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The Effect of Project Planning Practices on Sustainability of Drilled Community Water Point Projects in Lower Eastern Kenya

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Abstract
The sustainable development goal number 6 provides a global effort for universal access to clean, equitable and affordable drinking water by the year 2030. There is uneven distribution of the water sources. In arid and semi-arid lands, people depend on rivers, streams, dams, springs and wells and boreholes to get water for both domestic and livestock use. Access to adequate and safe water for domestic use remains a perennial problem in Lower Eastern Kenya. To remedy the situation national government, county governments and NGOs resorted to drilling community water points. However, the drilling community water points become unsustainable in the long run by water drying up, stalling and even collapsing of the projects after the start. This study therefore sought to determine the effect of project planning practices on sustainability of drilled community water-point projects in Lower Eastern Kenya. The study employed a concurrent triangulation research design. The scope of the study was limited to drilled community water-point projects in the lower Eastern Kenya. The unit of observation was one water executive committee chairperson manning the drilled community water projects in the selected regions. Thus, the target population were 1,308 water executive committee chairpersons. The sample size as obtained using Yamane formula was 306 water executive committee chairpersons who were selected through stratified random sampling. Primary data was used in the study with the questionnaire as the main data collection instrument. The study also involved interviews on the three county chief officers in the departments of water and sanitation in the three counties. Data was analyzed using SPSS Version 26. Data analyses involved descriptive and inferential statistics. The descriptive statistics comprised means and standard deviation while inferential statistics comprised Pearson correlation analysis and simple regression model. Test of hypothesis was done at 95% confidence interval. From the results, project planning practices had positive and statistically significant relations with the sustainability of drilled water point projects. The study concluded that project planning practices are significant determinants of the sustainability of drilled community water point projects in the counties of Kitui, Machakos and Makueni. The study recommended that the project managers ought to incorporate project planning practices in any drilled community water point project they are undertaking. The practices enhance the success rate in project implementation. The project further recommended that the counties under study ought to formulate policies that ensures the strict adherence to the stipulated project planning practices.
Key Words: *Project Planning Practices, Sustainability and Drilled Community Water-Point Projects.*
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1.0 Introduction

Sustainability of water sources entails the technique of bringing together several stakeholders with different points of view to decide how water should be handled (Morrison, 2003). Water is a source of life for every living thing and is a necessity for the survival of human beings (Feitelson, 2012). According to UN (2019), water scarcity affects more than 40 per cent of the global population and is projected to rise to 55% by 2050. Only 1% percent of the water on the Earth's surface is usable by humans and the remaining 99% of the usable quantity is situated underground (Balasubramanian, 2015). Sustainability of drilled water is the continuous ability of the water points to provide short term, medium term and long-term social, environmental and economic benefits and be able to maintain high ecological and conservation systems for posterity (Bazaanah, 2019). UNEP (2015) also define sustainability as the ability to reduce long-term risks that are associated with the depletion of a resource, the fluctuations in the product liabilities, energy costs, waste and pollution management.

The sustainable development goal number 6 provides a global effort for universal access to clean, equitable and affordable drinking water by the year 2030 (UNICEF, 2018). Holistic management of water resources is required in order to ensure water sustainability. The sustainable use of surface water can be achieved by building dams

properly, which would store water for later use (Oino, et al., 2015). If the amount of water entering and leaving the ground, as well as those being stored, is conserved, the ground water sources would be sustainable (Poff et al., 2016). Water projects have been facing sustainability challenges including social, environmental and economic aspects. Presently, more than 99 percent of all water on Earth is not available for human use. This is because it is too saline or is frozen as glaciers, ice, or snow (Balasubramanian, 2015). Unsustainability on the social front is caused by the increasing population and increased poverty levels. Increasing human population diminishes the quantity of water that is available per person (Kativhu, *et al.,* 2022).

Low-income persons are hard hit by the water scarcity more than high-income individuals. This is because the poor are not able to relocate anytime to seek clean water, unable to buy clean drinking water, unable to treat water and also unable to repair damaged water points (Schnoor, 2015). In Kenya, water shortages have been a challenge that is experienced in most parts of the country. The water supply is less than the water demand by the growing population of the country. However, 56% of the Kenyan population have access to safe drinking water (Unicef, 2019) while 44 per cent of the Kenyans cannot access to safe water (WASREB, 2017). The natural renewable water resources of Kenya are mainly the catchments covered by the montane forests in the country's highland areas with a humid climate. The distribution of these water sources is said to be uneven both within and across. These catchments contribute over 75% of the surface water (Mulwa et al., 2021). This uneven distribution of the catchment areas in Kenya has led to adverse water shortage. Some of the other causes of water shortages included persistent droughts, forest degradation, poor management of water supply and contamination of water. The impact of this water shortage is greatly felt in the Arid and semi-Arid areas. The resultant effect of the shortage is poor sanitation and other health related risks in these areas (Marshall, 2011).

Because of the limited water sources, the supply of water to meet the needs of the country's population is critical (Musau, 2020). In order to enhance the sustainability of the water projects, effective project management practices should be encouraged. Furthermore, adequate funding, proper project management practices including monitoring and evaluation during the project cycle and carrying out community training is critical (Ochelle, 2012).

Lower Eastern parts of Kenya is located in an arid and semi-arid land. The region encompasses counties including Machakos, Makueni, Kitui and Kajiado. The rainfall in this region is both low and unreliable. The communities in this region largely depend on ground water for domestic, livestock and agricultural uses including irrigation purposes (Gevera et al, 2020). The major sources of water in this arid and semi-arid region are rivers, streams, dams, springs and wells. These sources have been supplemented by the drilling of boreholes by the local governments of these regions.

Access to adequate and safe water for domestic use remains a perennial problem in Lower Eastern Kenya. An estimated 69 percent of residents in Lower Eastern Kenyan cannot access adequate water for domestic use. In Makueni County, 64.3% households that use unimproved water sources, 35.7% access improved water sources and only 17.7% have access to piped water (Nema, 2020). In Makueni County, majority of the populations depend on surface and subsurface dams for water, which often do not hold sufficient water due to high evaporation rates during the dry seasons (Kamadi, 2020). In Machakos County, only 30% of the county residents can access adequate and safe water (Machakos County report, 2021), Institute of Economic Affairs (2013) indicated that 21 per cent main source of water was boreholes, 30 per cent water vendors and 15 per cent river sources and 22 per cent piped water connection largely in urban areas. In Kitui County, only 53 percent of households have access to safe water (Khalif, 2017).

To provide solution to the water problem, water drilling projects are being conducted in the region. The water drilling activity are supported by the Kenyan Government through the Ministry of Water, Sanitation and Irrigation, County governments and Nongovernmental organization. However, the sustainability of drilled water projects is faced with the issues relating to staling, completion out of budget and time scope. The failure is attributed to high recurrent costs, lack of interest by the local community, locating the project far from the community, mismanagement of the projects and inappropriate technology adopted. Furthermore, lack of community training and access to electricity have also been attributed to the borehole failure. Mulei and Gachengo (2021) indicated that 25-30 % of the drilled water projects in lower eastern are managed by the community become non-operational in the first three years after completion. These projects become unsustainable to the community over time. Unsustainable programs have a low impact on the community in the long term, thus wasting human, financial, and technical start-up investments.

2.0 Methodology

The study utilized a positivist research philosophy and a concurrent triangulation design. The target population was 1,308 water executive committee chairpersons of drilled community water-point projects in Lower Eastern Kenya. The study also targeted the 3 county chief officers in the departments of water and sanitation. Stratified random sampling was used to obtain a sample of the water management executive committee who participated in the study. The strata were the particular drilled community water-point projects in Kitui, Machakos and Makueni. Yamane, (1967) simplified formula was used to obtain 306 water management executive committee from the three counties. A census of all the 3 chief officers in the departments of water and sanitation was conducted. Primary data was collected using structured questionnaire for water management executive committee chairpersons and the interview guide for Chief Officers departments of water and sanitation. A pilot test was conducted on 10% of the sample size to determine the validity and reliability of data collection instrument. The study further conducted correlation and regression analysis. Person correlation was used to determine the strength of association between project monitoring and evaluation practices and sustainability of drilled community water-point projects. Linear regression analysis was done to determine the mathematical model that shows the relationship between project planning practices and sustainability of drilled community water-point projects. The model estimated was presented as;

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

Y = Sustainability of drilled water point projects

β_0, β_1 are regression coefficients to be estimated.

X_1 = Project planning Practices

e = error term

3.0 Literature Review

The study was anchored on the Theory of Planning. The general theory of planning proposed by Campbell and Feinstein (1996) is one of the practice-oriented social sciences, concerned with the possibility, ways and procedures that have to actively shape the future as well as gives support about the feasible analyses of occasions in the past as well as existing or the tools enabling the management of future events. The theory of planning looks for to clarify the significance of teleological action and also provides a far better understanding of planning itself (Allmendinger, 2017). It likewise helps organizers to identify the interpretation that is most conveniently compatible with their sights, most appropriate for the object of preparation as well as is capable of raising awareness and strengthening organizers' dedication. The theory in preparing concentrating more on the practice of preparation, describes the various phases and methods utilized in creating the future, clears up the function of planners and also other actors involved, and recommends numerous tools for the option of the problems/tasks. Institution-oriented methods are carefully related to the latter, putting the standards affecting the planning process, the legal guideline of the procedure as well as the advancement of the institutional framework of planning in the emphasis of rate of interest (Alexander, 2017).

A review of relevant empirical literature was also conducted. A study was conducted by Rotich (2024) on project planning and implementation of water construction projects in Bomet County, Kenya. The study adopted a descriptive survey design. The target population of the study was 440 and the sample size were 164 respondents drawn from all targeted unit of analysis. The county government of Bomet should put down ways in which schedule plans, budgets, communication and resource planning can be used to improve successful implementation of water construction projects. Maina and Kyalo (2024) researched on project management practices and sustainability of water projects in Kiambu County, Kenya. The study used technology acceptance theory, Lewin's theory of change, resource dependence theory and stakeholder theory and a descriptive research design. The study concluded that by involving every stakeholder in decision-making processes, cost-sharing, and process monitoring will increase the sustainability of a project. In the current study, the effect of project planning practices on the sustainability of drilled water projects is analyzed. The scope of the study is limited to lower Eastern region in Kenya.

A research by Mukherjee and van Wijk (2018) was conducted on the project planning, monitoring and sustainability of community water supply and sanitation projects in Germany. The planning processes enhances sustainability of the water projects undertaken. Therefore, planning is a critical phase of the inception of any project. In Singapore, a research was conducted by Octastefani and Kusuma (2016) on the water governance of Singapore in achieving sustainable water security. With the good management and also active participation of the

government and society, Singapore has been able to enhance the sustainability of water projects. The current study seeks to analyze the effect of project planning practices on the sustainability of drilled water projects.

A study was conducted by Kattel et al. (2019) on China's south-to-north water diversion project empowers sustainable water resources system in the north. In order to achieve the set goal of ensuring adequate water supply and coupled with the objective of project sustainability, in-depth planning was carried out before the project was rolled out. In Tanzania, there is a study that was conducted by Kilonzo and George (2017) on the sustainability of community-based water projects focusing on the dynamics of actors' power relations. The study adopted a cross-sectional research design. In terms of planning therefore, the role of women in these projects should be underscored. This study used a cross-sectional research design. In Embu County, Kenya, a study was conducted by Mukaria (2021) on monitoring, evaluation practices and sustainability of community-based projects. The study used descriptive research design with a sample of 55 respondents. The results of the study showed that project planning had a significant impact on the existence of community-based operations in Embu County. Therefore, proper planning practices of the community projects is important in enhancing the sustainability of these community projects in Embu. The focus of this study was monitoring and evaluation practices whereas the current study seeks to determine the effect of project planning practices on the sustainability of drilled water projects.

4.0 Results

4.1 Descriptive Results

In order to determine the effect of project planning practices on sustainability of drilled community water point projects in Lower Eastern Kenya, the researcher utilized primary data that was collected using questionnaires and interview guides and analyzed using SPSS. The descriptive results were presented in the form of frequencies, percentages, mean and standard deviations. The Likert scale used was 1 represented Strongly Disagree (SD), 2 for Disagree (D), 3 for Neutral (N), 4 for Agree (A) and 5 for Strongly Agree (SA). A mean of 1 indicates that the responses are strongly in disagreement, a mean of 2 indicates that the responses were in disagreement, a mean of 3 pointing out that the responses were neutral, a mean of 4 indicating that the responses were in agreement and a mean of 5 indicating that the responses were in strong agreement. The coefficients of variation ratings were determined as 0 to 25% very good, 26 to 50% good, 51 to 75% fair, and 76 to 100% poor. The descriptive results are presented in Table 1.

Table 1: Descriptive Results for Project Planning Practices

Statement	SD	D	N	A	SA	M	S Dev	CV (%)
I participate in setting the goals and objectives of the community drilled water-point projects	3.7%	5.1%	19.2 %	66.4 %	5.6 %	3. 6	0.8	22.2 2
I am involved in setting the budget of the community drilled water-point projects	5.6%	2.8%	26.2 %	64%	1.4 %	3. 5	0.8	22.8 6
I participate in the identification of the drilled water-point projects deliverables	5.1%	3.3%	21%	67.3 %	3.3 %	3. 6	0.8	22.2 2
I am involved in creation of the drilled water-point projects schedules	8.4%	19.2 %	44.9 %	23.4 %	4.2 %	3. 0	1.0	33.3 3
I am involved in the short term and long-term planning of projects	3.7%	5.1%	4.2%	83.6 %	3.3 %	3. 8	0.8	21.0 5
I am involved in the planning of the activity timelines of the community drilled water-point projects	10.7 %	12.6 %	28%	43.9 %	4.7 %	3. 2	1.1	34.3 8
I take part in identifying risks associated with the community drilled water-point projects	2.3%	7.5%	4.2%	82.2 %	3.7 %	3. 8	0.7	18.4 2
I take part in the identification of the possible causes of risks.	5.1%	7%	5.1%	79%	3.7 %	3. 7	0.9	24.3 2

I participate in the coming up with solutions to the potential risks of the community drilled water-point projects	4.2%	6.1%	4.7%	80.8 %	4.2 %	3. 7	0.8	21.6 2
Aggregate Mean and Standard Deviation						**3. 5**	**0.9**	**24.4 9**

From the results in Table 1, 66.4% of the respondents agreed that they participated in setting the goals and objectives of the community drilled water-point projects. However, 5.6% recorded a strong agreement with the statement while 19.2% did not take sides regarding the statement with a mean of 3.6 and a respective standard deviation of 0.8 implying that on average, the respondents were in agreement. Regarding whether the respondents were involved in in setting the budget of the community drilled water-point projects, the responses indicated that 64% of the respondents concurred, 26.2% being neutral and 1.4% recording a strong concurrence with a mean and standard deviation of 3.5 and 0.8 respectively pointing out to an agreement among the responses on average. In an interview with one of the Chief Officers, the officer had this to say, "Planning for any project is critical. It is essential because it gives an overview of the where the project could be located to serve as many people as possible. Effective planning is also essential as it ensures optimum allocation of resources to the project based on the needs of the community. Planning also ensures that water point projects are drilled at a location where enough water can be found."

Furthermore, 67.3% of the responses were in agreement with the question 'I participate in the identification of the drilled water-point projects deliverables' while 3.3% recording strong concurrence and 21% did not take sides with a mean of 3.6 and a corresponding standard deviation of 0.8 implying that on average, there was concurrence among the responses. 44.9% of the study participants did take position with regards the statement 'I am involved in creation of the drilled water-point projects schedules'. However, 23.4% were in tandem with 4.2% strongly concurring with a mean and standard deviation of 3.0 and 1.0. This gives the implication of an agreement among the responses on average.

On whether the respondents were involved in the short term and long-term planning of projects, 83.6% of the participants were of a moderate view, 3.3% recording a strong view with 4.2% being neutral. The mean and the standard deviation recorded by the question were 3.8 and 0.8 respectively implying that, on average the respondents were in agreement. 43.9% of the respondents indicated an agreement that they were involved in the planning of the activity timelines of the community drilled water-point projects, while 4.7% strongly concurred in the question and 28% being neutral with a mean of 3.2 and a standard deviation of 1.1 indicating that overage, the respondents were neutral. In an interview with one of the Chief Officers, the officer had this to say, "Some of the challenges we have encountered during the planning stages has been that sometimes there has been lack of consensus among the community on where the project could be located."

With regards the statement 'I take part in identifying risks associated with the community drilled water-point projects,' 4.2% of the responses did not take sides, 82.2% indicated an agreement and 8(3.7%) recording a strong agreement with a mean and standard deviation of 3.8 and 0.7 respectively. These results indicate an agreement among the responses on average. On whether the respondents took part in the identification of the possible causes of risks, 79% of the responses were in agreement, 3.7% in strong agreement and 5.1% taking a neutral position with a mean and SD of 3.7 and 0.9 in that order. This implies an agreement among the responses on average.

Finally, 80.8% of the respondents agreed that they participate in the coming up with solutions to the potential risks of the community drilled water-point projects while 4.7% taking a neutral stand and 4.7% indicating a strong agreement with a mean of 3.7 and a standard deviation of 0.8 respectively. The aggregate mean and standard deviation for the statements on project planning practices was 3.5 and 0.9 respectively implying overage the statements were in agreement on average with project planning practices of the drilled community water point projects in lower Eastern Kenya. The overall coefficient of variation the statements on project planning practices was 24.49% implying that the variation was low and therefore very good. In an interview with one of the Chief Officers, the officer had this to say, "As a county, we have tried out level best to ensure that the drilled water point projects are distributed equitably across all the wards based on the community needs. The community through their ward representatives propose an appropriate location, from which the county allocates funds for the project."

From the quantitative results, majority of the respondents were in agreement on average that they were involved in setting goals and objectives for the project, setting budget, identifying community drilled water-point projects, in both short- and long-term planning of the projects as well as identifying the possible causes and solutions of

the project risks. However, with regards the involvement of the respondents in creation of the drilled water-point projects schedules and planning of the activity timelines, the respondents were neutral on average. These results are in tandem with the qualitative results of the study. From the qualitative results, participation of the respondents in project planning is evident. However, sometimes, there is lack of consensus among the community on where the project could be located but through the input of the ward representatives, the drilled water point projects are distributed equitably across all the wards based on the community needs.

4.2 Correlation Analysis

Correlation analysis is significant in determining the correlation among the variables in the study. The analysis is used to determine the strength and direction of correlation among the variables under review. The correlation values range from +1 to -1. A value of +1 implied perfect positive correlation, while -1 perfect negative correlation. 0.000 implied no correlation, 0.001 to 0.250 weak correlation, 0.251 to 0.500 moderately strong correlation, 0.501 to 0.750 strong correlation and finally 0.751 to 1.000 meant very strong correlation. The independent variable was project planning practices while the dependent variable was the sustainability of the drilled community water point projects in Lower Eastern Kenya covering the counties of Kitui, Makueni and Machakos. The correlation results are presented in Table 2.

Table 2: Correlation Matrix

		Sustainability of drilled community water point projects	Project Planning Practices
Sustainability of drilled community water point projects	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	214	
Project Planning Practice	Pearson Correlation	.545**	1
	Sig. (2-tailed)	0.000	
	N	214	214

** Correlation is significant at the 0.01 level (2-tailed).

The correlation between project planning practices and sustainability of drilled community water point projects was positive (0.545) strong and statistically significant ($p=0.000<0.05$). The Pearson correlation lies between the range 0.501-0.750 hence an indication that the correlation was positive and strong.

4.3 Regression Analysis

A simple linear regression analysis was conducted to determine the relationship between project planning practices and sustainability of drilled community water point projects. The hypothesis tested was,

H_{o1}: Project planning practice has no statistically significant effect on sustainability of drilled community water-point projects in Lower Eastern Kenya.

The model summary results are presented in Table 3.

Table 3: Model Summary for Project Planning Practices and Sustainability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.545a	0.297	0.294	0.31173

a Predictors: (Constant), Project Planning Practice
b Dependent Variable: Sustainability

From the regression results, project planning practices gives an explanation of 29.7% of the total changes in the sustainability of drilled community water point projects in lower Eastern. An R Square of 0.297 supports this. Thus, project planning practices is significant in explaining the sustainability of drilled community water point projects. Table 4 presents the ANOVA results.

Table 4: ANOVA for Project Planning Practices and Sustainability

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.723	1	8.723	89.769	.000b
	Residual	20.601	212	0.097		
	Total	29.324	213			

a Dependent Variable: Sustainability
b Predictors: (Constant), Project Planning Practice

The significance of the model was tested using a two-tail approach. From the results, the overall model was statistically significant (0.000<0.05). The results posit that project planning practices is an important component in the sustainability of drilled community water point projects. An estimated F value of 89.769, which is greater than the critical F value 3.8415 ($F_{1, 212}$) supports the results of this study.

The results of simple regression coefficients are presented in Table 5.

Table 5: Regression Coefficients for Project Planning Practices and Sustainability

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.211	0.149		14.813	0.000
	Project Planning Practice	0.410	0.043	0.545	9.475	0.000

a Dependent Variable: Sustainability

$Y = 2.211 + 0.41X_1$

As can be observed, the constant of the estimated simple regression model is positive implying that project planning practices is not the only variable that can be used to explain the sustainability of drilled community water point projects. Thus, there are other variables significant in giving explanation to the sustainability of drilled community water point projects. Furthermore, the linear relationship between project planning practices and sustainability of drilled community water point projects was both positive and statistically significant ($\beta = 0.41$, $p = 0.000 < 0.05$). Therefore, a unit improvement in project planning practices yields a significant 0.41 units improvement in the sustainability of drilled community water point projects.

The null hypothesis, project planning practice has no statistically significant effect on sustainability of drilled community water-point projects in Lower Eastern Kenya was rejected, and the study failed to reject the alternative hypothesis that project planning practice significantly affect the sustainability of drilled community water-point projects in Lower Eastern Kenya. A project plan gives an overview of what the work is and how the work is to be completed. A plan is developed at the beginning of a project. Project planning is part of project management and relates to the use of schedules to plan and subsequently report progress within the project environment (Ahamed, 2010). In an interview with one of the Chief Officers, the officer had this to say, "*Planning for any project is critical. It is essential because it gives an overview of the where the project could be located to serve as many people as possible. Effective planning is also essential as it ensures optimum allocation of resources to the project based on the needs of the community. Planning also ensures that water point projects are drilled at a location where enough water can be found.*"

Planning involves a series of decisions ranging from general and strategic decisions to specific operational decisions based on the gathering and analysis of information. The planning stage purposely analyzes the project in terms of cost, resources, work breakdown and timing. A project plan expresses the aspects of the project in terms of the scope, schedule, required resources, costs, quality and risk management (Klein, 2017). The most important aspects of project planning include, time management, human resource planning, material resource planning and financial resource planning and all these are essential in ensuring a successful project and a sustainable project (Muute & James, 2019).

The results for the study are consistent with the findings of Mukherjee and van Wijk (2018) who identified the planning practices as designing gender, demand processes that are poverty-sensitive and putting in place the tools and indicators to track the quality of the project processes. The planning processes enhances sustainability of the water projects undertaken. Kattel et al. (2019) pointed out that in order to successfully carry out the supply of water to the large population in North China, in-depth planning was carried out before the project was rolled out. A comprehensive understanding of the rapidly changing human–environment interactions, together with the

monitoring and assessment of the projects infrastructure, as well as the quantity and quality of water in the conveyance channel was carried out to ensure the success of the project.

Furthermore, Kilonzo and George (2017) in their study findings indicated that women participation in decision-making bodies improve the management of collectively owned projects because they are the major users of the services. In terms of planning therefore, the role of women in these projects should be underscored. The findings of Mukaria (2021) further concur with the results of the study and showed that project planning had a significant impact on the existence of community-based operations in Embu County. Therefore, proper planning practices of the community projects is important in enhancing the sustainability of these community projects in Embu.

4.4 Conclusion

The study concludes that project planning practices is a significant determinant of the sustainability of drilled community water point projects in the counties of Kitui, Machakos and Makueni. A unit improvement in project planning practices yields a significant improvement in the sustainability of drilled community water point projects. Therefore, the null hypothesis, project planning practice has no statistically significant effect on sustainability of drilled community water-point projects in Kitui, Machakos and Makueni Counties was rejected, and the study concluded that project planning practice significantly affect the sustainability of drilled community water-point projects in Kitui, Machakos and Makueni Counties. A project plan expresses the aspects of the project in terms of the scope, schedule, required resources, costs, and quality and risk management. The most important aspects of project planning include, time management, human resource planning, material resource planning and financial resource planning and all these are essential in ensuring a successful project and a sustainable project.

4.5 Recommendation

The study recommends that the project managers ought to incorporate project planning practices in any drilled community water point project they are undertaking. Incorporating these practices enhances the success rate as well as the sustainability rate of the project. Incorporating the practices also ensures that the resources including the financial resources dedicated to the project are well utilized to the maximum benefit of the community. The County governments of Kitui, Machakos and Makueni ought to formulate policies that ensures the strict adherence to the stipulated project planning practices. The policies should make it mandatory for public participation in the planning of the projects as well as making the source of funding public. The project managers should also be made known to the public. This enhances the level of transparency, accountability as well as the rate of success in the implementation of the drilled community water point projects.

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