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# Effect of Monitoring and Evaluation on Performance of Water Supply Projects in Gakenke District, Rwanda

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## Abstract

The general objective of this research was to assess effect of monitoring and evaluation on performance of water supply projects in Gakenke District. This study had the following specific objectives: assess effect of M&E planning process on performance of water supply projects in Gakenke District, find out effect of M&E technical capacity on performance of water supply projects in Gakenke District, determine effect of M&E resources allocation on performance of water supply projects in Gakenke District and examine effect of stakeholders' participation in M&E on performance of water supply projects in Gakenke District. 186 water project workers and head of household in Muzo, Janja, Gakenke and Ruli sector with Gakenke District officials made up the study's population. The sample size of 127 respondents was determined by the help of Solvin's formula. The results of the study rejected all null hypotheses ( $p < 0.05$ ). The research showed also that the effect of M&E planning process ( $\beta = 1.348$ ,  $p = .000$ ), the effect of M&E technical capacity ( $\beta = .968$ ,  $p = .001$ ), the effect of allocation of resources ( $\beta = .638$ ,  $p = .004$ ), and the effect of participation of stakeholders in M&E ( $\beta = .261$ ,  $p = .006$ ) have positive and significant effect on the performance of water supply projects in Gakenke District. The study recommends to the District to design M&E team to manage all monitoring and evaluation activities for all the projects; to provide regular capacity building to M&E staff members in order to enhance their expertise in designing and implementing M&E activities; to anticipate and address potential challenges that may hinder the effective utilization of M&E in improving project performance and to enhance engagement of all stakeholders in M&E.

**Keywords:** *Monitoring and evaluation, Planning process, technical capacity, Resources allocation, Stakeholders' participation, Performance of projects*

## 1.1 Introduction

Water supply projects play a role in improving the well-being of communities, particularly in developing countries like Rwanda. However, the success of these projects relies not only on their implementation but also on effective monitoring and evaluation (M&E) practices throughout their lifecycle.

Despite the efforts by all players in water industry, numerous water projects in Rwanda have a high risk of failure due to being much over budget and notably late, regardless the dedication of all actors in the water sector. The purpose of my study was to investigate the effect of M&E on the performance of water supply projects in Gakenke District, Rwanda. The findings of this research revealed that M&E have positive and significant effect on the performance of water supply projects in Gakenke District.

### Objective of the Study

The research objective of this study was categorized into two, which are as follows:

#### The general objective

The general objective of this research was to assess the effect of monitoring and evaluation on performance of water supply projects in Gakenke District.

#### Specific objectives

This study had the following specific objectives:

- i. To assess effect of M&E planning process on performance of water supply projects in Gakenke District.
- ii. To find out effect of M&E technical capacity on performance of water supply projects in Gakenke District.
- iii. To determine effect of M&E resources allocation on performance of water supply projects in Gakenke District.
- iv. To examine effect of stakeholders' participation in M&E in performance of water supply projects in Gakenke District.

### Hypotheses

The following null hypotheses were tested by the researcher:

**H0<sub>a</sub>:** There is no significant effect of M&E planning process on performance of water supply projects in Gakenke District.

**H0<sub>b</sub>:** There is no significant effect of M&E technical capacity on performance of water supply projects in Gakenke District.

**H0<sub>c</sub>:** There is no significant effect of M&E on resources allocation on performance of water supply projects in Gakenke District.

**H0<sub>d</sub>:** There is no significant effect of stakeholders' participation on performance of water supply projects in Gakenke District.

## 2.1 Literature Review

This chapter reviews existing literature on the variables of this study. Literature review for this study is presented in different parts including the conceptual review, the theoretical review, empirical review, research gap and the conceptual framework.

### Monitoring and evaluation

Monitoring and Evaluation is a process of continued gathering of information and its analysis, in order to determine whether progress is being made towards pre-specified goals and objectives, and highlight whether there are any unintended (positive or negative) effects from a project/programme and its activities. Monitoring is a continuous process of collecting, analyzing, documenting, and reporting information on progress to achieve set project objectives. It's useful for managing projects or programs since it reveals patterns, allows for strategy adjustments, and provides insight into what to do next. A project, program, or policy's conception, execution, and outcomes are periodically evaluated via a systematic and objective evaluation. It involves gathering, analyzing, interpreting and reporting information based on credible data. The aim is to determine the relevance and fulfilment of objectives, developmental efficiency, effectiveness, impact and sustainability (Carden & Orosz, 2019).

Progress may be tracked and decisions made with the help of monitoring and evaluation, two essential management tools. While an assessment may be necessary to satisfy the requirements of some donors, it may be the individuals with whom your organization interacts who stand to gain the most from the experience. By closely examining the work, organization can design programs and activities that are effective, efficient, and yield powerful results for the community (Johnson, 2019).

### Technical capacity

The qualifications and management experience of the project staff are very important to the reliability of the results. The World Bank agrees with this evaluation and suggests that organizations focus their evaluation strategies and monitoring systems on staff who know what they are doing. This is so because the caliber of the management staff has a significant impact on how well the plan works. The goals of the system should match the skills of the people who are hired to do M&E tasks. Personnel must have the bare minimum knowledge, skills, and attitudes about M&E systems that are needed to carry out these processes. Human resources and hiring staff use the basic requirements listed in the job description to decide who to hire. After being hired, workers learn about the company's systems, processes, and policies so that they can start doing their jobs (Kusek & Rist, 2020).

The author of the study says that improving the skills of workers is important if monitoring and evaluation systems are to last for a long time. Also, formal or informal M&E training and development is important for monitoring and evaluating programs in an objective way, because training leads to a change in attitude, more knowledge, and the skills to do a SWOT analysis of the project. A thorough training and orientation program is a big part of how people learn the skills they need to do M&E. Training is a process that cannot be rushed and requires consistent effort. Staff members at NGOs now have access to a variety of administrative tools, such as training manuals, designed to increase their M&E literacy. These educational materials are

helpful in fostering an efficient and effective culture that encourages positive project outcomes because they provide examples of ideal M&E environments (Mackay, 2020).

### **Resources allocation**

A project's resources are finite and multipurpose, so allocating them might be a challenge. The amount of resources required for each M&E stage can be estimated based on past experience and system-specific details. The ability to allocate resources to monitoring and evaluation is crucial for any endeavor. When the M&E system is underfunded, the quality of the data it collects is called into question. It is more likely that important details have been omitted from the data, making any conclusions drawn from it meaningless. To ensure that a project's costs do not outweigh its income and that both are accurately recorded, budgeting is used for control purposes. The only time funds are spent is when they are included in the agreed budget and when doing so contributes to the project's intended outcomes (Miller, 2021).

Allocations in a budget are a crucial part of any financial plan because they reveal how much money and other assets will be spent on a certain initiative. Simply put, it is hard to divide up resources because there are not many of them and each one can be used in different ways. Based on how each M&E system works and what it has learned, it is possible to figure out how many resources are needed for each stage. In order to be most effective, M&E systems should be coordinated not just with the project's capability for implementation but also with its design and purpose (Rossi & Ferrari, 2019).

### **Stakeholders' participation**

Stakeholder participation is a crucial aspect of successful project planning, implementation, monitoring, and evaluation. Stakeholders are individuals or groups that have a vested interest in the project or program and may be affected by its outcomes. Their participation helps ensure that the project meets the needs and expectations of all stakeholders and that their perspectives and feedback are considered in decision-making processes (Brouwer & van der Duin, 2020).

To make sure the program meets the goals and expectations of the people who have a stake in it, it was important to involve them early on in the process of making its tools. Participatory methods encourage those involved in a project to feel like they have a stake in its success. All of these factors are critical to the success of the project as a whole (Reed, 2019).

Most likely, everyone involved in the project, especially the people who will benefit from it, will be happy with the result. In the planning and implementation stages, the participatory approach takes into account the values, attitudes, beliefs, and actions of the people in the community. It is possible that this could cause a change in conventional wisdom. You may help your team grow by using a participatory approach to create monitoring and assessment tools (Gkargkavouzi *et al.*, 2019).

## Monitoring and evaluation planning process

It is important to come up with a plan for tracking and judging the progress of the project right from the start, while specific interventions are being made. Planned project interventions and a plan for monitoring and evaluating the project should be made at the same time. Planning the M&E ahead of time also helps to make sure that a thorough system is in place to track and evaluate each project activity and intervention. It also aids project managers and other staff members in understanding the project's overall goals and making sure it is headed in the proper direction (De Grauwe & Romijn, 2021).

The M&E strategy should be made with input from project managers, evaluators, donors, and other stakeholders. This will make it more likely that the plan will be carried out successfully. The goal is to work together to find solutions to problems and increase the overall impact of the project by finding potential openings and roadblocks early on in the planning process. To effectively evaluate the efficacy of interventions and the results of a project, it is necessary to integrate various M&E components into a unified whole. It is advised that the M&E work plan be designed to be adaptable, allowing for changes to be made at any time within the parameters of the plan to account for concerns that may arise (Love & Biggs, 2018).

## Project performance

Project performance is a project's ability to meet its goals, objectives, and targets within the time, budget, and resources that are available. It is important to measure and manage project performance to make sure the project is finished successfully and gives the desired results. A project's performance can be evaluated by various metrics, such as schedule variance, cost variance, quality, scope, and risk (Shenhar & Dvir, 2020).

The performance of a project can be evaluated not just in terms of how effectively it completes its goals in terms of time, money, and quality, but also in terms of how well it satisfies the client's needs in a way that is both lasting and satisfying. Reports on the progress of a project should include goals for performance that are easy to check. It highlights key assumptions and dangers, identify important challenges, and suggest potential solutions. Furthermore, included in these analyses are projections of the projects' future success in terms of both implementation and the realization of their development goals (Ojiako *et al.*, 2021).

Continuous improvement is also vital for enhancing project performance. The project team should analyze the project's performance data to identify areas for improvement and implement corrective actions to prevent similar issues from occurring in the future. Lessons learned from previous projects should also be documented and shared with the team to help them avoid making the same mistakes. By applying the principles of effective project management and continuous improvement, project managers can improve project performance and deliver successful outcomes (Pinto & Slevin, 2019).

## Theoretical review

### Stakeholder theory

University of Virginia professor of business administration and author of the 1984 book *Strategic Management: A Stakeholder Approach* Edward Freeman is credited with developing the concept of stakeholders. Freeman argued that businesses should not only focus on maximizing shareholder value, but also consider the interests and needs of other stakeholders. The idea of stakeholder theory was further developed by other scholars and practitioners, such as Thomas Donaldson, who highlighted the ethical and moral dimensions of stakeholder theory, and Archie Carroll, who proposed a framework of corporate social responsibility that incorporated stakeholder theory (Freeman, 2020).

Stakeholder theory is a management theory that suggests that an organization should consider the interests and needs of all of its stakeholders, rather than just its shareholders or owners. The stakeholders of an organization may include employees, customers, suppliers, communities, and even the environment. According to the stakeholder theory, an organization should take into account the interests of all its stakeholders when making decisions and planning strategies. This means that an organization should not only focus on maximizing profits for its shareholders, but also on creating value for all its stakeholders. By doing so, an organization can create long-term value for itself and for its stakeholders (Phillips & Freeman, 2021).

According to Jones (2021) the stakeholder theory also highlights the role of stakeholder engagement and communication. By engaging with its stakeholders and realizing their requirements and concerns, an organization can better address their interests and build stronger relationships with them. This can lead to greater trust, loyalty, and support from stakeholders.

### Goal setting theory

Goal setting theory was first proposed by Edwin Locke, a psychologist, and Gary Latham, a management researcher, in the late 1960s and early 1970s. They argued that setting specific and challenging goals can lead to improved performance and motivation for individuals and teams. Locke and Latham proposed that goals should be specific, measurable, attainable, relevant, and time-bound (SMART). They also suggested that feedback and support from managers and colleagues can help individuals achieve their goals and improve their performance (Locke & Latham, 2019).

Goal setting theory is a management theory that proposes that setting specific and challenging goals can lead to increased motivation, performance, and achievement. According to the theory, individuals and teams perform better when they have clear goals to work towards and a sense of purpose and direction. Goal setting theory has had a significant impact on management practice and continues to be an important area of research and development in the field of organizational behavior (Jacklyne & Joshua, 2020).

### Results Based Management Theory

Results-Based Management (RBM) theory emerged in the 1990s in response to a growing recognition of the need for more effective and accountable management of development programs and projects. The approach was developed in the context of international development

organizations, such as the World Bank and the United Nations, but has since been adopted by a wide range of organizations in the public and private sectors. The basic premise of RBM is that organizations should focus on achieving results and outcomes rather than simply implementing activities. RBM involves a systematic and continuous process of planning, monitoring, and evaluation to ensure that programs and projects are achieving their intended results and making progress towards their objectives (Yeoh & Chong, 2021).

RBM realize the role of defining clear and measurable results and outcomes, and developing strategies and activities that are aligned with these objectives. RBM is widely used by governments, non-profit organizations, and private sector firms around the world to improve the effectiveness and accountability of their programs and projects (Segerstedt & Öhman, 2020).

### **Theory of Change**

The Theory of Change (ToC) is a framework for planning, implementing, and evaluating programs and initiatives that emerged in the field of international development in the 1990s. The method depended on the idea that social change is a complex and non-linear process that requires a deep understanding of the underlying drivers of change, and the context in which change is occurring. ToC approach aid project managers to develop a more comprehensive understanding of the context in which their projects are operating, and to develop strategies that are better aligned with project outcomes and goals. The ToC approach can also help to build stakeholder engagement and participation, and to support ongoing learning and adaptation throughout the project lifecycle (Connell *et al.*, 2020).

ToC approach helped project managers to develop a more comprehensive understanding of the context in which their projects are operating, and to develop strategies that are better aligned with project outcomes and goals.

### **Conceptual framework**

A conceptual framework is used to map out the important ideas, variables, and relationships in this investigation. In other words, a conceptual framework is a strategy for organizing concepts in order to achieve a set of research objectives.



**Independent variables**

**M&E planning process**

- Clear and specific goals
- Plan for M&E tools
- Scheduling

**M&E technical capacity**

- Trainings to staff
- Technical abilities
- Identification of capacities

**M&E resources allocation**

- Budget allocation
- Staff allocation
- Time allocation

**Stakeholders' participation in M&E**

- Stakeholders concerns
- Stakeholders feedback
- Communication with stakeholders

**Dependent variable**

**Project performance**

- Effectiveness
- Timelines
- Goals achievement
- Beneficiaries satisfaction

- Government policies
- Organization rules and regulations

**Extraneous variables**

**3.1 Research Methodology**

**Study Design**

Due to the nature of the topic, this study employed quantitative method. The researcher used correlational research design to analyze the data. Regression was used to study effect of independent variables on the dependent variable.

**Target population**

According to Bazeley (2018), a population represents everything there is to be considered in a study. Researchers defined population as a resource of cases from which to draw conclusions, and the term has now come to mean the total number of objects in a specific area of

investigation. 186 water project workers and head of households in Muzo, Janja, Gakenke and Ruli sector with Gakenke District officials made up the study's population.

### Sampling

Researchers need to figure out the size of their sample to know how many things from the whole population used in a study. A maximum possible sample size taken into account while making selections.

### Sample size

The sample size was determined by the help of Solvin's formula.

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

Where **n** is the sample size, **N** is the population size and **e** is the marginal of error (5%).

$$n = \frac{186}{1 + 186(0.05)^2} = \frac{186}{1 + 0.465} = \frac{186}{1.465} = 127$$

### Sample Selection Technique

In this study, researcher used cluster sampling. To do this, the study divided the population into groups based on each person's area of expertise. They then make a sample by picking individuals at random from this pool. Respondents were selected from the clusters using a basic proportional sampling. As all respondents are interested parties in water supply projects in Gakenke District, random sampling used to choose a representative sample from each division.

### Data Collection methods and instruments

Each study goal was investigated with detailed inquiries to guarantee its fruitful conclusion. Documentary, and questionnaire sources were used to collect information for the study.

### Documentation Technique

Documentation is the study of information stored in files, in the depths of a company, or in a computer. The researcher found the existing data in whatever repository or filing system and then collect it. The researcher used this method to gather secondary data. As part of the documentary analysis process, the researcher used documents to evaluate and analyze the texts' relevance to this study, classify them on manuscripts, and then type them into a computer so they can be put together. This is very important because it looks at the relevant literature and tries to find international perspectives from which to build a comparative evaluation framework.

### Questionnaire

According to Creswell and Creswell (2017), in a questionnaire, respondents are given a list of questions to answer independently of the interviewer. Water project employees in Gakenke District were given questionnaires. Most of the questions on the survey were closed-ended. Closed questions require that responders pick one answer from a predetermined set of options. All 127 employees and related parties on the Gakenke District water project were given a questionnaire.

**Interview**

Interview technique in research refers to the specific methods and strategies used to conduct interviews as a data collection tool. It encompasses the various approaches, principles, and skills employed by researchers when interacting with participants to gather qualitative information and insights. For this study, it was important to get information from the managerial staff on M&E, its intervening variables to lead performance of Gakenke District water project.

**Data Analysis**

According to Denzin and Lincoln (2018) Information is analyzed by carefully describing it, giving examples, summarizing it, and using statistical and/or logical methods to judge it. Evaluation of data by breaking it down into its constituent parts and analyzing it logically. The researcher used SPSS to analyze the data.

**4.0 Data Interpretation and Findings**

**Regression analysis**

**Table 1: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791 <sup>a</sup>	.626	.614	8.78012

a. Predictors: (Constant), Stakeholders participation in M&E, M&E planning process, M&E technical capacity, M&E resources allocation

**Source: Field data (2023)**

Model Summary presented in Table 1 indicates the summary statistics of the regression model used to assess the effect of monitoring and evaluation (M&E) on the performance of water supply projects in Gakenke District. The strength and direction of the linear effect of the predictors (stakeholders' participation in M&E, M&E planning process, M&E technical capacity, and M&E resources allocation) and the outcome variable (performance of water supply projects) is represented by the correlation coefficient (multiple correlation coefficient) of 0.791. (R Square) is 0.626, which means that approximately 62.6% of the variance in the performance of water supply projects can be explained by the predictors included in the model. The regression model using the predictors (stakeholders' participation in M&E, M&E planning process, M&E technical capacity, and M&E resources allocation) explains a substantial proportion (approximately 62.6%) of the variance in the performance of water supply projects in Gakenke District.

**Table 2: ANOVAa**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15762.785	4	3940.696	51.118	.000 <sup>b</sup>
	Residual	9405.042	122	77.091		
	Total	25167.827	126			

a. Dependent Variable: Project performance

b. Predictors: (Constant), Stakeholders participation in M&E, M&E planning process, M&E technical capacity, M&E resources allocation

**Source: Field data (2023)**

The results of the analysis of variance (ANOVA) for the regression model used to assess the effect of monitoring and evaluation (M&E) on the performance of water supply projects in Gakenke District. The significance value (p-value) associated with the F-value is 0.000. In this case, the significance value is less than the typical alpha level of 0.05, suggesting that there is a significant effect of the predictors on the performance of water supply projects.

Mbogo and Mirara (2022) used the International Rescue Committee (IRC) to analyze the impact of M&E funding on charitable institutions' decision-making. Allocating funds for monitoring and evaluation improved the financing of humanitarian projects at the 5% significance level (B=0.534, p = 0.00). Therefore, it was determined that effective monitoring and evaluation methods had a beneficial impact on the preparation of humanitarian projects.

The results indicate that the regression model, which includes stakeholders' participation in M&E, M&E planning process, M&E technical capacity, and M&E resources allocation as predictors, significantly explains the variation in the performance of water supply projects in Gakenke District.

**Table 3: Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5.039	3.544		1.422	.015
M&E planning process	1.348	.326	.327	4.132	.000
M&E technical capacity	.968	.287	.301	3.372	.001
M&E resources allocation	.638	.378	.196	1.687	.004
Stakeholders participation in M&E	.261	.320	.081	.815	.006

a. Dependent Variable: Project performance

Source: Field data (2023)

The adopted model presented as follow:

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

$$Y = 5.039 + 1.348X_1 + 0.968X_2 + 0.638X_3 + 0.261X_4$$

Where:

Y= Project performance

$\alpha$ = Constant term

X<sub>1</sub>= M&E planning process

X<sub>2</sub>= M&E technical capacity

X<sub>3</sub>= M&E resources allocation

X<sub>4</sub>= Stakeholders' participation in M&E

$\beta$ = Beta Coefficient

The findings in Table 3 show the constant term ( $\alpha$ ) is 5.039. It represents the expected value of the dependent variable (project performance) when all predictors (M&E planning process, M&E technical capacity, M&E resources allocation, and stakeholders' participation in M&E) are zero. The unstandardized coefficient ( $\beta$ ) for M&E planning process is 1.348. This indicates that a one-unit increase in M&E planning process is associated with a 1.348-unit increase in project

performance. ( $p < 0.05$  suggesting a positive and significant effect of M&E planning process on performance of water supply projects in Gakenke District).

The unstandardized coefficient ( $\beta$ ) for M&E technical capacity is 0.968 indicates that a one-unit increase in M&E technical capacity is associated with a 0.968 -unit increase in project performance. ( $p < 0.05$  indicating a positive and significant effect of M&E technical capacity on performance of water supply projects in Gakenke District). The unstandardized coefficient ( $\beta$ ) for M&E resources allocation is 0.638 suggests that a one-unit increase in M&E resources allocation is associated with a 0.638-unit increase in project performance. ( $p < 0.05$  indicating a positive and significant effect). The unstandardized coefficient ( $\beta$ ) for stakeholders' participation in M&E is 0.261 implies that a one-unit increase in stakeholders' participation in M&E is associated with a 0.261 -unit increase in project performance. ( $p < 0.05$  indicating a positive and significant effect).

The coefficients of the adopted model indicate that M&E planning process, M&E technical capacity, M&E resources allocation and stakeholders' participation in M&E have significant positive effect on project performance in the context of water supply projects in Gakenke District.

**Table 4: Summary on tested hypotheses**

N <sup>o</sup>	Hypotheses	P-Value	Verdict
1	There is no significant effect of M&E planning process on performance of water supply projects in Gakenke District.	.000	Rejected
2	There is no significant effect of M&E technical capacity on performance of water supply projects in Gakenke District.	.001	Rejected
3	There is no significant effect of M&E on resources allocation on performance of water supply projects in Gakenke District.	.004	Rejected
4	There is no significant effect of stakeholders' participation on performance of water supply projects in Gakenke District.	.006	Rejected

**Source: Field data (2023)**

All four null hypotheses have been rejected ( $p < 0.05$ ) and the researcher can conclude that M&E have effect on performance of water supply projects in Gakenke District.

### 5.1 Conclusion

The general objective of this research was to assess the effect of monitoring and evaluation on performance of water projects in Gakenke District. The results of the study rejected all null hypotheses ( $p < 0.05$ ), confirming that there is effect of M&E on performance of water projects in Gakenke District.

The research showed also that the effect of M&E planning process ( $B=1.348$ ,  $p=.000$ ), the effect of M&E technical capacity ( $B=.968$ ,  $p=.001$ ), the effect of allocation of resources ( $B=.638$ ,  $p=.004$ ), and the effect of participation of stakeholders in M&E ( $B=.261$ ,  $p=.006$ ). All these four factors have positive and significant effect on the performance of water projects in Gakenke District.

### 6.1 Recommendations

Based on the findings and the conclusion of the research, the following recommendations should be implemented:

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- Gakenke District should design M&E team to manage all monitoring and evaluation activities for all the projects in the organization. This shall improve the performance of the projects.
- Gakenke District should provide regular capacity building to M&E staff members in order to enhance their expertise in designing and implementing M&E activities, utilizing appropriate data collection methods, analyzing findings, and effectively utilizing technology and data management systems.
- Gakenke District should anticipate and address potential challenges that may hinder the effective utilization of M&E in improving project performance.
- Gakenke District should engage all stakeholders in setting M&E objectives and indicators, regularly communicating progress and findings, involving them in data review and validation, and facilitating meetings for stakeholders' discussions on M&E.

### **7.1 Suggestions for Further Researches**

In light of this study, the researcher proposes further investigation into the following areas:

-Effect of monitoring and evaluation process on sustainability of water supply projects in Rwanda.

-Effect of project risk planning on performance of water supply projects in Rwanda.

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