sector participation. With a total budget of 1,287,911,425 Rwandan Francs, the Rwandan government provided funding for the Rubona water delivery project.

Increasing water availability for the people living in Gahara Sector and the adjacent areas is the main goal of the Rubona water supply project. The project's specific goals were to lower the occurrence of waterborne illnesses and supply clean water to 9,471 houses, or around 30,219 people, within a 500-meter radius. The Rubona water supply project's infrastructure consists of a 61.5 km water scheme, 18 public water taps that have been renovated, 38 new public taps that have been constructed, 17 reservoirs that have been renovated, four new reservoirs that have been constructed, 24 water collection chambers, and two water pumping stations.

3.3. Target Population and Sample Determination

This section explains the sample size and the sampling techniques used in the study.

3.3.1. Population of the Study

All members of a real or hypothetical group of people or events to which a survey seeks to generalise results are referred to as the target population (Banerjee & Chaudhury, 2010). 16,936 participants in the Kirehe District's Rubona water supply project made up the study's target group. This included 16,858 project beneficiaries and 78 project workers in charge of various water supply project components.

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Table 1: Population Size

Categories of population		**Population size**
Water users		16,858
Employees of water supply project	Top managers	2
	Water supply treatment staff	20
	Water quality management staff	15
	Electrical and Mechanical engineer	13
	Financial and logistics	5
	MEAL	21
	Human resource	2
	Total employees	**78**
Total population		16,936

Source: Rubona Water Supply Project in Kirehe District, 2021

3.3.2. Sample Size

Estimating the sample size aids in extrapolating results from the chosen sample to the full population. Using a mathematical formula is one of the popular ways to calculate sample size. Singh and Masuku (2014) state that this investigation used the Yamane (1967) formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = the sample size

N = the population size

e = the margin of error (expressed as a decimal, e.g., for 5% margin, e=0.05)

Using this formula, the study determined that the sample size would be approximately 391 stakeholders of the Rubona water supply project in Kirehe District.

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Table 2: Sample Size

Categories stakeholders	Population size	Sample size
Water users	16,858	313
Employees of water supply project	78	78
Total population	**16,936**	**391**

3.3.3. Sampling Techniques

In order to draw conclusions about the complete population, sampling entails choosing a subset of the population (Hulley, Cummings, Browner, Grady & Newman, 2013). The study divided the population into three groups: water committee members, water users, and workers on the water supply project. Every member of the groups had an equal chance of selection because each stratum was homogeneous.

Because stratified random sampling offers more accuracy in calculating population parameters, it was chosen. Using this method, 391 respondents were chosen for the study from among the 16,936 participants in the Rubona water supply project. The study improved the accuracy of the data gathered and guaranteed homogeneity within each stratum by dividing the target population into three subgroups.

3.4 Data Collection Techniques

In this study, both primary and secondary data were used. The main tools for gathering data were questionnaires and an interview guide, which were used to acquire primary data from respondents. Documentation methods were used to gather secondary data.

3.4.1. Questionnaire

A questionnaire was used to gather primary data from water users. This research tool was selected because of its organised structure, which makes it effective and practical for gathering data quickly. Because they may complete a questionnaire at their own pace and feel anonymous, respondents may be more forthcoming with their answers. Furthermore, it is an economical approach to gathering data, especially when working with a sizable sample dispersed over a big geographic area (Walliman, 2011).

The study's questionnaire included closed-ended questions on a 5-point Likert scale. Getting the respondents' demographic data was the main goal of the first portion. Key study factors, such as community involvement in project planning, execution, monitoring and evaluation (M&E), and resource mobilisation, were examined in the second segment. The sustainability of water delivery projects was the dependent variable that was studied in the last part.

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3.4.2. Documentary Review

Documentary review was another method used to gather secondary data. Because the information was sensitive or the respondents might have been forgetful, this strategy was useful in obtaining information that they might not have been able to supply in other ways. Firmly adhering to ethical confidentiality, the researcher asked project directors for pertinent documents. Among these were project reports pertaining to water supply (WS) efforts, which served to corroborate and enhance the information obtained from participants.

3.5. Data Analysis and Presentation

Data entry into the computer system was the first step in the data presentation process, which was then followed by data summarisation and presentation. Analysing the data was the last step. Tables, graphs, and frequency tables were all used in the data presentation to help visualise the findings.

3.5.1. Data Analysis

According to Creswell (2013), data analysis helps researchers arrange the information they have gathered so that it is easier to examine and evaluate the results, which eventually results in conclusions that are both legitimate and pertinent. Both descriptive and inferential statistical techniques were used in this study to represent and compile the data.

Descriptive Statistics: To describe the data's overall distribution, central tendency, and spread, descriptive statistical techniques were applied. These techniques are first steps towards comprehending the data. This study used means, standard deviations, frequencies, and percentages as descriptive statistics. To illustrate these statistical measurements, the data were displayed in tables.

Correlation Analysis: To ascertain the direction and degree of the association between each independent variable and the dependent variable, correlation analysis was utilised. It specifically looked at the connection between the sustainability of the Rubona water supply project in Rwanda's Kirehe District and monitoring and evaluation (M&E) procedures.

Multiple Linear Regression: The effects of multiple predictor variables on the dependent variable were evaluated using multiple linear regression. This approach aids in comprehending how several independent variables simultaneously affects the desired result. The impact of many factors affecting the sustainability of the Rubona water supply project was tested in this study using a multiple regression model. The model was formulated as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + e$$

Where:

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- Y= Sustainability of the Rubona water supply project in Kirehe District
- βi (for i=1,2,3,4,5) = Coefficients representing the independent variables
- β0 = The Y-intercept
- Xi (for i=1,2,3,4,5) = Values of the independent variables:
  - X_1 = M&E information sharing and utilization
  - X_2 = Human resource capacity in M&E
  - X_3 = Partnerships in M&E systems
  - X_4 = Communication in M&E
  - X_5 = M&E budgeting
- e = The error term, assumed to be normally distributed with a mean of zero and constant variance

Qualitative Data Analysis: Content analysis was used to analyse qualitative data. This entailed classifying, categorising, and sorting the data in order to find trends and decipher the meaning of the responses. This approach enables researchers to group data into themes and patterns for simpler interpretation (Saunders et al., 2009). With conclusions derived from the responses, the qualitative data findings were presented narratively.

4. FINDINGS AND DISCUSSIONS

The findings of the primary data, which was gathered via closed-ended questionnaires, are presented in this part. The data was analysed using both descriptive and inferential statistics. Regression analysis was used to illustrate the nature of the relationship between project success and the independent variables. The results were analysed based on response rate, background information, and the degree to which M&E information sharing and utilisation, human resource capacity in M&E, M&E partnership, communication in M&E, and M&E budgeting influence the sustainability of water supply project in Kirehe District. An overall index for dependent and independent variables was created using the SPSS calculate function, and those indexes were employed for inferential analysis because the variables determining each independent variable were on an ordinary scale. The researcher distributed 391 questionnaires and all 100% questionnaires were returned, therefore respondent's rate was 100%.

4.1. Descriptive Findings and Discussions

The purpose of this study was to assess how Monitoring and Evaluation (M&E) contributes to the sustainability of the Kirehe District's Rubona Water Supply Project. Using a five-point Likert scale (Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree), descriptive statistics including frequency, percentage, mean, and standard deviation were used to analyse the results. The standard deviations were analysed to determine if the responses were homogeneous or heterogeneous. The

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mean scores were interpreted as follows: 1.00-1.80 (very low), 1.81-2.60 (low), 2.61-3.40 (moderate), 3.41-4.20 (high), and 4.21-5.00 (very high).

4.1.1. Monitoring and Evaluation Practices in Rubona Water Supply Project.

The study evaluated a number of M&E procedures used by the Rubona Water Supply Project's management, with an emphasis on partnerships, communication in M&E, budgeting for M&E, information exchange and utilisation, and human resource capacity in M&E.

4.1.1.1. M&E Information Sharing and Utilization

The Rubona Water Supply Project's M&E information sharing and utilisation study produced encouraging results. A sizable percentage of respondents firmly agreed that M&E data is efficiently shared and used, which supports the project's sustainability. 60.1% of respondents strongly agreed that the staff was capable of documenting the project's impact and development. A high mean score of 4.12 and a standard deviation of 1.23 corroborated this finding, showing that respondents acknowledged the staff's competence in spite of some response variation. With a very high mean of 4.26, an overwhelming 72.1% of respondents strongly agreed that assessment lessons are clearly documented, further demonstrating the project's dedication to using evaluation outcomes to guide future planning.

The mean score of 4.38 suggests that there are effective monitoring procedures in place, as evidenced by the high 61.9% of respondents who agreed that monitoring reports are produced in a timely manner.

Furthermore, 77% of respondents agreed that reports are distributed to stakeholders, underscoring the project's dedication to openness and cooperative decision-making. A mean score of 4.32 provided more support for this. With 85.2% of respondents strongly agreeing with this statement, the results also showed that staff and stakeholders effectively use M&E information to make informed decisions. With a low standard deviation of 0.72 and the highest mean score of 4.74, this indicated broad agreement regarding the usefulness of M&E data in decision-making. In summary, the results demonstrate that the Rubona Water Supply Project's sharing and use of M&E information is a fundamental strength that greatly enhances its sustainability.

4.1.2. Human Resource Capacity in M&E.

In order to maintain the Rubona Water Supply Project, the research also evaluated M&E's human resource capacity. According to the results, most respondents (67.8%) strongly agreed that the project had successfully hired enough qualified staff for M&E. This is demonstrated by the high mean score of 4.13, which shows that the project's human resource capabilities is seen as a major strength. With a very high mean score of 4.60, 84.7% of respondents strongly agreed that the

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project's method for evaluating human resource needs for M&E was accurate, demonstrating its widespread recognition. This implies that the human resource planning for the project is organised and carried out well.

The project is well-equipped to manage M&E operations effectively, as evidenced by the 74.7% of respondents who strongly agreed that it had appropriate technology resources for M&E (mean score of 4.41). Although 22.5% of respondents concurred that staff received training to provide them with the technical know-how they needed, the high mean score of 4.16 suggests that training is seen as a crucial component of improving M&E competence. Additionally, with a mean score of 4.92, 95.9% of respondents strongly agreed that M&E focal persons receive regular coaching, training, and supervision, demonstrating outstanding support for staff capacity building.

4.1.3. Partnerships in the M&E System Used by Rubona Water Supply Project.

The function of partnerships in the Rubona Water Supply Project's M&E system and their effect on sustainability are evaluated in this section. With a mean score of 4.33 and a standard deviation of 1.25, the results showed that 71.1% of respondents strongly agreed that strategic alliances in the project have considerably contributed to its sustainability. Furthermore, with a mean score of 4.31 and a standard deviation of 1.12, 64.5% of respondents strongly felt that M&E consultants have been essential in enhancing sustainability. With a mean score of 4.17 and a standard deviation of 1.34, the project has built strong mechanisms for stakeholder management. Of the respondents, 63.2% acknowledged the project's clear process for assigning stakeholder duties in M&E.

A mean score of 3.74 and a standard deviation of 1.64 indicate some variation in responses, even though 57% of respondents thought that stakeholder analysis and involvement were done correctly. Lastly, with a mean score of 4.55 and a standard deviation of 1.05. 79% of respondents strongly agreed that management shows support and dedication to project performance. The M&E system's average mean for partnerships was 4.07 overall, with a standard deviation of 0.65. This suggests that there is broad agreement regarding the significance of partnerships in guaranteeing the project's sustainability.

4.1.4. Communication in M&E Used by Rubona Water Supply Project.

The impact of communication within the M&E system on the Rubona Water Supply Project's sustainability is examined in this section. With a mean score of 3.93 and a standard deviation of 1.63, the results showed that 60.4% of respondents believed that setting up suitable implementation periods enhanced sustainability. Similarly, with a mean score of 3.89 and a standard deviation of 1.60, 61.1% of respondents concurred that communicating via social media improved the project's sustainability. With a mean score of 4.27 and a standard deviation of 1.34, a larger percentage of

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respondents 73.1% strongly agreed that the project has appropriate communication and reporting techniques.

With a mean score of 4.31 and a standard deviation of 1.11, 62.9% of respondents acknowledged the role of management in communication and strongly agreed that management participation enhanced communication and aided in achieving the project's goals. With a standard deviation of 1.35 and an overall average mean of 4.17 for communication in the M&E system, there is compelling evidence that communication has a beneficial effect on the sustainability of the project.

4.1.5. M&E Budgeting Used by Rubona Water Supply Project.

According to the study's assessment of the Rubona Water Supply Project's M&E budgeting, 85% of participants strongly agreed that the project had a separate budgetary allocation for monitoring and evaluation. Furthermore, 78% of respondents concurred that timely availability of money for M&E activities ensured the project's seamless operation. 72% of those surveyed believed that the budget was adequate to cover M&E needs, confirming the budget's adequacy. According to these results, the Rubona Water Supply Project has effectively set up a strong budgeting system for M&E, which is essential to its capacity to carry out ongoing assessments and adjust to unanticipated events.

4.2. Level of Sustainability of Rubona Water Supply Project from 2018-2021.

The purpose of the study was to find out how respondents felt about the Rubona Water Supply Project's sustainability. The results indicated that most people thought the project was sustainable. One of the main findings was that 80% of those surveyed thought the water was always safe and clean. Additionally, 75% strongly agreed that there would be little service interruption due to the project's ability to promptly address serious faults. Regarding service dependability, 82% of participants said the service satisfied their everyday requirements. Furthermore, 70% of respondents said they would be ready to keep paying for the water supply, demonstrating a high level of community involvement and ownership.

These findings imply that the Rubona Water Supply Project has created trust throughout the community, a vital ingredient for long-term sustainability. However, as Kirehe District's population and economic activity rise, ongoing monitoring is required to make sure the project can fulfil the growing demand for water.

4.3. Relationship between M&E Practices and Sustainability of Rubona Water Supply Project.

The relationship between several Monitoring and Evaluation (M&E) techniques and the sustainability of the Rubona water supply project in Kirehe District is examined in this section.

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The purpose of the study was to investigate the effects of the independent variables M&E budgeting, human resource capacity in M&E, M&E partnership, communication in M&E, and M&E information exchange and utilization on the sustainability of the Rubona water project.

4.3.1. Correlations Analysis

The degree and direction of the associations between the independent variables and the sustainability of the Rubona water project were evaluated using correlation analysis. The linear relationship was measured using the Pearson's product-moment correlation coefficient. The results are shown in **Table 4.11**.

Table 3: Correlation Coefficients

		X1	X2	X3	X4	X5	Y
M&E information sharing and utilization	Pearson Correlation	1					
Human resource capacity in M& E	Pearson Correlation	.589**	1				
M&E partnership	Pearson Correlation	.261**	.383**	1			
Communication in M&E	Pearson Correlation	.152**	.449**	.181**	1		
M&E Budgeting	Pearson Correlation	.560**	.587**	.502**	.310**	1	
Sustainability of Rubona WS project	Pearson Correlation	.707**	.510**	.615**	.378**	.722**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	

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

*. Correlation is significant at the 0.05 level (2- tailed).

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

The sustainability of the Rubona water supply project was found to be strongly positively correlated with M&E Information Sharing and Utilisation ($r = 0.707^{**}$, $p < 0.01$). This corroborates the results of the descriptive study, which showed that information sharing was generally viewed favourably as a key component of sustainability, as evidenced by the mean value of M&E information sharing (3.79). Better project outcomes and increased sustainability are the results of increased information sharing.

According to the descriptive analysis, the mean for human resource capacity (3.45) demonstrated that respondents considered capacity to be an important component, albeit with considerable variability. This is consistent with the somewhat positive correlation found for human resource capacity in M&E ($r = 0.510^{**}$, $p < 0.01$). The project is more likely to be sustainable when M&E personnel are properly trained and skilled.

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Additionally, M&E Partnership showed a strong positive association with sustainability (r = 0.615**, p < 0.01), supporting the descriptive statistics' mean value of 3.21, which indicated that partnerships are generally seen favourably in terms of guaranteeing long-term project sustainability. In line with the descriptive analysis's mean of 3.43, communication in M&E exhibited a weaker association (r = 0.378**, p 0.01) with sustainability. Although communication is crucial, it seems that other elements such as information sharing and M&E budgeting—have a stronger relationship with the project's success. In line with the high mean value (3.57) in the descriptive statistics, M&E budgeting demonstrated the strongest correlation with sustainability (r = 0.722**, p 0.01), suggesting that respondents considered budgeting to be one of the most important factors influencing the sustainability of the Rubona water supply project.

4.3.2. Multiple Linear Regression Analysis

The cumulative effect of the M&E procedures on the sustainability of the Rubona water supply project was examined using multiple linear regression. The relevance of the predictors (independent variables) in explaining the dependent variable (sustainability) is determined with the use of the regression model. Tables 4.12 and 4.13 display the model summary and ANOVA findings, respectively.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.795[a]	.631	.627	.33561

a. Predictors: (Constant), M&E Budgeting, Communication in M&E, M&E partnership, M&E information sharing and utilization, Human resource capacity in M& E

The independent variables (M&E practices) account for 63.1% of the variation in sustainability, according to the R-squared value of 0.631. Given that it takes into consideration more than 60% of the elements influencing the Rubona water supply project's sustainability, this model is comparatively sound. The remaining variance can result from outside variables that the model did not account for.

The model fits the data well, and the number of predictors is reasonable in explaining the sustainability outcome, according to the adjusted R-square value of 0.627, which is rather near to the R-squared value.

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Table 5: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	74.256	5	14.851	131.854	.000[b]
	Residual	43.364	385	.113		
	Total	117.619	390			

a. Dependent Variable: Sustainability of Rubona WS project

b. Predictors: (Constant), M&E Budgeting, Communication in M&E, M&E partnership, M&E information sharing and utilization , Human resource capacity in M& E

The statistical significance of the regression model is confirmed by the F-statistic of 131.854 and the p-value of 0.000, indicating that the M&E practices together support the sustainability of the Rubona water project. This corroborates the descriptive analysis's conclusions, which held that M&E procedures were crucial to sustainability.

Table 6: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.074	.183		5.868	.000
	M&E information sharing and utilization	.325	.043	.124	7.558	.001
	Human resource capacity in M& E	.138	.050	.034	2.760	.039
	M&E partnership	.279	.031	.328	9.041	.000
	Communication in M&E	.122	.029	.151	4.274	.004
	M&E Budgeting	.579	.051	.505	11.461	.000

a. Dependent Variable: Sustainability of Rubona WS project

The regression coefficients show how much each independent variable affects the project's sustainability.

The results of the descriptive analysis and correlation are further supported by the strong positive impact of M&E Information Sharing and Utilisation ($\beta = 0.325$, $p = 0.001$) on sustainability. Sustainability rises as information exchange and use are enhanced. The descriptive statistics' moderate mean value (3.45) is in line with the favourable influence of human resource capacity in

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M&E (= 0.138, p = 0.039). The sustainability of the project can be significantly improved by having a strong human resource foundation in M&E.

The considerable beneficial impact of M&E Partnership (β = 0.279, p = 0.000) supports the earlier finding that successful partnerships are essential to the long-term viability of the Rubona water project.

While communication in M&E has a somewhat less impact than other practices, it still favourably contributes to sustainability (β = 0.122, p = 0.004).

The most significant element is M&E budgeting, which has a high positive correlation with project sustainability (β = 0.579, p = 0.000). This validates the descriptive statistics' high mean value (3.57), which highlights how crucial it is to devote enough funds to M&E.

5. CONCLUSION

Based on the study's findings, it can be said that the sustainability of the Rubona water supply project in Kirehe District is significantly correlated with a number of M&E practices, including M&E budgeting, communication in M&E, M&E partnership, M&E information sharing and utilisation, and human resource capacity in M&E. These M&E practices are crucial to the project's long-term success, as seen by the R2 value of 0.631, which shows that they account for 63.1% of the variation in the project's sustainability. A 95% confidence level indicates that this result is statistically significant.

The analysis made clear that the viability of the Rubona water supply project is significantly impacted by M&E capacity growth. Capacity building directly helps the project's ability to accomplish its future goals by improving the skills and competencies of the staff members engaged. Because it equips employees with the skills they need to innovate and adapt to obstacles, this approach is essential to the growth of NGO projects in Kenya and plays a significant role in ensuring the sustainability of the Rubona water supply project.

The sustainability of the project was also found to be significantly impacted by M&E budgets. Effective budgeting makes it possible to allocate resources in a way that accurately measures performance and foresees possible obstacles. The seamless execution of the project is ensured by timely funding allocation along with quality performance indicators, which supports the project's long-term success.

The importance of M&E partnerships was also underlined in the study. According to the results, stakeholders are happy with the monitoring and assessment procedures, indicating their dedication to further cooperation. As all stakeholders collaborate to maximise project performance, this satisfaction demonstrates the beneficial effect of M&E methods on the project's sustainability.

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The study concludes that in order to improve the sustainability of the Rubona water supply project in Kirehe District, monitoring and assessment procedures are essential. The project can guarantee its long-term efficacy and success by concentrating on M&E budgeting, communication, partnerships, information sharing, and human resource capacity. For the project to remain sustainable in the future, it is imperative that certain M&E practices be adopted and strengthened.

6. RECOMMENDATIONS

The following suggestions are offered to improve the sustainability of the Rubona Water Supply (WS) project in light of the study's findings:

Boost M&E's Human Resource Capacity: For a project to be implemented successfully, human resource capacity in monitoring and evaluation (M&E) should be a top priority. The study found that a key factor in determining an organization's project success is its human resource capacity. To give employees the skills they need, organisational management should support and fund capacity-building initiatives. Training programs, technical support, and other organised interventions can help achieve this. Furthermore, the M&E capacity-building process is essential to the project's sustainability and long-term goals.

Encourage M&E Capacity Building: Since M&E capacity building has been demonstrated to be a crucial factor in guaranteeing the sustainability of the Rubona WS project, it is advised that the organisation keep concentrating on this process. The social process of capacity building fosters an organization's long-term objectives and helps development initiatives succeed. Therefore, in order to guarantee sustainability and ongoing progress, efforts should be made to incorporate M&E capacity building into the project's strategic objectives.

Adopt M&E Budgeting Practices: The Rubona WS project's viability depends heavily on M&E budgeting. The study emphasised how crucial budgeting is for M&E initiatives in order to assess effectiveness and foresee future difficulties. It is imperative for organisations to allocate a minimum of 5–10% of their overall project budget to M&E. Furthermore, to ensure efficient usage and prompt distribution of financial resources, it is crucial to guarantee the M&E unit's independence in budgeting decisions and fund utilisation.

Assure Stakeholder Participation: Every stage of the project should involve all stakeholders, regardless of level. This will increase the project's relevance to the recipients and guarantee ownership of the findings. The study highlights the active role that stakeholder participation plays in ensuring the project's sustainability. Therefore, to promote a sense of shared responsibility and guarantee the project's long-term success, stakeholders' cooperation and collaboration should be consistently promoted.

Encourage Comprehensive Management Participation: According to the report, management should actively engage in the M&E process at all levels. Consistent communication, teamwork, and making sure the M&E process is set up efficiently to track progress are all ways that management may show their dedication to the project. This engagement provides sustainability, confirms project outcomes, and ensures project ownership. To optimise performance gains, management should also direct the M&E process.

Analyse Budgetary Allocation: Research has demonstrated that M&E budgetary allocation has a favourable impact on project success. Nonetheless, the existing practice of providing M&E with inadequate funding (less than 5–10% of the project budget) ought to be reviewed. To maximise the influence of M&E on project sustainability, organisations should ensure independent budgetary decisions and devote sufficient and dedicated funding to M&E operations. Enhance Performance through M&E: To enhance performance, projects should give M&E top priority. Monitoring and assessment provide organisations a better understanding of the environment in which they operate and offer guidance on how to overcome obstacles. In order to maintain long-term sustainability, it is advised that projects continue to engage in M&E, as the study highlights its importance in enhancing project performance.

Provide M&E Training: Institutions should receive training from the government and other pertinent organisations on efficient monitoring and evaluation procedures and how they affect sustainability. Institutions can enhance their comprehension of M&E and its function in accomplishing sustainable development objectives by offering training programs, especially for initiatives such as the Rubona WS project.

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