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EFFECT OF PROJECT PLANNING ON THE PERFORMANCE OF COMMUNITY WATER PROJECTS IN ARID REGIONS OF NORTHERN KENYA

Hassan Hussein Amin[1], Dr. Morrison Mutuku[2]

[1,2]Department of Management Science, School of Business, Economics and Tourism, Kenyatta University, Kenya

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Abstract: **The performance of community water projects in arid regions of Northern Kenya remains inconsistent despite continued investments aimed at improving access to a safe and reliable water supply. The Arid regions continue to experience challenges related to project delays, cost overruns, and limited sustainability of water infrastructure. According to the Northern Kenya Water Sector Status Report (2024), approximately 42% of community-managed water projects commissioned between 2014 and 2022 operate below expected capacity or have become non-functional within five years of completion. Therefore, this study examined the effect of project planning on the performance of community water projects in Arid Regions of Northern Kenya. A descriptive survey research design was adopted. The target population included 16 community-managed water projects implemented and rehabilitated between 2014 and 2024 in Garissa County. The study employed census method to ensure comprehensive coverage of the 16 projects. Primary data was collected through structured questionnaires administered to project managers, committee members, and other relevant stakeholders. Data analysis was performed using descriptive statistics, correlation analysis, and regression techniques, with the Statistical Package for Social Sciences used for data processing. The study found that project planning was found to have a positive and significant effect on project performance ($\beta = 0.191$, $p = 0.000$), meaning that improvements in budgeting, scheduling, and stakeholder involvement in planning enhance coordination, efficiency, and timely completion of project activities. The conclusion was made that the projects that have well-organized budgeting, scheduling, and planning processes that involve stakeholders are more likely to have better coordination, higher efficiency, and timely completion of activities. In order to improve project planning, implementing agencies and project managers ought to reinforce planning systems by making sure that budgeting, scheduling and stakeholder involvement are all incorporated at the initial phases of project design.**

Keywords: **Project planning, Sustainable Project Management Practices, Project Performance.**

1. INTRODUCTION

The effectiveness of community water projects serves as a vital factor that determines public health outcomes and sustainable livelihoods and economic growth in areas that depend on safe drinking water for their basic existence needs (Muthuri, Ochieng, and Odoyo, 2019). High-performing water projects lead to better health outcomes for households while decreasing the time women and children spend on domestic tasks and helping communities build resilience against droughts and climate shocks (World Bank, 2019). The method functions as a fundamental requirement for countries to attain Sustainable Development Goal 6 which emphasizes the need for people to have complete access to secure drinking water and sanitary facilities (United Nations, 2023). Many countries face difficulties with project execution because they do not establish reliable water services despite the widespread understanding of their importance, which leads to regular system failures, erratic water distribution, and inadequate cost recovery (Yimam, Debela, & Gebre, 2021).

The research conducted globally has discovered various elements which lead to different results in water project execution. The Australian system has achieved operational efficiency improvements through its use of adaptive management methods together with digital monitoring technologies which maintain services during drought conditions (Stewart & Green, 2022). The United States achieves high operational performance in rural water systems because of its combination of organized funding systems and effective community governance (McCarthy, Moonesinghe, & Dean, 2020). The presence of advanced infrastructure systems in developed areas still leads to project difficulties through outdated equipment, inadequate funding resources, and climate change-related interruptions, which impact project execution.

The African region south of the Sahara Desert faces challenges with community water projects because of their restricted technical abilities, insufficient funds for maintenance, and their disjointed system of responsibility (African Development Bank, 2019). The rural water systems in Tanzania experience operational issues because of insufficient financing and absence of local control which decreases their long-term viability (Kusiluka, Kessy, & Mushi, 2020). The water supply programs in Ethiopian communities fail to achieve their goals because of inadequate monitoring systems and sporadic stakeholder participation (Yimam et al., 2021). The presence of infrastructure investments fails to provide a solution for achieving continuous operational success.

The community water projects in Kenya display their most important operational value to residents of arid and semi-arid regions which include Garissa and Turkana and Wajir and Marsabit because these areas face persistent water shortages and drought emergencies (Ministry of Water Sanitation and Irrigation 2022). The national government and development partners made substantial financial contributions yet the projects in these areas still experience frequent system failures and unstable water service and poor financial recovery (Water Services Regulatory Board 2020). The research of Kihara Makau and Mwangi (2022) found that Isiolo County projects suffered from insufficient maintenance and weak local involvement which caused their operational efficiency to drop. The Office of the Auditor General conducted audits (2020) revealed ongoing deficiencies in project oversight and wasteful resource utilization and delayed infrastructure project finishes. The environmental conditions together with social cultural patterns and environmental aspects create special requirements that need specific solutions to achieve sustainable service delivery. The study of project management practices has gained popularity because organizations want to know which practices will boost their performance results.

The way sustainable project management practices get applied to projects serves as an essential factor which determines project results. Sustainable project management includes environmental protection measures and community involvement methods and project assessment techniques which get applied during all stages of a project (Silvius & Schipper, 2020). The practices focus on achieving economic development and social progress and environmental sustainability goals which results in better project outcomes and higher stakeholder contentment (PMI, 2021). Research indicates that organizations which implement sustainability practices actually attain steady operational results together with enduring business success. The implementation of renewable energy systems together with local capacity development and precise monitoring systems in Ethiopia led to enhanced system performance and improved user experience (Yimam et al., 2021). In Tanzania, participatory planning and structured oversight were associated with lower maintenance costs and higher operational uptime (Kusiluka et al., 2020).

The Ministry of Water, Sanitation and Irrigation (2022) asserts that sustainable project management practices must be implemented throughout all project activities to accomplish the national water policy goals. The practices involve active community participation during the planning process and the execution of environmental impact assessments and the creation of performance indicators that will direct their implementation. The community water projects face operational challenges because they lack essential resources and monitoring systems which are necessary to implement sustainable management methods (Transparency International Kenya, 2021). The research priorities for arid counties such as Garissa focus on understanding the impact of sustainable project management practices on community infrastructure resilience and public trust. Thus, the purpose of this study is to investigate how community water projects in Garissa County, Kenya, perform in connection to sustainable project management techniques.

Community water project performance assessment evaluates how development organizations together with their implementing partners build and operate water supply systems which meet the needs of beneficiary communities through their established goals for project delivery times and system quality and funding limits. Khan, Rasheed, and Maqbool (2022) define project performance in development infrastructure as the degree to which project outputs achieve planned goals in terms of scope, time, and cost, while delivering measurable improvements for target populations. Olaniran (2022) describes performance in water and sanitation initiatives as the sustained provision of reliable services that comply with technical standards and generate community satisfaction. Shao, Müller, and Turner (2021) express that performance evaluation

assesses two aspects of project implementation which includes operational efficiency and the process that generates value for stakeholders during the entire project duration. Ugwu and Kumaraswamy (2022) further conceptualize project performance as the alignment of design, execution, and governance practices to deliver resilient infrastructure which supports sustainable development goals.

Mpidaki and Omwenga (2025) define sustainable project management as a strategic approach to executing development initiatives using ethically sourced inputs, inclusive decision-making, and environmentally sound techniques that ensure project outcomes remain viable over time. Maina and Kyalo (2023) define sustainable project management as the process which ensures project execution follows equity principles while maintaining operational efficiency and creating sustainable systems through proper stakeholder participation and responsible financial management and sustainable technology integration. Muhatia and Wainaina (2023) establish sustainable project management as the intentional integration of sustainability factors throughout all project stages which include planning and implementation and evaluation.

The process of project planning involves three main activities which include establishing project objectives, determining necessary project materials, and creating a schedule for tasks which will help them reach both performance goals and sustainability targets. Odhiambo and Kimutai (2023) conducted research which showed that project performance improves when project teams execute their planning work through two specific processes which include cost estimation and budgeting and scheduling activities. Project research on water systems demonstrated that successful planning systems delivered reliable results because project planning served as an essential element which supported both sustainable development and project accountability. The research conducted by Kibet (2024) demonstrated that detailed work breakdown structures together with strict project control procedures produced positive results which led to better project outcomes. The research conducted by Mutuku et al in 2022 demonstrated that organizations achieved successful project results through precise planning operations which included establishing project timelines and predicting budgetary needs. The research study will assess project planning through three measurement methods which include demand forecasting accuracy and budget estimation precision and schedule compliance with planned timelines.

Community water projects along the arid regions of Garissa County provide essential support to pastoralists and rural communities who face ongoing challenges with water shortages and unstable livelihoods. The area of Garissa which exists in Northern Kenya suffers from both persistent drought conditions and unpredictable rainfall patterns that make it difficult to find safe drinking water sources. The county has established multiple water projects which include boreholes shallow wells and piped water systems to meet domestic needs and provide livestock drinking water while helping communities adapt to climate change. The County Government of Garissa leads these projects while partnering with the Ministry of Water and Sanitation and various donor agencies and non-governmental organizations (NGOs). Local Water User Associations (WUAs) serve as important entities which manage operations according to the Water Act (2016) regulatory system. The projects operate in accordance with both national development objectives which include Kenya Vision 2030 and international agreements which include Sustainable Development Goal 6 (SDG 6) that pertains to clean water and sanitation.

The community water projects in Garissa show mixed results because their primary development goal remains unfulfilled. The Water Services Regulatory Board (WASREB, 2023) reported that only 55% of rural water points in Kenya maintained full operational status during the assessment period, while arid counties especially Garissa displayed higher equipment failure rates. SNV Kenya (2023) reported that 40% of community-operated water systems in northern Kenya which includes Garissa, stopped working within two years because of weak financial systems and lack of proper planning and necessary spare parts.

Sustainable project management practices need their implementation because they provide essential tools for service delivery improvement through their project planning and risk management and stakeholder engagement and monitoring and evaluation functions. WASREB (2023) identified inadequate planning together with postponed maintenance work as the main reasons for water system failures. KEWASNET (2023) found that most community water projects in arid counties did not have proper systems for stakeholder accountability and operational monitoring. The existing deficiencies in these systems create obstacles for transparency while they increase the time needed to solve issues and decrease the effectiveness of water service delivery.

The existing national WASH (Water, Sanitation and Hygiene) policies and county development frameworks hold sustainability as a vital principle yet researchers have found insufficient evidence which connects sustainable project management methods to actual performance results in Garissa County. This researcher will investigate how project

planning, risk management, stakeholder engagement and monitoring, and evaluation methods impact project results to address the existing knowledge gap. The study will evaluate three performance aspects which include project completion speed, project quality, and budget adherence, to develop practical solutions that will improve community water service delivery in Garissa County's climate-vulnerable and resource-constrained environment.

2. STATEMENT OF THE PROBLEM

The community water projects which exist in Northern Kenya's arid regions specifically in Garissa County, serve as essential solutions which tackle persistent water shortages while they improve living conditions and protect against climate change. The people living in these areas rely on government and donor-supported water initiatives to fulfill their water requirements for both household and farming activities. The community water projects which exist in this area serve an essential purpose yet their effectiveness falls short of expected standards. The Water Services Regulatory Board (WASREB, 2023) reports that only 55% of rural water points operate at full capacity across all regions although arid counties exhibit their highest rate of system failures. SNV Kenya (2023) discovered that around 40% of boreholes and piped systems stop functioning within two years because of insufficient planning and poor maintenance and low levels of community participation. The project execution fails to achieve its intended results because of the main project performance indicators which assess project execution through three areas: delivery time and project outcome quality and financial budget adherence.

The Water Act (2016) and Vision 2030 national frameworks support sustainable project execution yet actual field research shows that organizations apply participatory planning and risk management together with continuous monitoring in an inconsistent manner. KEWASNET (2023) discovered that most water projects operate without established systems to monitor their progress while they lack defined processes for stakeholders to maintain accountability which results in diminished effectiveness throughout extended periods. The sustainability policy disconnect from practical operations in the field creates doubt about how effective project management methods function within these specific areas.

3. LITERATURE REVIEW

Theoretical Literature Review

RBV framework which Barney developed in 1991 shows that companies achieve competitive advantage through their capacity to acquire and utilize their resources which possess value and rarity and make their resources impossible to imitate and substitute. The Resource-Based View (RBV) framework enables analysts to examine how project management sustainability practices use organizational capabilities which include efficient planning systems and risk detection methods and staff members with extensive experience to control their project results. The theory faces criticism because it restricts its analysis to internal elements while it fails to acknowledge how political situations and stakeholder demands and regulatory modifications impact the system. Chatterjee et al., (2023) argue that the RBV framework fails to recognize how organizations interact with their social and economic environments which hold special importance for public and community sector initiatives.

The current research study uses this theory to show how internal managerial functions which include project planning and risk management create power within organizations. Community water projects in arid regions achieve cost-efficient and timely and high-quality outcomes through their internal capacity development. The Resource-Based View (RBV) framework shows that institutions need to develop their organizational capacity which helps them to maintain their sustainable development results. The theory informs the research by showing how the organization of internal resources in community water projects affects their planning and risk management functions through their impact on project success.

Empirical Literature Review

The research conducted by Ansah, Brown, and Owusu (2022) demonstrated how advanced planning frameworks improve efficiency for water projects in rural Ashanti Region of Ghana. The research examined the direct effects of SWOT-based planning methods and stakeholder analysis methods on project development outcomes. The researchers conducted their study using descriptive survey research which measured results according to strategic planning theory. The researchers selected 120 respondents from the target population which consisted of 45 rural water scheme committees and district engineers through purposive sampling. The researchers collected data via structured surveys, which they then analyzed using SWOT analysis scoring techniques and descriptive statistics. The researchers established project planning through three specific components which required SWOT assessments stakeholder participation in planning sessions and risk mitigation matrix development.

The study by Patel et al. (2023) looked at the impact of integrated digital planning platforms on community water project execution in rural India. To ascertain their impact on project outcomes, the researchers examined three project planning technologies: real-time project planning tools, data sharing dashboards, and distant community links. Digital project management theory served as the fundamental basis for the researchers' mixed-methods explanatory survey methodology. The study population consisted of 85 water user organizations and local authorities, from which 68 respondents were chosen using stratified random selection. The researchers gathered information by using structured questionnaires together with platform usage analytics which they examined through regression analysis and thematic coding methods. The integrated digital planning platforms enabled project teams to work together more effectively which resulted in fewer delays and better water service reliability.

Omuya (2023) examined how project planning practices impact both operational outcomes and environmental sustainability of water community initiatives throughout Samburu County Kenya. The researchers used a descriptive survey design which they based on both stakeholder theory and sustainability theory. The researchers selected managers and committee members from 28 community-managed water projects as their target population while they studied all 28 project managers and committee chairs. The researchers collected data through structured questionnaires and used correlation and regression methods to analyze the data. The research results showed that effective project planning practices brought about considerable improvements to the sustainability of water projects which operate in Samburu County.

Nzomo (2022) researched how project planning affects both performance and sustainability of water projects in Machakos County which exists in Kenya. The researchers employed a descriptive survey research design which followed the principles of sustainability and stakeholder theories. The research study selected water project leaders together with community representatives and implementing agencies to participate in the research which included 112 participants. The researcher gathered primary data which they analyzed through SPSS regression analysis. The research shows that project planning creates a strong positive link which leads to water project sustainability. The study presented informative content which examined sustainability results but it did not recognize other critical performance dimensions which included project completion times and budget management.

In Elgeyo Marakwet County, Kenya, Kibet and Senaji (2023) investigated how project planning techniques affected the results of water projects. A descriptive survey design which combined contingency and resource-based theoretical frameworks was used. The researchers selected 108 participants from a project implementation group which included 150 members through a process called stratified sampling. The researchers collected data through questionnaires which they analyzed using descriptive and inferential statistical tools. The study results showed that effective planning methods brought about major improvements in both project operational success and work efficiency.

4. RESEARCH METHODOLOGY

A descriptive survey research design was adopted. The target population included 16 community-managed water projects implemented and rehabilitated between 2014 and 2024 in Garissa County. The study employed census method to ensure comprehensive coverage of the 16 projects. Primary data was collected through structured questionnaires administered to project managers, committee members, and other relevant stakeholders. Data analysis was performed using descriptive statistics, correlation analysis, and regression techniques, with the Statistical Package for Social Sciences used for data processing.

5. FINDINGS

The descriptive statistics results on project planning are presented in Table 1.

Table 1: Project Planning

Statements	M	SD	CV (%)
The project budget was clearly defined and adhered to during implementation.	3.912	0.548	14.01
Cost estimates were prepared with stakeholder input and reviewed regularly.	3.876	0.531	13.70
Potential risks were identified and incorporated into the project plan.	3.954	0.507	12.82
The project included contingency funds or strategies for dealing with unforeseen events.	3.832	0.566	14.77
The project activities were planned with a detailed timeline and milestone tracking.	4.011	0.489	12.19
Implementation adhered closely to the initial schedule without major delays.	3.845	0.553	14.38
Aggregate Score	**3.905**	**0.532**	**13.62**

Source: Field Data (2026)

The presentations in Table 1 provide a foundation to comprehend the degree of project planning practices used in community water projects in arid areas of Northern Kenya. The overall mean score of 3.905 and standard deviation of 0.532 shows that the respondents tended to agree that the best practices of project planning were applied throughout the projects. The comparatively low standard deviation indicates consistency in the replies, indicating that most respondents had the same view about the adequacy of the planning procedures. This supports the data's validity and suitability for use in additional inferential analysis.

The coefficient of variation (CV) in Table 1 also shows that there is low variability among the respondents with the total CV of 13.62%. This is an indication that the respondents were fairly consistent in their views about the project planning practices. The statement on planning project activities with detailed timelines and milestone tracking had the lowest CV (12.19), which means that there was a high level of agreement among the respondents regarding the significance and use of structured scheduling. Conversely, the inclusion of contingency funds or strategies had the highest CV (14.77) indicating a slight difference in the way various projects integrate risk preparedness measures. However, the CV values are less than 20% which proves that the responses are consistent and valid.

The most frequently rated statement was that project activities were scheduled with a specific timeline and milestones (M = 4.011, SD = 0.489), which means that the systematic scheduling is one of the strengths of the community water project management. This observation is consistent with the research by Patel et al. (2023), which determined that real-time scheduling systems and systematic planning models can greatly decrease delays and enhance project coordination. Likewise, the process of risk identification and integration into project planning (M = 3.954, SD = 0.507) was rated highly, which is consistent with the findings by Ansah, Brown, and Owusu (2022), who assert that risk analysis integration into project planning frameworks improves project execution and reliability.

Project budgeting (M = 3.912, SD = 0.548) and stakeholder involvement in cost estimation (M = 3.876, SD = 0.531) also had high ratings, which indicated that financial planning processes were moderately effective. These findings are consistent with those of Omuya (2023) and Nzomo (2022), who found that improving the sustainability as well as efficiency of water projects requires efficient planning and budgeting that involves stakeholders. Also, compliance with project schedules (M = 3.845, SD = 0.553) shows that although schedules are typically adhered to, there can still be some difficulties like delays, which is a typical problem in resource-constrained settings as Kibet and Senaji (2023) note.

On the other hand, the inclusion of contingency funds or strategies had the lowest mean score (M = 3.832, SD = 0.566), indicating that not every project is prepared to deal with unexpected events. This brings out a possible disconnect in the planning practices especially in risk preparedness. Ansah et al. (2022) also identified similar constraints, stating that not all planning frameworks incorporate comprehensive contingency measures, which impacts the resilience of projects.

Inferential Statistics Results

The inferential statistics involved correlation analysis and regression analysis.

Correlation Analysis Results

Table 2: Correlation Analysis Results

		Project planning	Project Performance
Project Performance	Pearson Correlation	.952**	1
	Sig. 2-tailed	.000	
	N	118	118

Source: Research Data (2026)

Project planning shows a very strong positive and significant relationship with project performance (r = 0.952, p = 0.000). This implies that well-structured budgeting, scheduling, and planning processes significantly improve the performance of community water projects. This finding is consistent with Nzomo (2022) and Omuya (2023), who established that effective planning enhances sustainability, efficiency, and overall project success.

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Regression Analysis Results

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.881[a]	.776	.758	.01293

a. Predictors: (Constant), Project Planning

Source: Field Data (2026)

The adjusted R^2 value of 0.758 indicates that 75.8% of the variation in project performance is explained by the influence of project planning. This implies that the project planning was a strong predictor of project performance. The remaining 24.2% of variation is explained by other factors not included in the model.

Table 4: Analysis of Variance

Model		**Sum of Square**	**df**	**Mean Squares**	**F.**	**Sg**
	Regressions	221.598	1	221.598	272.719	0.002
	Residuals	94.256	116	0.813		
	Totals	315.854	117			

Source: Field Data (2026)

The ANOVA results confirms that the model was statistically significant since the mean square (221.598) is below F value (272.719) value and the significance value is below threshold (0.05) at .002.

Table 5: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.063	.025		2.523	.013
	Project Planning	.183	.042	.191	4.364	.000

Source: Research Data (2025)

Project planning was also found to positively and statistically significantly influence project performance (β= 0.191, p = 0.000). This means that an increase in the level of project planning practices will result in an increase in the project performance, other things being equal. The findings indicate that properly planned activities like budgeting, scheduling and stakeholder participation can improve the efficiency and timely delivery of water projects. These findings are consistent with those of Ansah, Brown, and Owusu (2022), who found that stakeholder participation and well-structured planning models like SWOT analysis may significantly improve the execution of water projects and the dependability of the services. Likewise, Nzomo (2022) discovered that good planning practices have a positive impact on the sustainability and long-term viability of water projects. The implication is that good planning systems enhance coordination, allocation of resources and the overall project outcomes in community water projects.

6. CONCLUSIONS

To determine the effect of project planning on project performance was the first objective. The results showed that project planning positively and significantly affects project performance. The conclusion was made that the projects that have well-organized budgeting, scheduling, and planning processes that involve stakeholders are more likely to have better coordination, higher efficiency, and timely completion of activities. Project planning is thus important in improving the overall success of community water projects.

7. RECOMMENDATIONS

In order to manage community water projects in dry and semi-arid regions of Northern Kenya, particularly in Garissa County, a number of practical and policy suggestions were developed based on the study's results. In order to improve project planning, implementing agencies and project managers ought to reinforce planning systems by making sure that budgeting, scheduling and stakeholder involvement are all incorporated at the initial phases of project design. There is also the need to enhance the contingency planning mechanisms to be more effective in preparing projects against the unexpected risks and environmental uncertainties. Enhancement of planning capacity by training and application of standardized planning tools will enhance coordination, efficiency and timely completion of projects.

REFERENCES

[1] African Development Bank. (2019). *Water supply and sanitation in Africa: Achievements and challenges*

[2] Kenya Water and Sanitation Civil Society Network. (2023). *WASH Accountability & Monitoring Framework Report*

[3] Khan, K., Rasheed, R., & Maqbool, R. (2022). Impact of project governance and top management support on project performance: The mediating role of project management practices. *International Journal of Managing Projects in Business*, 15(2), 307–328

[4] Kibet, C. (2024). Effect of project planning strategies on performance of community-based water projects in Elgeyo Marakwet County, Kenya. *International Journal of Social Sciences and Management Entrepreneurship*, 8(2).

[5] Kihara, R., Makau, J., & Mwangi, M. (2022). Factors influencing the performance of rural water projects in Isiolo County, Kenya. *International Journal of Scientific and Research Publications*, 12(2), 150–160

[6] Kusiluka, M. M., Kessy, F., & Mushi, D. (2020). Sustainability of rural water supply projects in Tanzania. *Water Policy*, 22(5), 727–740

[7] Maina, L., & Kyalo, D. (2023). Sustainable project management practices and sustainability of rural water infrastructure projects in Kiambu County, Kenya. *The Strategic Journal of Business & Change Management*, 10(2), 411–426

[8] McCarthy, D. S., Moonesinghe, R., & Dean, M. (2020). Sustainable community water supply systems in the United States. *Journal of Water Resources Planning and Management*, 146(2), 04019072

[9] Ministry of Water, Sanitation and Irrigation. (2022). *Annual water sector performance report*

[10] Mpidaki, P., & Omwenga, J. (2025). Integrating sustainability into development project delivery: A framework for rural infrastructure. *Journal of Environmental Management and Sustainable Development Projects*, 6(1)

[11] Muhatia, A., & Wainaina, G. (2023). *Stakeholder participation and sustainability of community water projects in Makueni County, Kenya*. International Journal of Social Sciences and Management Entrepreneurship, 7(2)

[12] Muthuri, N., Ochieng, P. &, & Odoyo, D. (2019). A Review on the Factors Affecting Performance of Community Water Projects in Kenya. *Journal of Public Policy & Governance*, *3*(2), 43–60

[13] Mutuku, M., Muathe, S., & Kihoro, J. (2022). Project planning and performance of water development projects in Machakos County, Kenya. *European Journal of Business and Management Research*, 7(5), 160–166

[14] Odhiambo, S., & Kimutai, B. (2023). *Project cost control techniques and performance of water projects in Kericho County, Kenya*

[15] Office of the Auditor General. (2020). *Audit report on water projects*

[16] Olaniran, O. J. (2022). Success factors and barriers in water and sanitation infrastructure projects: A systematic literature review. *Utilities Policy*, 74, Article 101339

[17] Omuya, I. (2023). *Project Planning and Sustainability of Water Projects in Samburu County, Kenya*

[18] Patel, R., Sharma, A., & Singh, V. (2023). Digital planning platforms and community water project performance: A case study in rural India. *Journal of Infrastructure Development and Management*, *11*(1), 32–50

[19] Project Management Institute. (2021). *A guide to the project management body of knowledge (PMBOK® Guide)* (7th ed.)

[20] Shao, J., Müller, R., & Turner, J. R. (2021). The impact of project governance and stakeholder engagement on project performance: A study of sustainable projects. *International Journal of Project Management*, 39(4), 399–411

[21] Silvius, A. J. G., & Schipper, R. (2020). Sustainability in project management competencies: Analyzing the competence gap of project managers. *Journal of Cleaner Production*, 244, 118657

[22] Stewart, S., & Green, G. (2022). The importance of legislative reform to enable adaptive management of water resources in a drying climate. *Water*, *14*(9), 1404

[23] Transparency International Kenya. (2021). *Integrity and corruption risks in Kenya's water sector*

[24] Water Services Regulatory Board. (2020). *Impact report: Performance review of Kenya's water services sector*

[25] World Bank. (2019). *Water in the balance: Kenya water sector diagnostic*