

EFFECT OF WATER PROJECTS COMMITTEES' FUNCTIONALITY ON THE SUSTAINABILITY OF WATER PROJECTS: A CASE STUDY OF MUTHA WARD, KITUI COUNTY

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Abstract: Sustainability is a major challenge in many water projects meant to serve communities, where efforts to realize clean water are undermined by high levels of non-functionality of water projects. Based on the community management model, most if not all water projects are managed by users' committees put in place to oversee the operation and maintenance as well as management of the projects to ensure their sustainability over time. The overall objective of this study was to determine the effect of water projects committees' functionality on sustainability of water projects in Mutha ward of Kitui County. The study specific objectives were to; determine the attributes that comprise the functioning management arrangement of water projects committees, financial management skills, communication skills and capacity to maintain water projects for sustainability in Mutha ward, Kitui County. This study was based on community participation theory. A descriptive survey was applied in the study of effects of water projects users' committees on the sustainability of the projects (a case study of Mutha ward, Kitui south). The targeted population was the Government technical staff in the water sector, the community leaders and water projects committees. A sample population of 213 is arrived at by calculating the target population of 478 with a 95% confidence level and an error of 0.05 using the below formula taken from Kothari (2004). The study selected the respondents using stratified proportionate random sampling technique. Primary data was obtained using self-administered questionnaires. The questionnaire is made up of both open ended and closed ended questions. The drop and pick method were preferred for questionnaire administration so as to give respondents enough time to give well thought out responses. Data from questionnaire was coded and logged in the computer using Statistical Package for the Social Sciences (SPSS V 25.0). This involved coding both open and closed ended items in order to run simple descriptive analyses to get reports on data status. Descriptive statistics involved the use of absolute and relative (percentages) frequencies, measures of central tendency and dispersion (mean and standard deviation respectively). Frequency tables were used to present the data for easy comparison. The qualitative analysis helped the researcher in giving recommendation in line with the conclusions drawn for the whole population under study (Mugenda & Mugenda, 2003). Quantitative analysis provided findings that were presented using tables and graphs for further analysis and to facilitate comparison. This generated quantitative reports through tabulations, percentages, and measure of central tendency. Correlation analysis was done to establish the strength of relationship between the four independent variables and the regressions was used because the procedure uses two or more independent variables to predict a dependent variable. The findings were presented using tables and graphs. The study found that attributes that comprise the functioning management arrangement, financial management skills and communication skills of water projects committees as well as capacity to maintain water projects affects the sustainability of water projects significantly. The study concluded that capacity to maintain had the greatest effect on the water project sustainability, followed by communication skills then functioning management arrangement while financial management skills had the least effect to the water project sustainability. The study recommends that skills of water committees should be continuously increased including setting minimum education and skills levels for effective participation in water committees, that proper communication should be ensured between water users and their leaders so as to clarify or rectify any problem happening at early times and that the water management committees with untrained community members should not be entrusted to manage these facilities as this can lead to mismanagement and unwarranted system breakdowns.

Keywords: financial management skills, communication skills and projects committees' capacity.

1. INTRODUCTION

Water is the source of life, a critical resource for social-economic development, healthy ecosystems and for human survival. It is at the core of sustainable development. The United Nations Development Programme (UNDP) report of 2006 states that people need water and sanitation to sustain their health and maintain their dignity. This report further says that water beyond the household sustains ecological systems and provides input into the production systems that maintain livelihoods. This certainly demonstrates how water is of gigantic use in like every human components and that loss of its get right of entry to at family degree might result in health troubles, poverty and vulnerability (Nwankwoala, 2011)

Over time, many institutions, such as the United Nations (UN), non-governmental organizations (NGOs), national and county governments have come forth to resolve this uneven access to water, sanitation and Hygiene (WASH) through their interventions. These interventions mainly target increasing water access, provision of safe sanitation facilities and promotion of hygiene knowledge. Implementing agencies often self-monitor their efforts, which lasts only through the current funding cycle, and face challenges sharing their results widely (Lockwood, 2013)

Statement of the Problem:

Access to potable water is a key requirement for sustained human development significant of which have been recognized by the international community. Nevertheless, the prominence given to the issue of water and sanitation interventions, many developing countries are faced with the problem of sustainability, a case evident in Kenya. The situation is even worse when alluding to both urban and rural settings.

Mutha ward has in the past and presently had a number of partners make a significant progress in providing access to improved water supply. This has seen a number of interventions come up as a result. Most of these community water projects are laid on the hands of the water users committees to oversee the day to day running of the project. A lot money is invested in training these committees on management issues, operation and maintenance, resource mobilization among other key areas to build their capacity. Most of these water projects users committees have been dormant even after capacity building was done after an intervention.

However, limited evidence is available on sustainability of such water supply interventions done by organizations on good faith. A number of these projects are no longer functioning or little do they serve the purpose for which they were anticipated for. The researcher is thus, guided by the desire to unearth the possible reasons that have led to poor or low functioning of such water project management groupings. The day to day operation and management of this dysfunctional water projects is manned by community-based organizations like water users' committees, community water and sanitation (WASH) committees, Water User Associations or Women groups (CIDA, 2000).

This study therefore sought to research into the effects of these water projects users committees on the sustainability of such projects over time way after intervention. With the intention of providing helpful information to guide partners and the community at large in future programming.

Objectives:

- i. To determine the attributes that comprise the functioning management arrangement of water projects committees on sustainability of water projects in Mutha ward, Kitui County
- ii. To determine the influence of financial management skills of the water projects committees on sustainability of water projects in Mutha ward, Kitui County.
- iii. To establish the effect of communication skills of water projects committees on sustainability of water projects in Mutha ward, Kitui County.
- iv. To assess water projects committees' capacity to maintain water projects for sustainability in Mutha ward, Kitui County.

2. THEORETICAL REVIEW

Community Participation Theory:

The theory on community participation appropriately fits for this study as it focusses on reinforcement of active participation of the local community at hand. Community participation is crucial in any project as this helps in determining the possible challenges that may hinder project phases. It is not possible to determine the problems, social

cultural aspects and constraints for a given community with community participation. Harvey and Reed (2007) upholds the fact that participation of assignment beneficiaries' is of exceptional in that it enhances the sense of possession a number of the assignment members. This concept is helpful in understanding and ensuring that water tasks are operated and maintained after the enforcing agency levels out.

Conceptual Framework

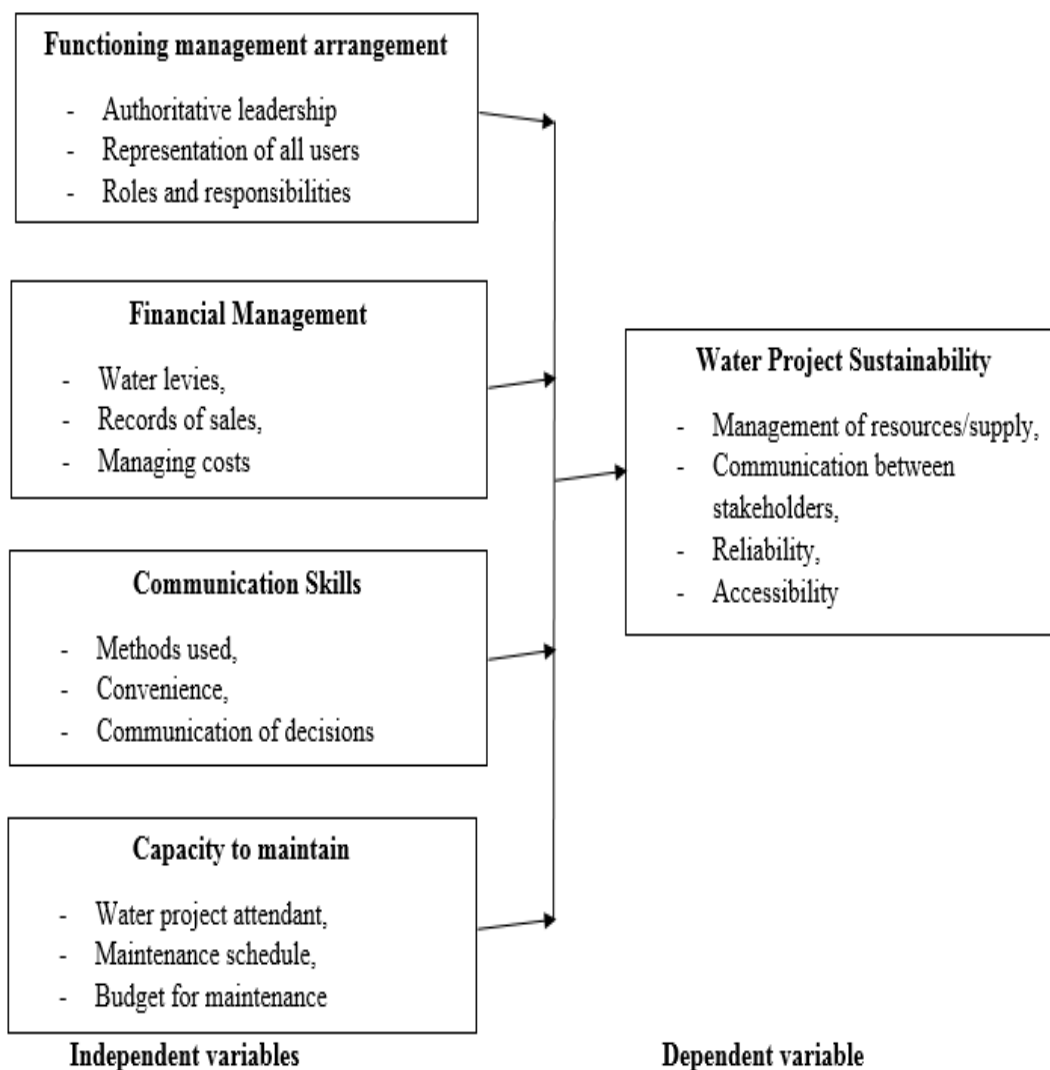


Figure 2.1: Conceptual framework

Critique of the Existing Literature:

Graciana and Sizwe (2012) established the factors affecting sustainability of rural water schemes in Swaziland. The main objective of this study was to assess the main factors affecting the sustainability of rural water schemes in Swaziland using a Multi-Criteria Analysis Approach. The results indicated technical and social factors as most critical while financial and institutional, although important, played a lesser role. Factors which contributed to the sustainability of water schemes were: functionality; design flow; water fetching time; ability to meet additional demand. However, the study was carried out factors affecting sustainability of rural water schemes in Swaziland.

Kwena and Makori (2015) assessed the determinants of sustainability of rural water projects in Kenya: a case study of the Netherlands development organization supported water schemes in Kajiado County. The study established that there is a strong positive influence on sustainability of rural water sustainability attributable to units of change of all the independent variables. However, the study focused on determinants of sustainability of rural water projects in Kenya: a case study of the Netherlands development organization supported water schemes in Kajiado County.

Macharia, Marvin and Oduor (2015) assessed sustainability of rural water projects in Naivasha, Kenya, case study: Maraigushu water project. In most cases, it is observed that the relationship between the independent variables and the dependent variable exist at 95% level of confidence. However, the study was carried out on sustainability of rural water projects in Naivasha, Kenya, case study: Maraigushu water project.

Konde (2016) established the factors influencing the sustainability of rural water projects: a case of Kalongoni water project in Kilifi County, Kenya. Research findings established that economic factors such as presence of income generating activities and over reliance on donor funding have major effect on sustainability of community projects. Munyao (2016) assessed the effect of community-based management on sustainability of water projects in Machakos County. The study concludes that project financial management and technical support affects sustainability of water projects in Machakos County.

Ochelle (2012) did a study on factors influencing sustainability of community water projects in Kenya: a case of water projects in Mulala Division, Makueni County. The findings of the study indicated that community participation, project financing, project management practices and community training do influence sustainability of community water projects. However, the study was carried out on the factors influencing sustainability of community water projects in Kenya: a case of water projects in Mulala Division, Makueni County different from effect of water projects committees' functionality on sustainability of water projects in Mutha ward of Kitui County.

Research Gaps:

Several scholars have conducted research on sustainability in rural water projects but little comprehensive study has been carried out on the factors responsible for lack of sustainability. Moreover, there are no empirical studies that can be traced to explain why there is non-sustainability. However, little has been done to link the community-based management systems and the sustainability of the projects in the study area.

A key weakness identified through the literature was that many sustainability studies only targeted urban water schemes and most of it was done on performance measurement and not sustainability. These studies have not also assessed Mutha ward representing Kitui South Sub-County in particular. This research will complement the research works in looking at the effects the water projects committees' functionality contributes towards sustaining the projects.

Summary of Literature Reviewed:

In summary, the study is based on community participation theory. Globally, sustainability was basically considered in terms of the continuation to improve human wellbeing without undermining the natural resource base that will support future generations. The development of water projects to aid communities in accessing clean water and hence enhance the quality of life is easily done but sustaining of the water projects poses the major challenge. Technical sustainability entails the availability of a reliable and functioning technology for water supply and delivery of enough water of the desired quality. Institutional sustainability refers to the availability of institutions which ensure water systems remain operational, accessible and widely utilized. The institutions possess cultural characteristics, rules for operation as well as agreed and valued procedures

Typically, such a committee has a position for a treasurer who is responsible collecting tariffs from water users who get water from the project. Communication is enabled considering the strengths and weaknesses of the population involved. This is achieved based on the hydrological resources available, its geographical resources, community size and variation within its population. Communication for sustainable water projects is essential and, in most cases, has been achieved through mass campaigns, displaying of posters to curb water wastage and vandalization of established water projects. The effect of water projects committees' functionality on sustainability of water projects in Mutha ward of Kitui County.

3. RESEARCH METHODOLOGY

A descriptive survey was applied in the study of effects of water projects users' committees on the sustainability of the projects. The targeted population was the water projects committees within Mutha Ward of Kitui County, which has 6 county villages with several water sources ranging from boreholes equipped with both hand pumps and other pumping systems, earth dams, sand dams and water. Specifically, the study targeted all the 300 water projects committees managing rehabilitated shallow boreholes fitted with hand pumps and those powered by solar or diesel established, functional and

non-functional. A sample population of 213 is arrived at by calculating the target population of 478 with a 95% confidence level and an error of 0.05 using the below formula taken from Kothari (2004). The study selected the respondents using stratified proportionate random sampling technique. Stratified random sampling is unbiased sampling method of grouping heterogeneous population into homogenous subsets then making a selection within the individual subset to ensure representativeness. Open and closed-ended questionnaires was prepared and administered for the officials and members respectively. The study relied on primary data using a questionnaire, which will be administered on the drop and pick from selected respondent. In this study, the quantitative data was collected and analyzed by calculating response rate with descriptive statistics such as mean, median, standard deviation and proportions using Statistical Package for Social Sciences (SPSS) version 24 and Microsoft Excel

Model:

Analysis of data used multiple regressions to test the research questions

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where,

Y = Water project Sustainability

β_0 = constant, β_1 , β_2 , β_3 and β_4 = regression coefficients

X_1 = Functioning management arrangement

X_2 = Financial management skills

X_3 = Communication skills

X_4 = Capacity to Maintain

ε = Error Term

4. REGRESSION RESULTS

Table 4.1: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.951	0.217		4.382	.000
Functioning management arrangement	0.812	0.352	0.784	2.307	.026
Financial management skills	0.633	0.281	0.539	2.253	.029
Communication skills	0.899	0.196	0.815	4.587	.000
Capacity to Maintain	0.913	0.233	0.872	3.918	.000

Source: Author

As per the SPSS generated table above, the equation ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$) becomes:

$$Y = 0.951 + 0.812X_1 + 0.633X_2 + 0.899X_3 + 0.913X_4$$

The findings showed that if all factors (Functioning management arrangement, Financial management skills, Communication skills, Capacity to maintain and training) were held constant at zero Water project Sustainability will be 0.951. The findings presented also show that taking all other independent variables at zero, a unit increase in the Functioning management arrangement would lead to a 0.812 increase in the scores of Water project Sustainability. This variable was significant since the p-value 0.026 was less than 0.05.

The findings also show that a unit increase in the score of Functioning management arrangement would lead to a 0.633 increase in the score of Water project Sustainability. This variable was significant since $0.029 < 0.05$. Further, the findings show that a unit increases in the scores of Communication skills would lead to a 0.899 significant increase in the score of Water project Sustainability since p-value (0.000) was less than 0.05.

The study also found that a unit increase in the score of capacity to maintain would significantly lead to a 0.913 increase in the score of water project sustainability since p-value (0.003) was less than 0.05. Moreover, the study revealed that a unit change in training would significantly change the Water project Sustainability by 0.576 since the p-value (0.006) was less than 0.05.

Overall, it was established that capacity to maintain had the greatest effect on the water project sustainability, followed by communication skills then functioning management arrangement while financial management skills had the least effect to the water project sustainability. All the variables were significant since their p-values were less than 0.05.

5. CONCLUSION

The study concluded that functioning management arrangement of water projects committees significantly affects sustainability of water projects in Mutha ward, Kitui County. The community and the local government genuinely recognize the project committee who have the mandate to have the capacity to make and enforce decisions. This committee is a representation of all the community users of the water project. The project committee are aware of their responsibilities which is to carry out and sources for maintenance work whenever needed. The water project committee also strongly works with the relevant stakeholders to ensure success of the projects.

The study also concluded that financial management skills of the water projects committees affects the sustainability of water projects in Mutha ward, Kitui County significantly. There is a complete record of the main contributors of the water project while maintaining transparency and allowing the community members to easily access the records. There are also banks accounts for each water projects is opened that each and every water project has a bank account and that none of the community members is exempted from paying for water. The study found that the water levies charged are high, that there is proper management of the funds collected, that the project managers have set aside budget for repairs and maintenance and that some income is generated for water projects generate income through selling of water.

The study further concluded that communication skills of water projects committees have a positive and significant effect on sustainability of water projects in Mutha ward, Kitui County. This is attributed to the fact that the community members are allowed to ask questions during the meetings and projects managers responds to their enquiries using a convenient method of communication. The mode of communication is through Baraza, Posters, Short messaging service (SMS) and Notices where the issues raised by the community members are well addressed. Further the necessary information about the water project is always available for the community members.

The study also concluded that water projects committees' capacity to maintain water projects have a significant effect on sustainability of water projects in Mutha ward, Kitui County. It was clear that pump attendant has the skills of conducting a leak test and the funds are always available for any required repairs or maintenance. The projects committee makes sure that there is at least one pump mechanic in every area with a water project for maintaining the pump periodically. The water attendant is equipped with the right skills and made available at the water project all the time the pump is in use. It was established that there is a record of any maintenance on the pump.

6. RECOMMENDATIONS

The study recommends that skills of water committees should be continuously increased including setting minimum education and skills levels for effective participation in water committees. This is because skilled water management committees are fundamental to achieving sustainable rural water supplies. Managing water supplies involves complex operations, processes and decisions in addition to coordination challenges with multiple stakeholders. Incentivizing water committees should also be considered as a strategy for attracting and retaining people with skills as volunteerism in the long run is unsustainable. Such incentives may include participation in learning exchange visits, regional or national level recognition awards for community service, gifts such as bicycles/motor cycles after a certain period of successful service at the facility and repeat trainings.

The study also recommends that the increasing rate of water project failure especially in the rural areas should be addressed in order to achieve reliable supply of safe and clean water to the rural populations. Local governments, donors and communities should make sure that capacity buildings for water project management teams to the community and water user association members become a sustainable process for the attainment of water project sustainability.

Proper communication should be ensured between water users and their leaders so as to clarify or rectify any problem happening at early times. There should be clear articulation of the roles for each actor in water management at the study area. Private sector should also be actively involved in the form of public-private partnership so that they become part and owners of the water management at the study area.

The study also recommends that the water management committees with untrained community members should not be entrusted to manage these facilities as this can lead to mismanagement and unwarranted system breakdowns. It is also recommended that implementers of water projects should ensure that water management committees are formed and members adequately trained.

There is need to enhance transparency and accountability levels among the committee members. Openness should be encouraged in the management of finances raised from sale of water and community contributions with proper records and bank statements being kept by the water management committees. Auditing of these financial records by independent parties should be encouraged by implementing organizations to ensure proper management of the resources. This will encourage community

Close monitoring and evaluation of water projects by implementing organizations is also recommended to enhance sustainability. The staff of implementing organizations and the beneficiaries should keep monitoring the progress of their water projects in order to enhance quality and also evaluate their performance over time.

Community participation right from conception and design of water projects to implementation is recommended so as to enhance community ownership of water projects. The views of community members should be appreciated by the donors implementing water projects. Community members should also be encouraged to contribute either in cash or by providing locally available materials during implementation and post implementation periods.

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