



Community Engagement and Water Flow Project Performance in Rwanda: A Case Study of Water and Sanitation Corporation (WASAC) Project in Bugesera District

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Abstract: This study explores the influence of community engagement on the performance of the Water and Sanitation Corporation (WASAC) project in Bugesera District, Rwanda. It employs the Theory of Social Change, Stakeholder Theory, and Resource-Based View as its theoretical framework. The research specifically examines how community engagement in project planning, implementation, and monitoring and evaluation (M&E) impacts the overall performance of WASAC projects in the region. A descriptive research design was employed, incorporating both quantitative and qualitative methods. The sample consisted of 292 respondents selected from a population of 2,356 through purposive and random sampling techniques. Data was gathered via structured questionnaires and interview guides and analyzed using SPSS software (version 21). Correlation and multiple regression analyses were used to assess the relationships between community engagement and project performance. The findings reveal a complex interaction between community engagement and project outcomes. Engagement in M&E practices was found to have a strong positive correlation with project performance ($r = 0.728, p < 0.01$). This indicates that active community participation in monitoring and evaluating the project significantly enhances its effectiveness. The study concludes that effective community engagement, particularly in M&E, is crucial for enhancing project performance. It is recommended that efforts be focused on strengthening community involvement in M&E processes, addressing challenges in the planning phase, and exploring further research into the long-term effects of community engagement, considering context-specific factors that may influence outcomes.

Keywords: Community Engagement, Water flow project, Project performance, Water and SANITATION Corporation, and Bugesera District

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1. Introduction

Community engagement in rural development is extensively recognized as a key operational principle, though discussions on its significance are vigorous. Historically, beneficiaries of community-based projects have often been viewed merely as consumers of services,

with their role in rural development considered less significant. Community engagement has typically been limited to consultations, which tend to stabilize the innovative and manageable capacities of community members at various levels. Effective community development initiatives are usually characterized by their

ability to integrate community perspectives and address community issues (Hope, 2021).

Globally, community engagement has increasingly become a focal point in many national policies and international development strategies in recent years. The prevailing belief is that involving citizens in rural programs and empowering them can enhance their livelihoods and drive development. Consequently, many projects in developing countries are unlikely to receive donor funding unless they include a component for engaging the community in their proposals (Chen, 2024). Thus, engagement strategies must be applied to small-scale development projects in ways that enable the disadvantaged to actively contribute, with external agents serving primarily as facilitators and sources of funding (Boddy, 2017). Advocates like Dwyer (2018) have supported the idea that community engagement is essential for allowing the disadvantaged to influence decisions. The inclusion of engagement elements in large-scale development aid quickly became prominent with institutions like the World Bank, through social investment funds and other forms of assistance.

In developing countries, implementing community engagement can be challenging because communities may not traditionally be prepared to undertake such responsibilities. The author believes that development programs are more likely to succeed if they incorporate a well-thought-out strategy to enhance community engagement during planning (Baccarini and Collins, 2023). This strategy supports effective community involvement in development, which is critical for empowering communities to contribute to and sustain development efforts. Rather than being passive recipients of development programs, communities are increasingly seen as essential stakeholders in the management of projects and programs in their areas (Atubaire, 2019).

In Africa, community engagement in project development involves ordinary citizens assessing needs and participating in the planning, budgeting, implementation, and monitoring of projects. This approach improves public resource management and reduces corruption, holding civil servants and political leaders accountable to the people. The exclusion of marginalized citizens from decision-making processes is a significant factor contributing to poverty, particularly in countries like Uganda, where it undermines their rights and creates unequal power dynamics. Many countries, unlike Uganda, have introduced mechanisms to enhance community engagement in local budgeting processes (Afsar, 2020).

Arora (2020) notes that engaging stakeholders in guiding and executing projects is essential for achieving the stated goals. Researchers have conceptualized community engagement in various ways depending on the project but

generally agree that communities should be involved in project selection and implementation. Arora (2020) emphasizes the need for community involvement in planning, implementation, and project management, while Burke (2018) focuses on involvement in the identification and planning phases. Conversely, Frank (2018) suggests that community engagement should be moderated, with communities included in advisory roles.

In the current study, community engagement is contextualized within the phases of project identification, planning, implementation, and monitoring and evaluation. The project identification process refers to the community's role in prioritizing and selecting the most suitable development project, involving ongoing assessment of viable options and the selection of the most appropriate ones (Arora, 2020). Project planning involves a systematic approach to executing a project, including setting objectives, and deliverables, and creating scheduled plans (Fraser, 2023).

In Rwanda, development projects aim to achieve economic progress by enhancing skills, thereby improving income and livelihoods. For instance, the livelihood project in Rwanda seeks to boost income and alleviate poverty and hunger through skills development, promoting savings, and providing loans for business startups. Studies by Mulwa (2019) indicate that while the livelihood project has positively impacted rural households, concerns about community engagement persist. Therefore, this study aims to investigate how community engagement influences the performance of development projects, using the Water and Sanitation Corporation (WASAC) Project in Bugesera District as a case study.

1.1. Problem statement

For many years, both government and non-governmental organizations have been involved in implementing water projects in rural areas to ensure reliable access to safe water. Despite these efforts, projects often face challenges related to poor management and sustainability issues (Mbabazi & Shukla, 2023). The Republic of Rwanda has addressed these concerns by prioritizing the sustainability of water supply projects within its National Development Agenda (MININFRA, 2020). However, recent reports and studies reveal that the performance and accessibility of these projects vary significantly across different regions.

Community engagement has been identified as a critical factor in enhancing project success and sustainability. Research by Bal (2021) and Ndegwa (2024) demonstrates that incorporating joint consultation and community involvement can significantly improve project outcomes. Engaging the community throughout the entire project life cycle—ranging from design to implementation and maintenance fosters a sense of ownership and

accountability, which is crucial for the long-term effectiveness of water projects (Mukundane, 2021). Despite these insights, empirical research, specifically addressing how community involvement impacts the management and sustainability of water projects remains insufficient.

In Bugesera District, significant investments have been made in water infrastructure, yet challenges such as inadequate community engagement, maintenance issues, and inefficient resource utilization persist. The WASAC annual report (2022) highlights a stark disparity in water accessibility across Rwanda, with Bugesera District having the lowest access rate at 24.0% compared to higher rates in other regions (WASAC, 2022). This study aims to address this gap by exploring how community engagement in planning, implementation, monitoring, and evaluation affects the performance and sustainability of water flow projects in Bugesera District.

This study sought to achieve the following Research objective:

- i. To assess how community engagement in monitoring and evaluation practices influences the performance of the WASAC project in the Bugesera District.

2. Literature Review

A conceptual review explores the essential theories and principles within a field to clarify its core concepts. By highlighting existing knowledge, identifying gaps, and outlining opportunities for further research, it provides a foundational understanding of the subject. This section specifically focuses on community engagement and project performance, offering insights into how these elements interrelate and impact overall outcomes.

2.1.1 Community Engagement

Community engagement can be broadly defined as the active involvement of individuals and groups within a community in various stages of projects aimed at addressing their own needs and concerns (Leipy, 2020). Unlike mere participation, community engagement emphasizes the collaborative process where people are not just involved but actively contribute to shaping, executing, and sustaining projects. This approach ensures that community members have a significant say in decisions that affect their lives, reflecting a fundamental democratic principle and a crucial element of human rights (Reela, 2021).

Community engagement encompasses various levels and forms, including planning, implementation, and evaluation. Stakeholders may assume roles ranging from

users and beneficiaries to advisors, contributors, managers, decision-makers, and service deliverers. The form of engagement is critical to project performance, as highlighted by Nance and Chen (2024). Their research indicates that while increased participation alone does not necessarily enhance performance, effective mobilization and decision-making processes are associated with better project outcomes. They categorize community engagement into four forms: Mobilizing, Decision-making, Construction work, and Maintenance work (Etwire et al., 2017).

Research by Katsi (2018) on community engagement in water and sanitation projects in the Zambezi Valley revealed that previous failures occurred due to inadequate local involvement. Local communities often perceived such projects as externally driven, leading to a lack of ownership and engagement with the facilities (Harvey & Reed, 2019). Insufficient community involvement before the establishment of these facilities contributed to the perception that the projects were not integral to the community's management or benefit.

2.1.2 Project Monitoring and Evaluation Practices

Project monitoring and evaluation (M&E) are crucial for ensuring that projects achieve their intended outcomes and provide value. Effective M&E involves systematically tracking project performance against predefined objectives, schedules, and budgets. According to Johnson and Patel (2021), employing a robust framework for collecting and analyzing performance data is essential for identifying potential issues early and making necessary adjustments to stay on course. This continuous oversight helps ensure that resources are utilized efficiently and that the project remains aligned with its goals (Johnson & Patel, 2021). Supporting this, recent studies have highlighted that integrating M&E into the project lifecycle not only improves performance tracking but also enhances overall project outcomes (Nguyen et al., 2022).

Recent advancements in M&E practices include the integration of advanced analytics and real-time monitoring tools. Smith and Clark (2023) highlight that leveraging data visualization and real-time dashboards can significantly enhance monitoring effectiveness by providing stakeholders with immediate insights into project performance. Such technologies enable more dynamic and responsive decision-making, allowing project managers to address issues as they arise rather than after the fact (Smith & Clark, 2023). Additionally, a study by Lee and Wright (2024) confirms that real-time data analysis helps in reducing project delays and improving resource allocation, further supporting the benefits of advanced monitoring tools (Lee & Wright, 2024).

Evaluating the impact and effectiveness of a project involves more than just performance metrics; qualitative assessments are also crucial. Lee and Robinson (2024) emphasize that incorporating qualitative feedback from beneficiaries and stakeholders provides a comprehensive understanding of a project's impact. Combining quantitative data with qualitative insights offers a more holistic view of project outcomes and can reveal nuances that metrics alone might not capture (Lee & Robinson, 2024). This approach is corroborated by a study conducted by Kumar and Singh (2023), which found that qualitative feedback significantly enhances the accuracy of impact assessments and helps in tailoring interventions more effectively (Kumar & Singh, 2023).

2.1.3 Project performance

Project performance refers to the evaluation of how well a project meets its predefined criteria and objectives (Serrador & Turner, 2021). Historically, performance was assessed using a limited set of metrics, primarily focusing on time, scope, and cost. These traditional criteria were foundational in determining whether a project was completed on schedule, within budget, and according to specifications. Over time, the scope of performance evaluation has expanded to include additional dimensions such as achieving strategic and financial objectives and ensuring stakeholder satisfaction. This broader perspective reflects the increasing complexity of modern projects and the need for a more comprehensive evaluation framework (Turner & Keegan, 2023).

Recent research highlights that project performance is influenced by both intrinsic and extrinsic factors (Loo, 2022). Intrinsic factors include aspects directly controlled by project managers, such as adherence to time schedules, budget constraints, and quality standards. These elements are crucial as they provide direct indicators of performance efficiency and effectiveness. Extrinsic factors, on the other hand, relate to the perceived value and impact of the project outcomes, including stakeholder satisfaction and the utility of the project deliverables. These factors are often assessed after project completion but can be managed throughout the project by aligning deliverables with client expectations and needs (Aibinu & Jagboro, 2019).

The evaluation of project performance often centers around critical performance indicators CPIs (Gass, 2020). CPIs are metrics used to assess whether a project is meeting its goals and objectives. These indicators typically include adherence to cost and schedule targets, as well as the alignment of project outcomes with strategic objectives (Gido & Clements, 2022). By tracking these indicators, project managers can identify performance issues and make necessary adjustments to ensure that the project

remains on track. The stability of these metrics, despite occasional reviews, underscores their importance in providing a consistent measure of performance (Kliem & Anderson, 2021).

Effective management of project performance also involves managing expectations and adapting to evolving project dynamics. As projects progress, it is crucial to continuously assess and adjust performance metrics based on stakeholder feedback and changing project requirements. Wangeci (2020) emphasizes that successful performance management is not just about meeting initial objectives but also about adapting to new challenges and expectations that arise throughout the project lifecycle. This ongoing adjustment reflects the dynamic nature of project performance and highlights the importance of flexibility and responsiveness in achieving project success.

2.1.3 Theoretical Review

Theories are a useful starting point for differentiating degrees and kinds of participation including their outcome. Providing a series of ideal types along which forms of participation may be ranged, most theories carry with them implicit normative assumptions which place these forms of participation along an axis of 'good' to 'bad'. This study focused on citizen participation Theory and Social Capital Theory.

2.1.3.1 Citizen Participation Theory

Citizen participation theory is a foundational concept in political science and public administration that underscores the importance of involving individuals in democratic governance. Key contributions to this theory include Sherry Arnstein's "Ladder of Citizen Participation," which categorizes involvement levels from non-participation to genuine citizen power (Arnstein, 1969), and Robert A. Dahl's emphasis on participatory democracy, which highlights the need for real opportunities for citizen influence (Dahl, 1989). Recent scholarship continues to build on these ideas, exploring how modern tools and practices can enhance citizen engagement (Renn & Schweizer, 2022).

Citizen participation theory is crucial for understanding and improving the performance of water flow projects, such as the WASAC initiative in Bugesera District, Rwanda. This theory highlights how effective community engagement can enhance project outcomes by aligning them with local needs and preferences. By involving community members in the planning and implementation stages, projects are more likely to address specific requirements, leading to greater efficiency and sustainability in water infrastructure. For instance, local

stakeholders' input can help tailor the water supply system to better meet the community's needs, potentially improving both the performance and long-term viability of the project (Liu et al., 2021).

Citizen participation theory is highly relevant to water flow projects, such as the WASAC initiative in Bugesera District, Rwanda. This theory underscores that involving community members in the planning and implementation of water infrastructure projects can significantly improve outcomes. By engaging local stakeholders, projects are better aligned with the specific needs and preferences of the community, leading to more efficient and sustainable solutions.

2.1.3.2 Social Capital Theory

Social Capital Theory, as articulated by James Coleman (1988), emphasizes the role of social networks, norms, and trust in facilitating cooperation within a community. Coleman's work focuses on how relationships within a community enable individuals to achieve shared goals, and how social structures and networks contribute to the collective wellbeing of society. According to Coleman, social capital is a form of capital that exists in the relationships between individuals and groups, which can be utilized to promote economic, social, and political cooperation. Contemporary research continues to validate that robust social network enhances cooperation, facilitates the exchange of information, and supports collective action, leading to improved social outcomes and economic benefits (Woolcock, 2020; Portes & Vickstrom, 2019).

At its core, Social Capital Theory focuses on the value of social networks, norms of trust, and reciprocity in fostering cooperation and enabling individuals to achieve common objectives (Woolcock, 2020). It posits that strong, interconnected networks can create opportunities for individuals and groups to access resources, share knowledge, and mobilize support for collective action. Social capital is not limited to the quantity of social ties but is more about the quality of those relationships and the trust they generate, which can lead to improved economic, social, and political outcomes. Through these social ties, communities can more effectively address challenges, share resources, and build long-lasting solutions.

In the context of community engagement and water flow projects, such as the WASAC initiative in Bugesera District, Social Capital Theory is highly relevant. Recent studies emphasize that robust social networks and trust among community members significantly impact project outcomes. For the WASAC project, engaging local communities helps to build trust, gather valuable input, and tailor water infrastructure to meet specific needs. By

actively involving community members in the planning and implementation phases, the project not only benefits from local knowledge and transparency but also fosters a sense of ownership and accountability. This approach ensures that water management solutions are sustainable and aligned with community expectations, ultimately leading to greater support and long-term success.

2.2 Empirical Literature

This section reviews existing studies related to community engagement and project performance, with a focus on how project Monitoring and Evaluation impacts the overall success of projects.

2.4.1 Project Monitoring and Evaluation and Project Performance

Monitoring and evaluation (M&E) have been identified as pivotal tools for enhancing project performance globally. A study conducted by Tache (2021) in Romania aimed to assess the impact of M&E on project sustainability. The findings indicated that the implementation of robust M&E systems improved the sustainability of projects by 75%. The regression model used in the study had an R-squared value of 0.81, showing a strong relationship between M&E practices and project sustainability. The study's Beta coefficient for M&E was 0.67, which suggests a significant positive effect on the sustainability of projects. However, a research gap remains regarding the specific cultural and contextual factors that could influence the effectiveness of M&E in different regions. Future studies could explore how local contexts interact with M&E practices to determine their true impact on project success.

In the African context, M&E systems are critical for enhancing the performance and sustainability of development projects, as demonstrated in a study by Paulinus and Iyenemi (2023) conducted in Nigeria and Ghana. This study found that projects with strong M&E frameworks had a 60% higher rate of sustainability compared to those with weak or absent M&E systems. The regression model's R-squared value was 0.72, indicating that M&E explained a substantial portion of the variance in project sustainability. The Beta coefficient for M&E was 0.58, suggesting a moderate but significant positive relationship between M&E implementation and sustainability. The research highlighted a gap in understanding how specific political and economic factors in African countries influence the effectiveness of M&E systems. Future research could focus on how these variables affect M&E's role in project success across different African nations.

In Rwanda, M&E systems have been particularly important in water-related infrastructure projects, such as the WASAC initiative in Bugesera District. A study by Mwanda (2019) focused on stakeholder management and its relationship with project success in the context of M&E. The study found that 85% of projects with effective stakeholder engagement and monitoring were more likely to meet their long-term objectives. The model summary showed an R-squared of 0.77, with the Beta coefficient for stakeholder management at 0.73, indicating a strong positive relationship between stakeholder management and project success. Despite these findings, there is a significant gap in understanding how the integration of local community knowledge and traditional management practices can enhance the M&E processes. Further research is needed to examine the role of community-based monitoring in improving the sustainability of water projects in Rwanda.

3. Methodology

A descriptive research design was chosen for this study, combining both qualitative and quantitative methods. The design was appropriate as it aimed to determine the influence of various community engagement variables such as project monitoring and evaluation on the performance of WASAC projects. This approach allowed for a detailed examination of how these factors contributed to the success of the projects.

The target population for this study consisted of individuals involved in the WASAC projects in Bugesera District, including 28 project team members, 4 planning and administrative staff, and 2,324 project beneficiaries, totaling 2,356 individuals. This population provided a comprehensive basis for assessing the role of community engagement in the performance of these projects. A sample of 331 respondents was selected from the total population of 2,356 individuals. The sample was determined based on the guidelines provided by Krejcie and Morgan (1970). The sample included 2 planning and administrative staff, 4 project team members, and 325 beneficiaries. Simple random sampling was used to select middle and lower-level staff, while purposive sampling was employed to select top-level staff. This ensured that both staff and beneficiaries with relevant experience contributed to the study.

The study used primary and secondary data collection methods. Primary data was gathered through questionnaires and interviews, while secondary data was obtained from documentary reviews. The interviews provided in-depth qualitative insights, while the questionnaires, distributed to the beneficiaries, focused on gathering quantitative data. The questionnaires were

designed to address the research objectives, and their content was validated through expert review. The researcher also ensured ethical standards by obtaining consent and guaranteeing the confidentiality of respondents' information.

A pilot study was conducted with 30 randomly selected participants to test the reliability and validity of the research instruments. The pilot study helped identify any ambiguities in the questionnaires and ensured that the instruments were effective in achieving the research objectives. Validity was ensured by consulting relevant literature and seeking expert opinions. The reliability of the questionnaire was measured using Cronbach's alpha, with results indicating satisfactory internal consistency across different sections, such as project planning, implementation, monitoring, and performance.

The data analysis process involved both descriptive and inferential statistical methods. Data from the questionnaires were analyzed using SPSS version 21, with descriptive statistics used to summarize the data and inferential statistics, including correlation and regression analyses, to explore relationships between the variables. The study utilized multiple regression analysis to test the research hypotheses and determine the influence of community engagement on project performance. The study used the following conceptual model:

$$Y=f(X_1)$$

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Where;

Y = Project Performance

β_0 = intercept (constant)

X_1 = project Monitoring and Evaluation

ε = the error term (residual).

Ethical considerations were rigorously followed in this study, ensuring participant confidentiality, informed consent, and voluntary participation. Personal identifiers were not collected, and data were securely stored to protect respondents' privacy.

4. Results and Discussion

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

4.1 Findings

4.1.1 Response rate

The response rate is a critical metric in assessing the reliability and validity of research findings. It reflects the proportion of targeted participants who actively engaged with the study, providing valuable insights into the study's

overall credibility and representativeness. In this context, the response rates for the study participants are presented in Table 1, demonstrating high levels of engagement from both the WASAC staff and beneficiaries. These rates are

essential for evaluating the quality of the collected data and ensuring a comprehensive understanding of the research subject.

Table 1. Response rate

Respondents	Targeted	Obtained	Response rate (%)
WASAC staff	6	6	100
Beneficiaries	325	286	88
Total	331	292	88.2

Source: Primary data, 2024

Table 1 illustrates the response rates for the study's participants. The WASAC team achieved a perfect response rate of 100%, with all 6 targeted staff members participating. For beneficiaries, out of 325 targeted individuals, 286 responded, resulting in a response rate of 88%. Overall, the study obtained responses from 292 out of 331 targeted individuals, yielding a total response rate of 88.2%. These high response rates, especially the full participation from the WASAC staff, indicate strong engagement and support for the study, enhancing the reliability of the collected data. To further enrich the findings, the WASAC team was interviewed to gather in-depth qualitative insights into their perspectives and experiences. In contrast, beneficiaries provided their input through a questionnaire, allowing for a broader quantitative assessment of their feedback. This mixed-methods

approach provided a comprehensive understanding of the study's subject matter.

4.1.2 Descriptive Statistics of Project Monitoring and Evaluation

Table 2 provides insights into respondents' perceptions regarding the influence of community engagement on the performance of WASAC projects in Bugesera District. The table employs a response scale where SD stands for Strongly Disagree, D for Disagree, N for Neutral, A for Agree, and SA for Strongly Agree. It details the mean and standard deviation for each response category, offering a detailed overview of how community engagement is perceived to affect project performance.

Table 2: Level of agreement on how project M &E affects project performance

Statements	N	Mean	SD
Community engagement in monitoring and evaluation practices has led to noticeable improvements in the services provided by WASAC	286	3.70	.55
Involving the community in M&E processes improves the overall effectiveness of project interventions	286	3.66	.87
Community feedback during M&E helps in identifying and addressing project challenges more effectively	286	3.82	.75
Projects that actively engage the community in M&E are more likely to achieve their intended outcomes.	286	3.69	.74
Community involvement in M&E fosters greater accountability and transparency in project implementation.	286	4.05	.57
Aggregate Score		3.79	

Source: Primary data, 2024-Key: M: Mean, SD=Standard Deviation

Table 2 provides insights into respondents' perceptions of how community engagement in monitoring and evaluation (M&E) practices impacts the performance of WASAC projects in Bugesera District. The data in the table reveals a generally positive view of the role of community involvement in enhancing project effectiveness. Specifically, respondents agree that community engagement has led to noticeable improvements in services (mean = 3.70, SD = 0.55) and that involving the community

improves the overall effectiveness of project interventions (mean = 3.66, SD = 0.87). They also believe that community feedback during M&E helps in identifying and addressing project challenges more effectively (mean = 3.8287, SD = 0.75) and that projects actively engaging the community in M&E are more likely to achieve their intended outcomes (mean = 3.69, SD = 0.74). The highest agreement is seen in the view that community involvement

in M&E fosters greater accountability and transparency in project implementation (mean = 4.05, SD = 0.57).

The aggregate score of 3.79 reinforces the positive perception of community engagement in enhancing project success. These findings suggest that continued and meaningful community involvement is crucial for improving project outcomes, fostering accountability, and ensuring the effectiveness of WASAC's water and sanitation initiatives, including specific projects like the water flow project in Bugesera District. These findings imply that while community engagement in M&E is

viewed positively, there is a need for improvements in how feedback is processed and utilized. Enhancing these aspects could lead to more effective M&E practices, better project outcomes, and increased community trust and support.

4.1.3 Correlation Analysis

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

Table 3: Correlations coefficients matrix

		Project M & E	Project Performance
Project M & E	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	286	
Project Performance	Pearson Correlation	.728**	1
	Sig. (2-tailed)	.000	
	N	286	286

Source: Primary data, 2024

The correlation matrix presented in Table 3 shows a strong positive relationship between "Project M&E" and "Project Performance," with a Pearson correlation coefficient of 0.728. This suggests that improvements in Monitoring and Evaluation (M&E) practices are associated with enhanced project performance. The significance of value (Sig. = 0.000) indicates that this relationship is statistically significant, with a confidence level of 99%. The sample size of 286 respondents further reinforces the reliability of these findings, concluding that effective M&E is positively linked to better project performance.

4.1.5 Multiple Regression

In this section, multiple regression analysis is used to assess the impact of various independent variables on project performance. This analysis examines the influence of project monitoring and evaluation (M&E) on project performance. The following table presents the results of this multiple regression analysis, including coefficients, significance levels, and overall model fit, providing a detailed understanding of how each variable affects project performance.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.830 ^a	.689	.686	.34111

a. Predictors: (Constant), Project Monitoring and Evaluation

The model summary in Table 4. provides an overview of the multiple regression analysis conducted to evaluate the impact of project monitoring and evaluation (M&E) on project performance. The model shows an R value of 0.830, indicating a strong positive correlation between the predictors and project performance. The R Square value of 0.689 suggests that approximately 68.9% of the variance in project performance can be explained by the combined effects of the independent variable. The Adjusted R Square

of 0.686 adjusts for the number of predictors in the model, reinforcing the model's explanatory power. The Std. Error of the Estimate of 0.34111 represents the average distance that the observed values fall from the regression line, providing a measure of the model's precision. This summary indicates that the model has a good fit and effectively captures the relationship between the independent variables and project performance. Therefore, the high R² value of 0.689 indicates that the model

effectively explains a substantial portion of the variance in project performance, suggesting that project planning,

implementation, and monitoring and evaluation collectively have a significant impact.

Table 5: ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72.827	3	24.276	208.627	.000 ^b
	Residual	32.813	282	.116		
	Total	105.640	285			

- a. Dependent Variable: Project Performance
- b. Predictors: (Constant), Project M&E,

Table 4 presents the Analysis of Variance (ANOVA) results for the regression model evaluating the impact of project monitoring and evaluation (M&E) on project performance. The regression model explains a significant portion of the variance in project performance, as evidenced by the F-value of 208.627, which is statistically significant with a p-value of 0.000. This high F-value and

low p-value indicate that the model's predictor project M&E collectively have a statistically significant effect on project performance. The Sum of Squares for regression is 72.827, and for residuals, is 32.813, with the total sum of squares being 105.640. This ANOVA result confirms the overall validity of the regression model in explaining project performance.

Table 6: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.798	.125		22.333	.000
	Project M & E	.324	.027	.486	12.000	.000

- a. Dependent Variable: Project Performance

Table 5 presents the coefficients from the regression analysis, providing insights into the relationship between Project Monitoring and Evaluation (M&E) and Project Performance. The constant value is 2.798, indicating the baseline project performance when M&E is zero. The unstandardized coefficient for Project M&E is 0.324, which suggests that for every unit increase in M&E, the project performance increases by 0.324 units. The standardized Beta coefficient is 0.486, indicating a moderate-to-strong positive effect of M&E on project performance. The t-value of 12.000 and the significance level (Sig. = 0.000) demonstrate that the relationship between M&E and project performance is statistically significant, suggesting that M&E has a substantial impact on project performance

4.2 Discussion of Findings

This section presents the results of the study, providing an in-depth analysis of the findings from the data analysis, including the correlation and regression tests. The discussion focuses on how community engagement affect performance of Water Flow Project in Bugesera District.

Specifically, the aim was to establish the effect of project M & E on project performance.

The descriptive analysis results revealed that community engagement in monitoring and evaluation (M&E) practices is viewed as significantly enhancing the performance of WASAC projects in Bugesera District. Community involvement is credited with leading to noticeable service improvements and increasing the effectiveness of project interventions. Feedback from the community is considered vital for addressing project challenges and achieving intended outcomes. The highest agreement is on the role of community engagement in promoting accountability and transparency in project implementation. To maximize these benefits, WASAC should focus on strengthening mechanisms for incorporating community feedback and addressing local needs.

During an interview with the project manager, he reported that community engagement in monitoring and evaluation (M&E) has been a critical factor in the success of WASAC projects. He highlighted that while there is strong community involvement in M&E processes, there are ongoing challenges in effectively utilizing feedback and

demonstrating the direct impact of community input on project improvements. The project manager acknowledged that, despite the generally positive perception of community participation, enhancing the management of feedback and ensuring that community contributions lead to tangible improvements are areas requiring further attention. He emphasized the need for more systematic approaches to integrating community feedback into decision-making processes to better address local needs and improve the overall effectiveness of the projects.

These findings concur with Johnson's (2022) study on community engagement in monitoring and evaluation (M&E), which highlights that while community involvement is crucial for effective project oversight, challenges often persist in effectively utilizing feedback. Johnson's research underscores the importance of not only engaging communities but also having robust systems to integrate feedback into meaningful changes. This aligns with the manager's observations, which emphasize the need for improved mechanisms to better utilize community input and demonstrate its impact on service improvements.

The correlational analysis results show a strong positive relationship between Project Monitoring and Evaluation (M&E) and Project Performance. The relationship is statistically significant, indicating that improvements in M&E practices are closely linked to enhanced project performance. This finding underscores the importance of effective M&E systems in driving successful project outcomes. The analysis is based on a sample size of 286 respondents, adding reliability to the conclusion that better M&E leads to improved project performance.

In addition, regarding inferential analysis, multiple regression was employed to assess the impact of project monitoring and evaluation (M&E) on project performance. The model summary indicated a strong positive correlation between the predictors and project performance, with a high proportion of variance in project performance explained by the independent variable. The ANOVA results confirmed the overall significance of the regression model, with the predictors collectively influencing project performance. The coefficients analysis showed a significant relationship between M&E and project performance, indicating that improvements in M&E are associated with enhanced project outcomes. This analysis highlighted the substantial effect of M&E practices on the overall success of projects.

These findings are supported by Hoe (2021), who found a similar positive relationship between Monitoring and Evaluation (M&E) and project performance in his study on infrastructure projects. Hoe (2021) emphasized that effective M&E systems lead to better project outcomes by improving decision-making, resource allocation, and

stakeholder engagement. Furthermore, the research aligns with the work of other scholars, such as Tache (2021), who identified that M&E practices significantly contributed to project sustainability and success in various contexts. These studies reinforce the notion that robust M&E systems are critical drivers of enhanced project performance.

Similarly, these findings align with the work of Anderson (2020), who demonstrated that rigorous M&E frameworks are essential for identifying potential issues early in the project lifecycle, thereby mitigating risks and ensuring smoother project execution. Anderson highlighted the importance of continuous monitoring and evaluation in driving accountability and transparency, leading to improved project efficiency and effectiveness. Additionally, the results resonate with the findings of Kinyua (2022), who argued that M&E systems are fundamental in fostering long-term project success by ensuring that objectives are met, and resources are utilized optimally. These studies collectively underscore the critical role of M&E in improving project outcomes, which aligns with the findings of this research on the significant impact of M&E practices on project performance.

5. Conclusion and Recommendations

5.1 Conclusion

The study concluded that community engagement in monitoring and evaluation (M&E) practices of WASAC projects in Bugesera District has a substantial positive impact on project performance. The results underscore the importance of involving the community in M&E processes to significantly enhance project outcomes. Active community participation in assessing and refining project strategies ensures that the projects are well-aligned with community needs and expectations, leading to better performance. The strong positive relationship between community engagement in M&E and project performance indicates that strengthening these practices can greatly improve project effectiveness. Efforts to deepen community involvement in M&E are likely to result in more successful project implementation and greater overall success.

5.2 Recommendations

Based on the findings of the study, the following recommendations should be considered to enhance community engagement and improve the performance of WASAC projects in Bugesera District:

1. WASAC should increase community participation, particularly during the monitoring and evaluation phases of projects. This can be achieved by holding regular consultations with residents, allowing them to provide feedback on service delivery. In addition, the community should be actively involved in identifying challenges and suggesting potential solutions throughout the project implementation process.
2. WASAC should create clear, structured processes for gathering, analyzing, and acting upon community feedback. This could involve setting up dedicated feedback loops to ensure that community suggestions are thoroughly reviewed and appropriate actions are taken to address any issues raised by residents.
3. To improve the community's ability to engage meaningfully in monitoring and evaluation activities, WASAC should offer targeted training programs. Establishing transparent reporting systems and feedback channels will ensure that community insights are integrated into project adjustments, ultimately contributing to better project outcomes.

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