

Monitoring and Evaluation Work Plan and Sustainable Water Supply in Nyamira South Sub-County, Kenya

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Abstract

This study assessed the influence of Monitoring and Evaluation (M&E) work plan on sustainable water supply in Nyamira South Sub-County, Kenya. The study was based on a theoretical framework composed of monitoring and evaluation work plan of water supply as the independent variable and sustainable water supply as the dependent variable. Frequencies, percentages, mean, and standard deviation; simple and multiple linear regression and Pearson Correlation Coefficient models were applied on the quantitative data while narrative analysis was applied on the qualitative data. The total respondents who agreed and strongly agreed that the water supply in Nyamira South Sub-County was: long enough were 22.7 per cent; adequate for the needs of the people were 22.5 per cent; of good quality were 31.2 per cent; safe for drinking were 32.1 per cent. Those who agreed that funds generated from the water supply were adequate were 15.4 per cent; and that the water was affordable were 22.1 per cent. The qualitative findings suggested that the water supply was not sustainable. Based on the composite mean and standard deviation of 2.47 and 1.01 respectively, the study suggested that the M&E work plan for Nyamira South Sub-County water supply existed and was available. However, the work plan was not in use, was not regularly reviewed nor updated. The study's hypothesis of no significant relationship between *M&E work plan and sustainable water supply in Nyamira South Sub-County, Kenya* was rejected since $P=0.000<0.05$. Strengthening the use of M&E work plan in project implementation was recommended.

Keywords: work plan, monitoring, evaluation, sustainability, water policy, community, participation, resources

1. Introduction

Monitoring and evaluation system is a collection of applications and processes for measuring the implementation of routine activity and assessing project performance against set benchmarks on regular basis (Abalang, 2016). Due to its increasingly demonstrated impact on project sustainability; monitoring and evaluation is becoming a universal component of most project designs around the world (Njama, 2015). A work plan for monitoring and evaluation is one of the components of a monitoring and evaluation system used to improve an organization's performance (Gorgens and Kusek, 2009). The M&E work plan is an important part of project implementation since it connects project activities to the project's long-term viability. Lack of robust monitoring and evaluation mechanisms for water systems jeopardizes the supply's long-term viability (Lu, Elliott, & Perlman, 2017). This study aimed at contributing to the body of research evidence and knowledge on sustainable water supply by examining the role of M&E work plan on sustainable water supply in Nyamira South Sub-County, Kenya.

Rural and urban areas of Sub-Saharan Africa are home to 325 million poor people lacking access to water, constituting almost half of the people deprived as such globally (UNICEF and WHO, 2014). The limited water available to these population is contaminated surface water due to the poor hygiene and sanitation living conditions (Plan, 2013). These are the same areas demonstrating the water-food-nutrition-health nexus of deprivation occasioned by water scarcity. Studies on the nexus are generating the knowledge needed for increased understanding of the causal relationships between malnutrition and poor sanitation (Mabhaudhi, Chibarabada, and Modi, 2016).

Kenya decentralized its water services by enacting the Water Act in 2002 (GoK, 2002; Richards, Doering, D'Souza, Lang, Plumm, Schaefer, and Werchota, 2008). The Water Act was subsequently reviewed in 2016 (GoK, 2016). However, water services remained unsustainable, and the country failed to meet the Millenium Development Goal

targets in 2015. Kenya did not do any better towards meeting the sustainable development goals and instead continued to rely on poorly developed and poorly maintained small scale and outdated water supply systems (Wagah, Onyango & Kibwage, 2010; Trepanier, Orare, Nyagwencha, & Grady, 2021). The few functional water supply systems are over exploited with leakages and illegal connections (Wagah, Onyango & Kibwage, 2010). Kenya has a significant part of its landmass that is dry and semi-arid with limited options for water sources except the occasional rains and overexploited underground water sources with a poorly developed culture of water harvesting, long term storage, and preservation (Ngaira, 2009; Yifru et al., 2021). While the national and sub-national levels in Kenya have updated water sector plans; they are hardly implemented in line with the water policy due to various capacity challenges, and poor water management systems (Mulwa, Li, & Fangninou, 2021). The fees for services are hardly enough to service the water supply systems and the budget allocations to the water sector are politically driven, lack prioritization, and are grossly insufficient to cover all the water needs. (Wagah, Onyango & Kibwage, 2010).

1.1 Sustainable Water Supply

Sustainability is defined as the ability to meet current needs without jeopardizing that ability in the future. WaterAid spearheaded an effort to develop a more systematic and structured measurement index of the sustainability of water supply (WaterAid, 2011; Adank & Kumasi, 2013; Macharia, Mbassana, & Odour, 2015). The national level index includes the current national water policy, existence of national water norms, standards, and water legislation at the national level. The sub-national index assesses the roles and responsibilities of the water sector's players at the sub-national level. This includes determining whether these formalized roles and responsibilities exist (Lockwood, 2012). The household index addresses the quality of water, access, adequacy, cost, and condition of the toilet at the point of use- household or institution. These variables were found relevant and applicable to the assessment of the sustainability of Nyamira South Sub County's water supply.

Communities' participation in joint water system monitoring with project staff influenced their satisfaction with the quality of water supplied to as high as 95 per cent (Silva, Heikkila, Filho, & Silva, 2013; Mgoba & Kabote, 2020). In Kenya, communities in Kwale County use hand pumps for water supply (Foster and Hope, 2016). The pumps' long-term viability was based on the principle of community collective action and pooled resources. Water pumps were valued as a source of water by the communities if the water quality was good, the pump location was convenient, and there was no other free water available, which was the case during the rainy season. Late or non-payments for pump maintenance was a major concern for the long-term viability of the community's water supply system. Thomson and Hope (2015) argued that pooling costs for the maintenance of local hand pumps improves sustainability, but this was not experienced in Kwale county, Kenya.

Cherunya, Janezic, and Leuchner (2015) study revealed that 86% and 98% of households in two study sites respectively obtained their domestic water from multiple sources, but the water was unsafe for consumption unless treated. Haysom (2006) conducted a mixed method study on sustainable water supply system in central Tanzania. Using a convenient sampling of 38 villages, quantitative analysis of data from closed ended questions, and narrative analysis of qualitative data from semi-structured questions were analyzed. The target group was the village water pump attendant, water management representative, village female members from the demand side. It was established that 45% of the water points were not functioning because of poor fiscal management. In a descriptive study based on literature review conducted in Kwa-Zulu Natal, South Africa, Dzwauro, Barratt, and Otieno (2015) emphasized the importance of water quality in determining the long-term use of water points. Monitoring provides accurate information on access to water, cost, willingness to pay, and the benefits of safe water, which is a key factor in the long-term sustainability of water systems (Francis et al., 2015).

Despite Kenya enacting the Water Act in 2002 (GoK, 2002), which decentralized water services into 117 water services boards (Richards, Doering, D'Souza, Lang, Plumm, Schaefer, and Werchota, 2008), the country failed to meet the Millennium Development Goal targets. Since then, the Kenya Act of 2002 (GoK, 2002) has been revised and updated to become the Water Act of 2016 (GoK, 2016). Gusii Water and Sanitation Company (GWASCO), the water service provider for Nyamira South Sub-County and the subject of this study, is one of the entities operating under the decentralized water services boards with the express goal of ensuring a sustainable water supply. Despite the operationalization of the Kenya Water Act, only about 35% of Nyamira County's population had access to water for both domestic and industrial purposes in 2016. (Department of Environment, Energy, Water, Mining and Natural Resources (DEEWMNR, 2016). The fact that 65 percent of the county residents did not have access to clean water was of great concern for the entire county including Nyamira South Sub-County, one of the five sub-counties of Nyamira County.

1.2 Work plan and Sustainable Water Supply

M&E work plan is used to capture the use of resources and achievement of project objectives as demonstrated in existing toolkits. Gorgens and Kusek (2009) developed a M&E toolkit based on qualitative secondary document review. The toolkit included specifications on the personnel needed for M&E planning, time frame, materials, finances, and capacity building on monitoring, and evaluation. Kanyanya (2014) also demonstrated how the work plan identifies the human, financial, and physical resources as well as the stakeholders that are required to complete a given task. Oluoch, Rambo, and Ganesh (2020) established a significant contribution of the M&E work plan to the effective provision of curative and preventive tuberculosis services in public health institutions in Kisumu, Kenya. When resources are allocated according to a work plan and put to the intended use, a presumption of sustainability is expected to hold (Mackay, 2007). Mackay (2007) found that good planning, implementation, and informed decision making based on M&E results contributed significantly to project sustainability.

Muniu (2017) observed that M&E practices and community participation affected the long-term viability of community water projects in Nyeri County, Kenya. The findings revealed that M&E practices, which included elements of an M&E work plan, had a statistically significant moderating effect on the sustainability of the water supply. While testing the M&E drivers and leadership on performance of horticultural projects in Nakuru, Kenya, Chebet (2017) found that developing and executing M&E budget through M&E work plan significantly influenced the performance of horticultural projects at $p < 0.05$ level. M&E work plans are known to improve policy, planning procedures, corporate governance, and intergovernmental relations (Kayser, Moriarty, Fonseca, & Bartram, 2013; Mamburi, 2014). The work plan has been shown to improve the success of water and sanitation projects in a descriptive study that used qualitative interview methods (Thode, Landick, Paterson, & Watkins, 2011). However, in Bungoma County, Kenya, Mutekhele (2018) could not establish any significant impact of M&E work plan on the performance of educational building infrastructure projects.

2. Methodology

The study was guided by a conceptual framework consisting of the M&E work plan as the independent variable and sustainable water supply as the dependent variable. The study design and implementation was informed by a 10-step framework for conducting evaluations and evaluability assessments (Smith, 1989), and Roe's narrative analysis theory (Roe, 1989, 1994). The 10 steps in Smith's framework included: determination of the purpose, defining the boundaries of the evaluation, identifying and analysis of programme documents, development of programme theory, identification of stakeholders, stakeholder's perceptions of programme, stakeholder's needs and concerns, plausibility of programme, conclusions/recommendations, and how to use findings. Roe's narrative analysis theory was used to guide the collection, analysis, and interpretation of qualitative data on M&E work plan and sustainable water supply in Nyamira South Sub- County.

The data used in this article was collected using mixed quantitative and qualitative methods. Quantitative data was collected using structured questionnaires, and qualitative data was collected using focus group discussions (FGDs). The quantitative questionnaires were administered to 380 heads of households or household representatives over the age of 18 years in Nyamira South Sub-County, and to 100 Gusii Water and Sanitation Company (GWASCO) Officers making a total of 480 completed questionnaires. Qualitative data was collected through focus group discussions involving 40 male and female village elders from Nyamira South Sub-County, Kenya. The qualitative data was subjected to narrative analysis of the responses from the focus group discussions (Roe, 1989; & Roe, 1994). The parameters on sustainable water supply covered by the study included perceived duration, adequacy, quality, safety, funds generation, and affordability of the water. The parameters covered on the M&E work plan for Nyamira South Sub-County included its: existence, availability, updating, use, and roles assigned as per the work plan.

3. Results and Discussion

3.1 Sustainable Water Supply

The respondents were subjected to a series of statements to solicit their opinions on sustainable water supply on a Likert scale of 1-5 whereby; Strongly disagree (SD)=1, Disagree(D)=2, Neutral(N)=3, Agree(A)=4 and Strongly Agree (SA)=5. The results were analyzed and presented using frequency, percentages, means and standard deviations for each item. The composite mean and composite standard deviation were also computed as depicted in Table 1.

Table 1. Sustainable water supply

Statement	SD	D	N	A	SA	Mean	Std Dev.
a. The duration of water supply by Nyamira South Sub-County water supply is long enough for the needs of the sub-county	161(33.5%)	116(24.2%)	94(19.6%)	79(16.5%)	30(6.2%)	2.38	1.27
b. You are aware of the duration of water supply by Nyamira South Sub-County water supply.	130(27.1%)	150(31.3%)	92(19.2%)	80(16.7%)	28(5.7%)	2.43	1.12
c. The water supplied by Nyamira South Sub-County water supply is adequate for the needs of the Sub-County and households	171(35.6%)	118(24.6%)	83(17.3%)	79(16.5%)	29(6.0%)	2.33	1.27
d. You are aware of the water supply needs in Nyamira South Sub-County water	84(17.5%)	115(24.0%)	66(13.8%)	148(30.9%)	67(13.8%)	2.99	1.34
e. The water supplied by Nyamira South Sub-County water supply is of good quality	111(23.1%)	81(16.9%)	138(28.8%)	86(17.9%)	64(13.3%)	2.81	1.33
f. You are aware of the community perception about the quality of water supplied by Nyamira South Sub-County water supply	110(22.9)	117(24.4%)	94(19.6%)	117(24.4%)	42(8.7%)	2.72	1.29
g. The water supplied by Nyamira South Sub-County water supply is safe for drinking	106(22.1%)	91(18.9%)	129(26.9%)	82(17.1%)	72(15%)	2.84	1.35
h. You are aware of the community perception about the safety of water supplied by Nyamira South Sub-County water supply	111(23.1%)	118(24.6%)	93(19.4%)	114(23.8%)	44(9.1%)	2.71	1.30
i. The funds generated locally by Nyamira South Sub-County water supply are sufficient for providing affordable water to the residents	170(35.4%)	119(24.8%)	117(24.4%)	53(11.0%)	21(4.4%)	2.24	1.17
j. The cost of water supplied by Nyamira South Sub-County water supply is affordable to most residents	164(34.2%)	116(24.2%)	94(19.6%)	67(14.0%)	39(8.1%)	2.38	1.30
Composite	Mean	and	Std	Deviation			
2.58	1.18						

A combination of Agree and Strongly Agree responses indicated that a total of about 22.7 per cent of the respondents perceived the duration of water supply as being long enough for the needs of the sub-county. These findings are in line with the respective composite means and standard deviations in table 1. The qualitative findings from the focus group discussions suggested that the duration of water supply was not adequate as captured in the following quotation from focus group discussion 2. *“We do not have any water supply from Nyamira South Sub-County. No duration is not long enough”-FGD-2*. Both the quantitative and qualitative findings suggested that the duration of water supply in the sub-county was not long enough to meet the needs of the people.

A combination of Agree and Strongly Agree responses indicated that a total of 22.5 per cent perceived the water supplied as adequate for the needs of the Sub-County. These findings are in line with the respective composite means and standard deviations in table 1. The findings from the focus group discussion expressed doubts on the sustainability of the water supply as indicated in a statement from focus group discussion 5. *“The county*

government water supply in Nyamira South Sub-County is not sustainable in the long run since it is available mostly during the rainy season"-FDG-5. Cherunya, Janezic, and Leuchner (2015) established similar findings showing that underserved households in urban (86 per cent) and rural (98 per cent) communities sourced their domestic water from multiple sources due to inadequate supply from any one of the sources. The findings on duration of water supply and its adequacy are relatively lower than the situation reported by the DEEWMNR (2016) in which about 35% of Nyamira County's population had access to water for both domestic and industrial purposes in 2016. The situation in Nyamira South Sub-County seems worse off than the overall situation on access to water in the entire Nyamira County in 2016.

A combination of Agree and Strongly Agree responses indicated that a total of 31.2 per cent perceived the water to be of good quality. On the other hand, a combined 40 per cent of the respondents disagreed and strongly disagreed that the water was of good quality. These findings are in line with the respective composite means and standard deviations in table 1. The mixed finding was supported by the focus group discussion proceedings as captured in the quote below from focus group discussion 5. *"The water is mostly of good quality and safe for drinking. Water is treated with chemicals before being released into water pipes"* FGD-5. The study results agree with Ahiablame, Engel, and Venort (2012) whose study suggested that communities might not fully trust quality of water supplied even by their preferred water supply system.

A combination of Agree and Strongly Agree responses indicated that a total of 32.1 per cent perceived the water to be safe for drinking. On the other hand, a combined 41 per cent of the respondents disagreed and strongly disagreed that the water was safe for drinking. These findings are in line with the respective composite means and standard deviations in table 1. Similarly, the findings from the focus group discussions doubted the safety of the water for drinking purposes as demonstrated through one of the statements from focus group discussion 5. *"We also have a challenge of unsafe water for drinking, sometimes we are supplied with the dirty water from the pipes which is not safe for drinking"*-FGD-5. The results are in line with the study by Cherunya, Janezic, and Leuchner (2015) that established that 84 per cent and 73 per cent of underserved households in urban and rural communities in Kenya perceived the water as unsafe respectively.

A combination of Agree and Strongly Agree responses indicated that a total of 15.4 per cent perceived the funds generated as being sufficient. These findings are in line with the respective composite means and standard deviations in table 1. On the other hand, a combined 60.2 per cent of the respondents disagreed and strongly disagreed that the funds generated were sufficient for providing affordable water to the residents. The findings are supported by observations from focus group discussion 5 on funds generation by the water supply system below *"Funds may not be enough as most officers request for payments which are not receipted when doing repairs. Right now, also the pipes are destroyed through road construction and no water is supplied therefore a loss to GWASCO-FGD-5"*. Other studies have also documented problems affecting water supply systems including high levels of inefficiency, corruption, leakages and illegal connections (Wagah, Onyango & Kibwage, 2010).

A combination of Agree and Strongly Agree responses indicated that a total of 22.1 per cent of the respondents perceived water supplied by Nyamira South Sub-County as affordable. On the other hand, a combined 58.4 per cent of the respondents disagreed and strongly disagreed that the water supply was affordable to most residents. These findings are in line with the respective composite means and standard deviations in table 1. The finding suggesting that Nyamira South Sub-County water supply was un-affordable is supported by focus group 5 discussion findings represented by one of the quotes below.

"The County service fees are too much than what we use.... the major challenge we face is payment of abnormal bills which are too much beyond the quantity of water we use. This discourages many from using county water – FGD-5". Both quantitative and qualitative findings suggested that the water supplied in Nyamira South Sub-County was not affordable, further supporting the overall finding that the water supply was not sustainable.

4. Monitoring and Evaluation (M&E) Work plan and Sustainable Water Supply

The M&E work plan for Nyamira South Sub-County water supply as the independent variable was analyzed against sustainable water supply as the dependent variable starting with the generation of simple computations including frequencies, percentages, means, and standard deviations, followed by simple and multiple linear regression, ANOVA, and generation of Pearson Correlation Coefficients.

4.1 Status of M&E Work plan for Water Supply in Nyamira South Sub-County

The respondents were subjected to a series of statements to seek their opinions on the status of M&E work plan for water supply in Nyamira South Sub-County using a likert scale of 1-5 whereby; Strongly disagree (SD)=1, Disagree(D)=2, Neutral(N)=3, Agree(A)=4 and Strongly Agree (SA)=5 as depicted on Table 2.

Table 2. Monitoring & evaluation work plan and sustainable water supply

Statement	SD	D	N	A	SA	Mean	Std Dev
a. Nyamira South Sub County water supply has an existing M&E work plan	82(17.1%)	75(15.7%)	173(35.9%)	131(27.3%)	19(4.0%)	2.85	1.12
b. You are aware of the M&E work plan for Nyamira South Sub County water supply	92(19.2%)	151(31.6%)	113(23.2%)	107(22.4%)	17(3.6%)	2.59	1.14
c. Nyamira South Sub County water supply M&E work plan available	89(18.7%)	114(23.9%)	150(31.4%)	103(21.6%)	24(4.4%)	2.69	1.13
d. You know how to access the Nyamira South Sub County water supply M&E work plan	118(24.7%)	183(38.4%)	95(19.3%)	69(14.5%)	15(3.1%)	2.33	1.09
e. Nyamira South Sub County water supply system M&E work plan is updated annually	98(20.4%)	128(26.7%)	189(39.4%)	51(10.6%)	14(2.9%)	2.49	1.03
f. Nyamira South Sub County water supply M&E work plan for 2020 available	92(19.3%)	108(22.6%)	180(37.7%)	84(17.0%)	16(3.4%)	2.62	1.08
g. Nyamira South Sub County water supply M&E work plan is in use	120(25%)	137(28.5%)	125(26.0%)	84(17.1%)	14(2.4%)	2.45	1.03
h. The activities of GWASCO staff dedicated to M&E are planned according to the M&E work plan.	100(20.8%)	111(23.1%)	160(33.3%)	94(19.6%)	15(3.2%)	2.61	1.11
i. The M&E work plan for Nyamira South Sub County water supply is regularly reviewed	112(23.3%)	125(26.0%)	177(36.9%)	57(11.9%)	9(1.9%)	2.43	1.03
j. You are aware of regular updates on the GWASCO M&E work plan	151(31.5%)	151(31.5%)	103(21.5%)	66(13.8%)	9(1.7%)	2.23	1.09
Composite	Mean,		Standard			Deviation	
2.47	1.01						

A combination of Agree and Strongly Agree responses is used in the subsequent presentation of the results on M&E work plan. A total of about 31.3 per cent of the respondents indicated the existence of an M&E work plan in line with the respective composite means and standard deviations in table 2. On the other hand, a combined 32.8 per cent of the respondents disagreed and strongly disagreed on the existence of an M&E work plan. Focus group discussion respondents confirmed the mixed findings indicating that they had not seen the work plan as captured in a representative quote from focus group 5. “*We have never seen the 2020 work plan-FGD-5*”. The findings from the study that could not strongly demonstrate support of existence of a work plan are supported by Diedericks and Nealer (2015), who also failed to establish presence of M&E work plan of the Kenneth Kaunda District Municipality water supply system.

A total of 26.0 per cent of the respondents indicated the availability of the M&E work plan in line with respective composite means and standard deviations in table 2. A total of 13.5 percent of respondents indicated that the M&E work plan was updated annually, while 19.5 percent of the respondents were of the perception that the plan was in use. All these three findings on the M&E work plan are low compared with a combined total of 42.6 per cent of the respondents disagreeing on the availability of the M&E work plan, 47.1 percent of respondents disagreeing that the M&E work plan was updated annually, and the combined 53.5 percent of the respondents who disagreed on the use of the work plan. These later finding was supported by focus group discussion 1: “*We don't know if the work plan is in use or not*”. The possible nonuse of the M&E work plan for Nyamira South Sub-County could potentially undermine sustainable water supply (Lu, Elliott, & Perlman, 2017).

A total of 22.8% of the respondents indicated that the activities of GWASCO staff dedicated to M&E are planned according to the M&E work plan in line with respective composite means and standard deviations in table 2.

However, a combined 43.9 per cent of the respondents doubted activities of staff dedicated to M&E are planned according to the M&E work plan. This finding supported the previous findings that doubted the use of the M&E work plan in Nyamira South Sub-County, Kenya.

4.2 Correlation Analysis of M&E Work Plan and Sustainable Water Supply

The study sought to examine the relationship between M&E work plan and sustainable water supply. Pearson correlation coefficient was run on the scores of each scale. The total scores of the scales were computed as a summation of the individual scores on each item by the respondent at 95% level of confidence. The study found a positive overall correlation($r=0.687$) which was statistically significant as ($P\text{-value}=0.000 <0.05$); implying that there is a significant relationship between M&E work plan and sustainable water supply in Nyamira South Sub-County, Kenya leading to rejection of the null hypothesis (H_0 : There is no significant relationship between M&E work plan and sustainable water supply in Nyamira South Sub-County, Kenya). The research results therefore conclude that there is a significant relationship between M&E work plan and sustainable water supply in Nyamira South Sub-County, Kenya. As demonstrated by Muniu (2017), M&E practices including maintaining of a work plan increased sustainability of community water projects in Nyeri County, Kenya, hence, in agreement with this study finding.

4.3 Regression Analysis of M&E Work Plan and Sustainable Water Supply

Simple linear regression was adopted to establish how M&E work plan as a predictor significantly or insignificantly predicted sustainable water supply. The model summary sought to determine how M&E work plan as a predictor significantly or insignificantly predicted sustainable water supply. The model summary suggests a positive correlation ($R=0.687$) between M&E work plan and sustainable water supply and those predicted by the regression model with about 47.2% of the variation in the sustainable water supply explained by M&E work plan. The findings concur with existing literature by Kayser, Moriarty, Fonseca, and Bartram (2013) who demonstrated that M&E work plan improved policy, planning procedure, corporate governance, and inter-governmental relationships. Thode, Landick, Paterson, and Watkins (2011) demonstrated that a work plan improved performance of water and sanitation projects.

The study further sought to establish if the regression model is best fit for predicting sustainable water supply after use of M&E work plan. The ANOVA results are presented in Table 3.

Table 3. ANOVA of the regression of M&E work plan and sustainable water supply

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	229.761	1	229.761	426.776	0.000 ^b
Residual	257.339	478	0.538		
Total	487.100	479			

a. Dependent Variable Sustainable water supply

b. Predictors: (Constant), M&E work plan

The ANOVA results indicated that the predictor co-efficient is at least not equal to zero and hence the regression model results in a significantly better prediction of sustainable water supply.

The regression coefficients representing the influence of M&E work plan on sustainable water supply are shown on table 4.

Table 4. Coefficients for the regression of M&E work plan and Sustainable water supply

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.529	0.105		5.047	0.000
	M&E work plan	0.811	0.039	0.687	20.659	0.000

a. Dependent Variable: **sustainable water supply**

The simple linear regression coefficients indicated that there was significant influence of M&E work plan on sustainable water supply. It was therefore concluded that M&E work plan and sustainable water supply were positively and linearly related. The study results demonstrate a significant relationship between M&E work plan and sustainable water supply. Other studies have identified that the allocation of resources for the M&E work plan is an important driver of strong M&E capacity as argued by Kithinji (2015). Kithinji (2015) demonstrated that resource allocation significantly influenced the utilization of M&E results. Kithinji, Gakuu, and Kidombo (2017) also demonstrated that resource allocation to M&E functions resulted into high level of M&E activities and results.

5. Conclusions

The research objective was to examine the extent to which M&E work plan influenced sustainable water supply in Nyamira South Sub-County, Kenya. The findings strongly suggest that the water supply in Nyamira South Sub-County was not sustainable based on the six-point measurement criteria employed by the study. The findings further suggest sub-optimal practice of the M&E work plan for the Sub-County's water supply. Simple linear regression coefficients as well as the Pearson correlation results indicated that there was significant influence of M&E work plan on sustainable water supply. The p-values less than the set threshold of significance; implied that there was a significant influence of M&E work plan on sustainable water supply. The implication of this finding is that strong implementation of the M&E work plan could significantly improve sustainable water supply in Nyamira South Sub-County, Kenya.

The study findings suggested limited involvement of the community in the implementation of the M&E work plan for the Nyamira South Sub-County water supply. The village elders indicated that they had not seen the M&E work plan nor knew how to access it. The FGD findings did also indicate that the village elders were not aware about the use or updating of the M&E work plan. These findings, therefore, point towards low level awareness, passive engagement, and non-participation of the community in M&E of water supply in Nyamira South Sub-County, Kenya.

6. Recommendations

- 1) GWASCO, Government Departments and Authorities dealing with water supply need to dedicate adequate resources for the development and implementation of the M&E work plan.
- 2) It is recommended that GWASCO institutes a regular, systematic, and participatory process of data collection to inform its M&E activities. GWASCO Staff and community members should be trained on participatory monitoring, evaluation and implementation of the M&E work plan for water supply.
- 3) GWASCO needs to strengthen its outreach activities to better meet the community expectations. It is recommended that the organization publicize its outreach activities to community members. This can be done through public fora such as chiefs' *Barazas*.
- 4) An operational research study adopting quasi experimental design is recommended taking the implementation of M&E work plan as the intervention while using sustainable water supply as the outcome variable.

References

- Abalang, J. A. (2016). *Assessment of performance of monitoring and evaluation systems at CARITA Torit in South Sudan*. Retrieved from <http://ir.cuea.edu/jspui/handle/1/561>
- Adank, M., & Kumasi, T. (2013). *Sustainability Index of WASH Activities. Ghana Country Report*. Retrieved from http://www.washplus.org/sites/default/files/ghana_sustainability.pdf
- Chebete, M. L. (2017). *Monitoring and Evaluation Drivers, Type of Project Leadership and Performance of Horticulture Projects Supported by Kenya National Farmers Federation, Nakuru County, Kenya* (Doctoral dissertation, University of Nairobi).
- Cherunya, P. C., Janezic, C., & Leuchner, M. (2015). Sustainable supply of safe drinking water for underserved households in Kenya: investigating the viability of decentralized solutions. *Water*, 7, 5437-5457. <https://doi.org/10.3390/w7105437>
- Department of Environment, Energy, Water, Mining and Natural Resources [DEEWMNR]. (2016). *A bulletin of Nyamira county*.
- Dzwauro, R. B., Barratt, G. J., & Otieno, F. A. O. (2015). Ecosystem-specific water quality indices. *African Journal of Aquatic Science*, 40(3), 227-234. <https://doi.org/10.2989/16085914.2015.1054341>
- Foster, T., & Hope, R. (2016). A multi-decadal and social-ecological systems analysis of community water-point payment behaviors in rural Kenya. *Journal of Rural Studies*, 47, 85-96.

- <https://doi.org/10.1016/j.jrurstud.2016.07.026>
- Francis, M. R., Nagarajan, G., Sarkar, R., Mohan, V. R., Kang, G., & Vinohar Balraj, V. (2015). Perception of drinking water safety and factors influencing acceptance and sustainability of a water quality intervention in rural southern India. *BMC Public Health*, *15*, 731. <https://doi.org/10.1186/s12889-015-1974-0>
- GoK. (2002). *Water Act 2002*. Retrieved from: <https://wasreb.go.ke/downloads/Water%20Act%202016.pdf>
- GoK. (2016). *Water Act 2016*. Retrieved from: <https://wasreb.go.ke/downloads/Water%20Act%202016.pdf>
- Gorgens, M., & Kusek, J. Z. (2009). *Making monitoring and evaluation systems work. A capacity development toolkit*. World Bank Group: Open Knowledge Repository. <https://doi.org/10.1596/978-0-8213-8186-1>
- Haysom, A. (2006). *A study of the factors affecting sustainability of rural water supplies in Tanzania*. Retrieved from www.wateraid.org/~media/Publications/faulty-distribution-points-tanzania.pdf
- Kanyanya, L. O. (2014). Factors influencing sustainability of community water projects in Shianda Division, Kakamega County – Kenya. Unpublished MA Thesis. University of Nairobi, Kenya
- Kayser, G. L., Moriarty, P., Fonseca, C., & Bartram, J. (2013). Domestic Water Service Delivery Indicators and Frameworks for Monitoring, Evaluation, Policy and Planning: A Review. *Int. J. Environ. Res. Public Health*, *10*, 4812-4835. <https://doi.org/10.3390/ijerph10104812>
- Kithinji, C. (2015). *Evaluation capacity building, monitoring and evaluation activities, organizational change and result utilization in non-profit organizations in Meru Counties of Kenya. Research report submitted in fulfillment of the requirements for the award of the degree of Doctor of Philosophy in Project Planning and Management, department of extra mural studies of the University of Nairobi*. Retrieved from <http://erepository.uonbi.ac.ke/handle/11295/8016/browse?value=Monitoring+and+Evaluation+Drivers&type=subject> Koehler, J.,
- Kithinji, C., Gakuu, C., & Kidombo, H. (2017). Resource Allocation, Evaluation, Capacity Building. M&E Results Utilization among Community Based Organizations in Meru County in Kenya. *European Scientific Journal*, *13*(16). <https://doi.org/10.19044/esj.2017.v13n16p283>
- Lockwood, H. (2012). *Sustainability index of wash interventions: global findings and lessons learned*. Retrieved from <http://www.washplus.org/sites/default/files/WashSustainabilityIndex.pdf>
- Lu, S. K., Elliott, S. J., & Perlman, C. M. (2017). Evaluability assessment of a small NGO in water-based development. *Evaluation*, *23*(2), 226–241. <https://doi.org/10.1177/1356389017697620>
- Mabhaudhi, T., Chibarabada, T., & Modi, A. (2016). Water-Food-Nutrition-Health Nexus: Linking Water to Improving Food, Nutrition and Health in Sub-Saharan Africa. *Int. J. Environ. Res. Public Health*, *13*, 107. <https://doi.org/10.3390/ijerph13010107>
- Macharia, E. W., Mbassana, M., & Oduor, S. (2015). Assessing sustainability of rural water projects in Naivasha, Kenya, case study: Maraigushu Water Project. *European Journal of Business and Social Sciences*, *4*(07), 52–83.
- Mackay, K. R. (2007). *How to Build Monitoring and Evaluation Systems to Support Better Government*. World Bank Publications.
- Mamburi, P. N. (2014). Factors influencing community ownership of water projects in Kenya. A case of Kinas Division, Isiolo County. Unpublished MA Thesis, University of Nairobi.
- Mgoba, S. A., & Kabote, S. J. (2020). Effectiveness of participatory monitoring and evaluation on achievement of community-based water projects in Tanzania. *Applied Water Science*, *10*, 200. <https://doi.org/10.1007/s13201-020-01273-5>
- Mulwa, F., Li, Z., & Fangninou, F.F. (2021). Water Scarcity in Kenya: Current Status, Challenges and Future Solutions. *Open Access Library Journal*, *8*, 1-15. <https://doi.org/10.4236/oalib.1107096>
- Muniu, F. N. (2017). *Monitoring and evaluation practices, community participation. Report submitted in fulfillment of the requirements for the award of the degree of Doctor of Philosophy in Project Planning and Management, Department of Extra Mural Studies of the University of Nairobi*. Retrieved from <http://erepository.uonbi.ac.ke/handle/11295/8016/browse?value=Monitoring+and+Evaluation+Drivers&type=subject>
- Mutekhele, B. (2018). *Utilization of Monitoring and Evaluation Systems, Organizational Culture, Leadership and Performance of Educational Building Infrastructural Projects in Bungoma County, Kenya. Report submitted*

- in fulfillment of the requirements for the award of the degree of Doctor of Philosophy in Project Planning and Management, Department of Extra Mural Studies of the University of Nairobi.* Retrieved from <http://erepository.uonbi.ac.ke/handle/11295/104830>
- Ngaira, J. K. (2009). Challenges of water resource management and food production in a changing climate in Kenya. *Journal of Geography and Regional Planning*, 2(4), 097-103. Retrieved from <http://www.academicjournals.org>
- Njama, A. W. (2015). *Determinants of Effectiveness of a Monitoring and Evaluation System for Projects: A Case of AMREF Kenya Wash Programme. Dissertation submitted in fulfillment of the requirements for the award of the degree of Master of Arts in Project Planning and Management, University of Nairobi. University of Nairobi.* Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/92952/Njama%2c%20Amos%20W_Determinants
- Oluoch, J. O., Rambo, C. M., & Ganesh, P. (2020). Monitoring and Evaluation Work Plan on Provision of Curative and Preventive Tuberculosis Healthcare Services in Institutions of Public Health in Kisumu County, Kenya. *IOSR Journal of Business and Management*. <https://doi.org/10.24018/ejbm.2020.5.1.175>
- Plan. (2013). *The Problems and solutions to safe water in Africa*. Retrieved from www.plan-uk.org
- Richards, T., Doering, E., D'Souza, A., Lang, A., Plumm, H., Schaefer, D., & Werchota, R. (2008). *Water supply and sanitation sector reforms in Kenya, Tanzania, Uganda and Zambia: Challenges and lessons*. Dar es Salam: Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ).
- Roe, E. (1989). Narrative analysis for policy analyst. A case study of the 1980-1982 medfly controversy in California. *Journal of Policy Analysis and Management*, 8(2), 251-273. <https://doi.org/10.2307/3323382>
- Roe, E. (1994). *Narrative policy analysis: Theory and practice*. Durham, N.C.: Duke University Press. <https://doi.org/10.1515/9780822381891>
- Silva, F. O. E., Heikkila, T., Filho, F. A.S., & Silva, D. C. (2013) Developing sustainable and replicable water supply systems in rural communities in Brazil. *International Journal of Water Resources Development*, 29(4), 622-635. <https://doi.org/10.1080/07900627.2012.722027>
- Smith, M. F. (1989). *Evaluability assessment: A practical approach*. Springer Netherlands. <https://doi.org/10.1007/978-94-015-7827-1>
- Thode, A. G., Landick, K. D., Paterson, K. G., & Watkins, D. W. (2011). Analyzing Methods to Achieve Successful Development. *International Journal for Service Learning in Engineering*, 6(1), 94-103. <https://doi.org/10.24908/ijlsle.v6i1.3214>
- Thomson, P., & Hope, R. (2015). Pump-priming payments for sustainable water services in rural Africa. *World Development*, 74, 397-411. <https://doi.org/10.1016/j.worlddev.2015.05.020>
- Trepanier, L., Orare, J., Nyagwencha, J., & Grady, C. (2021). How are we actually doing? Comparing water and sanitation in Kenya with MDG and SDG criteria. *Journal of Water, Sanitation and Hygiene for Development*, 11(4), 638-656. <https://doi.org/10.2166/washdev.2021.023>
- UNICEF, & WHO. (2014). *Progress on Drinking Water and Sanitation: 2014 Update*. Retrieved May 21, 2014, from http://www.wssinfo.org/fileadmin/user_upload/resources/JMP_report_2014_webEng.pdf
- Wagah, G. G., Onyango, G. M., & Kibwage, J. K. (2010). Accessibility of water services in Kisumu municipality, Kenya. *Journal of Geography and Regional Planning*, 3(4), 114-125. Retrieved from <http://www.academicjournals.org/JGRP>
- WaterAid. (2011). *Sustainability framework*. Retrieved from www.wateraid.org/public
- Yifru, B. A., Kim, M.-G., Lee, J.-W., Kim, I.-H., Chang, S.-W., & Chung, I.-M. (2021). Water Storage in Dry Riverbeds of Arid and Semi-Arid Regions: Overview, Challenges, and Prospects of Sand Dam Technology. *Sustainability*, 13, 5905. <https://doi.org/10.3390/su13115905>

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