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The influence of resource allocation in monitoring and planning on the performance of water supply projects at Songea Water Supply and Sanitation Authority, Tanzania

Adam O. Karia[1], Ghanima Chanzi[2]
Water Institute, P.O. Box 35059, Dar es Salaam, Tanzania
*Correspondence: adamkaria03@gmail.com

ABSTRACT
This study assessed the influence of resource allocation in monitoring and planning on the performance of water supply projects at the Songea Water Supply and Sanitation Authority (SOUWASA) in Songea, Tanzania. Adopting a mixed-methods research design, the study integrates quantitative surveys and qualitative interviews to provide a comprehensive understanding of the topic. Data were collected from a sample of 91 SOUWASA staff, community representatives, and local government officials. Quantitative data were analyzed using descriptive statistics and regression analysis, while qualitative data were examined through thematic analysis. The findings reveal that budget allocation, human resource availability, and the provision of materials and equipment have significant positive effects on project performance, with the provision of materials and equipment exerting the strongest influence. Qualitative results further highlight challenges, including inadequate funding, limited staff, and insufficient monitoring tools, that hinder effective supervision and timely project completion. The study concludes that the strategic and timely allocation of financial, human, and material resources, coupled with effective planning and coordination, is essential to enhancing the performance and sustainability of water supply projects. The findings offer practical guidance for SOUWASA and similar utilities aiming to optimize project outcomes through effective resource management.
Keywords: *Resource Allocation, Project Performance, Monitoring and Planning, Material Provision, Human Resources*
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Introduction

Resource allocation is the systematic distribution of financial, human, and material resources to planned activities to achieve organizational objectives efficiently. In project management, it ensures that sufficient funds, skilled personnel, and tools are assigned to critical functions such as planning, monitoring, and evaluation (Sripathi et al., 2026).

Globally, ineffective allocation of resources for monitoring and planning is recognized as a major constraint to achieving Sustainable Development Goal 6 (SDG 6) on safe and sustainable water for all. The WHO/UNICEF Joint Monitoring Program (JMP) Report indicates that 2.2 billion people worldwide still lack access to safely managed drinking water, partly due to weak planning systems and poor monitoring of existing water infrastructure (Rakotomanana et al., 2020). The UN World Water Development Report (2024) further reports that nearly 30–40% of water supply systems in low- and middle-income countries become partially or fully non-functional within five years of completion, largely because monitoring budgets and planning capacities are inadequate. The World Bank (2022) reports that many governments allocate less than 1% of their total water-sector budgets to monitoring and evaluation, despite international recommendations of 5–10%.

In Europe, although access to improved water supply exceeds 96%, performance disparities among water utilities persist due to differences in planning efficiency and in investment monitoring. The European Benchmarking Co-operation (EBC) Water Utility Performance Report (2023), covering utilities from 16 European countries, found that utilities allocating greater financial and human resources to performance monitoring recorded 15–25% lower non-revenue water and improved asset management outcomes. The European Environment Agency (EEA, 2022) reports that some Eastern and Southern European countries, including Romania, Bulgaria, and Greece, have infrastructure leakage rates exceeding 35%, largely due to underinvestment in monitoring systems and in long-term planning. Studies conducted in Germany and the Netherlands show that utilities that integrate digital monitoring tools and allocate consistent budgets for planning achieve higher operational efficiency and resilience to climate stress (Kurilenko et al., 2025).

Across Africa, water supply projects face severe performance challenges driven by limited financial capacity, weak institutional structures, and inadequate monitoring systems. According to the African Development Bank

(AfDB, 2021), more than 40% of rural and urban water supply systems in Sub-Saharan Africa are non-functional or operating below capacity, primarily due to insufficient monitoring and poor planning. In Rwanda, empirical research conducted in 2020 revealed that water projects with clearly allocated monitoring budgets and trained personnel exhibited significantly higher in-service reliability and maintenance performance than those without such support (Amuna et al., 2026). The UN-Water GLAAS Report (2022) further indicates that African countries allocate less than 50% of the required human resources for effective water-sector monitoring.

In Tanzania, the water sector has experienced significant investment through programs such as the Water Sector Development Program (WSDP); however, performance outcomes remain mixed. The Energy and Water Utilities Regulatory Authority (EWURA, 2024) reports that the average non-revenue water among urban WSSAs is approximately 36%, well above the national target of 20%. The Controller and Auditor General (CAG, 2022) identifies weak monitoring frameworks, inadequate planning, and limited allocation of financial and human resources as key factors affecting the performance of water projects in regions such as Dodoma, Morogoro, and Mwanza. Studies conducted in Dodoma City Council (2021) show that projects allocating less than 3% of their budgets to monitoring and evaluation experienced frequent system breakdowns and service interruptions (Mativila et al., 2023).

Songea Water Supply and Sanitation Authority operates in a rapidly growing urban environment within the Ruvuma Region, where demand for reliable water services continues to increase. EWURA performance reports from 2021 to 2024 indicate that medium-sized utilities, such as Songea, face persistent challenges in infrastructure maintenance, service coverage expansion, and operational efficiency (Mngale et al., 2025). Informal settlements and the expansion of peri-urban areas further strain existing systems, increasing the need for effective planning and continuous monitoring (Mwago et al., 2024). However, like many regional WSSAs, Songea experiences limitations in financial allocations for monitoring activities, shortages of specialized planning personnel, and reliance on manual or fragmented data systems. These constraints hinder the timely detection of system failures, effective decision-making, and long-term sustainability of water supply projects (Songea Water Supply and Sanitation Authority, 2024).

This study examined how resource allocation in monitoring and planning influences the performance of water supply projects at the Songea Water Supply and Sanitation Authority, with particular attention to financial resources, human capacity, and monitoring tools. By grounding the analysis in global, regional, and national evidence and generating localized empirical data, the study helps close the existing knowledge gap regarding the operational realities of WSSAs in Tanzania. The findings are expected to inform policymakers, regulators, and water utility managers on optimal resource allocation strategies for monitoring and planning, thereby enhancing efficiency, sustainability, and service delivery performance in the water sector.

Conceptual Framework

A conceptual framework is a hypothesized model identifying the concepts under study and their relationships. The conceptual framework describes the relationship between the independent and dependent variables. As shown in the figure below, the dependent variable depends on the function of the independent variable that occurs

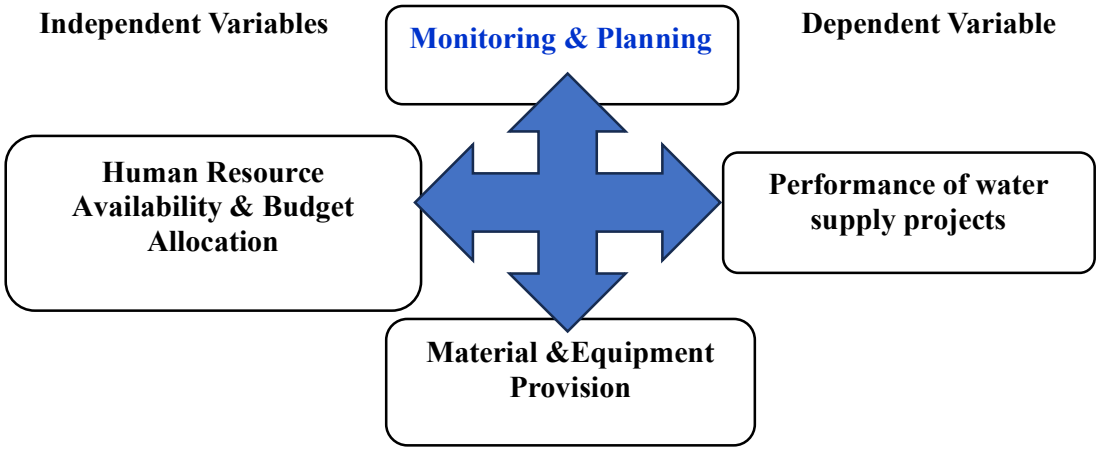

Figure 1: Conceptual Framework (*Source: Researcher construct, 2026)*

Material and Methods

Area of the Study

This study was conducted in Songea, specifically within the service area of the Songea Water Supply and Sanitation Authority (SOUWASA), to examine the influence of resource allocation in monitoring and planning on the performance of water supply projects. Songea is a rapidly expanding urban center in the Ruvuma Region, where population growth and urbanization have significantly increased demand for reliable and safe water services, making effective planning and monitoring increasingly critical. SOUWASA, as the primary water utility provider, has implemented several water supply projects with varying performance outcomes, providing a suitable context for assessing how financial, human, and technical resources allocated to monitoring and planning affect project efficiency, sustainability, and service delivery. Furthermore, limited empirical research has focused on resource allocation for monitoring and planning in water supply projects in this region, creating an opportunity for this study to generate context-specific evidence to inform utility management practices, policy decisions, and water sector reforms in Songea and similar urban settings in Tanzania.

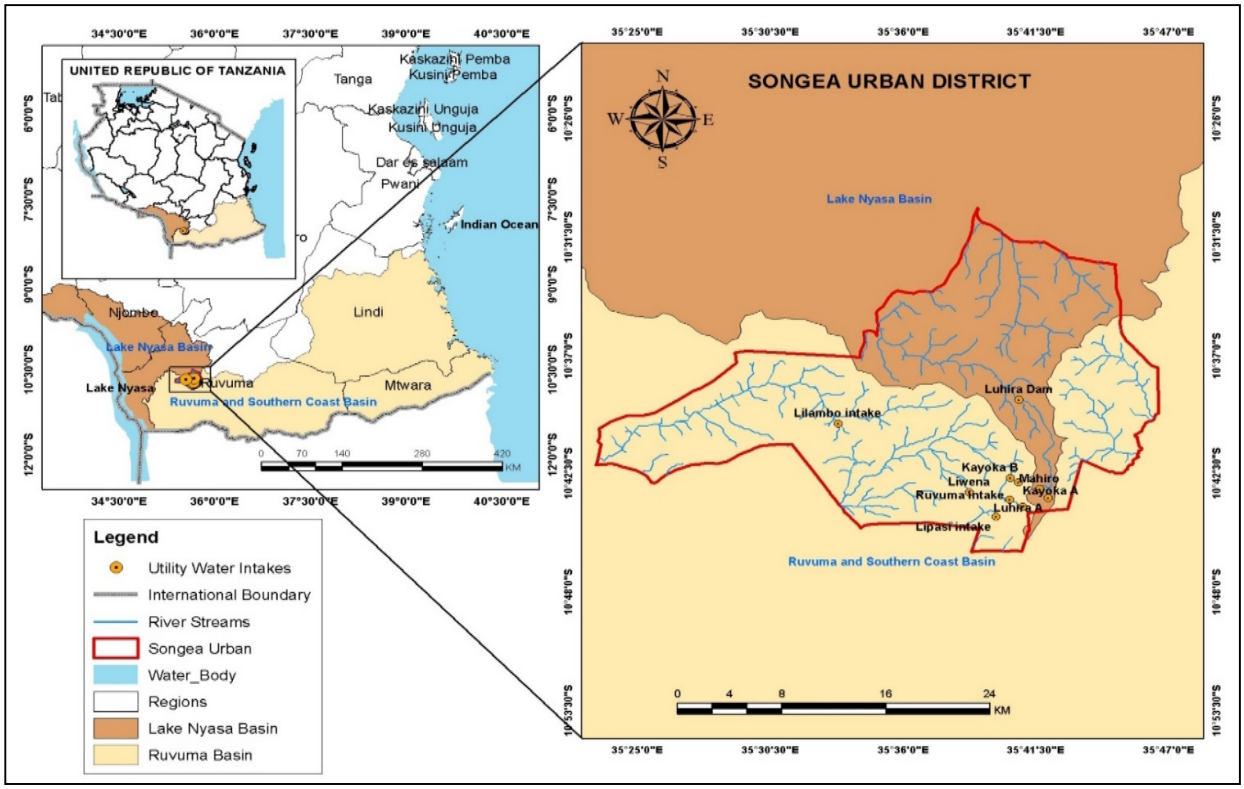

Figure 2: Songea map showing the geographical location of the service *area*

(Source: SOUWASA, 2026)

Research Methods/Approach

The research employed a mixed-methods approach, combining quantitative and qualitative techniques to explore key variables, thereby ensuring a robust and comprehensive analysis. This approach effectively integrates numerical data with descriptive insights, enabling the researcher to delve into the subject from both statistical and contextual perspectives. The mixed-methods approach is particularly valuable for this study as it enhances the depth and breadth of the investigation, allowing for a thorough exploration of complex phenomena (Dubey et a., 2022).

Targeted Population

In this study, the population refers to the entire set of individuals or entities that possess the specific characteristics relevant to the research objectives. According to SOUWASA (2025), the total population is 119 individuals, as outlined in Table 2.

Table 2: Distribution of SOUWASA Staff *(Source: SOUWASA, 2026)*

Category/Department	Population	Percentage (%)
Management Staff	9	8.4%
Engineers/Technical Staff	31	25.2%
Administrative Staff	20	16.8%
Operations and Maintenance	24	21.0%
Finance and Procurement Staff	16	12.6%
Customer Service Staff	19	16.0%
Total	**119**	**100%**

Sample Size and Sampling Techniques

Sample size

For this study, the sample comprised 91 participants. The Yamane formula was utilised by the researcher to determine the appropriate sample size from the population, whereby;

$n= N/(1+N(e)^2)$

n = Sample Size,

N= Total Number of Population,

95% confidence level

e = Sampling error in this study researcher uses 0.05 sampling error

$n = 119/ (1+119 (0.05)^2$

n = 91

Sampling strategies

The study employed a combination of Simple Random Sampling and Purposive Sampling to ensure both representativeness and the collection of in-depth insights. Simple Random Sampling was used to select a broad sample of employees at SOUWASA, ensuring each individual had an equal chance of selection and minimizing selection bias, thereby enabling generalization of the results. In contrast, Purposive Sampling targeted key informants, such as senior managers, project supervisors, and monitoring and evaluation officers, who possess specialized knowledge of project planning and monitoring. This dual approach enabled the study to gather comprehensive data from the general workforce while also capturing detailed perspectives from individuals directly involved in water supply project implementation and oversight (Smith, 2020).

Data Collection Methods

This study utilized multiple data collection methods to ensure a comprehensive and well-rounded analysis. The primary method was a survey, chosen for its efficiency in collecting structured data from a large sample and for its capacity to integrate both qualitative and quantitative insights. In the survey, Likert-scale questionnaires were used to measure participants' attitudes, perceptions, and experiences in a standardized, quantifiable manner, thereby enhancing the reliability and validity of the results (Muguro et al., 2024). Additionally, interviews were conducted to collect in-depth qualitative information from selected participants, enabling deeper exploration of insights that may not emerge from surveys alone. To complement the primary data, a documentary review was also conducted, drawing on academic literature, government reports, and credible online sources to provide contextual background and support the interpretation of the study's results (Muguro et al., 2024).

Data Analysis Methods

This study employed descriptive, thematic, and inferential statistics to provide a comprehensive analysis of both quantitative and qualitative data. Descriptive statistics, including measures such as mean, median, standard deviation, and range, were used to summarize and simplify complex data, revealing key patterns and trends. For qualitative data, thematic analysis was applied to identify and interpret recurring themes and insights, particularly from interviews and textual responses (Hamed et al, 2020). Additionally, inferential statistics, including regression analysis and hypothesis testing, were employed to draw generalizations about the broader

population from the sample, enabling the study to examine relationships among variables such as Budget Allocation, Human Resource Availability, and Material and Equipment Provision, and water supply project performance. The analyses were conducted using SPSS Version 26 to ensure accuracy and reliability in data interpretation (Hamed et al., 2020).

Results

Response rate

Table 3: Response rate (*Source: Field data, 2026)*

Category	Frequency	Percent
Questionnaire Distributed and returned	81	89%
Non – response Questionnaire and interview	2	2.2%
Interview	8	8.8%
Total	***91***	***100.00***

Table 3 presents the response rate for the study on resource allocation in monitoring and planning the performance of water supply projects at Songea Water Supply and Sanitation Authority (SOUWASA). Of the 91 targeted respondents, 81 (89%) successfully returned completed questionnaires, indicating a very high response rate that enhances the reliability and representativeness of the quantitative data. In addition, 8 respondents (8.8%) participated in interviews, providing valuable qualitative insights to complement the questionnaire findings, while only 2 respondents (2.2%) did not respond. The overall response rate of 100% across all data collection methods demonstrates effective procedures and sufficient participation, suggesting that the study's findings are credible and adequate for drawing valid conclusions about the influence of resource allocation in monitoring and planning on the performance of water supply projects at SOUWASA.

3.2 Socio-demographic characteristics

Socio-demographic characteristics involve the social and demographic attributes of a study's participants, such as age, gender, education level, occupation, and Position. Analyzing socio-demographic data is important for interpreting results, as it can reveal how different population groups may be affected by or respond to various factors in the research. The socio-demographic characteristics of the respondents, as presented in the figures, provide a comprehensive overview of the study sample at SOUWASA.

Gender distribution

In terms of gender distribution in Figure 3, the respondents were relatively balanced, with 44 males (54.3%) and 37 females (45.7%), indicating a fair representation of both genders and ensuring gender-inclusive perspectives in the study.

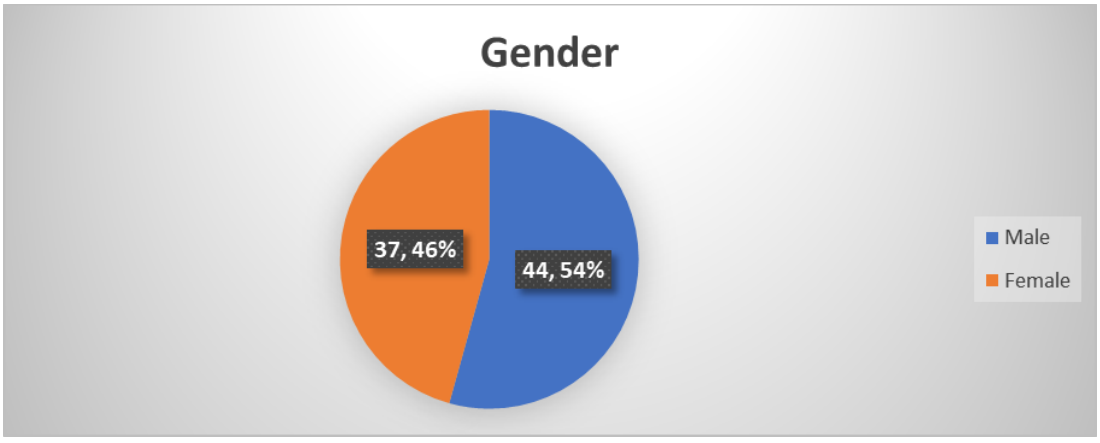

Figure 3: Gender of respondents (Source*: Field data, 2026)*

Age distribution

Regarding the age distribution in Figure 4, the majority of respondents fell within the productive working age range. Specifically, 34.6% (28 respondents) were between 31-40 years, followed by 24.6% (20 respondents) aged 18-30 years, 23.5% (19 respondents) between 41-50 years, and 17.3% (14 respondents) aged 51 years and above. This distribution suggests that most participants are in their prime working years, likely possessing relevant knowledge and experience related to water supply project planning and monitoring.

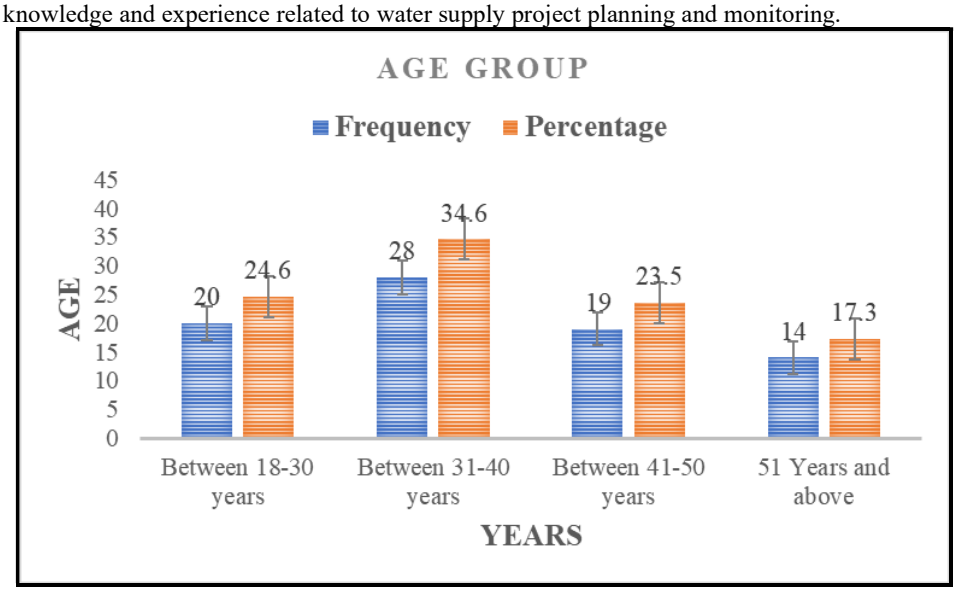

Figure 1: Age Group of respondents (*Source: Field data, 2026)*

Academic qualifications

In terms of academic qualifications in Figure 5, more than half of the respondents (51.9% or 42 individuals) held a bachelor's degree, followed by 19.8% (16 respondents) with a master's degree, 16.0% (13 respondents) with a Diploma, and 12.3% (10 respondents) with a Certificate. This indicates that the workforce at SOUWASA is relatively well educated, with a significant proportion having attained higher education, which is important for informed participation in project monitoring and stakeholder engagement.

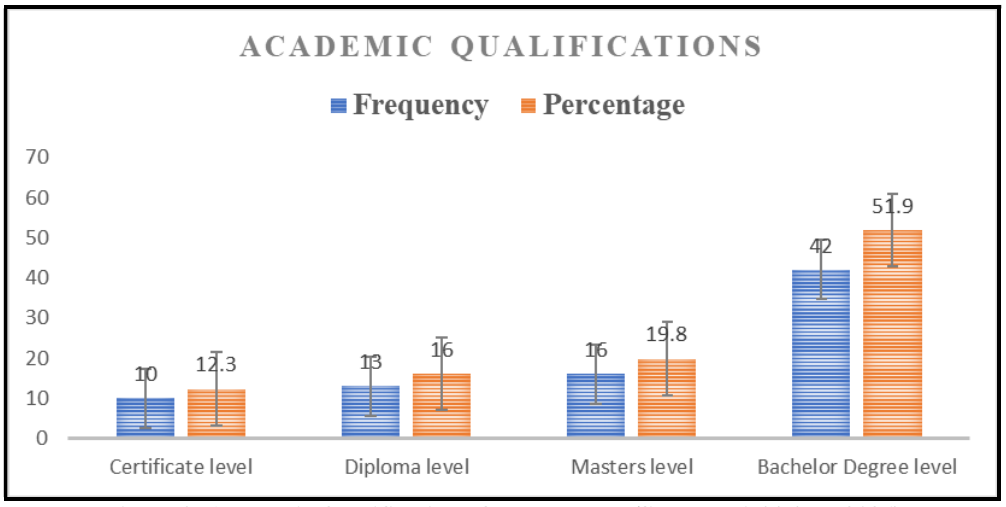

Figure 2: Academic Qualification of respondents *(Source: Field data, 2026)*

Work experiences

Lastly, in the work experience category in Figure 6, a significant proportion of respondents (65.4%; 53 individuals) had four or more years of experience, suggesting that most participants had ample time to become familiar with SOUWASA's operational procedures and water supply project practices. This is complemented by 18.5% (15 respondents) with 2-4 years of experience and 16.0% (13 respondents) with less than 1 year of experience. The combination of seasoned professionals and relatively newer employees adds depth to the results, providing both long-term perspectives and fresh insights into stakeholder engagement in monitoring planning.

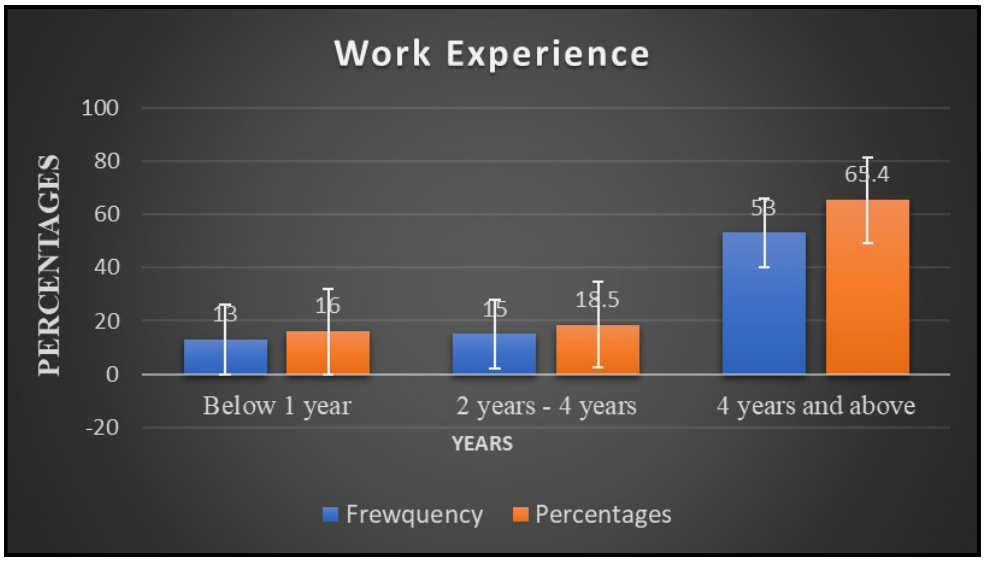

Figure 3: Work Experiences of respondents (*Source: Field data, 2026)*

Descriptive statistics

Table 4: Resource Allocation in monitoring planning on the performance of water supply projects

Statements For 5 Likert Scale		Frequency	Percent	Mean	SD
Sufficient resource allocation is essential for monitoring of water supply projects.	Strong Disagree	3	3.7	3.75	1.043
	Disagree	5	6.2		
	Neutral	23	28.4		
	Agree	28	34.6		
	Strong Agree	22	27.2		
	Total	***81***	***100.0***		
Inadequate funding impacts the implementation of monitoring plans in water supply projects.	Strong Disagree	3	3.7	3.49	1.074
	Disagree	14	17.3		
	Neutral	17	21.0		
	Agree	34	42.0		
	Strong Agree	13	16.0		
	Total	***81***	***100.0***		
Proper allocation of resources ensures smooth monitoring and timely completion of water supply projects.	Strong Disagree	4	4.9	3.56	1.095
	Disagree	11	13.6		
	Neutral	17	21.0		
	Agree	34	42.0		
	Strong Agree	15	18.5		
	Total	***81***	***100.0***		
Resource allocation delays hinder monitoring effectiveness and project performance.	Strong Disagree	6	7.4	2.96	1.134
	Disagree	28	34.6		
	Neutral	17	21.0		
	Agree	23	28.4		
	Strong Agree	7	8.6		

	Total	***81***	***100.0***		
Adequate allocation of manpower and infrastructure is crucial for successful monitoring.	Strong Disagree	3	3.7	3.68	1.035
	Disagree	7	8.6		
	Neutral	21	25.9		
	Agree	32	39.5		
	Strong Agree	18	22.2		
	Total	***81***	***100.0***		
Average Mean Score				***3.49***	***1.076***

(Source: Field Data from respondents, 2026)

Contents of Table 4: The implications of resource mobilization, monitoring, and performance of water supply projects at SOUWASA, Songea. The data above summarizes the results of the three indicators. "Adequate resource allocation is necessary for proper monitoring of water supply projects" was agreed/disagreed by a strong majority (mean score 3.75), with 61%+ of respondents agreeing that availability of adequate financial, human, and material resources is critical for the monitoring of the projects. Adequate resources facilitate timely progress monitoring, the identification of problems at an early stage, and their rapid correction, all of which reflect their importance to the success of the project.

There were also some comments regarding the risk of insufficient resources, with a mean score of 3.49 and 58% agreement. The lack of financial support may disrupt the monitoring process, resulting in incomplete data collection and ill-prepared reports, and increasing the likelihood of errors. This finding highlights the importance of a stable and adequate funding stream to support comprehensive monitoring throughout the project.

The importance of effective resource allocation for the successful execution of a project is further supported by a mean score of 3.56, with 60.5% of respondents agreeing. When financial, technical, and human resources are adequately allocated, monitoring processes can run smoothly, enabling projects to meet milestones on time and avoid frequent interruptions.

There were concerns about delays in resource distribution, as reflected in a relatively low mean of 2.96, and 37% of respondents agreed that such delays undermine the effectiveness of monitoring. This variation could indicate uneven resource allocation or that experiences across projects are widely dissimilar, suggesting that further planning and earlier dissemination are needed and that a bottleneck may be undermining performance.

Lastly, they underscored the need for sufficient staff and infrastructure ($\bar{x}$ = 3.68), with more than 61% agreeing. In addition to funding, there must be enough trained staff and necessary equipment, including monitoring equipment, communications gear, and transportation, to carry out effective monitoring. Taken as a whole, the results suggest that integrated (financial, human, and infrastructure) and timely inputs are necessary to improve the monitoring and implementation of SOUWASA's water supply projects.

Question: During the interview, the respondents were asked, "How do you rate the level of resource mobilization for monitoring and evaluation activities in water supply projects at Songea Water Supply and Sanitation Authority?"

Respondent1: Resource allocation for monitoring and evaluation is skewed negatively. Although some resources (funds and personnel) are allocated, they are not always sufficient to fully monitor all aspects of the project, resulting in lapses in supervision (Project Manager, 27 March 2025).

Respondent2: The small budget for monitoring activities makes it difficult to conduct periodic site visits and reviews. At times, essential supplies, such as transport and monitoring equipment, are in short supply (Monitoring Officer, 27 March 2025).

Respondent 3: Well, in my experience, they really do need far more people to help with the human side. The staff responsible for monitoring are usually understaffed, which makes it difficult to monitor project progress effectively (Project Supervisor, 27 March 2025).

Analysis of responses regarding expenditure on M&E revealed a mismatch between expectations and reality among respondents at SOUWASA; a sense of insufficiency permeated the responses. The respondents indicate that some funding and staff time are devoted to monitoring projects, but that it is not enough to conduct a full review of monitoring, and that gaps are hidden. Financial constraints also impede regular field visits and assessments due to shortages of essential resources, including transportation and monitoring tools. In addition, inadequate human resources were reported as a major problem due to an insufficient number of staff responsible

for monitoring project progress. This implies that, due to resource inadequacies, not only the monitoring activities at SOUWASA but also the entire water supply projects are adversely affected.

During the interview, have you ever observed under-monitoring or poor performance of water supply projects due to inadequate resource allocation?

Respondent 1: *Yes, there have been a few instances in which a lack of funds impeded the purchase of monitoring materials, thereby impairing the ability to monitor the quality and progress of a project effectively (Project Manager, 27 March 2025).*

Respondent 2*: Not enough resources to make monitoring visits consistent. In some instances, when a problem is detected, it has already led to major project delays (Monitoring Officer, 27 March 2025).*

Respondent 3: *On some projects, the lack of resources meant that monitoring activities were delayed and/or infrequent, which allowed for undetected defects in construction and the use of substandard materials (Project Supervisor, 27 March 2025).*

Thematic Analysis of the opinions of the participants on the under-performance of monitoring and project performance at SOUWASA: "Poor-Unrelenting Conditions. " The most common was the poor resourcing that led to poor monitoring and subsequently poor project performance in SOUWASA. “The most common complaint is the delay in purchasing necessary means of monitoring because of a lack of resources, compromising users' ability to monitor the quality and progress of the projects. Resource limitations have also disrupted regular monitoring visits and delayed the identification and resolution of problems. In some cases, monitoring interventions were delayed or conducted infrequently, resulting in undetected building damage and a reduction in overall project quality. This is indicative of under-resourcing, which leads to weakened oversight, heightened project risks, and ultimately negative outcomes for water supply projects at SOUWASA.

During the interview, respondents were asked the question “Which reforms would you suggest for improving resourcing for monitoring and planning at Songea Water Supply and Sanitation Authority?

Respondent 1*: There needs to be a baseline M&E budget that provides some protection against diversion to other project priorities. This could help ensure that funds are consistently allocated to monitoring (Project Manager, 27 March 2025).*

Respondent 2: *Technology investments, such as remote monitoring systems, to relieve staff from tedious manual inspections and to enable more efficient project assessment (Monitoring Officer, 27 March 2025).*

Respondent 3: *Resource planning shall be conducted to ensure that monitoring is not interrupted by transport and that the data collection system, etc., is not permanently unavailable (Project Supervisor, 27 March 2025).*

The analysis of the themes derived from the respondents' recommendations to improve resource management within SOUWASA indicates that the organization requires financial viability, modernized infrastructure, and sound corporate governance. A central proposal is to establish a dedicated, ring-fenced monitoring and evaluation budget line to avoid decommitment of funds. Furthermore, investment in technology, including remote monitoring systems, is recommended to enhance efficiency and reduce dependence on labor-intensive inspections. In addition, respondents also stress the need for strategic resource planning (consistent funding and availability of basic tools such as transport and sampling kits) to prevent monitoring from being interrupted (monitoring can stop because of a lack of funds or because cells conducting monitoring can be deactivated due to an inability to perform satisfactorily under the rules of the program). These changes would improve monitoring and, consequently, project performance.

Regression analysis

Table 5: Regression Coefficients (*Source: Field Data, 2025)*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	0.174	0.078		2.250	0.027	0.020	0.329
	Budget Allocation	0.116	0.033	0.122	3.491	0.001	0.050	0.182
	Human Resource Availability	0.311	0.073	0.335	4.275	0.000	0.166	0.456
	Material and Equipment Provision	0.517	0.080	0.557	6.490	0.000	0.358	0.675
Detailed Analysis of Dependent Variable: Performance of water supply projects								

Table 5 presents the regression coefficients showing the influence of resource allocation components on the performance of water supply projects at Songea Water Supply and Sanitation Authority (SOUWASA). The results indicate that all independent variables have a positive and statistically significant effect on project performance. Budget allocation has a significant positive effect ($B = 0.116$, $p = 0.001$), indicating that increased financial resources allocated to monitoring and planning are associated with improved performance of water supply projects. Human resource availability also has a strong positive effect ($B = 0.311$, $p < 0.001$), suggesting that the presence of adequate, skilled personnel enhances effective monitoring, planning, and overall project outcomes. Material and equipment provision has the strongest influence among the predictors ($B = 0.517$, $p < 0.001$), indicating that the availability of sufficient monitoring tools, equipment, and supporting materials substantially improves project performance. The constant term is also statistically significant ($p = 0.027$), confirming the overall validity of the model. The confidence intervals for all predictors do not cross zero, further reinforcing the reliability of the results. Overall, the findings demonstrate that effective allocation of financial, human, and material resources in monitoring and planning significantly improves the performance of water supply projects at SOUWASA.

Table 6: Model summary (*Source: Field Data, 2025)*

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	0.98	0.96	0.96	0.16

Table 6 presents the regression model summary for the analysis examining the effects of resource allocation for monitoring and planning on the performance of water supply projects at the Songea Water Supply and Sanitation Authority (SOUWASA). The results show a very strong positive relationship between the independent variables and project performance, as indicated by a high correlation coefficient ($R = 0.98$). The R Square value of 0.96 indicates that approximately 96.5% of the variation in the performance of water supply projects is explained by budget allocation, human resource availability, and the provision of materials and equipment. The adjusted R-squared of 0.96 further confirms the model's robustness after adjusting for the number of predictors, indicating minimal overfitting. Additionally, the low standard error of the estimate (0.16) suggests that the model provides accurate predictions of project performance. Overall, the model demonstrates a very high explanatory power, confirming that resource allocation in monitoring and planning is a key determinant of water supply project performance at SOUWASA.

Table 7: ANOVA (*Source: Field Data, 2025)*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	54.51	3	18.17	710.2	0.000[b]
	Residual	1.97	77	0.03		
	Total	56.48	80			

Table 7 presents the ANOVA results for the regression model assessing the effects of resource allocation for monitoring and planning on the performance of water supply projects at the Songea Water Supply and Sanitation Authority (SOUWASA). The findings indicate that the regression model is statistically significant, as evidenced by a very high F-statistic ($F = 710.2$; $p < 0.001$). This implies that the independent variables budget allocation, human resource availability, and material and equipment provision collectively have a significant effect on the performance of water supply projects. The regression sum of squares (54.51) is substantially higher than the residual sum of squares (1.97), indicating that the model accounts for most of the variation in project performance, with only a small portion remaining unexplained. Overall, the ANOVA results confirm the regression model's adequacy and goodness of fit, demonstrating that resource allocation for monitoring and planning is a statistically significant predictor of water supply project performance at SOUWASA.

4. Discussion

The findings from this study indicate that resource allocation in monitoring and planning has a significant positive impact on the performance of water supply projects at SOUWASA. The regression results show that budget allocation, human resource availability, and the provision of materials and equipment all contribute positively to project performance, with the provision of materials and equipment being the strongest predictor. This suggests that adequate monitoring tools, transport, and technical resources are crucial for timely supervision and quality assurance, while skilled personnel ensure proper implementation and adherence to project standards. Descriptive results further support these findings, as the majority of respondents agreed that adequate financial, human, and material resources are essential for effective monitoring. Proper resource allocation facilitates early problem detection, timely corrective actions, and smooth project implementation, thereby enhancing overall project outcomes. Conversely, delays or inadequacies in resource provision were reported to undermine monitoring effectiveness, indicating that both the sufficiency and timely distribution of resources are critical for achieving optimal project performance.

The qualitative thematic analysis complements these results by revealing the challenges and implications of inadequate resource allocation on monitoring and project performance. Respondents consistently noted that limited budgets, insufficient staffing, and shortages of essential monitoring tools led to lapses in supervision, delays in defect identification, and, in some cases, compromised construction quality. These “poor and unrelenting conditions” reflect how under-resourcing weakens oversight, heightens project risks, and negatively affects overall outcomes. Participants suggested that establishing a dedicated monitoring and evaluation budget, investing in technology such as remote monitoring systems, and ensuring strategic resource planning would mitigate these challenges. Such measures are likely to improve the consistency, coverage, and effectiveness of monitoring activities, thereby enhancing the performance and sustainability of water supply projects at SOUWASA. Overall, the study highlights that integrated and timely allocation of financial, human, and material resources is essential not only for effective monitoring but also for the successful implementation of water supply projects.

Furthermore, the current study’s emphasis on effective resource allocation for monitoring and planning aligns with the findings of Kamau et al. (2022) in Kisumu County, Kenya, who found that adequate financial and human resources for water projects significantly improve project efficiency and service delivery outcomes. This similarity confirms that proper resourcing is not only a support mechanism but also a strategic approach to ensuring timely implementation and high-quality project outputs. Similarly, Adebayo (2021) in Lagos, Nigeria, highlighted that consistent availability of monitoring equipment and trained personnel positively affects the overall performance and sustainability of urban water supply projects. The study emphasized that resource gaps often lead to delays, inadequate supervision, and substandard service delivery, findings that align closely with those at SOUWASA. Additionally, Mureithi et al. (2023) in Nairobi, Kenya, reported that projects with structured budgeting and integrated planning for monitoring activities achieved higher performance and reduced the risk of implementation failure. Compared to projects with intermittent resource allocation, those with strategic planning and dedicated M&E funding lines experienced smoother execution and enhanced accountability. Therefore, across these studies, a consistent theme emerges effective, timely, and integrated resource allocation in monitoring and planning is essential for achieving both short-term performance and long-term sustainability in water supply projects.

5. Conclusion

In conclusion, this study has shown that effective resource allocation in monitoring and planning is crucial for the success of water supply projects at SOUWASA. Adequate financial, human, and material resources enable timely supervision, early problem detection, and smooth project implementation, while shortages or delays in

these resources can lead to poor monitoring and reduced project performance. The findings highlight the importance of integrated and consistent resource planning, including sufficient staffing, proper equipment, and protected budgets for monitoring and evaluation. By addressing these challenges, SOUWASA can improve oversight, enhance project efficiency, and ensure the sustainability of water supply services for Songea's growing population.

6.0 Recommendations

The following recommendations aim to strengthen resource allocation in monitoring and planning, thereby improving the performance and sustainability of water supply projects at SOUWASA. They focus on ensuring adequate, timely, and well-coordinated deployment of financial, human, and material resources.

- Establish a dedicated, protected M&E budget: SOUWASA should create a ring-fenced M&E budget to prevent funds from being diverted to other project activities. This ensures consistent funding for monitoring efforts, allowing regular site visits, data collection, and timely detection of project challenges. A protected budget can improve oversight, reduce delays, and enhance overall project performance.

- Enhance human resource capacity and allocation: SOUWASA should ensure that monitoring teams are adequately staffed with skilled personnel who are trained in project supervision, reporting, and data analysis. Strategic deployment of staff across projects can enable comprehensive monitoring, faster problem resolution, and smoother project execution.

- Invest in material and technological resources for monitoring: Provision of sufficient equipment, transport, and monitoring tools, as well as modern technologies such as remote monitoring systems, can support efficient and accurate tracking of project progress. These resources can reduce reliance on labor-intensive inspections, increase coverage, and improve the quality of monitoring outcomes.

- Implement strategic resource planning and coordination: SOUWASA should adopt integrated planning approaches to ensure that financial, human, and material resources are aligned and delivered on time. Early planning, regular review, and proactive resource allocation can reduce disruptions, prevent resource shortages, and improve the effectiveness of monitoring and project execution.

- Promote transparency and accountability in resource use: All stakeholders, including project staff and the community, should be informed about how resources are allocated, utilized, and monitored. Clear reporting and accountability mechanisms can improve trust, facilitate collaboration, and ensure that resources directly contribute to improved project performance.

Taken together, these recommendations aim to ensure that SOUWASA's water supply projects are effectively monitored and managed, thereby facilitating timely completion, higher-quality outcomes, and the long-term sustainability of water services in Songea.

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