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Continuous Improvement and Performance of Water Projects in Machakos County, Kenya

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Abstract- Over the past two decades, national governments, bilateral agencies, and devolved authorities have made significant efforts to improve access to clean and safe water through various national and community-based water projects. To enhance the effectiveness and sustainability of these initiatives, many institutions have integrated continuous improvement strategies into their results-based management frameworks. Despite these efforts, water projects continue to face performance issues, including delays and inefficiencies. This study aims to assess the effect of continuous improvement on the performance of water projects in Machakos County, Kenya. The research employs the pragmatism research paradigm and utilizes both correlational and descriptive cross-sectional survey designs. It focuses on 70 water projects within Machakos County, targeting beneficiaries represented by members of the Water Management Committee, Ministry of Water employees, and project managers. Slovin's Formula was used to determine the sample size, leading to the selection of 216 respondents through stratified random sampling. This sample was divided into three strata: Ministry of Water employees, project managers, and Water Management Committee members.

Keywords: continuous improvement, project perfor-mance, water projects.

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Continuous Improvement and Performance of Water Projects in Machakos County, Kenya

Richard Orengo Odhiambo [α] & Charles M Rambo [σ]

Abstract- Over the past two decades, national governments, bilateral agencies, and devolved authorities have made significant efforts to improve access to clean and safe water through various national and community-based water projects. To enhance the effectiveness and sustainability of these initiatives, many institutions have integrated continuous improvement strategies into their results-based management frameworks. Despite these efforts, water projects continue to face performance issues, including delays and inefficiencies. This study aims to assess the effect of continuous improvement on the performance of water projects in Machakos County, Kenya. The research employs the pragmatism research paradigm and utilizes both correlational and descriptive cross-sectional survey designs. It focuses on 70 water projects within Machakos County, targeting beneficiaries represented by members of the Water Management Committee, Ministry of Water employees, and project managers. Slovin's Formula was used to determine the sample size, leading to the selection of 216 respondents through stratified random sampling. This sample was divided into three strata: Ministry of Water employees, project managers, and Water Management Committee members. Data collection involved secondary data from annual reports of the Ministry of Water in Machakos County and primary data from semi-structured questionnaires and key informant interviews. Qualitative data from interviews were analyzed thematically, while quantitative data were examined using descriptive statistics and inferential techniques such as correlation and regression analysis. Correlation results indicated that there is a positive linear association between selection of continuous improvement and water projects performance in Machakos County ($r=0.225$, p-value$=0.005$). Regression results showed that continuous improvement has a positive influence on the performance of water projects Machakos County, Kenya ($\beta_1=0.932$, p-value$=0.000$). From the findings, the study recommends that key stakeholders especially end users should be involved in continuous improvement through feedback mechanisms, joint performance reviews, community sessions, and site visits. The community sessions would solicit inputs on aspects that need improvement including water quality, management systems and operation processes. The community engagement sessions would provide an opportunity to review progress made and share lessons from monitoring reports.

Keywords: continuous improvement, project performance, water projects.

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I. Introduction

The performance of water projects, particularly in meeting scope, time, and budget constraints, is a significant challenge for managers of projects funded by government bodies and international organizations like the World Bank, INGOs, and the UN (Bassanetti, 2021). These projects frequently encounter issues such as unexpected technical problems, logistical hurdles, and variable financial resources, leading to delays and cost overruns. Additionally, aligning project goals with community needs and managing stakeholder expectations complicates execution further (Arias & Friðriksdóttir, 2022). The complexity of water projects, requiring extensive planning, coordination, and regulatory compliance, intensifies these challenges. According to Lainjo (2019), Results-Based Management (RBM) enhances project performance by emphasizing accountability, transparency, and efficiency throughout the project lifecycle, with continuous improvement being a key component.

Continuous improvement involves systematically evaluating and revising project processes, strategies, and practices based on performance data and feedback to enhance efficiency and effectiveness. Rahman and Hossain (2020) observed that continuous improvement practices played a crucial role in enhancing project performance in Bangladesh. Projects that incorporated continuous improvement methodologies showed higher levels of success in terms of meeting deadlines, staying within budget, and achieving desired outcomes. The research highlighted that systematic improvements and regular performance evaluations are key to achieving superior project results. In addition, Khan and Shah (2019) indicated that continuous improvement strategies significantly enhance project success in Pakistan's construction industry. These strategies, including quality management practices and iterative feedback mechanisms, led to improvements in project efficiency, cost management, and overall project quality. In Ghana, Asante and Osei (2021) assert that continuous improvement practices were instrumental in enhancing the performance of development projects in Ghana.

In Kenya, Chirchir and Koros (2021) assert that continuous improvement initiatives, including structured training programs and feedback mechanisms, signi-

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ficantly enhance staff performance in Baringo County. Specifically, regular seminars and workshops led to notable improvements in employee productivity, effectiveness, and job satisfaction. In addition, Abdill (2017) argues that continuous improvement practices, such as iterative process enhancements and performance evaluations, positively impact project performance in Kenyan county governments. Also, Mwangi and Ndungu (2019) demonstrated that continuous improvement practices, including regular assessments and process optimizations, significantly boost project performance in Kenyan NGOs. The implementation of best practices and systematic feedback loops led to enhanced project delivery, increased stakeholder satisfaction, and greater overall effectiveness. Continuous improvement contributed to better project outcomes by addressing inefficiencies and adapting strategies based on performance data.

The performance of water projects in Machakos County presents a mixed picture, reflecting both successes and challenges (Nzomo, 2022). Some projects have effectively improved access to clean water, while others struggle with issues like poor quality, cost and time overruns, failure to meet objectives, and lack of sustainability (Muema & Ngugi, 2021). These problems often arise from inadequate planning, limited resources, and insufficient project management capacity. Integrating continuous improvement, a key element of Results-Based Management (RBM), is crucial for addressing these issues. It provides a structured approach to setting clear objectives, monitoring progress, and evaluating outcomes through established indicators (Kosgei, 2021). By embracing continuous improvement, Machakos County can improve accountability, transparency, and efficiency in water project implementation, leading to better resource utilization and achievement of project goals in a sustainable and timely manner.

II. Statement of the Problem

In Results-Based Management (RBM), continuous improvement plays a crucial role in water projects by providing measurable criteria to evaluate the effectiveness and impact of water initiatives (Arias & Friðriksdóttir, 2022). Continuous improvement enhances the performance of water projects by fostering ongoing evaluation and refinement of processes. According to Lainjo (2019) it helps identify and address inefficiencies, leading to better resource management and cost reduction. Khan, Begum, and Razak (2020) indicate that by implementing feedback mechanisms and incorporating best practices, continuous improvement ensures that water projects are more effective, sustainable, and responsive to community needs. However, Chirchir and Koros (2021) argue that continuous improvement can be resource-intensive, requiring significant time and financial investment. They also point out that frequent changes may encounter resistance from employees, disrupting workflow and morale. In addition, Abdill (2017) suggests that the focus on incremental changes might overshadow the need for addressing fundamental issues or pursuing larger innovations.

In Machakos County, 67 percent of water projects encounter issues such as stagnation, cost overruns, and time delays, and often cease to function immediately after donors and contractors hand them over to the communities (Lillian & Mutiso, 2019). These projects frequently break down due to a shortage of spare parts, the inability of community water management committees to cover operational costs, and inadequate maintenance and operational oversight. Furthermore, Kosgei (2021) noted that only 60% of stakeholders expressed satisfaction with the completed projects. This dissatisfaction arises because many projects fail to deliver on their goal of providing safe water, ultimately becoming social and environmental hazards rather than sustainable solutions for the communities they were meant to benefit.

Various studies have examined the selection of continuous improvement across different project contexts globally. For instance, Rahman and Hossain (2020) examined the role of continuous improvement practices in project performance in Bangladesh; Khan and Shah (2019) conducted a study on the impact of continuous improvement strategies on project success in Pakistan's construction industry while Asante and Osei, R. (2021) looked at enhancing project performance through continuous improvement among development projects in Ghana. Despite these insights, it's important to recognize that each country's unique macroeconomic conditions and legal frameworks can influence project outcomes and the effectiveness of continuous improvement. Furthermore, these studies have primarily focused on infrastructure development and community-based water projects, potentially limiting their applicability to other types of projects and sectors.

In Kenya, Chirchir and Koros (2021) examined the impact of continuous improvement initiatives on staff performance in Baringo County; Abdill (2017) studied continuous improvement and its impact on project performance in county governments in Kenya; and Mwangi and Ndungu (2019 looked at the effectiveness of continuous improvement practices in enhancing project performance in Kenyan NGOs. However, these studies were limited to construction projects and development projects by NGOs. Different types of projects have different project objectives, resources requirements and technical expertise. This study therefore sought to answer the research question: how does continuous improvement influence the performance of water projects in Machakos County?

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The researcher sought to test the following null hypotheses:

$H_1 1$: There is no significant association between continuous improvement and the performance of water projects in Machakos County, Kenya.

III. Literature Review

a) *Continuous Improvement and Performance of Water Projects*

Abdill (2017) investigated the impact of continuous improvement on the performance of county government projects through a descriptive research survey design. The study encompassed a large population of 2,028 participants, including 28 project heads and 2,000 project beneficiaries. Utilizing a stratified sampling method, the research focused on a sample of 204 individuals. Data collection was achieved using a combination of questionnaires and interview guides to gather primary data. The study's findings highlighted that continuous improvement practices enable project managers to develop higher-quality projects while reducing costs, thus effectively meeting project objectives and enhancing overall performance. This demonstrates the practical benefits of ongoing improvement efforts in project management.

Odhiambo (2021) conducted a study to examine how continuous improvement and learning impact performance of water projects run by the county governments' within Machakos County. Moreover correlational research approach was utilized. The study population was 361 respondents comprising beneficiaries of the water projects, project managers, employees working with the ministry of water and employees in the Tana -Athi Water Service board. The study employed semi-structured questionnaires to obtain primary data. Moreover, questionnaires in this study were disseminated using the DOPU technique, and face-to-face interviews were conducted for key informant interviews. The study found that continuous learning as well as improvement impacts county governments' water projects' performance to a large extent.

In Kenya, Njagi, Muna and Njoroge (2021) assessed the role of continuous improvement in resource mobilization on water supply management in Murang'a County. Additionally, the researcher used descriptive study approach. Target population in Murang'a County consisted of beneficiaries or local stakeholders, personnel of water management and supply organizations, County and National Government officials from Ministry of Water, and employees of non-state actors dealing with water, totaling 89,415. A total of 225 people took part in this study. This study used questionnaire to collect qualitative and also quantitative data. For data analysis, SPSS version 25 was employed. The studies demonstrated that constant resource mobilization leads to significant improvements in water supply management.

Chirchir and Koros (2021) conducted an investigation into how continuous improvement initiatives affect staff performance within Baringo County. Employing a descriptive research approach, the study utilized a questionnaire to collect data from 14 senior employees and 57 middle-level managers. The analysis was carried out using both inferential and descriptive statistical methods. The findings indicated that the county government's training programs, provided through a series of seminars and workshops, had a substantial positive impact on staff performance. This highlights the importance of structured training and development efforts in enhancing employee effectiveness. The study suggests that well-organized training initiatives are crucial for improving overall organizational performance and achieving better results in county government operations.

b) *Theoretical Framework*

The RBM theory started in the mid-1980s with the Australian government, after which in the 1990s it spread to other organizations, including the OECD. The RBM theory involves orienting all use and action of resources towards achieving demonstrable and clearly defined results (Dempster, 2017). The RBM improves accountability and openness by letting initiatives to continue to collaborate and reduce waste and duplication. Good planning and M, M&E are interconnected procedures that can significantly improve investment projects and programs' efficacy. Good planning ensures that resources are allocated and subsequent execution is concentrated on essential outcomes. Try and Radnor (2017) contend that proficient monitoring and evaluation facilitate the assessment of progress towards achieving goals and enable learning from previous experiences, thereby ensuring that future projects contribute more effectively to development outcomes.

Results-based management seeks to drive substantial changes in the operations of public and private sector entities, such as institutions, projects and agencies. Its main objective is to improve performance and achieve more effective outcomes. RBM also attempts to manage interventions while ensuring relevance, efficiency, effectiveness, and impact, among other quality criteria (Dempster, 2017). Management improvement refers to management learning and decision-making processes and is one of the drivers of result-based management. Another motivator is performance reporting, which can help inform and enhance resource allocation (Rivenbark, 2016). The RBM has six distinct components: stakeholder participation/situational analysis; defining anticipated results; managing and identifying risks; gathering performance information, selecting performance

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indicators and performance reporting, learning, and corrective actions.

Results-Based Management (RBM) theory elucidates the influence of continuous improvement on the performance of water projects in Machakos County by emphasizing a structured approach to achieving specific, measurable results. In RBM, continuous improvement plays a crucial role by systematically evaluating project progress, identifying performance gaps, and implementing iterative enhancements based on real-time data and stakeholder feedback. For water projects in Machakos County, this means using performance metrics to track effectiveness in delivering clean water, assessing the impact of various interventions, and adjusting strategies to address emerging challenges. By focusing on results and continuously refining practices, RBM ensures that water projects are more efficient, responsive, and capable of meeting their goals, thereby improving overall project outcomes and sustainability in the region.

c) Conceptual Framework

The study sought to assess the influence of continuous improvement on performance of water projects in Machakos County, Kenya. As shown in Figure 1, the dependent variable was performance of water projects and the independent variable was selection of key performance indicators.

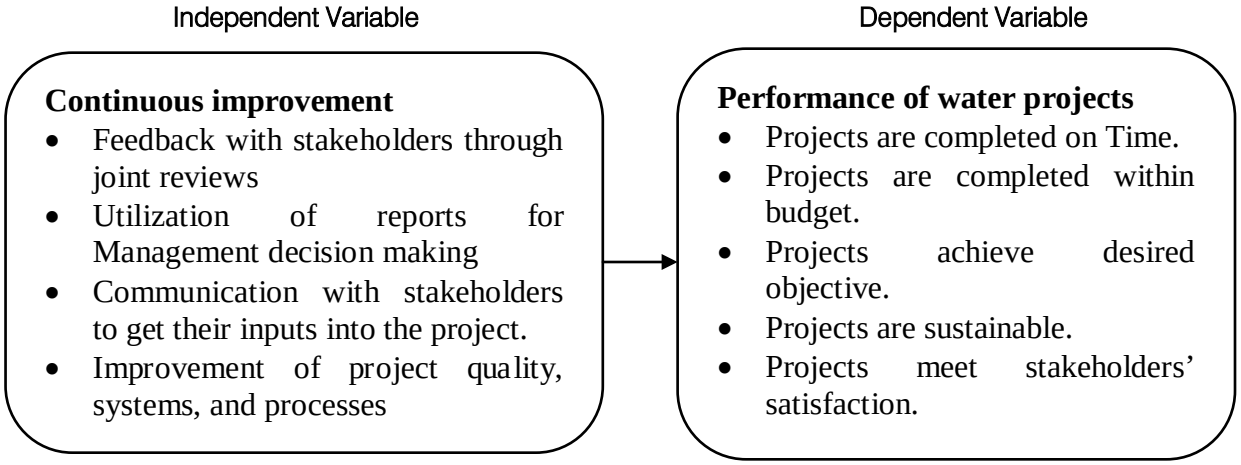


Figure 1: Conceptual Framework

IV. Research Methodology

This study adopted the pragmatism paradigm and combined qualitative and quantitative research approaches. In addition, the study employed a correlational approach and a descriptive cross-sectional survey approach. The target population comprised of 70 water projects located within Machakos County. The unit of observation included the beneficiaries of the water projects represented by five members of the Water management committee, Ministry of water employees, and project managers in Machakos County. Water projects comprise five members of the water management committee, and hence the total members in the 70 water projects were 350 members. The project managers were 70, and the Ministry of water employees was 54. The target population therefore, consisted of 474 individuals.

Sample size determination in this study adopted the Slovin's Formula. This formula was adopted as it puts into consideration margin of error, target population and sample size.

$$n = \frac{N}{1 + NE^{-2}}$$

Where:

N =entire population

n =sample size

E =Error margin (0.05)

$$n = \frac{474}{1+(474*0.05^2)} = 216$$

The study employed stratified random sampling to select 216 respondents and divided into smaller sub-groups referred to as strata which had three groups of respondents, including the ministry of water employees, project managers and water management committee members.

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Table 1: Sample Size

Category	Target Population	Sample Size
Ministry of water personnels	54	25
Project managers	70	32
Water management committee members	350	159
Total	**474**	**216**

The study used primary data collected through semi-structured questionnaires and in-depth interviews with key informants. A preliminary pilot study was conducted to evaluate the reliability and validity of the research instruments. Project managers and members of the water management committee took part in the pre-test, including 21 respondents (10% of sample size) from Makueni County. Makueni County was used to test the research instruments due to proximity to Machakos County and similarity in characteristics including culture, environment, and water needs.

The research instruments generated both qualitative and quantitative data. Qualitative data from key informant interviews and unstructured questionnaires was analysed thematically. The quantitative data analysis was done using both inferential and descriptive statistics with the help of Statistical Package for the Social Sciences (SPSS Version 25). Descriptive statistics included mean, standard deviation, percentages, and frequency distribution. Inferential analysis was conducted using Pearson correlation coefficient analysis and univariate regression analysis. The univariate regression models were employed to examine the relationship between the study variables. The regression model used was as follows:

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

Where;

Y = County governments' water projects Performance;

β_0 = Intercept (Constant);

β_1 = Coefficients of determination;

X_1 = Continuous improvement; and

ε = Error term

V. Research Findings and Discussions

Out of 216 questionnaires that were administered, the researcher obtained 157 responses, conducted 18 KII with staff from the ministry of water and 23 KII with project managers. This represents a response rate of 91.67%. Babbie (2017) argues that 50% response rate is generally considered good for analysis, inferences as well as reporting purposes whereas 70% response rate is considered excellent. Therefore, in this study response rate of 91.67% is adequate for conducting analysis as well as making inferences. There was 8.33% non-response rate, which came as results of unavailability of some participants.

a) Performance of Water Projects

In this study, the performance of water projects served as the dependent variable, assessed through indicators such as projects completed on time, within budget, achieving objectives, sustainability, stakeholder satisfaction, and managing environmental and social impacts. A five-point Likert scale was employed to measure respondents' level of agreement with statements concerning the indicators within Machakos County. With mean of 4.089, participants agreed that sometimes they have cost overrun when implementing water projects in Machakos County. Additionally, they agreed that there are few complaints on the quantity of water supplied in the county government and they have experienced cost over runs at completion of some county water projects as indicated by a means of 4.051 and 4.038. participants also agreed that County water projects are completed within schedule and that there are several complaints on the quality of the water supplied in the county government as shown by means of 3.981and 3.822, respectively. Respondents expressed overall satisfaction with the quality of water supplied in their communities, as indicated by an average rating of 3.669. However, they also reported experiencing delays in the completion of some county water projects, with a mean score of 3.592. Respondents expressed a neutral opinion towards the services provided by county water projects, as indicated by a mean score of 2.803. Similarly, their views on the cost-effectiveness of these projects were neutral, with a mean rating of 2.745.

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Table 2: Performance of Water Projects

Statements	Mean	Std. Deviation
County Water projects are completed within schedule	3.981	0.711
I have experience delay in completion of some county water projects	3.592	0.891
The costs for water projects in my community is always within the budget	2.745	1.092
I have experience cost over runs at completion of some county water projects	4.038	0.275
Sometimes we have cost overrun when providing water supply services in the county	4.089	0.414
I am satisfied with the services of county water projects in my community	2.803	1.083
I am satisfied with quality of the water supplied in my community	3.669	0.812
There are several complaints on the quality of the water supplied by the county government	3.822	0.693
There are few complaints on the quantity of the water supplied in the county government	4.051	0.372
Composite mean and composite standard deviation	**3.643**	**0.705**

b) Continuous Improvement and Performance of Water Projects

The respondents were asked to indicate their extent of agreement or disagreement with different statements used in measuring continuous improvement of water projects in Machakos County. According to the findings, shown in Table 2, the respondents agreed that monitoring reports and performance reviews inform the resource allocation for county water projects and management decisions of the water project in the county as shown by a mean of 4.178. In addition, respondents agreed that the county government use lessons from ongoing water projects to improve the design of new projects with a mean of 4.147. Further, the respondents agreed with a mean of 4.127 that performance reviews are used to gauge and compare the performance of water projects. Prioritizing the integration of monitoring and performance evaluation processes into project management practices is essential for driving informed decision-making, fostering innovation, and maximizing the impact of water projects on community development.

They also agreed that performance reviews and reports lead to improvements of implementation of water projects when such lessons from the project are communicated in a timely manner with key stakeholders as shown by a mean of 4.096. Moreover, they agreed with a mean of 4.026 that the management of water projects ensure improvements made to the performance of the water project are communicated timely. This proactive approach to knowledge dissemination fosters transparency, accountability, and continuous improvement within the project management framework, ultimately contributing to enhanced project outcomes and stakeholder satisfaction. Therefore, prioritizing timely communication of performance-related insights and improvements is essential for fostering a culture of learning, driving organizational agility, and maximizing the impact of water projects on the community.

The respondents further agreed with a mean of 3.631 that they are satisfied with the level of continuous improvement in their water projects. Nonetheless, they disagreed with a mean of 2.478 that as stakeholders they are effectively involved in the process of continuous improvement in the water projects. This disconnect could hinder the identification and implementation of relevant improvement measures, thereby limiting the project's ability to address evolving challenges and optimize outcomes. Effective stakeholder involvement is crucial for fostering a culture of continuous improvement, as it enables diverse perspectives, insights, and feedback to inform decision-making and drive meaningful change.

Table 3: Continuous Improvement

Statements	Mean	Std. Deviation
Performance reviews are used to gauge, compare, and analyse the performance of water projects	4.127	0.334
Performance reviews inform management decisions of the water project	4.178	0.384
Monitoring reports and performance reviews leads to improvements of implementation of water projects	4.096	0.372
Performance reviews and reports inform the resource allocation for water projects	4.178	0.474
As a stakeholder I am involved in the process of continuous improvement of water projects	2.478	0.910
The management of water projects ensure timely communication of lessons from the project reports	4.096	0.295
The management of county water projects ensure timely communication of changes made to improve performance of the water project	4.026	0.252
The county government use lessons from ongoing water projects to improve design of new projects	4.147	0.355
Am satisfied with level of continuous improvement in county water projects	3.631	0.736
Composite mean and composite standard deviation	**3.884**	**0.457**

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The key informants revealed that continuous improvement helps to identify project weakness, risks and develop mitigation measures to overcome the challenges in the project. The county government gets feedback from the stakeholders concerning the performance of the project and uses this information to improve projects. This use of progress information by key stakeholders leads to continuous improvement of performance which then leads to more sustainable satisfaction of the beneficiaries with the quality and quantity of water services. Moreover, continuous improvement assists in reducing the cost of designing new projects since documented lessons learnt from previous projects are used to improve new designs. Continuous improvement promotes timely communication of the changes made to the projects, better engagement with stakeholders, better designs for future project and effectiveness of ongoing projects. Continuous improvement also provides an enabling environment for the county government to improve quality, quantity, and scale of water services to the people of Machakos County.

"*Continuous improvement helps in identifying project weaknesses, risks, and developing mitigation measures to overcome challenges. The county government uses stakeholder feedback to enhance project performance, resulting in more sustainable satisfaction with water services. Furthermore, documented lessons learned contribute to reducing the cost of designing new projects and promoting timely communication, better stakeholder engagement, and improved project effectiveness*" KII13

The key informants revealed that the county government ensures continuous improvement in the delivery of water projects by collecting views from beneficiaries on the quality and quantity of water services offered. This regular consultation with the project beneficiaries and key stakeholders provides timely feedback on the performance of water projects which in turn contributes to the broader objectives and goals of the county integrated development plans. Some of the consultations are done by frequently visiting the projects site with key stakeholders to interact with beneficiaries. Moreover, the key informants revealed that the county government ensures continuous improvement in the delivery of water projects by using performance reviews to collect feedback from beneficiaries and communicate changes made in the project designs.

"*We ensure continuous improvement in water project delivery by actively seeking feedback from beneficiaries regarding service quality and quantity. Regular consultations and site visits with stakeholders provide valuable insights for project performance enhancement, aligning with broader county development objectives*" KII08

c) Correlation Analysis

Correlation analysis was used to examine the relationship between continuous improvement and water project performance in Machakos County. As shown in Table 4, the findings showed a positive linear association between selection of continuous improvement and water projects performance in Machakos County (r=0.225, p-value=0.005). Therefore, the results imply that as the continuous improvement increases, there is a corresponding increase in Water Projects performance in Machakos County.

Table 4: Correlation Coefficients

		Performance of Water Projects	Continuous Improvement
Performance of Water Projects	Pearson Correlation	1	
	Sig. (2-tailed)		
	n	157	
Continuous Improvement	Pearson Correlation	.550**	1
	Sig. (2-tailed)	.000	
	n	157	157

d) Regression Analysis

To evaluate the influence of continuous imporvement on water project performance in Machakos County, univariate analysis was conducted. The null hypothesis for this analysis was:

$H_0 1$: There is no significant relationship between continuous improvement and performance of water projects in Machakos County, Kenya.

A summary of the model analyzing the relationship between continuous improvement and water project performance is provided in Table 5. The R-squared was 0.302, suggesting that about 30.2% of variability in water projects performance, dependent variable, can be elucidated by independent variable (continuous improvement) included in the model. This suggests that the selection of continuous improvement can account for 30.2% of the performance variation observed in water projects within Machakos County, Kenya.

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Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.550[a]	.302	.298	.36426

a. Predictors: (Constant), Continuous Improvement

The ANOVA results examining the relationship between continuous improvement and water project performance are presented in Table 6. From the results, the F-statistic (67.192) exceeds the critical F-value (3.94), and the p-value (0.005) is below the significance level of 0.05. These findings indicate the statistical significance of the model and support the prediction regarding the impact of continuous improvement on Water Projects performance in Machakos County.

Table 6: Analysis of Variance

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.916	1	8.916	67.192	.000[b]
	Residual	20.567	155	.133		
	Total	29.482	156			

a. Dependent Variable: Performance of Water Projects

b. Predictors: (Constant), Continuous Improvement

From the findings, the regression equation can be displayed as;

$$Y = 0.22 + 0.932 \text{ (Continuous Improvement)}$$

Based on the findings, continuous improvement positively impacted water projects performance in Machakos County, as evidenced by 0.932 regression coefficient. The findings suggest that for an improvement in the continuous improvement, there is a 0.932 enhancement in water projects performance in Machakos County, other factors being constant.

Table 7: Regression Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.022	.443		.050	.961
	Continuous Improvement	.932	.114	.550	8.197	.000

a. Dependent Variable: Performance of Water Projects

VI. Discussion of the Findings

The results from correlation analysis showed that there is a positive linear association between continuous improvement and the performance of Water Projects in Machakos County. The results from regression analysis also showed that continuous improvement has a positive influence on the performance of Water Projects in Machakos County. These findings show that continuous improvement impacts performance of water projects' performance to a large extent. The findings conform to Abdill (2017) findings that continuous improvement allows project managers to generate better projects at reduced costs while meeting the desired project goals.

The study established that performance reviews and reporting inform the priorities in the county integrated development plans and ultimately resource allocation for water projects the county. These findings agree with Kiumbe, Wambugu and Luketero (2018) findings that project performance review helps determine whether the organization can continue investing time and resources in the ongoing and new projects. The study found that performance reviews inform county priorities especially when there is need to prioritize projects based on resource constraints. These findings agree with Okul and Nyonje (2020) findings that the outcomes of the performance reviews are critical in management decisions on resource allocations, performance improvement of projects, and recommend systems for better implementation of the project. In addition, the study revealed that the county government uses lessons from project performance reviews of ongoing projects to improve the design of new projects.

The study found that performance reviews and reporting as a key foundation of continuous improvement leads to effective implementation of water projects in Machakos County. These findings are in line with Winiko, Mbugua and Kyalo (2018) arguments that data from performance reviews are key ingredients for quality improvement and decision-making during project implementation. The study also found that performance reviews help management to document lessons, communicate progress and make changes in consultation with relevant stakeholders of the project. These findings are in line with Kithinji, Gakuu and Kidombo (2017) findings that communicating and disseminating the progress and impact of the projects through reports with external and internal stakeholders

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leads to accountability and ownership. The study also found that when effectively consulted and informed, the stakeholders are generally satisfied with the level of continuous improvement and changes made in the design of water projects. However, the study established that in Machakos county, some stakeholder especially project beneficiaries, are never meaningfully involved in the process of continuous improvement for water projects due to time and resource constraints.

VII. Conclusion and Recommendations

The study concludes that continuous improvement has a positive and significant effect on performance of Water Projects in Machakos County. The findings indicated that feedback with stakeholders through joint reviews; utilization of reports for Management decision making; communication with stakeholders to get their inputs into the project; improvement of project quality, systems, and processes; and adapting the project to manage risk and changing context. The findings imply that an improvement in continuous improvement leads to a subsequent improvement in the performance of Water Projects in Machakos County.

The study established that as a stakeholder beneficiaries and community members are not adequately involved in the continuous improvement in the water projects as such decisions are made by technocrats from the Ministry of water, project managers and donors. Therefore, this study recommends that key stakeholders especially end users should be involved in continuous improvement through feedback mechanisms, joint performance reviews, community sessions, and site visits. The community sessions would solicit inputs on aspects that need improvement including water quality, management systems and operation processes. The community engagement sessions would provide an opportunity to review progress made and share lessons from monitoring reports. The project managers should also create opportunities and channels to inform key stakeholder of management decisions and strategies for continuous improvement of water projects in Machakos County.

Suggestions for Further Research

This research was limited Machakos County, Kenya. The findings of these studies cannot be applied to other counties in Kenya because the country has 47 other counties with different and diverse geographical, socio-economic, and political contexts. The research also recommends further studies on effect continuous improvementon performance of other types of projects like health care projects and construction projects among others. The research revealed that continuous improvementonly explains 30.2% of performance of water projects in Machakos County. Further studies should be carried out to determine what other factors affecting the performance of water projects in Machakos County.

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