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Impact of Capacity Building on Performance of Water Projects in Kitui South Sub County, Kenya

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ABSTRACT:- The study examined the effect of capacity building on performance of water projects in Kitui South Sub County, Kenya. Community capacity building has increasingly been recognized as a fundamental pillar of participatory governance and a key determinant of sustainable performance of water project, particularly in community-based water projects, where access to project information, community and clarity in decision-making significantly influence project effectiveness and long-term sustainability. The study was anchored on Arnstein's Ladder of Citizen Participation Theory, which emphasizes meaningful citizen engagement and access to information as essential components of participatory governance. A mixed-methods approach based on a convergent parallel research design was employed, allowing for simultaneous collection and analysis of quantitative and qualitative data. The target population of 308 stakeholders involved in water project governance, including county water officials, water committee members, technical operators and community representatives. A sample size of 174 respondents, with a response rate of 162 valid responses yielding a response rate of 93.1%. Data were collected using questionnaires and key informant interview guide. Analysis was done using descriptive and inferential statistics, for quantitative data while qualitative data were analyzed thematically. The findings indicating that capacity building (training and skill development) significantly contribute to better project performance through improved technical and managerial capacity ($r = 0.721$, $p < 0.01$). Qualitative findings further indicated that capacity building is a critical determinant of water project sustainability. Training programs for pump operators, committee members, and local technicians were reported to have significantly improved maintenance practices and reduced system breakdowns. The study concludes that capacity building is a critical determinant of water projects performance and sustainability in Kenya's Kitui South Sub County. The study recommends that capacity building be institutionalized as a continuous process rather than a project-based intervention. County governments should establish permanent training programs for water committees and technical operators enhance efficiency and trust in water governance.

Keywords: Capacity Building, Water Governance, Community Participation, Project Performance, Kitui South Sub County

I. INTRODUCTION

Globally, capacity building has emerged as a central principle of sustainable project performance and sustainable development, particularly in the management of natural resources and community development projects. Within the framework of the Sustainable Development Goals (SDGs), capacity building is considered essential for ensuring efficiency, inclusiveness and sustainability in project service delivery. In participatory governance, capacity building facilitates project ownership, sustainability through maintenance processes, thereby strengthening trust between service providers and beneficiaries (World Bank, 2021). Capacity building can take many forms, including training, mentoring, coaching, technical assistance, institutional strengthening, and resource mobilization. People are the fundamental building blocks of sustainable project performance. In community water projects, transparency enhances stakeholder confidence and encourages collective responsibility for resource management. When project information is openly shared, communities are more likely to support fee collection systems, protect infrastructure, and participate in maintenance activities, which improves sustainability and functionality (Transparency International, 2022).

Water scarcity affects more than 40% of the world population. The proportion is expected to rise as temperatures do. Although water sanitation services have been improved, supply of drinking water is affecting

every continent. Water scarcity is worsening due to the increasing drought and desertification trends (Abong & Wamalwa, 2025). Dealing with the menace requires investment in water infrastructure and facilities. It is projected that, by 2050, one in every four people will be experiencing recurring water shortage worldwide (UNDP, 2020). Sustainable development goals, aims by the year 2030, among others to achieve universal access to safe water, implement integrated water resources management at all levels and capacity build local communities in improving water management.

While water demand is increasing, water availability is decreasing due to limited resources, and increasing population. Population growth means intensifying demand and completion for water for domestic, agriculture and industrial use (Jacob, 2025). The total number of people living in an area determines the available per capita water resource in that area. When it comes to water scarcity, population growth tops climate change. Agriculture sector accounts for about 70-95% of global water use. As population grow, more food is required. Therefore, there is a close interrelation between water scarcity and hunger. Thus, posing an increased pressure on water resources (Shields & Graham, 2021).

In Africa, however, water service delivery continues to face persistent governance challenges, including corruption, financial mismanagement, and weak accountability systems (Osei-Tutu, & Adjei, 2022). These challenges have contributed to widespread inefficiencies and premature failure of rural water infrastructure. In response, development actors have increasingly promoted transparency-enhancing interventions such as public audits, open contracting systems, and participatory financial reporting to improve service delivery outcomes.

In Kenya, 25-30 % of community-managed water projects will be non-operational in the first three years after completion. Unsustainable programs have a low impact on the community in the long term, thus wasting human, financial, and technical start-up investments. They can weaken community trust and support for future programs. Today, project managers must not only be concerned with achieving the traditional functions of management but also deliver projects with sustainability potential (Korzenevica, (2024). According to Mgoba and Kabote, (2020), the reliability of community water-based systems is based on the availability of technical skills and infrastructural facilities to sustain the systems. Also, the study suggests that the establishment of local institutions to effectively manage the water systems.

1.1 Statement of the Problem

Water projects are expected to be sustainable for it to address water problem in the communities. Capacity building is widely recognized as a vital pillar participatory governance and water performance because it leads to project ownership by the community, sustainability (World Bank, 2021). When capacity building is effectively implemented, communities are more likely to participate in sustaining infrastructure, contributing user fees, and protecting shared resources, which ultimately improves project performance and sustainability (Transparency International, 2022).

Despite water policy frameworks both in national and county governments, the performance of water projects in rural semi-arid regions of Kenya remains a major concern. Generally, it is estimated that between 30% and 40% of rural water supply systems in sub-Saharan Africa are non-functional at any given time, largely due to poor maintenance, weak governance, and limited community ownership. In Kenya specifically, studies indicate that a significant proportion of community-managed water projects fail within a few years of implementation, with some regions reporting functionality rates below 60% (Simon & Moturi, 2025). In Kitui County, a semi-arid region highly dependent on water infrastructure, several boreholes and sand dams constructed since 2021 have either broken down or are operating below capacity, leaving many households without reliable access to water (Simon & Moturi, 2025). These failures not only undermine service delivery but also intensify water scarcity, increase competition for limited resources, and heighten the risk of conflicts within communities (Jacob & Moi, 2025). Based on this, the study tested the following hypothesis; ***Ho: There is no significant impact of capacity building on performance of water projects in Kitui South Sub County, Kenya***

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was anchored on Arnstein's Ladder of Citizen Participation Theory, developed by Sherry R. Arnstein (1969). The theory explained the varying levels through which citizens' participation in decision-making processes affects public projects and governance outcomes. Arnstein conceptualized participation as an eight-rung ladder, categorized into three broad levels: non-participation, tokenism and citizen power (Arnstein, 1969).

At the lowest level of the ladder, non-participation which included manipulation and therapy citizens had little or no meaningful influence over decisions. In such contexts, information flow was limited and decision-making remained entirely in hands of project implementers or authorities. At the intermediate level, tokenism which includes informing, consultation and placation citizens received information or were consulted;

however, they do not possess sufficient power to influence final decisions in a meaningful way. At the highest level, citizen power which include partnership, delegated power and citizen control communities possess real authority over decision-making processes and resource management (Abubakari, 2025).

Within the context of this study, capacity building is conceptualized as a critical enabler of movement up the ladder of participation. It is assumed that when water participatory governance structures provide relevant skills and technical knowledge, communities are better positioned to participate meaningfully in maintenance of the water project in long run hence sustainability (Abubakari, 2025).

In water projects, the theory suggests that performance improves when beneficiaries are fully informed about how resources are mobilized, allocated and utilized. Capacity building systems empower community members to monitor project activities, question irregularities and contribute to the maintenance and protection of infrastructure (Mutanda & Nhamo, 2024). This enhances ownership, reduces conflicts and increases willingness to support water services financially and socially.

However, the theory also implies that when transparency is weak or absent, participation remains at lower levels of the ladder, where communities are limited to being informed without influence or are completely excluded from decision-making processes. In such cases, information asymmetry persists, trust declines and water projects are more likely to experience inefficiencies, mismanagement, and reduced sustainability.

2.2 Empirical literature; *Impact of Capacity Building on Performance of Water Projects*

Capacity building is a major factor that determines the performance, efficiency, and sustainability of development projects. This is because it provides the knowledge, skills, and institutional capacity to the stakeholders such as community members, local water committees, technical operators, and municipal authorities, who then are able to manage water systems in a proper manner. Capacity building involves not only technical training, but also governance education, participation in planning, and institutional strengthening thus making it possible for communities to be the ones who plan, operate and maintain water infrastructure independently (Moriarty, Butterworth, & van Koppen, 2021). Capacity-building activities through the development of local skills lead to greater ownership, accountability, and sustainability of water supply systems over time.

Capacity building by way of education and training has always been an important part of development project success in the rural areas of Kenya and has contributed largely to the achievement of positive outcomes. Apart from operational efficiency, capacity building facilitated the delivery of the services designed to meet the needs of all user groups as the committees who had been trained in governance used democratic methods to ensure that women, youth, and disadvantaged households had equal access to water resources, (Pretty, Boyd & Reed, 2021). These results demonstrate that the empowerment of local stakeholders through targeted capacity development has both technical and social benefits.

Testimonies from across the continent also shout out the necessity of capacity development. Research from South Africa revealed that in community-managed water projects, where the reshuffling of staff included technical training and governance education, there was a big leap in service reliability and community cohesion (Van Koppen, 2020). The local communities were trained in carrying out maintenance activities, participatory monitoring, and resolving disputes; and as a result, they experienced fewer breakdowns, they had faster responses when systems were at fault, and they were less involved in conflicts over water allocation. Likewise, in Tanzania, projects aimed at capacity building that concentrated on participatory monitoring and evaluation had a positive impact on the skills of local committees in overseeing water projects that eventually led to better resource management and the satisfaction of the beneficiaries (Mgoba & Kabote, 2020). These scenarios point to the fact that capacity building is not only a question of technical skills but also the facilitation of community empowerment in governance and decision-making processes.

The same patterns can be discerned worldwide; particularly, in Asian countries. Drought-ridden rural areas of India have water projects that undertake comprehensive training programs for both operators and users. Such programs cover technical skills like the upkeep of a borehole, monitoring of water quality, and scheduling of irrigation, but also skills related to participatory governance and planning (Singh & Kumar, 2022). The projects which had both the technical aspect integrated with the governance one attained greater water infrastructure functionality, shorter maintenance response times, and efficient water distribution. These are some of the results that show capacity development is directly linked to the improved functioning of water systems.

To sum up, capacity building is a major factor that influences technical competence, governance capacity, community ownership as well as long-term sustainability of water projects. Such projects where there is a priority of local operators and water committees receiving structured, context-specific training are the ones that will most likely have high functionality, deliver services in an equitable way, and be resilient to future challenges. The experiences of Kenya, South Africa, Tanzania, and India confirm that the implementation of proper capacity-building strategies leads to the empowerment of communities to take charge of water project management while at the same time the delivery efficiency, equitable access and water sustainability of rural

water project gets improved (Moriarty et al., 2021; Kariuki & Nyandega, 2021; Singh & Kumar, 2022; Van Koppen, 2020).

III. METHODOLOGY

This study adopted a mixed-methods research approach using a convergent parallel research design. This design enabled simultaneous collection of both quantitative and qualitative data, for a comprehensive understanding of the effect of transparency on performance of water projects in Kitui South Sub County, Kenya (Creswell & Plano Clark, 2018). The study targeted a population 308 stakeholders directly involved in the governance and management of water projects, including County Water Department officials, water project management committee members, technical operators, and community representatives (women, youth, and persons with disabilities). A sample size of 174 respondents was determined using Slovene's formula, selected using a combination of simple and stratified random sampling techniques, ensuring that all stakeholder categories were adequately and proportionately represented, with minimized selection bias and enhanced representativeness.

Data collection involved both primary quantitative and qualitative tools, using structured questionnaires designed with a five-point Likert scale, ranging from strongly disagree to strongly agree. The questionnaire captured respondents' perceptions on transparency practices (which included financial disclosure, procurement openness and reporting mechanisms) as well as their perceived performance of water projects. Qualitative data were collected using Key Informant Interview (KII) guides administered to selected stakeholders with in-depth knowledge of water project governance. These included county water officials and experienced water committee members. The interviews provided detailed insights into transparency practices, governance challenges, accountability mechanisms and community perceptions of project performance.

3.1 Data Analysis

The quantitative data collected through questionnaires were analyzed using descriptive statistics (frequencies, percentages, means and standard deviations), used to summarize respondents' characteristics and perceptions regarding transparency and project performance. Inferential statistics employed the Pearson Product-Moment Correlations to determine the impact of capacity building to performance of water projects. Qualitative data were analyzed using thematic analysis, transcribed, coded, and organized into themes that reflected patterns in respondents' views on capacity building and water project governance. These were then integrated with quantitative results during interpretation to provide a comprehensive explanation of the findings.

IV. RESEARCH FINDING

4.1 Response Rate and Demographic Characteristics of Respondents

The study targeted a total sample of 174 respondents (164 questionnaires and 10 interview) drawn from County Water Department officials, local water committee members, and community representatives including women, youth, and persons with disabilities within Kitui South Sub-County. Of the 164 questionnaires distributed to respondents selected for the quantitative component, 162 were successfully completed and returned, representing a high response rate suitable for statistical analysis. In addition, 10 key informants were purposively selected and participated in semi-structured interviews for the qualitative component of the study. Table1 shows a summary of results from the demographic characteristics of respondents.

Table 1: Demographic Characteristics of Respondents

Gender	**Frequency**	**Percentage (%)**
Male	98	60.5
Female	64	39.5
Total	**162**	**100**
Age Bracket	**Frequency**	**Percentage (%)**
19–25 years	34	21.0
26–30 years	48	29.6
31–45 years	56	34.6
46 years and above	24	14.8
Total	**162**	**100**
Education Level	**Frequency**	**Percentage (%)**
Certificate	28	17.3
Diploma	54	33.3
Bachelor Degree	58	35.8

Master Degree	14	8.6
Other	8	4.9
Total	162	**100**

Source: Primary Data (2026)

From Table 1, majority of the respondents (60.5%) were male compared to 39.5% females, suggesting that male dominance among stakeholders involved in water project governance and management. Regarding age, respondents aged 31–45 years constituted the largest proportion (34.6%), followed by those aged 26–30 years (29.6%), 19–25 years (21.0%), and 46 years and above (14.8%), suggesting that water project governance is largely driven by youth and middle aged economically active and productive members of the community, which diversity is important in enhancing decision-making, promoting community ownership, and improving the performance of water projects through the incorporation of varied experiences and energies. As for education level, Bachelor's degree (35.8%) and Diploma holders (33.3%) dominated the sample, while Certificate (17.3%) and Master's degree (8.6%) holders were few, though expected, suggesting that respondents were adequately educated to effectively respond and participate in governance, planning and management of water projects, reflecting inclusiveness in representation.

4.2 Descriptive Statistics on Capacity Building of water projects in Kitui South Sub County, Kenya

Respondents evaluated the capacity building using seven questionnaire items on a five-point Likert scale, and the responses were analyzed using frequencies, means, and standard deviations, as presented in Table 2.

Table 2: Capacity Building of water projects in Kitui South Sub County, Kenya

Statement	SD	D	NS	A	SA	Mean	Std. Dev
Water committees receive operational training	4(2.5%)	11(6.8%)	18(11.1%)	73(45.1%)	56(34.5%)	4.15	0.85
Technical operators possess preventive maintenance knowledge	5(3.1%)	12(7.4%)	20(12.3%)	72(44.4%)	53(32.8%)	4.08	0.87
Stakeholders acquire conflict resolution skills	7(4.3%)	14(8.6%)	24(14.8%)	68(42.0%)	49(30.3%)	3.96	0.94
Local operators learn water quality monitoring techniques	9(5.6%)	15(9.3%)	25(15.4%)	65(40.1%)	48(29.6%)	3.89	0.99
Financial management training supports repairs	4(2.5%)	11(6.8%)	19(11.7%)	71(43.8%)	57(35.2%)	4.11	0.81
Communities gain skills for independent project management	6(3.7%)	12(7.4%)	20(12.3%)	72(44.4%)	52(32.2%)	4.02	0.88
Capacity building enhances sustainability and service delivery	2(1.2%)	6(3.7%)	11(6.8%)	58(35.8%)	85(52.5%)	4.41	0.66
Composite Mean & SD						**4.09**	**1.01**

Source: Primary Data (2026)

Legend

Range	Mean range	Response mode	Interpretation
5	1 – 1.8	Strongly Disagree	Very unsatisfactory
4	1.8– 2.6	Disagree	unsatisfactory
3	2.6 – 3.4	Neutral	None
2	3.4 – 4.2	Agree	Satisfactory
1	4.2 – 5	Strongly Agree	Very Satisfactory

The findings presented in Table 4.8 indicate that capacity building has a strong and positive influence on the performance of water projects in Kitui South Sub-County. Across all indicators, the majority of respondents selected “Agree” and “Strongly Agree,” suggesting that training and skills development are widely

recognized as critical drivers of effective water governance and service delivery. Overall, the construct recorded a composite mean of 4.09 and a composite standard deviation of 1.01, which indicates a generally high level of agreement among respondents with relatively moderate variation in opinions. This implies that while respondents broadly share similar views on the importance of capacity building, there are still slight differences in how strongly they perceive its effectiveness across different aspects.

A detailed analysis of individual items shows that the statement "capacity building enhances sustainability and service delivery" recorded the highest level of agreement, with 58(35.8%) agreeing and 85(52.5%) strongly agreeing, compared to only 2(1.2%) strongly disagreeing and 6(3.7%) disagreeing. This produced a mean of 4.41 (SD = 0.66), indicating a very strong consensus that capacity building is central to long-term functionality and sustainability of water projects.

Closely related, water committees receiving operational training also recorded strong agreement, with 73(45.1%) agreeing and 56(34.5%) strongly agreeing, while only 4(2.5%) strongly disagreed and 11(6.8%) disagreed. The mean of 4.15 (SD = 0.85) suggests that respondents perceive training of governance structures as a key factor in improving project management and coordination.

Financial management training supporting repairs also attracted high agreement, with 71(43.8%) agreeing and 57(35.2%) strongly agreeing, compared to 4(2.5%) strongly disagreeing and 11(6.8%) disagreeing. The mean score of 4.11 (SD = 0.81) indicates that financial skills are viewed as essential for enabling timely maintenance and minor repairs, which in turn improves service continuity.

Technical capacity is also positively rated, as reflected in the statement that technical operators possess preventive maintenance knowledge, where 72(44.4%) agreed and 53(32.8%) strongly agreed, while only 5(3.1%) strongly disagreed and 12(7.4%) disagreed. The mean of 4.08 (SD = 0.87) suggests that technical skills contribute significantly to system reliability and reduced breakdowns.

Communities gaining skills for independent project management recorded 72(44.4%) agreeing and 52(32.2%) strongly agreeing, with a mean of 4.02 (SD = 0.88), indicating that empowerment of communities enhances ownership and long-term sustainability of water projects.

Stakeholders acquiring conflict resolution skills recorded a mean of 3.96 (SD = 0.94), with 68(42.0%) agreeing and 49(30.3%) strongly agreeing. While still positive, the slightly lower mean suggests that conflict management training may not be as widespread or as strongly experienced as other forms of capacity building.

Similarly, local operators learning water quality monitoring techniques recorded a mean of 3.89 (SD = 0.99), the lowest among the indicators. Although 65(40.1%) agreed and 48(29.6%) strongly agreed, the relatively higher levels of neutrality and disagreement suggest that technical monitoring skills may still be limited in some areas, potentially affecting quality assurance processes.

Overall, the results demonstrate that capacity building is widely perceived as a key enabler of effective water project performance, particularly in strengthening sustainability, governance effectiveness, and operational efficiency. However, variation across indicators suggests that while general training is strong, specialized technical areas such as water quality monitoring and conflict resolution may require further strengthening to fully optimize project outcomes in the study area. This is in line with Van Koppen, (2020) who noted that in South Africa, community-managed water projects, where the reshuffling of staff included technical training and governance education, there was a big leap in service reliability and community cohesion. The local communities were trained in carrying out maintenance activities, participatory monitoring, and resolving disputes; and as a result, they experienced fewer breakdowns, they had faster responses when systems were at fault, and they were less involved in conflicts over water allocation

Across all interviews, capacity building was identified as a critical determinant of water project sustainability. Training programs for pump operators, committee members, and local technicians were reported to have significantly improved maintenance practices and reduced system breakdowns. An NGCDF official stated:

"Where training has been consistent, water systems are more functional because local operators can handle minor repairs without waiting for external support." ***[KII, 2026]***

Despite these improvements, respondents noted that training is often irregular and dependent on donor or project cycles, which affects long-term sustainability. This supports the quantitative findings showing high agreement on the importance of capacity building, particularly in improving service delivery and sustainability.

Table 3: Performance of Water Projects in Kitui South Sub-County, Kenya

Statement	SD	D	NS	A	SA	Mean	Std. Dev
Water points remain functional throughout the year	6(3.7%)	12(7.4%)	21(13.0%)	70(43.2%)	53(32.7%)	4.01	0.89
Communities access water without discrimination	4(2.5%)	10(6.2%)	20(12.3%)	73(45.1%)	55(33.9%)	4.12	0.82
Projects meet domestic and livestock needs	5(3.1%)	11(6.8%)	20(12.3%)	72(44.4%)	54(33.4%)	4.08	0.85
Timely repairs reduce service interruptions	3(1.9%)	9(5.6%)	17(10.5%)	75(46.3%)	58(35.7%)	4.21	0.77
Beneficiaries are satisfied with water quality and reliability	5(3.1%)	12(7.4%)	19(11.7%)	73(45.1%)	53(32.7%)	4.06	0.88
Trained local operators manage infrastructure sustainably	4(2.5%)	11(6.8%)	18(11.1%)	73(45.1%)	56(34.5%)	4.10	0.83
Community involvement reduces conflicts over water	3(1.9%)	8(4.9%)	16(9.9%)	73(45.1%)	62(38.2%)	4.24	0.75
Participatory governance improves service delivery efficiency	2(1.2%)	6(3.7%)	12(7.4%)	65(40.1%)	77(47.6%)	4.37	0.68
Composite Mean & SD						**4.05**	**0.97**

The results presented in Table 4.10 show that the performance of water projects in Kitui South Sub-County is generally rated positively by respondents, with consistently high levels of agreement across all performance indicators. The overall composite mean of 4.05 and standard deviation of 0.97 indicate that respondents largely agree that water projects are performing well, and that perceptions are fairly consistent with limited variation.

A closer examination of the findings shows that the highest rated indicator is that participatory governance improves service delivery efficiency, where 65(40.1%) of respondents agreed and 77(47.6%) strongly agreed, compared to only 2(1.2%) strongly disagreeing and 6(3.7%) disagreeing. This yielded a mean of 4.37 (SD = 0.68), indicating a strong consensus that participatory governance directly enhances efficiency in water service delivery.

Similarly, community involvement reducing conflicts over water recorded a high mean of 4.24 (SD = 0.75), with 73(45.1%) agreeing and 62(38.2%) strongly agreeing. This suggests that involving communities in water governance significantly contributes to minimizing disputes over access and distribution, thereby improving operational stability.

Timely repairs reducing service interruptions also scored highly, with 75(46.3%) agreeing and 58(35.7%) strongly agreeing, and only 3(1.9%) strongly disagreeing and 9(5.6%) disagreeing. The mean of 4.21 (SD = 0.77) indicates that maintenance responsiveness is a key driver of continuous water supply and system reliability.

Access to water without discrimination recorded a mean of 4.12 (SD = 0.82), with 73(45.1%) agreeing and 55(33.9%) strongly agreeing. This suggests that equity in water access is largely achieved, although a small proportion of respondents expressed neutrality or disagreement, indicating that inclusivity may still vary across locations or user groups.

Trained local operators managing infrastructure sustainably also received strong support, with 73(45.1%) agreeing and 56(34.5%) strongly agreeing, producing a mean of 4.10 (SD = 0.83). This highlights the importance of capacity building in ensuring long-term functionality of water systems.

Projects meeting domestic and livestock needs recorded a mean of 4.08 (SD = 0.85), with 72(44.4%) agreeing and 54(33.4%) strongly agreeing, indicating that water projects are generally aligned with community livelihood needs, although some gaps remain.

Beneficiaries' satisfaction with water quality and reliability had a mean of 4.06 (SD = 0.88), with 73(45.1%) agreeing and 53(32.7%) strongly agreeing. While satisfaction is generally high, the relatively higher standard deviation suggests some variation in user experiences, possibly due to differences in water source reliability or quality across sites.

Water points remaining functional throughout the year recorded the lowest mean (4.01, SD = 0.89), with 70(43.2%) agreeing and 53(32.7%) strongly agreeing. However, the presence of respondents who disagreed or were uncertain suggests that seasonal disruptions or infrastructure breakdowns still affect reliability in some areas.

Overall, the findings indicate that water project performance is perceived to be strong, particularly in areas related to efficiency, conflict reduction, and maintenance responsiveness. However, the relatively lower scores in reliability and consistency of functionality suggest that sustainability challenges still exist. These results reinforce the earlier findings that participatory governance mechanisms contribute significantly to improved performance outcomes, especially when communities are actively engaged in decision-making, monitoring, and maintenance processes.

Interviewees generally agreed that water project performance has improved due to participatory governance mechanisms. Improvements were noted in water accessibility, reduced conflict, and better maintenance practices. However, challenges such as seasonal water shortages, infrastructure breakdowns, and funding limitations still affect reliability.

One ward administrator summarized this by stating:

"The projects are better managed now compared to the past, but sustainability is still affected by drought and limited funding." ***[KII, 2026]***

V. DISCUSSIONS OF FINDINGS

The descriptive findings recorded a composite mean of 4.09 and a composite standard deviation of 1.01, which indicates a generally high level of agreement among respondents with relatively moderate variation in opinions. This implies that while respondents broadly share similar views on the importance of capacity building, there are still slight differences in how strongly they perceive its effectiveness across different aspects.

The study also established that capacity building has a positive and statistically significant influence on the performance of water projects in Kitui South Sub-County, Kenya ($\beta = 0.276$, $t = 4.381$, $p < 0.001$), indicating that training and skills development for committees, operators, and community members significantly improves project performance through better management, maintenance, and sustainability practices.

The findings demonstrated that training and skills development for water committees, technical operators, and community stakeholders significantly improve the operation and maintenance of water systems. Respondents indicated that trained operators are better able to carry out preventive maintenance, handle minor repairs, and ensure more reliable water service delivery. Despite these improvements, capacity-building initiatives are often irregular and dependent on external support, which limits sustainability. This confirms that continuous and institutionalized training is essential for long-term project success. The findings are consistent with the finding of Banda et al., (2023), Moriarty, Butterworth, & van Koppen, (2021), thus, capacity-building activities through the development of local skills lead to greater ownership, accountability, and sustainability of water supply systems over time.

5.1 Conclusion

The study concludes that capacity building is a key enabler of effective water project performance, particularly in strengthening sustainability, governance effectiveness, and operational efficiency. Capacity building is an essential for ensuring technical sustainability of water infrastructure. Trained personnel significantly improve maintenance and operational efficiency, reducing system breakdowns. However, reliance on external training support limits long-term sustainability, indicating the need for institutionalized capacity development frameworks.

5.2 Recommendations

The study recommends that county government of Kitui, through the Department of Water, should establish robust capacity building mechanisms hence capacity building be institutionalized as a continuous process rather than a project-based intervention. County governments should establish permanent training programs for water committees and technical operators. These programs should focus on preventive maintenance, financial management, conflict resolution, and water quality monitoring to ensure long-term sustainability of water systems.

The County Government, together with development partners and non-governmental organizations, should continuously build the capacity of water committees through training on financial management, transparent procurement practices, record keeping, governance principles, and community engagement. Such capacity-building initiatives will improve compliance with governance standards and enhance the ability of committees to manage water projects effectively and accountably.

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