MONITORING AND EVALUATION PRACTICES, COMMUNITY PARTICIPATION AND SUSTAINABILITY OF COMMUNITY WATER PROJECTS IN KENYA: A CASE OF NYERI COUNTY

BY

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Doctor of Philosophy in Project Planning and Management of the University of Nairobi

2017

DECLARATION

This Thesis is my original work and has not been presented in any university for any academic award.

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DEDICATION

This study is dedicated to my wife Purity and children Maureen, Sylvia, and Jeff who have given me great encouragement in the course of my studies.

ACKNOWLEDGEMENTS

I wish to extend my sincere appreciation to all individuals and institutions that contributed in one way or another towards this study. My appreciation goes to the university of Nairobi for availing this rare opportunity to undertake a doctoral programme in the institution. Special thanks goes to my university supervisors, Prof. Christopher Gakuu and Prof. Charles Rambo who constantly provided guidance, encouragement, and constructive criticism in most considerate, organized and timely manner. Thanks also to all the lecturers in the department of extra mural studies for their guidance, encouragement and support in my studies. Special thanks goes to my fellow doctoral students for sharing their insights in this academic journey, more specifically Paul Kiumbe, Alex Mirara, Edward Mburu and Gideon Thuku, I always found direction as we shared our struggles and thoughts. I wish to thank the management and staff of Tana Water Service Board; especially the County water officers from Kamakwa water office for availing water records that enabled me obtain the background information of this study. In the same vein I also want to thank Edward Kuria who took time to introduce me to various officers of water projects in the Sub counties covered by this study. Appreciation also goes to the members of the management committee of the ten water projects covered in this study for allowing me to collect data from the projects and for taking an active as respondents. I also want to thank my family which has been a continuous source of strength, love, inspiration, support and motivation. Indeed want to note the unwavering love and support of my wife, Purity Ngotho. Completion of this thesis would not have been possible without her. Overall, I would like to give my sincere gratitude to the God almighty for providing me with strength, guidance, patience, knowledge and financial resources to complete this thesis.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

AWF	Africa water fund
CDD	Community Driven Development
CWP	Community Water Project
GOK	Government of Kenya
I EA	Institute of Economic Affairs
JMP	Joint monitoring programme
MDG	Millennium Development Goals
PRA	Participatory Rural Appraisal
SDIA	Supply Driven Implementation Approach
TWSB	Tana Water Services Board
UNICEF	United International Nations Children Education Fund
WASREB	Water Services Regulatory Board
W.H.O	World Health Organization
WRM	Water Resource Management
WRMA	Water Resources Management Authority
WSB	Water Services Board
WSP	Water Service Provider
WSTF	Water Services Trust Fund
WUAs	Water Users Associations;
WP	Water projects

ABSTRACT

Water sector has been undergoing various reforms in the past decade aimed at promoting projects sustainability. There is a general acceptance that (M&E) ie Monitoring and Evaluation practices has an influence on community project participation but its moderating influence on community participation and sustainability is not clear. This study sought to establish the moderating influence of M&E practices on community participation and sustainability of community water projects in Kenya, a case of Nyeri County. The study adopted a mixed method research anchored on a concurrent triangulation. The study was conducted in three sub counties of Nyeri County, Tetu, Mathira and Nyeri central which had a total of 10 water projects with 1052 beneficiaries. Respondents for this study comprised three strata. In the first strata were water project beneficiaries picked using Yamane formula (1967) and resulted into a sample size of 290 and later proportionately stratified across the ten water projects. Individual respondents of beneficiaries were identified using a systematic sampling procedure and subjected to self administered questionnaire. Out of 290 contacted respondents 207 positively responded to the survey questionnaire representing 71.38 percent successful return rate. The second strata comprised of 8 respondents who were included in focus group discussions of which 3 were committee members purposely selected while the rest 5 were ordinary project beneficiaries who were randomly selected. The third strata comprised of 10 water officers who were picked from the 10 water projects. Each of the 10 officers was subjected to a semi structured interview. Instrument validity was ensured with input from two supervisors from the University of Nairobi while reliability was determined using a split-half testing technique. Quantitative data was analyzed using linear regression model in SPSS software. The study established a significant independent influence at ($p < 0.000$) of community participation; in decision making, resource, mobilization, institutional collaboration and joint community participation on sustainability of projects at 5% level of significance. The study established that community participation in; decision making, resource mobilization and institution collaboration independently and jointly, influenced sustainability of community water projects at $t \geq 1.96$ and $p \leq 5\%$ level of significance. The increasing strength of participation from weak, moderate to strong was positively correlated to the level of project sustainability. The study established that M&E Practices had a significant moderation effect on the relationship between community participation and sustainability of community water projects. However when the interaction between joint community participation and M&E practices are taken on board there is no significant effect between participation in institution collaboration and sustainability of water projects. The study concluded that community participation in decision making, resource mobilization and institution collaboration had significant independent and joint influence on sustainability of community water projects. Sustainability increased as their level increased. On the other hand M&E practices had a significant influence on the relationship between the community participation and sustainability of community water projects. To guarantee project sustainability the study recommends that community projects ensure project beneficiaries are involved in all the stages of the project, Project beneficiaries contribute both initial project capital as well as monthly fee for operation and maintence, projects to have supportive sector policies and regulations to attract support from a range of institutions, M&E practice is embedded in project management to aid in demonstrating accountability and ensure effectiveness. Future studies should; examine how institutional collaboration in water services has been affected by devolution of water services, the influence on performance of co–management of community projects, and consider how communities could harness appropriate technologies such rain-harvesting water technologies to build community water.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Sustainability of water projects has been of great concern as fewer projects are being sustained which means that the cost of implementation is not commensurate to the benefits accrued (UNDP,2009).Various global efforts have attempted to address the growing water problem, increasingly inefficient' public sector services and lack of project sustainability. One of the major subscriptions has been community project participation and there has been a rush to jump on the participatory bandwagon (Mansuri and Rao, 2004). However, previous attempts to address the problem using community management model have not born positive results in Sub-Saharan Africa. The most modern approach envisaged to address the sustainability question is an intervention of M&E practices in community based water projects (UNDP, 2009).

Experiences word over indicate that access to water is an up-hill task requiring concerted efforts both at local and international levels (UNDP, 2009). Department of Public Health Engineering (DPHE) and JICA (2008) carried out a study to assess operational status of 120 village piped water supply schemes in Bangladesh and found that 52% of them to be non-functional. The study concluded that despite the technical options in place, non functionality of a huge number of systems fades the sustainability of the rural water supply (DPHE and JICA, 2008). In Ghana, the government tried to address the challenge of lack of water project sustainability by establishing community sanitation authority within a framework of decentralization whereby community drilled boreholes and fitted them with manually operated pumps; however the pumps often broke down within no time making the communities to fall back on traditional water sources (Carter, 2009). Kenya has approximately about 680 community water projects that provide over 740,000 households with water throughout the nation. However majority of them are not active due to poor management and lack of maintenance (Republic of Kenya, 2007).

In the year 2000, the UN established the millennium Development Goals (MDGs) and identified Water supply sanitation (WSS) as projects that could be used to achieve its social development objectives. The MDGs targeted to reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015 (WHO/UNICEF/ JMP, 2013).In the

global platform there have been efforts aimed to address the water challenge, among them the International Conference on Water and the Environment (ICWE) in Dublin which crafted the Dublin principles. These principles informed United Nations to shift from development paradigm characterized by massive production and top down approach to one that is participatory and sustainable (Mulwa, 2010). From the foregoing deliberations, decisions and policies of water related issues at international, regional and national levels have in the last decade been influenced by participation and sustainability paradigm.

The 2009 MDG report indicate that the world was on track to achieve the safe water target, however it cautioned that 884 million people worldwide still used unimproved water sources for their domestic activities in which 84 percent (746 million) of these people were reported to be living in rural areas (UNDP, 2009).Report by UNICEF and WHO (2012) indicate that in rural Sub-Saharan Africa 19 percent of the population still use surface water source for domestic use. The low access to improved rural water supplies in this region is explained in part by poor sustainability of water infrastructure with report indicating that 36% of rural water supply infrastructure is not working at any given time (IEA, 2006).

Development planners attempted to address the challenges posed by lack of project sustainability by shifting from a centralized, supply-driven paradigm toward a more flexible, demand-oriented strategy (Briscoe and Ferranti, 1988). The demand driven supply model requires that water users participate in project planning, implementation, monitoring and evaluation and vests in them key decisions making functions (Sara and Katz, 1997). Development actors and policy makers envisaged that Community-managed model of service delivery in the rural water sub-sector as the single most important of the strategies to deliver greater access, equity and sustainability in service delivery (UNICEF and WHO 2012). While community water projects may be working well in some developing country contexts such as in Latin America and Asia, the results in sub-Saharan Africa are still not promising (Lockwood and Smits, 2011). When Kenya gained her independence in 1963 it adopted a water policy based on the principle that "water is a social good to be provided free of charge with heavy subsidies and without cost recovery" (JMP, 2012).However due to budgetary constraints and failure of centralized system of supply, a new approach was adopted in 1992 which emphasized on decentralization and demand driven approach. This policy was implemented by adopting Community-managed based model of

service delivery in the rural areas of Kenya. Community management model brought some improvements which include time saving, reduction in water borne disease and other benefits in limited targeted projects (Sida, 2009). Despite these improvements, challenges of sustainability and viability continued in community level projects and this is noted in various sector reviews reports (Sida, 2009).

In an effort to improve sustainability and access to water, the water Act 372 of Kenya was reviewed resulting into a new of water act 2002 whose Implementation was guided by the national water service strategy (NWSS) for the year 2007-2015.The strategy was based on the principle of sustainable access to safe water as a human right as well as an economic good with commitments to cost recovery by service providers and formalization of service provision. The water act also established WASREB as the national institution with the mandate of carrying out water service regulation. The 2002 act put water provision service in the hands of water service boards who delegates this mandate to water service providers (WSPs) (MWI, 2010). Water service providers for rural areas are community water services registered as water users associations (WUAS).

Among the reforms brought by the Kenya water act 2002 was an intervention of M&E practices which envisaged at addressing the sustainability question in community based water projects. The "Kenyan Constitution 2010" that gave all citizens the right to water and effective national water services states that the Government has to carry out Monitoring and evaluation function to ensure progressive realization of this right. In view of this WASREB established the National Water Master Plan 2013 that comprised an information system called Water Regulation Information System (WARIS).Through WARIS, WASREB has been conducting M&E on performance of a number of WSPs whose results are indicated on various annual WASREB status reports (Sida, 2009).

According to WASREB (2013) annual performance report, access to water in Kenya stood at 54% with large disparities between geographic areas with Northern Counties of Kenya having less than 30% of access to safe water as compared to some 60% in Central Kenya with the highest level of 72% registered in Nyeri County. However even within Nyeri County large disparities still exist with some Sub Counties registering a performance index of 74 % while

others had a low of 30% which begged for answers. The report continued to cite Nyeri County as having some of the most efficiently run community water services; however the report failed to indicate whether the observed performance was due to the difference in the M&E practices in water projects nor was it attributed it to any known factor.

The water projects in this study are in Nyeri County of Central Kenya. The county is sandwiched between two fresh water towers of Aberdares ranges and Mount Kenya. The projects are located in Tetu, Nyeri Cenral and Mathira Sub Counties of Nyeri County. They are managed by a committee of between 9 - 15 people under the supervision of Sub County Water officers seconded from the Ministry of Water and Irrigation (M.E.N.R, 2010).

M&E practices was expected to intervene in various important aspects of community projects that includes planning (decision making) to ensure suitability of projects and technology, community resource mobilization to ensure equality and transparency, institution collaboration to ensure resources mobilization from all the water sector stakeholders besides assuring accountability for the mobilized resources. Despite the existence of M&E practices in community based water projects which were aimed at addressing the question of sustainability, no empirical study had been carried out to find out its influence on the relationship between community participation and sustainability of community water projects. A study in this area was therefore imperative.

1.1.1Community Participation in Decision Making

The importance of community participation in decision making is emphasized in the World Bank's definition of participation as "a process through which stakeholders influence and share control over development initiatives and the resources that affect them" (World Bank, 2003). Participation at an early stage of the decision-making process of a project can reduce both time and cost of the project and is most likely to achieve benefits both as a means and as an end (Mansuri and Rao, 2004).Benefits of involving community in decision making include among others better project buy-in, better designed projects, better targeted benefits , more cost effective projects, more equitable distribution of project benefits, less corruption and strengthens the capabilities of the community to undertake self-initiated development activities all of which are attributes of project sustainability (White, 2011). The study sought to establish if

involvement of community in decision making is evidenced in the water projects and its links to project sustainability.

1.1.2 Community Participation in Resource Mobilization

The factor that best differentiates a demand-responsive project from a project in which people simply participate is the requirement of a community resource mobilization (Sara and Katz, 1997).Community resource mobilization is the amount people give in cash, in kind, and labor in exchange for services and is linked to demand responsive project. In an analysis of the relationship between mobilization and sustainability it was found that in a demand-responsive approach, community resource mobilization serves as an indicator of project demand (Khan, 2000).The level of community resource mobilization both in initial project investment costs and recurrent costs provides a strong indication that it is willing and able to bear the expected costs of the system (Harvey and Reed, 2007). Willingness and ability to pay the expected costs of the water systems is a good indicator that the project is most likely to be sustainable (Evans and Collins,2005).This study sought to establish the element of community resource mobilization in water projects and its linkage to project sustainability.

1.1.3 Community Participation in Institutional Collaboration

There is increasing recognition that the majority of communities will be unable to manage their own water supply systems without some form of external assistance and that the community management model has definite limitations (Lockwood, 2002).The phrase institutional collaboration is used to describe the support and resources that the community receives from partners (Davis and Iyer, 2002). Community-managed Rural Water Services (RWS) system is also classified as sustainable if has access to continuous external support (Schouten and Moriarty, 2003). Kleemeier (2000) carried out an empirical study on the performance of piped water projects in rural parts of Malawi and found that 50% of the schemes were performing poorly which was attributed to lack of technical support from external institutions. This study sought to assess the influence of institutional collaboration on sustainability of community water projects.

1.1.4 Monitoring and Evaluation Practices

The Kenyan Constitution provides a strong foundation for the country's M&E practices by strongly advocating for responsive, accountable and effective institutions(Republic of Kenya, 2012).Given the clarity of the transformation agenda in Kenya's State, provided by the new Constitution and Vision 2030 there is a unique opportunity for planning, budgeting, monitoring and evaluation to be placed at the heart of new institutional arrangements (Republic of Kenya, 2007).The Kenya water act 2002 envisaged to bring out reforms in the water sector. Key among its provision was establishment of an institution called WASREB whose major objective is monitoring and Evaluation of the water sector.

The 2010 Kenyan Constitution that gave all citizens the right to water and effective national water services states that the Government has to carry out Monitoring and evaluation function to ensure progressive realization of this right. In view of this WASREB established the National Water Master Plan 2013 to guide the M&E practices in the water sector. The M&E practices are supposed to intervene in the various aspects of the community water sector which includes; the planning stage so as to ensure that decisions are made from the grass root level to ensure suitability of projects and technology ; that projects have self-financing capacity by lowering production costs; maximizing the mobilization of resources from the community and private sector; and that projects are commercially sustainable and socially responsible to consumers (WASREB, 2013).This study therefore sought to establish the moderating influence of M&E practices on the relationship between community participation and sustainability of community water projects.

1.1.5 Sustainability of Community Water Projects

Many researches in water and sanitation sector have tried to define sustainability from different perspectives. In rural water supply, sustainability has been studied by various researchers shedding light on its different aspects and recommends for adopting sustainability factors for supplying of safe water in the rural areas. Hodgkin (1994) defines sustainability of a WSS project development as the ability of the project to maintain or expand a flow of benefits at specified level for long period after project inputs have been ceased. Sara and Katz (1997) define sustainability of a WSS as a system which is able to provide an acceptable level of services all through the period for which the water supply system was designed. Abrams, Palmer, and Hart

(1998) elaborated definition for sustainable water service as one where water continues to be available in the same quantity and quality for the period for which the system was designed. Harvey and Reed (2002) defines sustainable rural water supply covering most of the aspects of sustainability. They argue that a project is sustainable when "the water sources are not over exploited but are naturally replenished, facilities are maintained in a condition which ensures a reliable and adequate water supply, the benefits of the supply continue to be realized by all users over a prolonged period of time, and the service delivery process demonstrates a cost-effective use of resources that can be replicated". A cursory look at above-mentioned definitions reveals several key issues of sustainability in water and sanitation sector which are as follows; Long term external support should be minimal, operation and maintenance costs should be financed by users while access to benefit should be continued over a long period.

1.2 Statement of the Problem

Global sustainability of water projects has been of great concern as fewer projects are being sustained and there have been concerted strategies at local and international levels to address the challenge(UNDP,2009). Among the strategies is water delivery system based on participatory approach and recognition of water as an economic good. From the foregoing many policy makers and development actors adopted a water supply policy based on community-managed model of service delivery (Mansuri and Rao, 2004). Implementation of community water projects has resulted into improvement in global access to water over time but with great disparities within regions, countries and within countries (Brikké, Francois and Rojas, J (2001). In sub-Saharan Africa only 50 percent of the people have access to improved water supply sources which compare miserably with 90 percent or more in Latin America, the Caribbean, Northern Africa, and large parts of Asia (Carter, 2009). Low access to improved water supplies in sub-Saharan is explained in part by poor sustainability of water supply infrastructure which indicate that 36 % water projects are not working at any given time. In the year 2009 the United Nations Development Program, advocated the need to embed M&E practices as an innovative way of implementation and management of community based water projects as it creates knowledge and learning around results that is useful to project stakeholders in improving project performance to address the question of poor project sustainability (UNDP 2009). Whereas scholars and development practitioners in the water sector concurs that the intervention of M&E has improved the performance of water projects the rate of project failure in the developing

countries has fallen short of expectations. In Kenya Water supply to households has evolved through a long process of policy reforms. Immediately the country gained independence, it adopted a policy of water supply that perceived "water as a social good to be provided free of charge", with heavy subsidizes without cost recovery" (Mulwa, F.W, 2010). However owing to economic constraints coupled with failure of centralized approach of supply the government changed the water policy and adopted Community management approach of water supply (Republic of Kenya, 2007). Like in many developing countries the approach didn't yield much in terms of project sustainability (MWI 2001).

In the year 2002 the Government of Kenya instituted comprehensive policy reforms detailed in 2002 Water Act. The policy was aimed at propagating the intervention of M&E practices in community based water projects as a modern approach envisaged at addressing the sustainability question. Application of M&E practices is carried out at the back drop of continued low accessibility to water in Kenya. Annual performance report by WASREB (2013) indicated that access to water in Kenya stood at 54% with large disparities between geographic areas. This report indicated that Northern Counties of Kenya had less than 30% of accessibility to safe water as opposed to 60% in Central Kenya with the highest level of 72% registered in Nyeri County. However even within Nyeri County large disparities still existed with some sub counties registering a performance index of 74 % while others have a low of 30%.The low performance apparently exist even where there is interventions M&E practices in project implementation and management. These observations begged for answers as to why the continued "death" of water projects despite the policy reforms and the heavy investments put aside to support them .While there is wide rhetoric and substantial interest for application M&E practices to project management , the use of the approach seems to be restricted and the assertions hardly been empirically tested (Guijt, I. (1999). Some notable evaluations studies on "community water supply projects" have attempted to link community project participation with various indicators of project performance (Katz and Sara (1997), Isham and Kahkonen (2007),Okungu (2008) Araral, 2009, Nkhata, Breen and Freimund (2008), Mosse (1995) and Kleemeier (2000). However there has not been any serious attempt to evaluate the influence of community participation sustainability nor is there demonstrable cause effect relationship between interventions of M&E of practices on community project participation and sustainability of community water projects.

It was therefore imperative that a study on interventions of M&E in the management of community based water projects be carried out to address the gap in knowledge, poor project sustainability as well as reinforce the significance of the M&E practices in influencing sustainability; otherwise the role M&E practices in project interventions would remain an academic rhetoric. This study therefore sought to investigate the influence of M&E practices on the relationship between community participation and sustainability of community water projects in Kenya.

1.3 Purpose of the Study

The purpose of this study was to investigate the influence of monitoring and evaluation practices, community participation and sustainability of community water projects in Kenya: A case of Nyeri County.

1.4 Objectives of the Study

The study will sought to achieve the following objectives:

1. Establish the extent to which community participation in decision making influence sustainability of community water projects in Nyeri County.
2. Assess the extent to which community participation in project resource mobilization influence sustainability of community water projects in Nyeri County.
3. Assess the extent to which community participation in institutional collaboration influence sustainability of community water projects in Nyeri County.
4. Determine the extent to which joint community participation influence sustainability of community water projects in Nyeri County.
5. Establish the moderating influence of M&E practices on the relationship between the joint community participation and sustainability of community water projects in Nyeri County.

1.5 Research Questions

The study sought to answer the following questions

1. To what extent does community participation in decision making influence sustainability of community water projects in Nyeri County?
2. To what extent does community participation in project resource mobilization influence sustainability of community water projects in Nyeri County?

3. To what extent does community participation in institutional collaboration influence the sustainability of community water projects in Nyeri County?
4. To what extent does joint community participation influence sustainability of community water projects in Nyeri County?
5. What is the moderating influence of M&E practices on the relationship between joint community participation and sustainability of community water projects in Nyeri County?

1.6 Research Hypothesis

The study sought to test the following research hypothesis.

1. **H_1**: Community Participation in decision making has a significant influence on sustainability of community water projects.
2. **H_1**: Community Participation in resource mobilization has a significant influence on sustainability of community water projects.
3. **H_1:** Community participation in institutional collaboration has a significant influence on sustainability of community water projects.
4. **H_1:** Joint community participation has a significant influence on sustainability of community water projects.
5. **H_1:** The joint influence of community participation in decision making, resource mobilization and institutional collaboration on sustainability of community water projects is moderated by M&E practices.

1.7 Significance of the Study

The findings of the study are useful in providing empirical data on moderating influence of M&E practices on the relationship between community participation and sustainability of community water projects and the ways in which specific experiences of participation can provide lessons for policy makers in Nyeri County and in the Kenyan water sector. The lesson learnt about the moderating influence of M&E practices on the relationship between community participation and sustainability of community water projects is important in ensuring a smooth the transition of devolution of water service provision from the national government to community management services under the County governments as enshrined in the 2010 constitution. The findings and recommendations could be used in rural development planning and implementation of development strategies. It is also hoped that the research findings would bear a positive

influence in enlightening communities on the need to take part in activities that affects their wellbeing. It is envisaged that the findings could go a long way in contributing to the general awareness to scholars on the moderating influence of M&E practices on the relationship between community participation and sustainability of community water and the ways in which contextual factors shape participation.

1.8 Limitations of the Study

The study was limited in terms of previous studies that could be used to compare findings. From literature little information existed on empirical studies that examined the moderating influence of the independent variables (participation in; decision making, resource mobilization and institution collaboration) on sustainability of community water projects. However the study was able to link the relationship of the individual independent variables and sustainability of community projects with the findings of the previous studies that examined similar or closely related variables.

In the course of obtaining data the study encountered information that had many gaps. This was overcome through the application of triangulation methods of data collection in which data was collected from many sources and then collated to authenticate its accuracy.

1.9 Delimitation of the Study

The study sought to investigate the moderating influence of M&E practices on various variables of community participation in water projects that include participation in decision making, resource mobilization, and institutional collaboration on sustainability of community water projects. Sustainability of community water projects was operationalised in terms of project finance and tariff collection, user satisfaction, capacity of water committees, definition of rules and responsibilities for system management and on-going training. The study was carried out in Nyeri County, and confined in its three sub counties namely Nyeri Central, Tetu and Mathira. Community water projects in these rural regions displayed great disparity between them in terms of performance despite having similar social economic and geographic conditions with some presenting poor state of water supply while a few others were in good working conditions. According to WASREB (2013) the sub counties in question contain water projects with an average performance index of continuous water supply of 74% as compared to similar others

with 30%. This factor formed a major interest for this study and was the basis for anchoring this study in the region.

The study targeted 10 water officers, 133 project committee members and 1052water consumers from 10 water projects in 3 Sub-Counties of Nyeri County.

1.10 Assumptions of the Study

The study assumed that, the variables used in the study are the ones moderated by M&E practices in their influence to sustainability of community water projects. The study was also based on the assumptions of normality, linearity, interval data, homoscedasticity and independence of residuals, which refer to the various aspects of the distribution of scores and the nature of the underlying relationship between the variables. These assumptions allowed for analyses to be based on parametric tests. The assumptions were checked through tests such as Kolmogorov-Smirnov (K-S) test, Shapiro-Wilk's test and Chi-square tests of independence. The study also assumed that the selected respondent were the key ones required in soliciting the relevant information required in this study and that the respondents gave correct and valid information for arriving at valid data that was used in arriving at conclusion in this study.

1.11 Definition of Significant Terms used in the Study

Community Participation in Decision Making: Participation of community in project planning activities in which major decision concerning community water projects are made by the members. This is reflected in project members being active in project design, control over project decisions, contribution in meetings and choice of project representatives.

Community participation in Resource Mobilization: This the process in which community take an active role in pooling together capital and operation and maintenance project resources that include cash, labor, and in-kind resources. Indicators of participation in resource mobilization include mobilization of project finances, Labour/ skills and materials.

Community Participation in Institutional Collaboration: The partnership formed between community and external organizations that enables the community project access external resources that community is unable to avail in their projects and includes collaboration in project financing, technical &extension services, research and development and capacity building.

Community Water Projects: Water projects that seek to improve the status water supply service from unimproved sources to improved sources and are constructed, financed managed and maintained by a local community with or without collaboration with external partner

M&E practices: The exercise of conducting M&E activities in community water projects in the process of project implementing cycle and includes resource allocation for M&E, data collection, data analysis, dissemination of results, and utilization of M&E results

Sustainability of Community Water Projects: Water projects that can demonstrate continued active community participation that is crucial in stimulating new actions, cost recovery and as well as maintaining a desirable level project services. This is reflected by ability to meet operational cost, the working condition of infrastructure, compliance with license and tariffs, continuous water supply, ability to meet emerging demands

1.12 Organization of the Study

The study is organized into five chapters. Chapter 1 contain the introduction with sub-themes on background to the study, independent variables namely community participation in decision making, community participation in resource mobilization, community participation in institutional collaboration, M&E practices, sustainability of community water projects, statement of the problem, purpose of the study, research objectives, research questions, research hypothesis, significance, limitations, delimitation, assumptions of the study and definition of the significant terms used in the study. Chapter 2 constitute the literature review which is organized around the following themes namely sustainability of community water projects, the concept of community participation and sustainability of water projects, decision making and sustainability of community water projects, resource mobilization and sustainability of community water projects, institutional collaboration and sustainability of community water projects, M&E practices and sustainability of water projects. Also included in chapter 2 are theoretical framework, conceptual framework and summary of the literature review. Chapter 3 constitute research methodology which contains research paradigm, research design, target population, sample size and sampling procedures, research instruments, data collection procedure, data analysis techniques, ethical issues and operationalization of variables. Chapter 4 constitutes data presentation, analysis and interpretation and discussions of findings. Chapter 5 constitutes summary of findings, conclusions and recommendations.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature which is related to the study based on thematic and sub thematic areas in line with the study objectives. The main thematic areas are based on sustainability of community water projects and the concept of community participation and sustainability of community projects. The sub thematic areas used for literature review include various aspects of community participation in water projects that influence sustainability of projects, they include community participation in; decision making, resource mobilization, and institutional collaboration and M&E practices. It also discusses the empirical studies that explain these relationships. It also highlights the theoretical framework and conceptual framework against which the study was based and summary of literature.

2.2 Sustainability of Community Water Projects

Project sustainability is explained from the idea of resilience theory. Resilience in the context of human being is the ability of a system to adapt itself to changing environmental the process of learning, innovation and transformation (Norton, 2005).Resilience is essential for the prosperous development of communities. Decision making in the context of sustainable developmental projects must acknowledge space time relationships in the dynamism of economic, social, and environmental factors (Norton, 2005). A system in resilience is one the has the characteristics of; capacity to absorb disturbance and still remain within the same domain or state, capable self organizing itself and the ability to increase learning and adaption (Carpenter, Walker, Anderies and Abel 2001).Applied to a water project a sustainable project is one capable of withstanding social economic challenges, is able to provide same level of services despite changes in its environment and has the capacity to even embrace changes and improve. The viewpoint of resilience emphasizes "the need for persistence" that has a connection with sustainable development which has the objective of creating and maintaining prosperous social, economic, and ecological systems (Berkes and Folke, 2003).

Community projects looked from the idea of resilience is that since members of the community depends on services of ecosystems for its socio-economic development; there is need of striving

for resilient socio-ecological systems in light of sustainable development. The systems must be in a position to function as complex, evolving and integrated systems" (Carpenter *et al*, 2001). A sustainable system in terms of a "resilient social-ecological system" according to Carpenter *et al*, (2001) is "one which has a greater capacity to continue providing goods and services that support quality of life while being subjected to a variety of shocks". From the foregoing community water projects should be in a position to withstand the many changes taking place in their environment if they have to be seen to be sustainable.

Researches in water and sanitation sector have tried to define sustainability from different perspectives. In rural water supply, sustainability has been studied by various researchers shedding light on its different aspects and recommends for adopting sustainability factors for supplying of safe water in the rural areas. Sustainable water projects should be in a position to provide services for a long period and is on this bass that Hodgkin (1994) posits that sustainability of a WSS project development is the ability of the project to maintain or expand a flow of benefits at specified level for long period after project inputs have been ceased. Worth noting is that sustainability is not just the ability of the project to just provide services but quality of the service services provided matters for the definition to stand. It is on this basis that Sara and Katz (1997) define sustainability of a WSS as a system which is able to provide an acceptable level of services all through the period for which the water supply system was designed. Abrams, Palmer, and Hart (1998) elaborated definition for sustainable water service as one where water continues to be available in the same quantity and quality for the period for which the system was designed.

Sustainability of a system need not be static as the environment in which the systems operate keep on varying. This assertion is supported by Harvey, Reed and Skinner 2002; Carte, Tyrrel and Howsam 2009) who averred that sustainability should be viewed as a dynamic process, with many interrelated components that change over time. They observed that typical of most projects is the change in the pattern of benefits which increase immediately after implementation and construction phase and the level off as communities take over responsibility. Finally, the benefits drop off over the long-term as communities struggle to maintain their level of service.

Sustainable projects should cover a wide range of issues in line with this Harvey and Reed (2007) defines sustainable rural water supply covering most of the aspects of sustainability. They argue that it is sustainable when "the water sources are not over exploited but naturally replenished, facilities are maintained in a condition which ensures a reliable and adequate water supply, the benefits of the supply continue to be realized by all users over a prolonged period of time, and the service delivery process demonstrates a cost-effective use of resources is that can be replicable". From the above-mentioned definitions this study identified several key issues of sustainability in water and sanitation sector as revealed which include; users to finance operation and maintenance costs, some minimal long term external support and flow of benefit to be continued over a long period of time.

Sara and Katz (1997) divided sustainability under three components, namely technical aspects, institutional aspects and social aspects. Harvey and Reed (2007) categorized sustainability into eight factors which include institutional arrangements, policy context, technology, natural environment, financing and cost recovery, community and social aspects, maintenance, training and capacity building. Several researchers have also depicted sustainability as a dynamic mechanism (Carter, Tyrrel and Howsam, 2009) have proposed a sustainability chain consisting of four essential components namely motivation, maintenance, cost recovery and continuing support from external institutions and avers that if any one of these is missing may endanger the sustainability of whole system.

Community motivation is deemed essential as it encourages community to utilize the new service when they become aware of the benefits in comparison with the previous water service in terms of access, or proximity and safety. It is also observed that motivation, value, worthiness, self interest are a requisite for all including individual consumers (Carter, Tyrrel and Howsam, 2009). Stakeholders involved in water providing water service that include community management, Government organization, Non-government organization, and private sector entity need to make sure there are participation and the delivery of high quality services that include health education, community involvement as well as establish community ownership. These factors are regarded as harmonious to community motivation (Carter, Tyrrel and Howsam, 2009).

Maintenance level for water supply system is dependent on the nature and type of technology in place. That notwithstanding for all types of technology it is essential to have a clearly structured, resourced and trained maintenance organization. For community projects the project management committee bestows this mandate upon caretaker. However in most of the cases such projects require some assistance from the collaborating institution like government or NGO. Therefore an efficient line of communication is vital between community and collaborating institution for low down maintenance response time (Harvey and Reed, 2007).

Water services require cost recovery mechanism in order for their financial sustainability. Cost recovery is essential for water service projects since it enables them meet cost for staffing, training, transport, spare parts, materials, tools, and replacement of units. Cost recovery can ensure projects sustainability hence it is necessary for the community to establish good mechanisms for cost recovery such as the basis of payment, the means of administering and accounting for water charges (Carter, Tyrrel and Howsam, 2009). Water supply services need to function for a long time for the function to term as sustainable. (Mazango and Munjeri 2009) observed that in developing countries water and sanitation facilities work long time when service is managed jointly by community and external support agencies hence they came to acknowledge external support is a vital factor which affects sustainability of water supply.

From the reviewed literature the study adapted sustainability that is based on three broadly defined indicators of a sustainable water project that include operation, maintenance and management. These indicators imply that: Facilities for water services are operational and in a good condition and their benefits can accessed by all the users; this means that infrastructure as the environment around the facilities are technically in good working condition (now and in the near future), so as to always delivers a satisfying colour, quantity and quality of water at an accepted distance to all the intended beneficiaries, in order for them to benefit from a better health (Carter, 2009).

The other indicator of sustainability of water projects has to do with the maintenance of water facilities. A sustainable water community water system has to have a preventive maintenance.

This includes the spare parts, tools which are supposed to within the reach of the community so as to keep the system operational. On the other hand capable caretakers should be available for monitoring and cleaning the water facilities on a regular basis (Harvey and Reed, 2007).

The third indicator of sustainability adopted by this study has to do with project finances. This is in respect of how the financial issue is managed, whether the management water management committee competent, has been elected by the community and has institutionalized structures. When this scenario is in place there is like hood that they set appropriate water fees that is capable to cover administrative, operation, maintenance and replacement costs. It would also be in a position to properly account for the collected finances. A water project with financial sustainability has facilities that continue to function over a prolonged period of time. The definition 'that facilities continue to function' implies that their operation, maintenance and management future aspects are already taken into account. The aspects are for instance budgeting for future repairs, possibilities for extension and financial planning (Sara and Katz, 1997).

2.3 The Concept of Community Participation and Sustainability of Community Water Project

Involvement of community in developmental projects has become a norm rather than an exception. Giordano, Passarella, Uricchio, and Vurro, (2007) avers that the notion has been gaining momentum in the process of human empowerment and development. The term participation is generally operationalised differently depending on the context it is studied. In order to construct a framework to conceptualize and analyze community project participation there is need to define participation.

Participation should instill an individual the capacity for self determination, the claim is supported by Rahema (1992) who avers that participation is linked with moral or desirable goals and the freedom to exercise free will. White (2011) views genuine participation as a "free act that is adherent to moral", which draws its strength from human compassion, unselfish motives, is sensitive to the feelings and worth of others, supportive communication, openness to change in which responsibilities and power are shared'. World Bank working group views participation as a process as in which primary stake holders' influence and share control over development initiatives, decisions making process and the resources which affect them (World Bank,2010).

Participation is supposed to develop many facets of human endeavors this observation is in line with Rahnema (1992) who avers that participation as a development model was introduced to perform cognitive, social, instrumental and political functions. In cognitive terms, participation allowed the tapping of people's knowledge and understanding and formed the basis of new form of development while the social function of participation equipped people with new hope and re-activated the development. In political terms participation legitimized development by establishing a link as well acting as a new source of empowerment of the targeted community.

In the last decade theories on participation distinguished between participation as a means and as an end. Chambers(1997) avers that participation as a mean is a process through which people cooperate and collaborate in project process; as an end participation is a process that empowers people as they gain skills, knowledge and experience which create self reliance and self management. It was observed that participation is low if decision making process and management is under the control of project members and high level when powerless and poor people are cooperatively and actively involved in all stages of the project (World Bank, 2003). Stakeholders views should be consulted when project decision are taken, these views are also shared by World Bank (2003) which measures community participation in terms of information sharing, consultation decision making and initiating action. Information occurs when project beneficiaries are informed about the project objectives and their effects on their lives; consultation means that people are asked to give views on key issues and their views are implemented. Decision making process is required during project design and implementation. Project initiating action takes place when people make steps and decisions about implementing such initiatives. From the literature, there is agreement that in order to achieve community project objectives it is advisable to adopt an effective people oriented approach. This is has the effect of empowering the grass root communities who are supposed to take charge of their own development.

2.4 Community Participation in Decision Making and Sustainability of Community Water Projects

In order to construct a framework to conceptualize and analyze community project participation in decision making the study adopted two viewpoints namely the property theory and outcomes of social learning process. From the perspective of property theory there are useful social

exchanges among collaborative actors and interest groups in a common pool resource. Water being a resource of nature has many stakeholders who lay claim over its access. Ostrom (1999) avers that benefits' from resources of nature should involve consideration of the property rights of participants in which users of benefits are given more voice in the design of institutions for governing the resultant service to increase sustainability. From the foregoing this study opined that project beneficiaries should be involved in all the stages of the project so that they can give their physical as well as psychological support so as to increase project sustainability.

The above perspective is also supported by Gozie, (2007) observations that involvement of project beneficiaries in decision-making increases ownership of development efforts which enhances project effectiveness. Project beneficiaries should be allowed to take an active part in the decision making process of their projects no matter the level of technical and financial assistance offered to the project external institutions (Melo, 2005).

Since the local people are the beneficiaries of development plans and projects it is then imperative to take their views, choices, needs and feelings on board for sustainable projects (Cooke and Kothari, 2001).When project beneficiaries are given a leeway to decide what works for them not only improve their creativity it also lead to empowerment. This observation is consistent with that of Mansuri and Rao, 2004 averred that when the potential beneficiaries are given a free hand to take part in key project decisions making process they are able to initiate their projects that not only help to solve their problems but are also able to exercise their voice and choice and result in empowerment. Involvement of community in decision making process results into better designed projects, better targeted benefits , more cost effective projects, more equitable distribution of project benefits, less corruption, strengthened community capacity to undertake self-initiated development activities and improves the match between the target of the community and what it obtains (Mansuri and Rao, 2004).

Decision-making process is influenced by attributes like participation of members in project design, attendance of project meetings, members control over major project decisions, members control over choice of committee members among others. During this process their interactions results to the building of social capital. This in line with the assertions of Argyris and Schon (1978) that decision-making process is influenced by outcomes of social learning process. When

project members participate they are in a position share their experiences, ideas and values with other individuals and might transform, thus creating the basis for a common understanding of the system or problem at hand. Consequently it facilitates decision making through consensus building.

Project beneficiaries can only arrive at the right choices only when they have the relevant information about the available alternatives. This assertion is supported by Carter, Tyrrel and Howsam (2009) by proposing that the extent to which community is able to select a supply option that is sustainable depends on the knowledge and the information about the water system. Therefore the researcher opines that some effort should be spent in making the community to be better informed. M&E practice is important in contributing necessary information needed for decision making. The information needed should include project context, and data on the quality of implementation, why given changes have or have not come about and what we can be done to make efforts to be more effective in future(Nyonje,Ndunge and Mulwa,2012).
Participation of community in decision making process can as well be examined from the perspective of the theory of social learning..

However the concept of community project participation is not free from flaws ranging from high cost of decision making, delays in project implementation, and the risk of elite capture. This is consistent with Ganande and Dagg (2005) who argues that democratic decision making processes may not necessarily imply greater efficiency or material outcomes because the degree of power that consumers can effectively assert does not flow automatically from them. Critiques of community decision making blame the process for being costly and slow as compared with convectional forms of projects, such that a project may take longer to engage, work and come to a consensus with local communities besides such projects having a higher start up costs than convectional projects (Ganande and Dagg (2005). In addition, community participatory projects are criticized for reaching a smaller population than traditional development. This is attributed to the fact that Community dialogue and augmentation may initially involve only a few individuals (Hays, 2007).

When you take into account that time is directly proportional to money, community decision making process is a time-consuming process and hence it is sometime difficult to justify it due to

the high expenditures of the approach (UNDP, 2010).However since of lack of trust in the ability of communities to make sensible decisions, governments still cling to this paternalistic approach of decision-making process (Lockwood, 2001).That notwithstanding it is the observation of the researcher that lack of capacity to make sound decisions by the community could be harnessed if governments collaborated with them c in capacity building. If this is done perhaps it could go a long way in eliciting the support of beneficiaries which is very crucial for project sustainability.

To assist project stakeholders in decision making some effort should be made to embrace M&E policy at the stage of project planning. According to Nyonje Ndunge and Mulwa (2012) `information generated through M&E provides the project stakeholders with a clear basis for decision making at the project planning stage. They go on to say that M&E could enhance learning, strengthen design and, enrich quality of project intervention. From the foregoing it is clear that the intervention of M&E policy can go a long way in strengthening the performance of project thus increasing impact of the project results to beneficiaries and perhaps leads to project sustainability.

Household view is very crucial in determining the quality of participation this view is in line with Isham and Kahkonen (2009) who asserts that extent of participation of community in decision making process is determined in terms of the share of involvement of households in particular planning or construction activity. On the other hand intensity of household participation is measured using the following indicators; quantity of cash or labor contributed, the number of planning meetings attended preceding the construction, and whether households identified themselves with project-related decisions. In an effort to address the challenges posed in sustaining water supply infrastructure planners in the water sector came up a paradigm shift from a centralized supply-driven towards demand-oriented strategy in which communities are given a chance to choose the technology and capacity of their water supply system (Briscoe and Ferranti, 1988). World Bank sponsored two empirical studies whose findings suggested that demand-oriented planning has improved project performance of rural water supplies programs in developing regions.

One of the studies was undertaken by Sara and Katz (1997) who investigated the extent to which demand responsiveness planning affected sustainability projects. The study was conducted

among 125 communities in 10 rural water projects across six countries. Data was collected using direct observation and project inspection, focus group discussion and house hold interviews. Hypothesis that stated "at the community level demand-responsive water supply services are more sustainable than those the less demand-responsive ones" was confirmed (Sara and Katz, 1997). This indicated that demand responsiveness which also associated with community choice is positively with indicators of project sustainability. While this study covered 10 projects that were spread in six different countries, a similar study using interview guide, focus group discussion and household questionnaire was imperative to find out if similar results would be arrived at in a scope of 10 community water projects in one county.

When individuals are given autonomy to make decisions over their projects they are able to make choices that work best for them which can lead to project effectiveness. This is assertion is supported by a world Bank study carried by Isham, Narayan and Pritchett (1995) who examined record s of 121 rural water projects in various parts of the world. The studies examined the extent to which the degree of control exercised by community members over project-related decisions during planning and construction influenced project effectiveness. Project effectiveness was measured in terms of construction quality, ongoing management, and the benefits delivered to community members. The findings indicated that greater community control was significantly associated with improved project effectiveness which in turn improved project sustainability.

This study obtained data using document review that notwithstanding the study failed to collect data primary source therefore a study was imperative that collects data from primary source. Furthermore this study concentrated on the influence of community project control on project effectiveness but didn't find out the influence of community project control on project sustainability; hence the necessity of a study in this respect.

Another study that underpinned the role involvement of project beneficiaries in decision making with better project performance was done by Prokopy (2005). The study examined 45 rural water projects in India. The study found out that involvement of household in decision making is associated with indicators of better water project performance however households' attendance of planning and construction meetings was not. Whereas this study only attributed household involvement to project performance but it wasn't clear how household involvement on decision

making affected project sustainability because a project that is initially performing well could as well collapse in the long run hence is not sustainable. Therefore a study on this area was imperative.

When community is given freehand to make choice of what of the project design they most likely choose projects they are able to maintain. This is supported by a study carried in Northern Pakistan by Khwaja (2004). The study found out that involvement of community in nontechnical decisions in infrastructural projects households' was associated with better maintenance of assets while involvement in technical decisions was found to be detrimental to maintenance. Though Kwanja's study has attributed household decision to an indicator of sustainability in non technical areas of a project it only concentrated on project maintenance but didn't shed light on the influence household participation on the overall sustainability of a project hence a study was necessary to shed light in this area.

Grassroots participation of projects by households enhances their capacity to make informed decisions besides boosting their confidence in the project which can lead to project sustainability. A study by Adekeye and Niyi (2012) examined the effect of grassroots participation in decision-making process on sustainability of community development projects in Nigeria using a descriptive survey research design in which stratified random sampling technique was adopted to select respondents from nine communities' in Osun and Kwara states. Questionnaires were used to collect data on grassroots participation in decision-making process and on sustainability of community Development. One research question was answered and two hypotheses tested at 0.05 level of significance. Data was analyzed using Pearson's Product Moment Correlation.

Results showed that there is a positive significant relationship between grassroots participation in development projects and project sustainability. While this study concentrated on community developmental projects a study specifically on community water project is needed. While (2012) collected data using a questionnaire, this study collected data using questionnaire, focus group discussion and interview from 10 community water projects in one county. Adekeye and Niyi study dwelt on maintence of projects but not on implementation, more to that this study dwelt on infrastructural project and not on community water projects hence a study on water project was necessary to fill the knowledge gap.

2.5 Community Participation in Resource Mobilization and Sustainability of Community Water Projects

Community participation in resource mobilization is closely linked to the question of project ownership and sustainability (Isham and Kahkone, 2009). Community projects require resources that are needed to meet the recurrent costs of running and maintaining the system .Resource mobilization could take many forms depending on the different shades and capacity in different project stakeholders, this assertion is in line with the arguments of White, (2011) who asserts that depending on individual circumstances; resource mobilization need not always be financial in nature, but could either be in-kind, labour and local materials. In the same vein Ostrom (2000) observed that as a condition breaking the patterns of dependency and passivity it was necessary for project beneficiaries to provide labor, time, money and materials. Water is a shared resource and as such individual should cooperate in its exploitation, this view is also shared by Reed-Erichem, (2003) who emphasized that since water is a shared common property resource and water services have basic investment costs it is imperative that local communities work together to manage the resources and the services accruing. That notwithstanding they could engage civic organizations and donors to encourage existing incentives for shared action or co-production the services.

Continued involvement of members of community projects in the aspects of maintenance and management of the water system and is an important indicator of project resource mobilization. This view is also held by Harvey Reed and Skinner, (2002) who argues that projects require collecting tariffs and costing recovery to cover routine operation from beneficiaries.

Demand by household to be connected to water can be used to signal their willingness to support the project, this assertion is supported by Reed-Erichem (2003) who observed that the demand to be connected to access safe water determines how willing individuals are to pay for the services. In the same note Evans and Colin (2005) observed that the level of willingness of users to provide the necessary resources to keep the system functioning which include time, money and labor may affect the level of sustainability of rural water system.

The willingness may be affected by socio-economic factors such as income level, ethnic homogeneity, and the social capital of the villagers (Evans and Colin, 2005). That

notwithstanding willingness also depends on the satisfaction consumer derives from the water service, this view is held by (Evans and Colin, 2005) who argues that water beneficiaries would be more willing to pay for operation and maintenance if they perceived significant improvements in services of the water system. Water service beneficiaries would motivated to pay if they felt ownership of the project, this view is in line with that of Brikké and Rojas, (2001) who asserts willingness of the community to pay for water is also affected either by perceptions of ownership or sense of entitlement to free services from the government.

Willingness of the beneficiaries to pay for services provided by the water projects is crucial in sustainability of projects. This claim is supported by a study Ohiani and Oni (2010) who observed that many of the efforts to strengthen sustainability of community water projects are mainly directed towards the willingness to pay .This variable is influenced by project approaches and plays a key-role in sustainability of rural water projects and can be described as the decision taken under a situation of free choice to spend some of the available resources on a service or good. Whereas some project beneficiaries may be willing to pay they find themselves handicapped by lack of cash however it is they could also contribute in other forms which could benefit they projects .This observation is supported Cornwall, (2009) who avers that willingness to pay is an expression of the willingness to contribute not only in cash, but also in kind

The level of household participation in resource mobilization can be used to measure demand for water. This assertion is supported by Katz and Sara (1997) who avers that community resource mobilization is an indicator of a demand-responsive project and can be used to differentiate from a project in which people simply participate. Community contribution is the amount people give in cash, in kind, and labor in exchange for services, and should, be linked to the relative costs of providing different levels of service (Katz and Sara, 1997).

The degree of the community to contribute project resources has bearing on its performance. This observation is supported by a study by (Haysom, (2006) who examined the sustainability of rural water supplies in 38 villages in Tanzania on local financing and cost recovery. The study established a direct correlation between local contributions and project functionality. Whereas some communities had established water saving accounts in which communities deposited local contributions for operation and maintenance others didn't. The study found that over 85% of

projects in which communities deposited local contributions into a water account were regularly operating and repairing their water systems. However none of the communities with a failed system had a water account. This is indicated that of lack of local contribution of funds led to system failure. This underscores the importance of the role played by funds contributed by the community in the sustenance of community projects.

Community project control and ownership may motivate the project members to take project responsibilities that may enhance sustainability. However literature review conducted by Harvey and Reed, (2007) on studies of community water projects in Ghana, Kenya, Uganda and Zambia found that contrary to the popularly held view that community principle encouraged project beneficiaries to own and take responsibility for ongoing project operation and maintenance (O&M) which leads to project sustainability. Contrary the study found that community management didn't automatically lead to willingness to manage or finance water supply over a prolonged period of time as facilities fell into disrepair soon after installation.

An empirical relating community resource mobilization and sustainability of community water was carried out by Okungu (2008) in Kisii County in Kenya. The study examined the influence of community driven projects, participatory appraisal and resource mobilization on sustainability of donor funded projects .The study established that community participation in donor funded projects was high during implementation but waned in the post project period. That notwithstanding the study failed to find the effect of failure of community resource contribution to project sustainability. Both Isham, and Kahkonen (2009) and Khwaja (2004) studies confirmed that when community mobilized resources projects performed well but Khwaja found that community mobilization is only valuable for nontechnical aspects of the projects. However none of these studies addressed the influence of participation in resource mobilization on sustainability of community water projects.

2.6 Community Participation in Institutional Collaboration and Sustainability of Community Water Projects

Implementation of projects through community participation has its own challenges owing to the limitations found in the communities. This assertion is supported by both scholars and development practitioners such as Rosensweig (ed.) (2001) who avers that despite the many

positive impacts, community managed projects continue to face many challenges in sustaining services over the long-term. The challenges faced by community base projects could be bridged if the projects sought some form of external assistance. This observation is in line with Lockwood (2002) who asserts that majority of communities are not able to sustain their systems alone and therefore require some form of external assistance which can be provided by a range of institutions, from national and local government, to the private sector, NGOs or self-help associations.

In order to have meaning and positive collaboration community water projects requires a guiding policy or rules of engagement, similar views are made by Lockwood, (2002) who observes that for institutional support to communities to be effective it is imperative that they be anchored in supportive sector policies with clearly defined roles, responsibilities as well as consistent financing . This notwithstanding according to (Rosensweig (ed.) 2001) it has been observed that many countries lack an institutional framework to provide a systematic external institutional back-up and as such most of the projects do not last for long before collapsing.

A number of empirical studies suggest that abilities of communities to sustain their projects is limited and suggest that they should be encouraged to lobby for continued support for marginal inputs and training from the relevant and capable institutions (Lockwood, 2002).

An empirical study relating external institutions support to sustainability of community project include a study carried out by Cleaver, (1999) who examined the effect of community participation in water projects in Sub Saharan Africa. The study established that although communities were successful in creating water project, they may later lack the material resources and the connections to sustain the efforts.

Collaboration between development partners is vital in ensuring the availability of skills and enhancing capacity of the project. This observation is reinforced by Mazango and Munjeri 2009) who carried out a case study of community water management in a hyperinflationary environment in Nkayi district in Zimbabwe. The study found out that water supply is being a long term function needed facilities that could work for a long time. The study also found out that in developing countries water and sanitation facilities only worked well for long time if the

service is managed jointly by community and external support agencies; hence the study recommended the need to deploy government agencies or NGOs for follow-up support.

The support received by a projects from external institutions in areas they face challenges enhances project performance. This idea is supported by an empirical study by Sara and Katz (1997) that established that success of community participatory projects goes beyond the construction of the project facilities. In order for them to succeed it entail the ongoing and dynamic involvement of external agencies.

External agencies are essential to provide marginal inputs and training to project staff and community members which is crucial in making the community make informed decision and for project maintenance. This observation is underpinned by Netshiswinzhe (2000) who demonstrated the need of financial training of water management committee.He noted that committees that don't have the capacity to do financial planning are not able to determine service tariffs and deal with non-payment and therefore training should broaden the local level of financial management capacities instead of focusing on the individual.

Household should also be made aware of the cost of production of water and its delivery to the consumer or households so as to increase user commitment. Awareness should be inform of information about pumping cost, treatment, maintenance of lines, supply and how they relate to the charged water tariffs. This observation is supported by an empirical study conducted by Ntwengwe, 2004 established a linkage between awareness and user commitment. The study established that awareness by the beneficiaries improved their willingness to pay, which will avert financial challenges during the O&M stage which are key attributes to sustainability.

Intervention of M&E practices is important for project in eliciting support from external institutions. Information generated through M&E is important in providing regular feedback besides acting as a tool of project accountability to project funders. M&E practice is useful in can be used to generate detailed information about projects implementation process and results. Such information is useful for public relation exercise; elicit project funds as well as identifying possibilities for project replication (Nyonje, Ndunge and Mulwa 2012).

Project collaboration with external institutions can enable a project to be in a position to access resources that are otherwise not locally available but very critical for project continuance. This observation is underpinned in the study by Whittington and Davis and Iyer (2002) who carried out study on some 400 rural water projects in Bolivia, Peru, and Ghana. The study established that demand-driven, community management model and institution collaboration in areas of technical advice, training and project financing from public agencies or NGOs led to improvement in project performance.

Four case studies from Africa and India by WaterAid, (2005), examined the attribution of impacts and project continuance after construction to the level of external support to community water supply projects. The study observed that there was an increase in the level impacts of interventions and project continuance with increased level on-going external support.
This notwithstanding a similar study is necessary to find out if similar results would be achieved using a survey in place of case studies.

A case study on the effectiveness of use of participatory project appraisal (PRA) tools on cooperation and collaboration between community and external agencies in rural water projects in East Java (Peltz, 2008) found out that application of PRA tools increased cooperation and collaboration between community and government as well as NGOs. However this study didn't find out if the cooperation and collaboration were effective in sustenance of community projects.

An empirical study on the effects of community management model in oats water supply scheme in Ghana Opare, (2011), found that community management model among other issues enabled the projects to minimize internal differences, increase technical knowledge and management experiences .the study also established that project co-management with public agencies, private firms immediately after commissioning enabled the community able to assume full responsibilities thereafter six months. That notwithstanding the study didn't find out if the co-management with external agencies influenced project sustainability.

A study on the effect external agents on community tank management in South India by Mosse (1998) found that active community involvement in the maintenance of community infrastructure is a factor of external agents. A study by Kleemeier (2000) on the influence of external institutions in technical collaboration on the performance of community piped water

projects in Malawi and found that found that 50% of projects not receiving technical collaboration were performing poorly.

Studies by Opare, Kleemeier and Mosse addressed the influence of external collaboration project performance. Opare and Kleemeier studies addressed the influence technical external collaboration on project performance while Peltz addressed the effectiveness of PRA tools on collaboration between community and external agencies; however none of the studies addressed the influence of community participation in institutional collaboration on sustainability of community water projects.

2.7 M &E Practices, Community Participation and Sustainability of Community Water Projects

This theme examines at how M&E practices, moderates the relationship between community participation and sustainability of community water projects.

Hailey and Sorgenfrei, 2004; Guijt, 1999) observed that the practice M&E in the development arena has found increased relevance as the strategies to achieve development emphasizing social change have the concept of success become difficult to measure.

In the year 2000 the United Nations introduced into the development arena the Millennium Development Goals (MDGs) which placed poverty reduction as the paramount mission of development, while stressing the importance of achieving the desired results by 2015.

There is emerging trend in the global community regarding the need for effectiveness projects and place emphasis on those engaged in project implementation accountable for their overall impact. This trend has resulted to an increased focus on M&E practice in terms of measuring performance. Publication by Hirschman 1967 "Development Projects Observed" linked the role or project evaluation with project performance (World Bank, 2004).

The increased demand for comprehensive reporting practices and rise of sound management has made project performance a central agenda in the developmental field (Reeler, 2007).Consequently M&E in the developmental arena is supposed to play two vital roles; demonstrate accountability for funds to project stakeholders and shore up performance by providing relevant information to facilitate sound management decisions. The latter implies that

M&E increases the capacity of the project team to respond and manage which in turn translate into better project performance and thereby project "sustainability" (Crawford, 2004).
To monitor and measure results of development interventions many organizations embraced the practice of Monitoring and Evaluation.

Monitoring and evaluation practices can guide a project towards achieving its objective. Kolb (1984) articulates the same argument, that one of the tasks that a developmental project should be able to execute is the monitoring and evaluation of progress towards the achievement of the intended objectives. M&E information can be useful in strengthening project performance thus increasing the impact of the projects results to beneficiaries. According to Kusek and Rist (2004), monitoring provides descriptive information on where an intervention is at any given time in relation to targets and outcomes while evaluation provides an analytical view, giving evidence of how and why targets and outcomes are or are not being achieved.
Project stakeholders should consider embedding M&E during the project formulation. According Valadez and Bamberger (2000) monitoring and evaluation should be considered complementary parts of an integrated practice. Consequently monitoring provides information and data whose value evaluation is very much dependent. M&E should take place either continuously or periodically from the time the project is formulated through implementation and the operational phase. Thus, the study will refer to monitoring and evaluation as one concept thus the "M&E practice".

For an M&E system to be effective it is good practice that some planning should go into it. This assertion is supported by Taylor, and Balloch, (2005) who observes that an M&E plan that is adequately documented encourages project stakeholders what to do in terms of M&E activities before implementation of a project begins. Therefore details of how monitoring and evaluation will work within a project should be written up at the earliest possible time. There is need to provide greater detail which should be captured in an M&E plan. Taylor and Balloch, 2005 asserts that an M&E plan will not only enhance understanding amongst different stakeholders of the tasks ahead, but should also alert planners to the time and resources required for proper monitoring and evaluation work. Taylor, and Balloch, (2005) avers that good M&E practice suggests that the process of developing an M&E plan involves a wide an engagement with different stakeholders as

possible, and certainly anyone expected to carry out the work contained in the plan should be informed or consulted during its development.

For M&E practice to enhance tracking project accountability there is need to feed project information into it so as to help in tracking of project progress. This view supports that from UNDP (2000) that avers that Monitoring information should be fed into the project monitoring and evaluation process to build up data bank that can be used to improve the selection and design of future projects besides improving the project, in line with this observation the study sought to investigate in M&E information was fed into the M&E process to track project transaction and enhancing improvements. Kusek and Rist (2004) assert that M&E is a powerful tool that can be used to "help policy-makers and decision-makers track progress", while at the same time, "demonstrate the impact of a given project, program or policy," therefore enabling accountability (Kusek and Rist (2004). According (Binnendijk, 2000) M&E can also be conducted geared towards enhancing accomplishment of results. In this case M&E is conducted in view of attributing results to factors which can be changed in order to enhance effectiveness. This is enhanced through regular feedback of performance information and consolidation of lessons learned into decision making and management.

M&E intervention which is also referred to as managing-for-results tool during project implementation can be used to achieve project results. This assertion is supported by Kusek and Rist (2004) who observed that results-based M&E systems, when implemented effectively, can be an institutionalized form of learning around results. Since results are at the heart of development projects, then projects can incorporate a results-orientation by embracing M&E practices in all projects processes (Everett, 2003).

According to Kusek and Rist (2004) result based M&E practices are concerned with the provision of information about results that enables verification of the progress of development interventions towards the achievement of outcomes. Use of the information creates knowledge and learning around results hence improves performance and effectiveness of development intervention. This study will seek to find out if the information obtained from M&E of service delivery improves performance of community water projects.

The water act of 2002 paved the way for the Kenya water sector to embrace the interventions M&E tools in the development and management of water projects. The M&E policy is important in the management of water projects as it creates knowledge and learning around results that is useful to project stakeholders in improving project performance. According to Bernt (2014) M&E practices can provide use data for, decision-making and planning. It also help project stakeholders manage activities enhance transparency and support accountability relationships by revealing the extent to which the project has attained its desired objectives. It is in this light that this study seeks to find the moderating influence of the said M&E practices on community participation and project sustainability.

M&E Practice is vital during the stages of project implementation, management as well acting as a tool for project sustainability. This agrees well with that of Binnendijk, (2000) who avers that M&E practices has to be at the centre of project implementation if has to improve performance, Van den Berg (2005) who notes that evaluation in the light of M&E practices has moved from the study of input and output, as well as their related processes of causality, to the assessment of outcome, impact and/or long-term results. Therefore it is imperative that developmental practitioners embrace M&E practices in all facets of project cycle so as to ensure better performance as well as sustainability

Project mangers as well project stakeholders need to make decisions that are well informed and given their role in producing performance information. This proposition is confirmed by Kusek and Rist (2004) who affirms that Results-Based M&E is a powerful tool that can be used to "help policy-makers and decision-makers track progress", while at the same time, "demonstrate the impact of a given project, program or policy," therefore enabling accountability. Therefore this study will endeavor to explore how information obtained from M&E is to improve project design selection, planning and accountability.

Rojas (2009) carried out an empirical study on analysis of influence of implementation of result based M&E system on organization effectiveness in multilateral development organizations. The study used a case study where primary data was collected using interviews and participant observations while secondary data was collected using document review. The study found that use of Result-Based M&E improves organizational management but not organizational

effectiveness. Linkage between use of RBM&E and improvement of organizational management is attributed to the program requirements need for a framework to meet accountability demands such that the framework is designed toward these demands rather than influencing organizational effectiveness. A similar study but using mixed method of study is important to seek if M&E that is tailored toward learning from results can improve on indicators of project performance hence project sustainability.

Warren and Susan (2011) conducted study on analysis of feminist voices, in women, technology, and international development ideologies. The study was based on a co-operative society which was to generate income from the sale of the flowers. The study established that projects failed when women reduced their participation to protest the fact that men were the only ones who received payment. The study recommended that effective monitoring and evaluation would play a vital role in detecting the signs of project failure and hence suggesting corrective actions that may be necessary. However this study failed to explore how monitoring and evaluation practices impacts on project sustainability.

Ondari & Gekara (2013) carried out a study on factors influencing successful completion of roads projects in Kenya. The study found out that use of work schedules and plans to monitor project implementation by project teams which had supervision capacity had a significant influence on the successful completion of projects. This study corroborates with the other studies that monitoring and evaluation is critical to project success even in Kenya. However this study was based on construction projects but did not explore the influence of M&E on the relationship between participation and sustainability of water projects.

Ika, Diallo & Thuillier (2012) carried out an empirical investigation on Critical success factors for World Bank projects: The study found out that project in Africa often failed due to lack of effective monitoring and evaluation. The study further found out that projects in Africa are faced by four main problems namely one-size-fits-all technical trap, the accountability-for-results trap, the lack-of-project-management-capacity trap, and the cultural trap. The study recommended that increase in supervision and monitoring efforts as one of the actions that should be taken to avoid some of the traps. This study indicated how M&E practices can help projects avoid traps but did not address how M&E practices can impact project sustainability.

2.8 Theoretical Framework

The major theory guiding the study is the System theory which was developed by Ludwig von Berlanffy (1968), the is complemented sub theories which include organization learning theory and social learning theory whose proponents were Argyris and Schon (1978) .

2.8.1 System Theory

System theory was developed by Ludwig von Berlanffy (1968) and was propounded by the work of Daniel Katz and Robert Kahn of general systems and social ecological systems (Katz and Kahn, 1966).Systems thinking imply that the world can be understood in terms of complex interacting wholes that have inherent characteristics attributable to wholeness rather than properties of component parts. The wholeness in Community water projects can bring about sustainability of the projects. This can be brought about by the interactions of various components of participation which include community participation in decision making; resource mobilization; and institutional collaboration.

2.8.2 Organization learning Theory

The study is as well underpinned in organization learning theory which was developed by Argyris and Schon (1978). They asserted the need for organization to learn so as to enhance performance. The need for learning is also emphasized by a growing body of literature linking organizational performance with their ability to learn in complex and unpredictable environments (Senge, 1995). Community water projects in their attempt to moderate sustainability have enhanced the stakeholders' ability to learn through M&E practices by increasing M&E budget support, collecting relevant data, enhancing capacity to conduct M&E activities, utilization of M&E data, and usage of M&E results to enhance decision making. This study seeks to establish the moderating influence of monitoring and evaluation practices on the relationship between community participation and sustainability of community water projects in Kenya.

2.8.3 Social learning theory

The outcomes of a social learning process are assumed to influence both the social process and the outcomes of the decision-making process (Argyris and Schon (1978). Social learning may result in the generation of new knowledge and technical and social skills as well as a change in cognitions and attitudes. By sharing and reflecting on our experiences, ideas and values with

others, individuals might transform these, thus creating the basis for a common understanding of the system or problem at hand. This may enable a group of stakeholders to reach agreement and decide on collective actions based on a shared understanding of the situation (Senge, 1995).

2.8.3 The Relationship between the Theoretical and Conceptual Framework

The main theory under which the study is anchored is system theory. The thinking in the system theory implies that the world can be understood in terms complex interacting wholes that have attributes of wholeness. From the perspective of the interactions of variables in community water projects different forms of project participation which includes decision making process, project resource mobilization and institutional collaboration interacts and results to wholeness is project sustainability. Literature on Organizational learning theory indicates that organizations like community water projects are in a position to enhance learning through M&E practices which leads to quality decision making process and better utilization of projects resources which results to better project outcomes and hence project sustainability. Social learning theory influences the social processes which results to generation of new knowledge, technical and social skills that increases efficiency and effectiveness in the management of community water projects. Social learning theory Also improves cognitions as well attitudes which transforms individual stakeholders involved in participation such that they have a common understanding. Hence project participants are in a position reach consensus in decision making and take collective actions of participation in resource mobilization and institutional collaboration which leads to sustainability of community water projects.

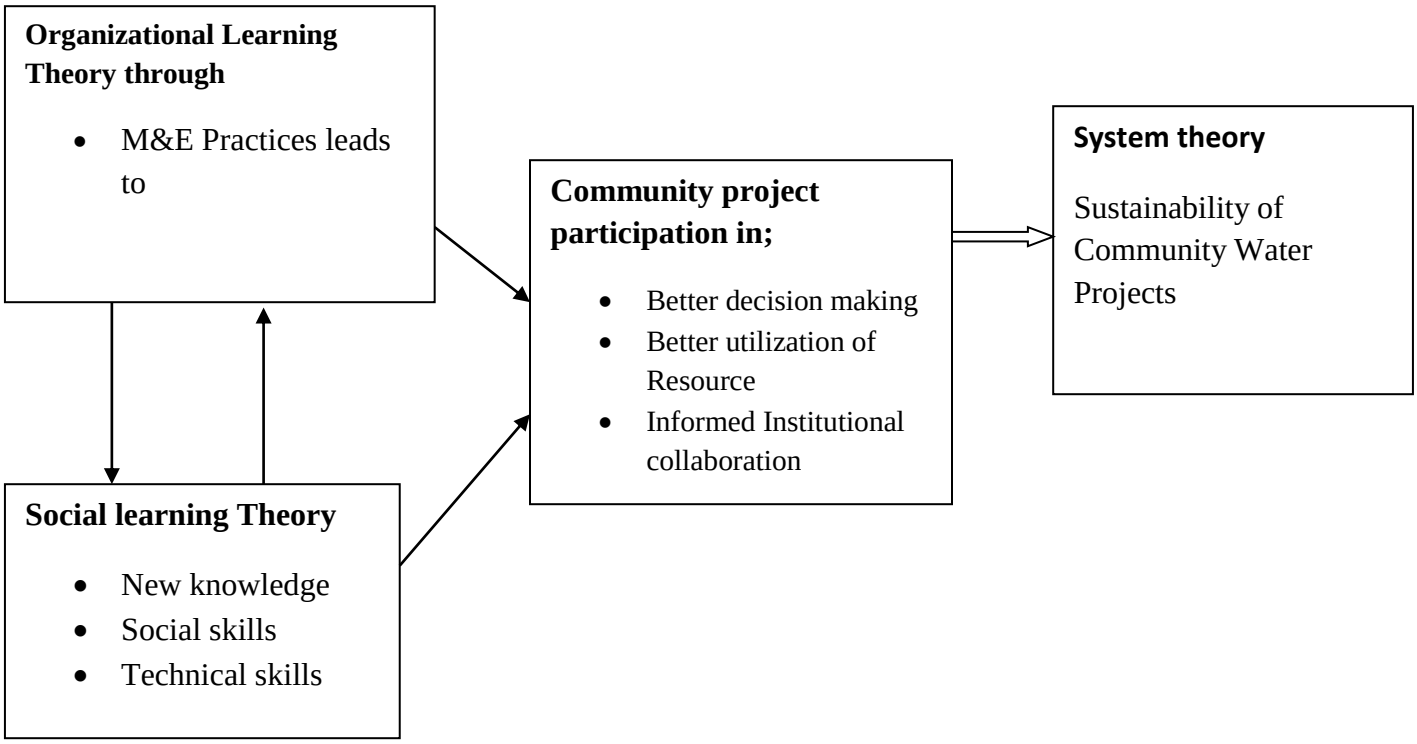

Figure 2.1 Relationships between Theoretical and Conceptual Framework

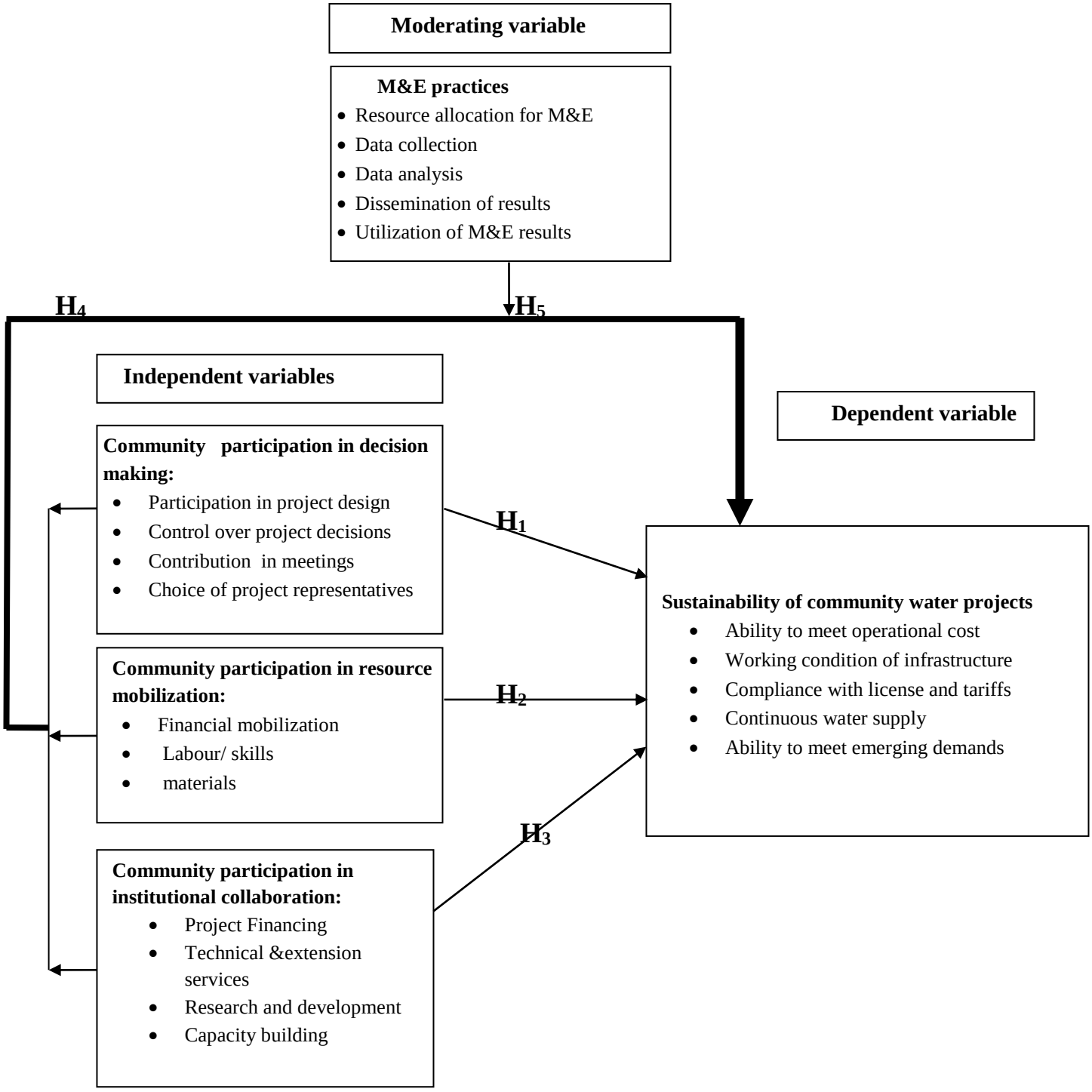

Figure 2.2 Conceptual M&E Practices, Community Participation and Sustainability of Community Water Projects

The conceptual framework shows the moderating influence of monitoring and evaluation practices on the relationship between community participation and sustainability of community water projects. The figure illustrates how independent variables namely community participation in decision making, resource mobilization, institutional collaboration directly relates to dependent variable. It also illustrates how the independent variables are moderated by M&E practices in their relationship with the dependent variable (water project sustainability).

Table 2.1 Summary of the Literature Review

Variable		Author & (Year)	Title of the study	Findings	Knowledge gaps	Current Study
1.	Community Participation in Decision Making	Sara& Katz (1998)	effects of decision making process on performance of water systems	Demand-oriented planning is associated with indicators of project sustainability	Data was collected using direct observation and inspection, focus group discussion and household interviews across six countries.	A study where data was collected using questionnaire, focus group discussion and interviews in 3 sub counties in Kenya.
		Isham & Kahkonen (1995)	impact of decision making procession infrastructure i 121 projects in development in Northern Pakistan	Greater community participation in decision making process is associated with better designed community projects	Collected data using document review. Didn't state whether the greater participation in decision making led to project sustainability.	A study that collect primary data is imperative to attribute the influence of decision making to project sustainability
		Khwaja(2004)	Influence of household in decision making on project maintenance	Household decision making is associated with better asset maintenance	It didn't shed light on the influence household participation on the overall sustainability of a project hence a study is necessary to shed light in this area	A study is necessary to shed light on if household participation leads to project sustainability

		Prokopy (2005)	Carried out a study on influence of household decision making on project performance	high level of participation in decision is correlated with better project performance	The study didn't address itself to the influence of decision making on project sustainability	A study is needed which seeks to collect data using questionnaire, focus group discussion and interview to find out the influence of house hold in decision making on project sustainability
		Adekeye & Niyi (2012)	Using a descriptive survey examined the effect of grassroots participation in decision-making process on sustainability of community projects	There is a positive significant relationship between grassroots participation in development projects and project sustainability	The aforementioned study collected data using a questionnaire and studied influence of grass root decision making on maintenance of developmental projects	A study where data is collected using questionnaire and triangulated using FGI and interview guide is necessary
2.	Community Participation in resource mobilization	Isham & Kahkonen (1999)	community resource mobilization on effectiveness of Indonesian water projects	When house hold mobilized, and monitored resources during project implementation the projects performed well	The study didn't find how the projects performed beyond the implementation period to know if the said performance was sustainable	The study will find out if the of household resource mobilization on project sustainability
		Sara & Katz(1997)	Effects of community resource mobilization in demand responsive water systems in East Java, Indonesia	Where household viewed resource mobilization as a tax and could not draw the link between it and the level of services didn't lead to project sustainability	The study didn't find out how the project performed when the level of resource mobilization was linked to the level of service delivery	Will find out if resource mobilization leads to better project service delivery

		Khwaja (2004)	Impact of community resource mobilization on infrastructural development projects	Community participation in nontechnical aspects of the projects like cash and labour and led to a more sustainable projects	Didn't find out the influence of community resource mobilization in community water projects.	An empirical is imperative to show if community resource mobilization lead to project sustainability
		Okungu (2008)	Community participation in resource mobilization in donor funded projects	Community participation in donor funded projects was hig during implementation but waned in the post project period	The study didn't find out I community participation during implementation led project sustainability	The study will find out if community participation during project implementation leads to project sustainability
3.	Community participation in institutional collaboration	Mosse (1995)	Effects of external agents in maintenance of tank management in community infrastructure in south India	-Maintenance of community infrastructure is often crucially dependent upon external agents	Didn't if the said dependency led to project sustainability	The study will find out if the external project support lead to project sustainability
		Kleemeier (2000)	Performance of community piped water projects in Malawi	50% of projects not receiving technical collaboration from external institutions were unsustainable	Didn't find out the influence of institutional collaboration in areas of capacity building, M&E ,and project financing on project sustainability	The study will find out if institutional collaboration in areas leads to project sustainability

		Water Aid (2000)	Studies on whether the impact of RWSS projects is influenced by longer periods of external support to community organizations after system construction	Continued and on-going external support to community organizations contributed both to an increase in the impact of interventions and to the length of time over which these impacts were sustained.	Didn't find out the influence of community participation in institution collaboration on sustainability	The study will find out the extent to which community institutional collaboration influence project sustainability
		Peltz (2008)	Effectiveness of use of PRA tools on cooperation and collaboration between community and external agencies in rural water projects in East Java.	Use of PRA tools increased cooperation and collaboration of community with government and NGOs	Didn't find out if the increased cooperation and collaboration between community with government and NGOs led to project sustainability	The study will try to establish the link between the level of collaboration and the level of project sustainability
		Whittington *et al*,(2000)	The role of supportive external relationships on project performance	found that the demand-driven, community management model and ongoing support improved project performance	Didn't find out if the observed performance was sustainable	This study seeks to explore if external support leads to project sustainability

		Mazango & Munjeri (2009)	Water management in a hyperinflationary environment in Nkayi district in Zimbabwe	water and sanitation facilities work for long time if service is managed jointly by community and external support agencies	Didn't specify the areas of institutional collaboration that result to project sustainability	This study seeks to find out if community participation in institutional collaboration in financial mobilization, technical, research and development and capacity building influence project sustainability
4.	M&E practices, community participation and sustainability of community water projects	Rojas(2009)	Influence of result based M &E system on organization effectiveness in multilateral development	M&E improves organizational management but not organizational effectiveness.	Rojas used case study	This study seeks to use a mixed method of study to find out if M&E practices can lead to project sustainability.
		Warren and Susan (2011)	Analysis of feminist voices, in women, technology, and international development ideologies	Projects failed when women reduced their participation to protest the fact that men were the only ones who received payment. Recommended that effective monitoring and evaluation would play a vital role in detecting the signs of project failure	This Study failed to explore how monitoring and evaluation practices impacts on project sustainability.	This study will seek to establish if M&E practices influence project sustainability

		Ondari &Gekara (2013)	Factors influencing successful completion of roads projects in Kenya.	Use of work schedules and plans to monitor project implementation by project teams which had supervision capacity had a significant influence on the successful completion of projects.	This study was based on construction projects and didn't find out if use of M&E has influence on water related projects.	This study will find out the influence M&E on the relationship between participation and sustainability of water projects
		Ika, Diallo & Thuillier (2012	Investigation of Critical success factors for World Bank projects	Projects in Africa often failed due to lack of effective monitoring and evaluation and that increase in supervision and monitoring efforts could help projects avoid failure	This study indicated how M&E can help projects avoid failure but did not address how M&E can impact project sustainability.	This study will find out if M&E has influence on project sustainability

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology that was used in conducting the study. This includes; research paradigm, research design, target population, sample size and sampling procedure, research instruments, data collection methods, data analysis techniques, ethical consideration and operationalization of variables.

3.2 Research Paradigm

Paradigm influences the way knowledge is studied and interpreted and its choice sets down the intent, motivation and expectations for the research (Mertens, 2005). The paradigm that was found suitable for this study is Pragmatism. For pragmatist knowledge claims and understanding arise out of actions, situations, and consequences rather than antecedent conditions in which there is a concern with applications of "what works and solutions to problems" (Patton, 2010). In this case a pragmatist will focus on multiple approaches to understand the problem (Rossman& Wilson, 1985). A pragmatic approach is based on abduction reasoning that employ both induction and deduction reasoning to enable use of both qualitative and quantitative methods in the same research study (Creswell, 2008) The paradigm has the advantage of being flexible in its investigative techniques because it allows the use of both qualitative and quantitative techniques of gathering information. Qualitative research is used to enlighten the quantitative segment of research studies (Onwuegbuzie and Leech, 2004). The philosophy is further advanced by Tashakkori and Teddlie (2003)) who argue that pragmatism is best paradigm for justifying the use of mixed methods research.

The study applied pragmatism as its philosophical underpinning because it sought an understanding of the depth and direction of the relationships between variables by use of direct measurement of variables in the quantitative study.On the other hand the study sought a deeper and wide understanding of the different realities and meanings as a pertains to the relationships between the variables namely sustainability of community water projects, M&E practices and community participation through the use of qualitative study.

3.2.1 Research Design

Research design is defined as the clearly defined structures within which the study is implemented (Burns and Grove, 2001).The study adopted a mixed method approach; and was based on convergent parallel design, whereby quantitative and qualitative studies were done independently during the data collection and analysis and then merged during the interpretation of overall results .

A mixed-method approach to research is one that involves gathering both quantitative data as well as quantitative data so that the final database represents both quantitative and qualitative information (Creswell, 2003).

This method is appropriate in improving accuracy as it allows triangulation for comparing and contrasting quantitative results with qualitative findings for corroboration and validation purposes (Tashakkori and Teddlie 2003). Bryman (2003) avers that mixed method enables a study develop a more complete understanding of a phenomenon from complementary data sources. Quantitative data was used to provide allowed the study to work with a large sample of the population that gave the statistical power to look at influence and empirical associations among the variables.

Qualitative data provided the study with interesting quotes that were used to validate and embellish the quantitative survey findings. The combined data was used to specifically establish the existence of a relationship(s) between the independent variables (community participation) and the dependent variable (sustainability of community water projects), the extent and strength of the relationships and the influence of various proportions of independent variables on the dependent variable, with the aim to establishing the combinations and proportions of independent variables that had significant effect on the dependent variable. These relationships were better understood and appreciated from this choice of design. This offered the researcher the opportunity to explore the influence M&E practice in greater depth and detail, in terms of its role of place, time, practice, and processes. The study collected, analyzed and interpreted quantitative and qualitative data besides testing five research hypotheses based on the moderating influence of M&E practices on the relationship between community participation and sustainability of community water projects.

3.3 Target Population

The study targeted community water projects in three sub counties of Nyeri County. The sub counties included Tetu, Nyeri Central, and Mathira which had a total of 10 community water projects distributed as follows; Tetu Sub County three projects, Nyeri Central Sub-County two and Mathira Sub-County three projects. The ten projects had a combined total of 1052 registered membership of water consumers. Each of the projects is managed by a project committee whose members ranged between 12 and 15 individuals. On the other hand each of the projects is under the supervision of a project officer who was seconded from the national government. Therefore the study sampled respondents from the three strata; namely water officers, management committee members and water beneficiaries/consumers.

Water consumers were selected as respondent because they would provide primary data concerning the water projects as they are the beneficiaries of the water supplied by the projects for domestic use and small scale irrigation. Management Committee members acts on behalf of their respective community water projects; they were also found be an important category of respondents because they performed water related transactions on behalf of the water consumers. The Water officers were selected as respondents in the study because they are involved in the implementation and supervision of the community water projects on behalf of the line ministry and were therefore deemed were to be key informants in issues related to the variables in this study.

Table 3.1 Distribution of target population by Administrative Units

Name of Sub county	Name of water project	Number of consumers /members	Number of Committee members	Number of water project officers
TETU	Zamwua	242	15	1
	Kinaini	92	12	1
	Gaithuri	60	12	1
NYERI CENTAL	Githiru	62	13	1
	Njeng'u /Nyaribo	172	14	1
MATHIRA	Muteithia	76	15	1
	Kiaguthu	98	15	1
	Kanjuri	94	12	1
	Kihuri	76	13	1
	Hika	80	12	1
TOTAL		**1052**	**133**	**10**

Tana Water Service Board (2014)

3.4 Sample Size and Sampling procedures

This section describes the framework within which the sampling is undertaken. It describes the sample size and sampling procedures used in the study. The choice of sample size is important because it determines the extent to which the researcher can make statistical and/or analytic generalizations (Onwuegbuzie and Leech, 2004).

3.4.1 Sample size

The study was based on 10 community water projects that had 1052 water project beneficiaries. To arrive at a reasonable sample size from this stratum, Yamane formula (1967) for calculating sample sizes was applied. The formula is stated as:

$$n = \frac{N}{1 + N(e)^2}$$

With a population of 1020 water beneficiaries and assuming a 95% confidence level and $p = .5$, when this formula is applied, we get:

$$n = \frac{1052}{1+1052(.05)^2} = 290$$

3.4.2 Sampling Procedure

Information pertaining to this study was obtained from three strata namely water officers, committee members mixed with ordinary project members and water consumers. The first stratum comprised of the water officers seconded to the project from the ministry of water and irrigation. A census of all the 10 water officers was purposefully picked to form the respondents in this stratum. Water officers were chosen as respondent because the researcher was convinced that each was knowledgeable especially on the technical aspects of the project that each was in charge of.

The second stratum comprised of three committee members and five ordinary members of the projects. The two groups were combined together to form focus groups discussion (FGD) of 8 individuals. Krueger (1998) recommends that 6-12 subjects are a suitable number for focus group discussions. He notes that the number is large enough to generate rich discussion but not too large to limit participation of all subjects. Focus groups discussions (FGDs) were considered for this study as they had the potential to generate wide information as well as shed a deeper understanding about the constructs under this study. Participant in this category were picked using both purposeful sampling and simple random sampling. Purposefully sampling was applied to obtain the respondents of three committee members in which the project chairman, treasurer, and the secretary were picked while simple random sampling was applied to pick 5 ordinary project members. According to Brink (1996), purposive sampling requires selecting participants who are knowledgeable about the issue in question, sheer involvement in and experience of the situation hence the application of the method in picking the three project officials. The researcher was convinced that the three officials contain the relevant information concerning their respective projects because of their sheer involvement in the day today running of the projects. The total number of respondents in focus group discussion was 8 for each project; therefore ten water projects had of 80 respondents who represented them in FGD.

The third stratum was made up of 290 respondents who are obtained by subjecting the total population of beneficiaries to Yamane formula (1967). To obtain the number of respondents of

water consumers to represent each of the 10 water projects the study adopted a stratified random sampling. According to Cochran and Lytle (2009) stratified random sampling is a probability sampling design. Stratified random sampling technique is preferred because stratification produces a gain in precision in population. It assumes there is a common view held by categories of individuals, and that a sample of each category gives an estimate of this common view, such that inferential statistics can be used for testing the null hypothesis that groups hold similar views (Jeff, 2001). Stratified sampling ensured that water consumers from each of the different community water projects were given a chance to be included in the sample.

The following formula was applied to determine the number of respondents to be selected from each stratum

ns = PXS/N

Where

ns= sample size

PS =population of consumers in each stratum

N=the total number of water consumers

To obtain the individual respondent in this category the study obtained the names of water consumers from their respective registers and applied systematic random sampling so as to pick the number that was required from each of the water project.

Systematic random this has the effect of giving each individual an equal chance to be included in the sample and in the effect biasness was eliminated (Kathuri and Pal, 1993).After the individual respondent were identified the researcher put them down in a register, got their personal contacts from the project office and then mapped their actual location with the help of local administration with a view of reaching them for the purpose of data collection.

Table 3.2 Sample Size of Respondents from each Stratum

NAME OF SUB-COUNTY	Water project	Consumers Population	Sample size consumers (stratified)	Sample size committee members (purposive)	Sample size water officers (purposive)	Total Sample size
TETU	Zamwua	242	67	8	1	**76**
	Kinaini	92	25	8	1	**34**
	Gaithuri	60	17	8	1	**26**
NYERI CENTRAL	Githiru	62	17	8	1	**26**
	Njengu/ Nyaribo	172	47	8	1	**56**
MATHIRA	Muteithia	76	21	8	1	**30**
	Kiaguthu	98	27	8	1	**36**
	Kanjuri	94	26	8	1	**35**
	Kihuri	76	21	8	1	**30**
	Hika	80	22	8	1	**31**
	TOTAL	**1052**	**290**	**80**	**10**	**380**

Tana Water Service Board (2014)

3.5 Research Instruments

The instruments of data collection for this study were questionnaires, focus group discussion and an interview guide. Structured and open ended questionnaires were administered to collect primary data from project water consumers. According to Mugenda and Mugenda (2003), structured questionnaires are easier to administer, analyze and economical to use in terms of time and money, on the other hand open ended questionnaires are easy to construct and allow a greater depth of response. Structured questionnaire were used for consumers for ease of analysis owing to the large number of responses. The questionnaire was organized in three main sections. Section one collected data pertaining demographic nature of the water consumers; section two

collected data on the influence of community participation on sustainability of community water projects. It had four sub-sections, sub-section one solicited data on the influence of community participation in decision making on sustainability of community water projects, sub-section two on the influence of community participation in resource mobilization on sustainability of community water projects and sub- section three on the influence of community participation in institutional collaboration on sustainability of community water projects ; section three solicited data on consumer perception about sustainability of community water projects.

Focus group discussion (FGD) was used to gather qualitative information. Krueger (1998) recommends that 6-12 subjects are a suitable number for focus group discussions. He notes that the group should not be so large that each participant does not have a chance to contribute, nor should the group be so small that it limits the range of experiences and opinions to be shared. Therefore the researcher organized the focus group discussions into groups comprising of six committee members. The study conducted focus group discussions using a team consisting of the researcher and a research assistant. The researcher acted as a moderator by introducing the topics for discussion and then helped the group to participate in a lively and natural discussion amongst them. The research assistant took notes. Each focus group discussion ran for a period of about one hour. The strength of FGD relies on its ability to allow the participants to agree or disagree with each other so as to provide an insight into how a group thinks about an issue, about the range of opinion and ideas, and the inconsistencies and variation that exists in a particular group (Krueger, 1988).The session was prepared through carefully identification of the main objective(s) of the meeting, development of 10 key questions, development of an agenda, and a plan on how to record the session. The researcher ensured even participation of respondents by careful wording of the key questions, maintaining a neutral attitude and appearance, and summarizing the session to reflect the opinions evenly and fairly. A detailed report was prepared after a session was finished; observations during the session was noted and included in the report.

The study administered interview schedule to Water Officers who are seconded to supervise community water projects on behalf of the ministry of water and irrigation. Mouton (1990) asserts that interview allows greater flexibility in the discussion by the interviewee on the topics besides attempting to appreciate what had happened from their perspectives. Therefore it enabled

the researcher extract important information from the water officers who had an in-depth understanding of the management of the water project and were able to give a comparative analysis of the different water projects from a technical point of view. The interview was administered after scheduling with the respective officer at his/her convenience. A desk top review journals, books and project reports were used to source relevant secondary data.

3.5.1 Pilot Testing of Research Instruments

To improve on internal validity of the research instruments, the study carried out a pilot study procedure. Through pre-testing, the internal consistency of the questionnaires was established before embarking on data collection. This involved administering the instruments to pilot subjects in exactly the same way as was done in the main study. The study adopted a sample of 10% of the sample size of the final study. Mugenda and Mugenda (2003) theory of sampling asserts that a sample of 10% is adequate for conducting a pilot study. Hence the study picked a sample of 38 respondents from Kirinyaga County for pilot study. Kirinyaga County happened to have had similar demographic characteristics in terms of social economic activities and similar water projects to those in the study area. Appropriate data collection tools were administered to the three categories of respondents. Data collected was analyzed to determine reliability and feasibility of the study. From the Pilot Study, it became apparent that some questionnaire items were not very clear to the respondents. The study noted that section E which was designed to extract information on M&E practices was not adequate to bring out the desire information and on the hand items were not well understood by the respondents. The researcher went back and redesigned the section and improved the questions in way that ensured they were able to capture the required data. The study has displayed the initial section E as used in the pilot study, along with the resigned section E as was used in the final study in appendix v.

3.5.2 Validity of the Instruments

Validity of research instruments ensure scientific usefulness of the findings arising there of (Serakan, 2002). Validity is the extent to which the instruments will capture what they purport to measure (Doole, Zubrick and Waters, 2013).The types of validity relevant to this study include content and construct validity. Content validity measures the degree to which the test items represent the universe of the trait or property being measured (Brewer, Jones, 2002). According to Gray (2004), content validity is established by an expert. To uphold content validity; the

researcher formulated a draft questionnaire which were presented to experts in the water sector and the supervisors who reviewed, improved and approved on the content. Expert advice is important to identify all necessary questions, eliminate unnecessary ones and ensure that the questions and response categories allows comparisons to other existing data (Babbie, 2003).

Construct validity refers to the degree to which inferences can legitimately be made from the operationalizations of the study to the theoretical constructs on which those operationalizations were based (Trochim, 2006).This study ensured that construct validity was observed by ensuring the questions in the questionnaire were constructed in a manner that ensured clarity to the respondents and avoided vagueness.

Internal validity is a property of scientific study which reflects the extent to which a study minimizes systematic error or bias (Mitchel and Jolley, 2008). To uphold internal validity the study ensured that the respondents were picked by random sampling such that all the individuals who made the study population had an equal chance of being selected. External Validity is the extent to which the results of can be generalized to other situations and people (Golafshani, 2003).To improve on external validity the study applied triangulation where semi structured interview guide, open and close ended questions was applied in a pilot study on a selected sample of five respondents in the study area. The data obtained during pretesting was analyzed and used to develop dummy results that were used to find out if they were correlating.

3.5.3 Reliability of the Instruments

The reliability of a research instrument concerns the extent to which the instrument yields similar result over a number of repeated trials (Orodho, 2005). Stratford (1989) argues that a reliable instrument is one with small errors of measurement, one that shows stability, consistency, and dependability of scores for individuals on the trait, characteristic or behavior being assessed. The study used split half method to pretest the reliability of the instruments by subjecting research items to 38 respondents who represented 10% of the study population. The pilot respondents were drawn from Kirinyaga County that happened to be a different population but experienced similar intervention in terms of community water projects. The study randomly divided all items that purported to measure the same construct into two sets and then administered the entire instrument to a sample of the respondents after which the total score for

each randomly divided half was calculated. Correlation between the two total scores was established by computing Cronbach's coefficient alpha of internal consistency. The coefficient measures how closely a related set of items are as a group (Cronbach, 1951). Cronbach Alpha is preferred because it is efficient in determining data extracted from dichotomous questionnaire as well as multipoint questionnaire. The results of the Cronbach's coefficient alpha obtained in the study are as represented in table 3.3

Table 3.3 Analysis of reliability of research instrument

Variable	Cronbach's alpha	No of items
Community participation in decision making	.821	7
Community participation in resource mobilization	.835	6
Community participation in institutional collaboration	.802	6
M&E practices	.796	14
Sustainability of community water projects	.782	11

To determine if the coefficient obtained from the analyzed data is acceptable or not the researcher followed a commonly accepted rule of the thumb for describing internal consistency using Cronbach's alpha as follows:

Cronbach's Alpha	Internal Consistency
a≥0.9	Excellent
0.9>a≥.8	Good
0.8>a≥0.7	Acceptable
0.7>a≥ 0.6	Questionable
0.6>a≥0.5	Poor
0.5 > α	Unacceptable

A co-efficient of Alpha 0.7 and above indicates that the research instrument is reliable. The higher correlation between the results in both tests the greater is the reliability. The Alpha coefficients obtained in this study were all greater than 0.7. This meant that the research the instrument was reliable hence was appropriate for the study.

3.6 Data Collection Procedure

In order to collect data, the researcher sought a research permit from the National Commission for Science Technology and Innovation (NACOSTI) of the ministry of education. The researcher also sought permission from the Board of Post Graduate Studies of the University of Nairobi. Data from the water service consumers was collected by enlisting the services of two research assistants to administer the questionnaire to the respondent and assisted those that had difficulties understanding some items in the questionnaire. To ensure the competency of the assistants, they were trained on the various aspects of handling the respondents in the process of administering the questionnaire and on the ethical procedures of conducting the research. The questionnaire was accompanied with a covering letter introducing the researcher and the purpose of the study.

Data from committee members was collected by conducting focus group discussion with respondents picked from among the committee members. The researcher sought an appointment with the targeted respondents through a letter addressed to the committee chairman which was done some two weeks in advance. The researcher then confirmed the appointment by making a phone call to the group chairman. On the material day of the appointment the researcher accompanied with the research assistant visited the venue of the group discussion and on time. The researcher welcomed the discussion group, explained the purpose of the discussion, the ground rules and procedure for data collection which included note taking as well as tape recording and then proceeded to conduct the group discussion. Data from water officers was collected after the researcher sought an appointment with the respective officers. At the appointed time, the researcher visited the respondent by taking care of ensuring punctuality. The researcher then introduced the subject and then conducted the interview while striving to create a good rapport with the respondent in order to extract the required data.

3.7 Data Analysis Techniques

Quantitative data was collected using a questionnaire which sought data on three independent variables, the moderating variable and the dependent variable. This was administered to the study respondents-community water beneficiaries. For analysis of Likert responses, the study used a 5-point equidistance scale (Carifio and Perla, 2007).The scale provided ranges between the points as follows. Strongly disagree ($1 < SD < 1.8$); Disagree ($1.8 < D < 2.6$); Neutral ($2.6 < N < 3.4$); Agree ($3.4 < A < 4.2$) and Strongly Agree ($4.2 < SA < 5.0$). Based on this scale, this study considered an item mean of above 3.4 to indicate that a majority of the respondents were in agreement with the opinion expressed in the item. Data from the respondents were entered, cleaned and analyzed using the Statistical Package for Social Sciences (SPSS) Version 17.0 software.

Data was then explored for normality, linearity, homogeneity and factorability to decide on the probable statistics if relevant assumptions were met. Since most of the assumptions for parametric tests were met, the study utilized both descriptive and inferential statistics amenable to parametric analysis. Whereas descriptive statistics involved the use of central tendency (mean, mode and median), frequencies, proportions, standard deviation and variance; the inferential tests employed the use of Pearson *r* correlation to test the relationships between the main study variables and the nature thereof; as well as to test the hypotheses. The relationships were considered strong when $r = .5$ and above, moderately strong when *r* is between 0.3 and 0.49, weak when *r* is below 0.29; and a correlation of 0 indicated no relationship. Once analyzed, the information was presented in the form of tables, which form a significant part of this research report.

The study adopted a stepwise regression analysis of the relationship between dependent and the independent variables. Stepwise procedure was helpful in controlling for multicollinearity. The empirical analysis was based on the standard regression formula:

$$Y=\beta_0 + \beta_1 X_1 + \beta_2 X_2 \ldots\ldots\ldots\ldots + \beta_n X_n + \varepsilon$$

Where Y = project sustainability (dependent variable

β_0= Constant term or intercept

X_1= the first predictor variable, X_1second predictor variable, $X_n = n^{th}$ predictor variable

β_1= the coefficient the first predictor variable, β2 the coefficient the second predictor variable, β_n = the coefficient of the n^{th} predictor variable

ε = ε is a stochastic [random] error.

In order to appropriately interpret the ensuing statistics, the following considerations were made: When: *r* = -1 (a perfect negative linear relationship); *r* = -.70 (a strong negative linear relationship; *r* = -.50 (a moderate negative relationship); *r* = -.30 (a weak negative linear relationship; *r* = 0 (no linear relationship); *r* = +.30 (a weak positive linear relationship); *r* = +0.50 (a moderate positive linear relationship); *r* = +.70 (a strong positive linear relationship); r = +1 (a perfect positive linear relationship). *t*-value of greater than 1.96 with p less than .05 indicates that the independent variable is a significant predictor of the dependent variable within and beyond the sample. The greater the *t*-statistics, the greater the relative influence of the independent variable on the dependent variable. A *t*-statistics of less than 1.96 with significance greater than .05 indicates that the independent variable is not a significant predictor of the dependent variable beyond the sample. Coefficient of Determination (R^2): R^2 = 1 (perfect fit); R^2 = 0 (no variation). Table 3.2 gives a summary of hypotheses of the study, the model, type of statistical analysis and interpretation of the results.

Table 3.4 Summary of test of hypotheses

Hypothesis	Model	Statistical Analysis	Interpretation of Results
H_1: Community Participation in decision making has a significant influence on sustainability of community water projects.	$Y_1=\beta_0 + \beta_1X_1+\varepsilon$ Where: Y_1=sustainability of community water projects X_1 participation in decision making	Pearson *r* Correlation coefficient: Linear regression r, R2, F and t values	The model establishes the variation in sustainability of water projects resulting from participation in decision making
H_2: Community Participation in resource mobilization has a significant influence on sustainability of community water projects.	$Y_2=\beta_0 + \beta_2X_2+\varepsilon$ Y_1=sustainability of community water projects, X_2 participation in resource mobilization	Pearson *r* Correlation coefficient: Linear regression r, R2, F and t values	The model establishes the variation in sustainability of water projects resulting from participation in resource mobilization
H_3: Community participation in institutional collaboration has a significant influence on sustainability of community water projects.	$Y_3=\beta_0 + \beta_3X_3+\varepsilon$ Y_1=sustainability of community water projects, X_3 participation in institution collaboration	Pearson *r* Correlation coefficient: Linear regression r, R2, F and t values	The model establishes the variation in sustainability of water projects resulting from participation in institutional collaboration
H_4: Joint community participation has a significant influence on sustainability of community water projects	$Y_4=\beta_0 + \beta_1X_1+ \beta_2X_2+\beta_3X_3+\varepsilon$ Y_1=sustainability of community water projects, X_1 participation in decision making, X_2 participation in resource mobilization, X_3 participation in decision making	Pearson *r* Correlation coefficient: Multiple Regression Analysis r, R2, F and t values -Stepwise regression	The model establishes the variation in sustainability of water projects resulting from joint participation in decision in decision making, resource & institutional collaboration
H_5: The joint influence of community participation in decision making, resource mobilization and institutional collaboration on sustainability of community water projects is moderated by M&E practices.	$Y_6=\beta_0 + \beta_1X_1+ \beta_2X_2+\beta_3X_3 + \beta_5(X_{1*} X_{2*} X_3 *X_5+ \varepsilon$ Y_1=sustainability of community water projects, X_1 participation in decision making, X_2 participation in resource mobilization,X_3 participation in decision making, X_5Monitoring & Evaluation of practices	Pearson *r* Correlation coefficient: Multiple Regression Analysis r, R2, F and t values -Stepwise regression	The model establishes the variation in sustainability of water projects resulting from joint participation in decision making, resource mobilization& institutional collaboration when moderated by Monitoring & Evaluation of service delivery

Where:

Y1... Y6= dependent variable

X1... The first predictor

X2…The second predictor variable

X3…The third predictor variable

X5…The moderating variable (and also the fifth predictor variable)

β_0…Y-intercept (the constant term)

β_1...The coefficient the first predictor variable,

$\beta_{2\ldots}$The coefficient the second predictor variable

$\beta_{3\ldots.}$The coefficient of the third predictor variable

$\beta_{5\ldots.}$The coefficient of the joint variables (independent and moderating

(X_{1*} X_{2*} X_3 $*X_5$)…The interaction term between the independent variable ie (X_{1*} X_{2*} X_3) and the moderating variable (X_5)

3.8 Ethical Issues

The researcher ensured that the right to self-determination of the subjects is observed. According to Burns and Grove (2001), the right to self-determination is based on the ethical principle of respect for a person. The researcher ensured that participants are given adequate information regarding how the research will be conducted. This enabled them to be capable of comprehending the information; had the power of free choice, enabling them to consent voluntarily to participate in research or declined participation.

The researcher also observed the principle of right to confidentiality of the subjects, confidentiality is the researcher's management of private information shared by the participants, which must not be shared with others without the authorization of the participants(Capron,1999).The information and identity of the respondents' was kept confidential during the process of data collection, to ensure that there was no unnecessary disclosure of the identity of the participant.

The researcher maintained privacy in all personal matters arising from information coming from the participants. This was in the form of feelings, beliefs or attitudes, and opinions. Raw data was protected from unauthorized persons, and was not shared or names linked to the data.

The information obtained was only used for the purposes of this study. The research was conducted with permission from Management of Tana Water service Board, management of water users committees and the consent of the individual respondent from the membership of water projects.

3.5 Operationalization of the Variables

Objective	Variables	Indicators	Measurements	Measurement scale	Type of data	Method of analysis	Specific tools	Tools of data collection
1.To establish the extent to which community participation in decision making influence sustainability of community water projects	**Independent Variable** Community participation in decision making	-Community Participation in project design -Control over project decisions -contributions during meetings - Control over choice of project representatives	-Level of participation in project design -Being in control over project decisions -Level of Contribution in meetings -Choice of project representatives	Interval Interval Interval Interval	Descriptive statistics Inferential statistics	Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R^2 - F and t test	Questionnaire, FGD, & interview guides
	Dependent Variable sustainability of community water projects s community water projects	-Ability to meet operational cost -Working condition of infrastructure -Compliance with license and tariffs -Continuous water supply -Ability to meet emerging Demands	-level of ability meet operational cost	Interval Interval Interval Interval Interval	Descriptive statistics Inferential statistics	Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R^2 F and t test	
2.To assess the extent to which community participation in project resource mobilization influence sustainability of community water projects	**Independent Variable** community participation in project resource mobilization	Participation in mobilizing project -Finances -Labour/skills -Materials	-level of community mobilization of -Project finances -Project labour -project materials	Interval	Descriptive statistics Inferential statistics	- Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R^2 F and t test	Questionnaire, FGD, &interview guides

	Dependent Variable Sustainability of community water projects s community water projects	-Ability to meet operational cost -Working condition of infrastructure -Compliance with licence and tariffs -Continuous water supply -Ability to meet emerging demands	Level of ability to meet project operational cost -The level of the working condition of the infrastructure - The level of project compliance with licensing and tariffs -level of the project to meet continuous water flow - the level of the project to meet emerging water demands	Interval Interval Interval Interval	Descriptive statistics Inferential statistics	Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R^2 - F and t test	
3.To assess the extent to which community participation in institutional collaboration influence sustainability of community water projects	Independent Variable Community participation in institutional collaboration	Collaboration in: -Financial mobilization -Technical & extension services -Conducting research activities -Capacity building and development	-Level of collaboration in financial mobilization -Level of technical &extension services -Level of Conducting research -Level of capacity building and development	Interval Interval Interval Interval	Descriptive Statistics Inferential statistics	Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R2 - F and t test	Questionnaire, FGD, &interview guides
	Dependent variable Sustainability of community water projects s community water projects	-Ability to meet operational cost -Working condition of infrastructure -Compliance with license and tariffs -Continuous water supply -Ability to meet emerging demands	-Level of ability to meet project operational cost -The level of the working condition of the infrastructure - The level of project compliance with licensing and tariffs -level of the project to meet continuous water flow - the level of the project to meet emerging water demands	Interval Interval Interval Interval	Descriptive statistics Inferential statistics	Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R^2 - F and t test	

4.To determine the extent to which joint community participation influence sustainability of community water projects	Independent Variables Combined influence of Community participation in; -decision making -resource mobilization -institutional collaboration	1.Community participation in decision making in; Project design -Control over project decisions -contributions during meetings - Control over choice of project representatives 2.Participation in mobilizing project; -Finances -Labour/skills -Materials 3.Participation in Collaboration in; -Financial mobilization -Technical &extension services -Research and development -Capacity building	-being in Control over project decisions -Level of participation in project design -Being in control over project decisions - level of contributions during meetings - -level of Control over choice of project representative -level of community mobilization of; -Project finances -Project labour -project materials Level of collaboration in -financial mobilization -Level of technical &extension services -Level of Conducting research -Level of capacity building and development	Interval Interval Interval Interval Interval Interval Interval Interval Interval Interval Interval	Descriptive statistics Inferential statistics	Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R^2 - F and t test	Questionnaire, FGD, &interview guides
	Dependent variable Sustainability of community water projects s community water projects	-Ability to meet operational cost -Working condition of infrastructure -Compliance with license and tariffs -Continuous water supply -Ability to meet emerging demands	-Level of ability to meet project operational cost -The level of the working condition of the infrastructure - The level of project compliance with licensing and tariffs -level of the project to meet continuous water flow -level of the project to meet emerging water demands	Interval Interval Interval Interval Interval		Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R^2 - F and t test	

	Dependent variable Sustainability of community water projects	-Ability to meet operational cost -Working condition of infrastructure -Compliance with licence and tariffs -Continuous water supply -Ability to meet emerging demands	-level of M&E resources allocated -the level of data collection -the level of data analysis -level of data dissemination -Level of utilization of M&E data	Interval Interval Interval Interval Interval	Descriptive statistics Inferential statistics	Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R2 - F and t test	
5.To establish the moderating influence of M&E practices on the relationship between community participation and sustainability of community water projects	**Moderating Variable** Extent to which M&E practices influence sustainability	-Resource allocation for M&E -Data collection for M&E - Data analysis for M&E -Dissemination of M&E results -Utilization of M&E results	-Level of participation in project design -Being in control over project decisions -Level of Contribution in meetings -Choice of project representatives level of community mobilization of; -Project finances -Project labour -project materials **Level of collaboration in** -financial mobilization -Level of technical &extension services -Level of Conducting research -Level of capacity building and development	Interval Interval Interval Interval Interval Interval Interval Interval Interval Interval Interval	Descriptive statistics Inferential statistics	Measures of central tendency Linear and multiple regression Thematic content analysis	Mean, Mode Median - Standard Deviation -Pearson r correlation test; Coefficient of determination R2 - F and t test	Questionnaire, FGD, &interview guides

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the study and is organized into thematic and sub-thematic areas based on the study objectives. The thematic areas include community participation in decision making and sustainability of community water projects, community participation in project resource mobilization and sustainability of community water projects, community participation in institutional collaboration and sustainability of community water projects, joint community participation and sustainability of community water projects, M&E practices and sustainability of community water projects, moderating influence of M&E practices on the relationship between the joint community participation and sustainability of community water projects.

4.2 Questionnaire Return Rate

The study administered 290 questionnaires in the 10 water projects from the three sub-counties (Tetu, Nyeri Central and Mathira) for data collection, out of which 207 questionnaires were properly filled and returned. This represented 71.38 percent successful return rate.

Babbie (2003) suggested that a return rate of 50% is adequate, 60% good and 70% very good for analysis. Chen (1996) argued that the larger the return rate, the smaller the non-response error. This implies that 71.38% return rate was appropriate for data analysis. The 71.38 percent return rate was attributed to the use of self-administered questionnaire in which the researcher was in position to clearly explain items the respondents found difficulties responding to. The results of questionnaire return rate are presented in Table 4.1.

Table 4.1: Questionnaire Return Rate

Sub County	Project	Sample size	Returned	Return rate (%)
Tetu	Zamwua	67	49	**73.13**
	Kinaini	25	18	**72.00**
	Gaithuri	17	12	**70.58**
Nyeri Central	Njengu/ Nyaribo	47	33	**70.21**
	Githiru	17	12	**70.58**
Mathira	Muiteithia	21	15	**71.42**
	Kiaguthu	27	18	**66.66**
	Kanjuri	26	18	**69.23**
	Kihuri	21	15	**71.42**
	Hika	22	17	**77.27**
Total		**290**	**207**	**71.38**

4.3 Demographic Information of the Respondents

The criterion used to determine the participants for the quantitative component of the study was based on the membership to community water projects. All the members of the water projects qualified to take part in the study. This section present demographic information of the respondents of the members of the ten community water projects in the three sub counties of Nyeri County. The result is presented in Table 4.2

Table 4.2: Demographic Information

Categories of Demographics	Frequency	Percent
Gender		
Male	121	58.5
Female	85	41.1
No Response	1	.5
Total	**207**	**100.0**
Age of the respondent		
18-25	3	1.4
26-35	16	7.7
36-45	27	13.0
46-55	60	29.0
56 and above	101	48.8
Total	**207**	**100.0**
Education		
No formal education	12	5.8
Primary	94	45.4
Secondary	80	38.6
College Diploma certificate	17	8.2
First Degree and above	4	1.9
Total	**207**	**100.0**
Current Occupation		
Farming	169	81.6
Employed	11	5.3
Causal Labour	4	1.9
Business	17	8.2
Others	6	2.9
Total	**207**	**100.0**
Monthly income(approximate)		
5000 and below	88	42.5
5001-10000	60	29.0
10001-15000	23	11.1
15001-20000	19	9.2
20000 and above	17	8.2
Total	**207**	**100.0**

The study revealed that 121(58.5%) of respondents were male while 85(41.1%) female. The data indicates members of both gender participated in giving their views about the water projects. This was important to offset bias that would otherwise accrue as a result of different gender viewing the issues in water projects in different ways. Every human being is biased, this assertion is supported Wijk-Sijbesma, (1998) who avers that it is a fact of life that an individual sees the world through his/her own particular set of lenses. An individual will see things differently depending on such factors as gender, age, ethnic group, educational level and

experience, wealth standing, caste, etc. All of those factors combine to make the individual experience life and observation to report things in different ways. It is advisable that researchers conducting surveys especially in the rural development to obtain information from diverse discipline, background, gender, age groups, social and interest as far possible (UNDP 2006),this is important to avoid biasness in research.

Response in terms of age of the respondents (project members) was 101(48.8%) individuals were aged 56 years old and above while 60(29%) were between 46-55 years old. The average age of the respondents was computed and returned a mean score of 4.16.which indicates that many of project members were in the age bracket of 56 years and above. This therefore indicates that most of the project members were old. Water use is directly related to the age of the members of the households. Households teaming up with youth tend to use more volume of water for domestic chores and economic activities as opposed to with those aged households (Wijk-Sijbesma, 1998). The observed phenomenon in part explains why performance of projects was satisfactory despite the fact some of them were small scale in terms of service delivery.

The results of the study revealed that community under the study had some level of basic education with 94(45.4%) of the respondents having primary school education while 80(38.6%) had secondary school education. The result reveals that the communities in the water projects had moderate level of education. This implies that community had the capacity to make valid and informed decisions that impacted on project sustainability. This observation is consistent with that of Gitari, Mbabaz and Jaya (2016) who avers that households with some basic forms of education are in a position to provide valid and consistent information that impact positively on sustainability of water Projects in their locality. The findings also support those by UNESCO (2002) which observed that sustainable development requires knowledgeable, caring and informed decision makers capable of making the right choices on the complex and interrelated economic, social and environmental issues facing mankind. Issue raised in water projects are complex and transcends economic, social and environmental sectors and therefore require that the stakeholders who are informed hence their level of education has implications.

Responses in terms of income of the respondents revealed that 169(81.6%) of the respondents were farmers who had average income of Kshs 5001 per month. Thus the level of income

combined with literacy level of the community members implies that the communities in the water projects under this study had some capacity to manage the water projects. Capacity at community level is needed in form of skills needed to effectively manage water projects and to successfully lobby resources for project improvements. This observation is supported by (Sullivan, Meigh, Fediw, 2002) who avers that capacity of community to effectively manage water projects is indicated by the level of education, skills, income present, as well as the presence and effectiveness of water users' associations. The study revealed that the population in the study area possessed in one way or the other the outlined indicators.

4.4 Tests for Statistical Assumptions and Analysis

Tests for statistical assumptions and analysis were necessary to ensure that basic assumptions for parametric tests were observed. Typical assumptions for parametric tests include normality, homogeneity of variances, linearity and independence. Hence this study proceeded to test for these assumptions to ensure that they were adhered to.

4.4.1 Test of Normality

Tests of normality were conducted to determine whether the distribution was normal. This was fundamental in order to determine appropriate tests to be conducted and make sure that assumptions of normal distribution were not violated (Shapiro and Wilk, 1965).

To test for the normality of the dependent variable (Sustainability of community water projects), Kolmogorov-Smirnova (K-S) and Shapiro-Wilk tests were conducted. Kolmogorov-Sminov and Shapiro-Wilk tests for normality are used to detect all departures from normality (Shapiro and Wilk, 1965). The tests reject the hypothesis of normality when the P-value is less than or equal to 0.05 (Shapiro and Wilk, 1965). Table 4.3 shows that the Kolmogorov-Smirnova and Shapiro-Wilk statistics were .041 and .990 respectively. The associated P-value was .200 and .485 for Kolmogorov-Smirnova and Shapiro-Wilk statistics respectively. Since the P-values were greater than the significance level (0.05) (not significant at $p<.05$), implies that the variables were normally distributed.

The data represented in table 4.3 indicate that on the basis of the computed significant test statistics, for Kolmogrov-Smirnov and Shapiro Wilk tests, normality of dependent variable was maintained.

Use of Kolmogrov-Smirnov and Shapiro Wilk was validated by applying the tests on the normality of the dependent variable using the following two the studies. One of the studies is by Jones and Mygind (2010) who studied the effects of water privatization on productive efficiency

Table 4.3 Normality Test Results (Kolmogorov-Smirnov[a]) for Dependent Variable

Factors	Kolmogorov-Smirnov[a]		Shapiro-Wilk		
Statistics	df	Sig	Statistics	df	Significance
Sustainability of water Projects	89	041	. 990	89	
P-value		.200			.485

4.4.2 Test of Homogeneity of Variance

The Levene test was used to verify assumption that variances are equal across samples ie the error variances are all equal or homoscedastic. Violation of this assumption leads to bias in test statistics and confidence intervals. If the error terms do not have constant variance (have differing variance), they are said to be heteroscedastic. Hence an assessment of homoscedasticity of the residuals of Sustainability of community water projects was conducted. In Levene test null hypothesis is rejected if (homoskedasticity) level of significance is less than 0.05.

Table 4.4 shows Levene Statistic of 4.642 with an associated p-value of .000. Since the probability associated with the Levene Statistic is 0.000 which is less than 0.05 level of significance, We fail to reject the null hypothesis at the 0.05 significance level and conclude that there is insufficient evidence to claim that the variances of the dependent variable are not equal hence the variance were homogeneous.

Table 4.4: Test of Homogeneity of Variances

Levene Statistic	df1	df2	P-value
4.642	5	202	.000

To test the null hypothesis that heteroskedasticity was not present Breusch-Pagan and Koenker test statistics was applied. Breusch-Pagan test is a large sample test and assumes the residuals to be normally distributed. The null hypothesis is rejected if (homoskedasticity) level of

significance is less than 0.05. Table 4.60 shows Breusch-Pagan and Koenker test statistics of 12.757 with an associated p-value of.000. Since the probability associated with the Breusch-Pagan and Koenker test was 0.000 which is less than 0.05 level of significance, we reject the null hypothesis and conclude that the variance of the dependent variable were homogeneous.

Table 4.5: Breusch-Pagan and Koenker Test for Heteroskedasticity

	SS	df	MS	F	Sig
Model	12.757	4.000	3.189	1.088	.000
Residual	416.364	142.000	2.932	-999.000	-999.000

4.4.3 Multicollinearity test

To test the correlation between variables, multicollinearity test was conducted. Multicollinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated (Gujarat and Porter, 2009). It arises when there is a linear relationship between two or more independent variables in a single equation model (Gujarat 2009). In a multiple regression analysis, the estimated regression coefficients fluctuate widely and become less reliable as the degree of correlation between independent variables increases (Kothari, 2004). This result in the sample coefficient being far from the actual population parameter and when the coefficients are tested, the *t* – statistics becomes small, which leads to the inference that there is no linear relationship between the affected independent variables and the dependent variable (Cooper and Schindler, 2011).

Multicollinearity also increases the standard errors of the β coefficients, meaning that the βs have relatively higher variability across samples making it difficult to assess the individual importance of a predictor. Detection Tolerance and Variance Inflation Factor (VIF) method was used to test for multicollinearity (Cooper and Schindler, 2011). O'Brien (2007) suggested that a tolerance of less than 0.20 and a VIF of 5 or 10 and above indicates a multicollinearity problem. Multicollinearity is reflected by lower tolerance values and higher VIF values (Hair, Anderson, Tatham and Black's, 1998). Table 4.6 indicates that Variance Inflation Factor (VIF) results for the study variables was less than 5 while Tolerance was greater than 0.2 which shows no multicollinearity between predictor variables.

Use multicollinearity tests is validated by the study of Dinar and Subramanian (2007) who applied the tests in their study on the relationship between form of water production and production costs in Spain.

Table 4.6: Coefficient for Tolerance and Variance Inflation Factor Tests

Variables	Co linearity Statistics	
	Tolerance	VIF
Community Participation in Decision Making	.889	1.296
Community Participation in Resource Mobilization	.771	5.834
Community Participation in Institutional Collaboration	.733	1.364
Community participation in decision making, resource mobilization and in institutional collaboration	.449	2.352

Dependent Variable: Sustainability of Water Project

4.4.4 Independence of Residuals - Durbin–Watson Statistic

Durbin–Watson statistic is a test statistic used to detect the presence of autocorrelation (a relationship between values separated from each other by a given time lag) in the residuals (prediction errors) from a regression analysis (Chatterjee, Samprit, Simonoff and Jeffrey, (2013). Autocorrelation makes predictors seem significant when they are not. The value of Durbin-Watson statistic lies between 0 and 4 and 1.5-2.5 for the acceptable range (Gujarati and Porter 2009).Values of 2 means that there is no autocorrelation in the sample (Verbeek, 2012). Durbin–Watson statistic computed for this study was 2.048 as is shown in Table 4.62; this is within the acceptable range. This shows that that there is no autocorrelation in the sample, hence the residuals were found to have independent errors.

Table 4.7: Test of independence (Durbin–Watson Statistic)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig.F Change	
1	.738[a]	.545	.534	.1109456	.545	48.186	5	201	.000	1.107

a. Predictors: (Constant), Community participation in decision making, Community Participation in Resource Mobilization, Community Participation in Institutional Collaboration and Monitoring & Evaluation Practices

b. Dependent Variable: Sustainability of community Water Projects

4.4.5 Tests for Factorability and Sphericity: Kaiser Meyer-Olkin and Bartlett Test

Factorability is the assumption that there are at least some correlations amongst the variables so that coherent factors can be identified. Basically, there should be some degree of collinearity among the variables (Fabrigar, Wegener, MacCallum and Strahan, 1999).

To assess the factorability of items, two indicators were examined. They include Kaiser Meyer-Olkin Measure of Sampling adequacy and Barletts Test of Sphericity. The tests were generated by SPSS, and helped to assess the factorability of data or suitability of data for structure detection (Pallant, 2010). Kaiser-Meyer-Olkin (KMO) test was used to assess sampling adequacy. The index ranges from 0 to 1 (Tabachnick and Fidell, 2011). For adequate sample, KMO test statistic should be greater than 0.5 (Hair *et al.*, 2013). The world-over accepted index is 0.6 or higher to proceed with factor analysis (Fabrigar, Wegener, MacCallum and Strahan, 1999). Table 4.23 shows KMO statistics of 0.768 which is greater than the convectional probability value of 0.5 and over .60 for a satisfying sample. This implies the sample was adequate for factor analysis.

On the other hand Table 4.8 also presents the results of Bartlett's test of sphericity. Bartlett test of sphericity was performed to assess the appropriateness of using factor analysis (Hair, *et al.*, 2013). For factor analysis to be recommended suitable, the Bartlett's test of sphericity should

have p-value of less than 0.05 (Fabrigar *et al.*, 1999). Bartlett's test of sphericity indicates a chi-square of 1388.137 with an associated p-value of 0.00 which is lower than the convectional probability value of 0.05. It was thus concluded that factor analysis was an appropriate approach for assessing construct validity of the scale.

Parker and Zhang (2006) also used this approach in their sample adequacy test in their study on relationship between water production costs and forms of water service provision. Similar the tests were also conducted by Dijkgraaf and Gradus (2006) who carried a study to determine the effects of increase in taxation on prices of water by private water service providers in Holand .

Table 4.8: Results of Kaiser-Meyer-Olkin and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.768
Bartlett's Test of Sphericity	Approx. Chi-Square	1388.137
	Df	231
	Sig.	.000

Table 4.9 Correlation between M&E, Community participation and Sustainability of community water Projects

		Water Project Sustainability	Community Participation in Decision Making	Community Participation in Resource Mobilization	Community Participation in Institutional Collaboration	Joint Community participation
Water Project Sustainability	Pearson Correlation	1	.545**	.474**	.473**	.607**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	207	207	207	207	207

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

4.4.6 Correlation between Community participation and Sustainability of community Water projects

The study examined the correlation between community participation in; decision making resource mobilization institution collaboration and sustainability of community water projects.

Each of the study main variables was correlated with the response variable, sustainability of community water projects. The Pearson correlations between the variables are shown in Table 4.9. The study found that community participation in decision making was positively correlated sustainability of community water projects ($r = 0.545$, $p < .01$), resource mobilization and sustainability of community water ($r = 0.474$, $p < .01$) institutional collaboration and sustainability of community water projects at ($r=0.473$, $p < .01$)and joint community project participation and sustainability of community water project($r=0.607$, $p < .01$).This implies that as the level of community project participation increases, sustainability of community water projects increases. Community participation in decision making, community participation in resource mobilization and community participation in institutional collaboration are moderately correlated to sustainability of community water projects. However correlation increases in joint community participation and sustainability of community water projects.

Table 4.10 Correlation between Community participation and Sustainability of community Water projects

		Participation in Decision Making	Community Participation in Resource Mobilization	Participation of Community in Institutional Collaboration	Joint community participation	Monitoring & Evaluation Practices
						1
Monitoring &	Pearson Correlation	.600**	.259**	.305**	.712**	
Evaluation	Sig. (2-tailed)	.000	.000	.000	.	000
Practices	N	207	207	207	207	207

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

4.4.7 Correlation between Community participation and Sustainability of community Water projects

The study examined the correlation between M&E practices, community participation projects in; decision making, resource mobilization institution collaboration joint community participation and sustainability of community water projects.

M&E was correlated with each the response variable. The Pearson correlations between the variables are shown in Table 4.10. The study found that M&E was positively correlated to community participation in decision making ($r = 0.600$, $p < .01$), resource mobilization ($r = 0.259$, $p < .01$),institutional collaboration ($r=0.305$, $p < .01$) and joint community project participation($r=0.702$, $p < .01$).This implies that as the level of M&E practices increases all of the response variables increases. M&E and community participation in resource mobilization and community participation in institutional collaboration are weakly correlated, while M&E practices and community participation in decision making are moderately correlated. However M&E and joint community project participation are strongly correlated.

4.4.8 Analysis and Decision Rule of Likert-Scale Data

The study utilized multiple Likert-type items whereby responses were summed together yielding data that was considered as interval. According to Carifio and Perla, (2007); Carifio and Perla, (2008); Norman, (2010), Likert scales are totals or averages of answers to multiple Likert items. Norman 2010 avers that when analyzing Likert scale responses parametric tests are sufficiently robust to yield largely unbiased answers that are acceptably close to "the truth". The population in this study exhibited a normal distribution while the sample was large enough to allow the application of parametric tests.

The questionnaires in quantitative study utilized the same Likert scale, and were coded in such a way that indicated the magnitude of difference between items. A Likert-type scale of five-point was applied with anchors that ranged from a very low score to very high score between 1 and 5 Where 1=strongly disagree, 2=Disagree, 3=Neutral, 4= Agree and 5= strongly agree. Consequently the averages of the summed scores also ranged from 1 to 5.

In order to fulfill the equidistance assumption in the likert scale the distance between 1 and 5 in the likert scale was divided into 5, which resulted into equidistance of 0.8 units. The equidistance of 0.8 was distributed across the likert resulting into the following intervals1.0<1.8, 1.8 <2.6, 2.6< 3.4, 3.4 <4.2, 4.2< 5.0.The decision rule was such that; 1.0<SD<1.8=Very Low/Strongly Disagree (SD); 1.8D<2.6=Low/Disagree (D); 2.6<N<3.4= Neutral (N); 3.4<A<4.2=High/Agree (A); and 4.2<SA<5.0=Very High/Strongly Agree (SA).

The study further summed up the means of individual items and then obtained the mean of means. The mean of means acted as the base for interpretation of average performance of the main variable. Hence the mean was used in the analysis and in the interpretation the result of individual items while the mean of means was followed in the analysis and interpretations of the main variables of the study.

4.5 Sustainability of Community Water Projects

This section present data analysis on sustainability of community water projects identified as the dependent variable. The study identified sustainability of community water projects as dependent on five community participatory variables which include decision making, resource mobilization, institution collaboration and Monitoring and evaluation practices (Kolb 1984, Lockwood 2002, Gozie 2007, Carter, Tyrrel and Howsam 2009, White 2011). The study examined sustainability of community water projects using the following indicators; ability of the consumers to promptly pay monthly water bills, ability of the project to pay workers salaries payment on time, ability to pay the required licenses and tariffs on time, whether the water infrastructure is in good working condition, whether the project has capacity to carry out major repairs whether water provided by the project is free of dirt and germs.

Other indicators of sustainability include whether the project provides continuous flow of water on daily basis, whether the project has ability to meet emerging water demand, if there has been an increase in membership in the projects, willingness of the consumers to pay for services provided by water project and if the consumers were satisfied with the services of the community water project. Respondents were asked to provide answers on 11 Likert items in the questionnaire that were measured by a five point Likert scale. Where 5= strongly agree, 4= Agree, 3=Neutral, 2=Disagree and 1=strongly disagree. The mean of each item was computed to assess the extent to which respondent agreed with views expressed in the item after which the

mean of means was computed to assess the extent to which respondents agreed with the level of project sustainability.

The results data obtained from the respondents is indicated in table 4.9

Table 4.11: Sustainability of Community Water Projects

	Statements	SD	D	N	A	SA	MN	STDV
1	I am able meet payment of my monthly water bills promptly	29 (14.1%)	9 (4.3%)	14 (6.8%)	51 (24.6%)	104 (50.2%)	3.93	1.417
2	The water project is able to pay salaries of workers on time	30 (14.5%)	6 (2.9%)	31 (15.0%)	57 (27.5%)	83 (40.1%)	3.76	1.386
3	The project is able to pay the required licenses and tariffs on time	4 (1.9%)	3 (1.4%)	40 (19.4%)	57 (27.5%)	103 (49.8)	4.22	0.938
4	The water pipes and tanks are always in good working condition	77 (37.1%)	22 (10.6)	8 (3.9)	67 (32.5)	33 (15.9)	3.06	1.328
5	Project has capacity to carry out major repairs on time	17 (8.2%)	46 (22.2%)	13 (6.3%)	84 (40.6%)	47 (22.7%)	3.47	1.284
6	The water provided by the project is free of dirt and germs	36 (17.4%)	68 (32.9%)	23 (11.1%)	58 (28.0%)	22 (10.6%)	2.86	1.477
7	The project provides continuous flow of water on regular basis	23 (11.0%)	59 (28.5%)	15 (7.2%)	62 (30.0%)	48 (23.3%)	3.26	1.378
8	The Project has ability to meet emerging water Demand	26 (12.6%)	90 (43.5%)	6 (2.9%)	52 (25.1%)	33 (15.9%)	3.26	1.378
9	The membership of the project has been Increasing	17 (8.2%)	8 (3.9%)	15 (7.2%)	73 (35.3%)	94 (45.4%)	4.06	1.193
10.	Willingness to pay for services given by water Projects	15 (7.2)	6 (2.9)	8 (3.9)	80 (38.6)	98 (47.4)	4.16	1.123
11.	I am satisfied with the services of the communit water project	17 (8.2%)	8 (3.9%)	15 (7.2%)	73 (35.3%)	94 (45.4%)	3.70	1.226
	Mean of Means						**3.61**	**1.284**

The study assessed the ability to pay monthly water bills promptly. The result returned a mean score of 3.93 and a standard deviation of 1.417. Respondents were in agreement that most of

them were able to pay their water bills on time. The study examined whether Salaries Workers was paid on time. The score on this item was a mean of 3.76 and a standard deviation of 1.386.This result indicated that respondents believed their water projects were in a position to pay workers salaries on time. Further the study sought examined whether the water project paid the necessary tariffs on time. The item scored a mean of 4.22 and standard deviation of 0.938 which indicated that respondents were of the opinion that their water projects complied with the payment of the necessary licenses and water tariffs on time. It went on to review whether the water infrastructure was in good working condition and the result recorded a mean score of 3.06 and a standard deviation of 1.328,this indicates that there wasn't a clear consensus that the water project infrastructure was always in good working condition. Half of the respondents were in agreement that the projects pipes and tanks were always in good working condition while the other half expressed opposite opinion. The study also sought the Project capacity to carry out major repairs. The mean score was 3.47 which show that almost an equal number of respondents either affirmed or failed to affirm that the projects had the capacity to carry out major repairs. Further the study examined if water provided by the water projects was free from germs and dirt**.** The mean sore was 2.86 and standard deviation was1.477. The result indicated that almost an equal number of respondents either affirmed or failed to affirm that the water provided by the projects was free from germs and dirt. The study went to investigate whether the water projects supplied continuous flow of water. The item recorded a mean score of 3.26 with standard deviation of 1.378. The results indicate that respondents were indifferent with almost half of the respondents who were in agreement that the projects provided continuous flow of water with another half who disagreed. In another item it examined the ability of the projects to meet emerging water demand. The score on this item was a mean of 3.26 and standard deviation of 1.378. Similarly results showed that the respondent were divided over the issue, with one half holding that the projects were not in a position to meet emerging water demand while another half affirmed. The study went further and assessed if the project membership had been increasing. The item returned a mean score of 4.06 and standard deviation of 1.193. The results indicated that respondents were in agreement that membership in their project had increased.The study also assessed the willingness of project members to pay for services provided by the water projects. The score on this item was a mean of 4.16 and standard deviation of 1.123.This indicated that respondents were in agreement of their willingness to continue paying for the services provided by the water projects.

Finally on this variable the study reviewed the satisfaction of the members of the project with services provided by the water project. Responses returned a mean score of 3.70 and standard deviation of 1.226. The result implied that respondents were in agreement they were satisfied with the services offered by the water projects.

In summary the findings of the study indicated that the respondents were able to pay their water bills on time, the projects paid workers, licenses and tariffs on time, projects had the capacity to carry out major repairs, project membership had increased with time, indicated the continued willingness of the beneficiaries to pay for services rendered by the projects and were satisfied with the services provided by the water projects. However the respondents were indifferent that the water provided by the project was free of dirt, flow of water was continuous and projects had ability to meet emerging water demand.

The study computed the mean of means of the items that extricated the project sustainability in order to obtain the composite scores for this variable. The mean of means was 3.61 and a mean standard deviation of 1.284. The result indicates that respondents were convinced that community water projects were sustainable.

Table 4.12: Changes brought by implementation of the water project

Response	Frequency	Percentage
No change	13	6.3
Irrigation	47	22.7
Domestic	107	51.7
Domestic and irrigation	40	19.3
Total	**207**	**100.0**

The study assessed changes realized since implementation of the water projects, results indicated that 107(51.7%) of the respondents realized improvement in access to domestic water, 40(19.3%) access to domestic and irrigation water, 47(22.7%) to irrigation water while 13(6.3%) didn't observe any change, this is as shown in table 4.10.

The study also validated the quantitative information by collecting qualitative data using both focus group discussions and semi structured interviews. To achieve this data on the ability of water consumers to pay their monthly water bills on time which is vital for the project to recoup recurrent expenditure and is a requisite for sustainability of community projects. This observation is in line views of Carter, Tyrrel and Howsam (2009) that it was necessary for water schemes to fix cost recovery mechanism as a basis of payment and accounting for water charges. Participants were in agreement that they were able to pay for their monthly water bills on time. The study noted that the fixing and reviewing of water of user fees was set by members through consensus and as such, the rates set were affordable to the beneficiaries. This view was captured from a participant who retorted;

> *"...the benefits of remaining connected to the water system out ways the monthly charges; this encourages us to make payments in time" (FGD, Muteithia WP).*

The participants further revealed that the projects under the study were operating in small scale, employing a few workers and hence incurred small wage bills that facilitated their ability to pay workers in time. That notwithstanding the participants revealed that in cases where members failed to pay in time was attributed to poor service delivery by the said projects and not the members' ability to pay.

Further, qualitative revealed that projects under this study had up-to-date compliance in payment of water sector licenses and tariffs. Capacity of the water sector institutions was enhanced by coming into force of the Water Act 2002.As such, their watch dog roles was enhanced to an extent that it is difficult for water service providers to fail to comply with tariff payment, otherwise non compliance often results to project closure . Therefore the projects opted to comply with requirements.

Indeed, the respondents, who also participated in the qualitative phase of this study, affirmed this observation;

> *"…You can't fail to pay for tariffs and expect to continue drawing water from the river, if that was to happen you would be liable for heavy penalties. Therefore payment of tariffs is done in time" (FGD, Hika WP)".*

The study investigated the state of the water projects infrastructure to find out their working condition**.** There was wasn't a clear consensus that the water project infrastructure was always in

good working condition. The respondents didn't fully agree pipes and tanks were always in good working condition. The study observed that respondents who received continuous flow of water responded in the affirmative while those who didn't receive continuous supply responded in the negative. This observation was affirmed by participants in FGD who retorted:

> *"... this project doesn't fully meet our expectations, some areas receive water throughout the year while some are faced with frequent break downs and water rationings" (FGD, Zamwua WP)".*

One of the indicators of a sustainable project is the ability to carry out operation and maintenance of its infrastructure this opinion is also supported by Harvey and Reed Harvey and Reed, (2006) in their study on community water projects who observed that a sustainable community water project has to have a preventive maintenance. The study revealed that respondents were of the view that the projects had the capacity to carry out major repairs. The water projects investigated were of small scale in nature and delivered water through gravity. They applied simple technology that could be operated efficiently under a community water project model. However it was also noted that at times breakdowns overwhelmed the capacity of the projects operation and maintenance team and in such circumstances indulgence of external collaborators was necessary. Responses from qualitative survey also bore this out;

> *"...Sometimes the breakages are overwhelming for the project team to handle and in such cases we seek the assistance of Engineers from Tana water service board and Nyeri water and sewerage company" (FGD, Njengu- Nyaribo WP).*

This study further examined if the water provided by the water projects was save for human consumption. Respondents were indifferent with half indicating that the water provided by their projects was clean because it rarely caused outbreak of water borne diseases. Respondents associated cleanliness of water to lack of disease causing microorganisms. In other cases respondents commented that although the water received had some solid particles it was clean since they couldn't attribute it to water borne diseases. Some of the respondents perceived the water to be dirty even if it caused no illness. On further probing it was found that that this perception was associated with poor treatment. However a participant from Kanjuri WP attributed outbreak of water borne disease to their project;

"…I can't rule out the water provided by our system is dirty because at one time villagers contacted cholera which was linked to water from our system- since then we usually boil the water before drinking (Kanjuri WP)*".*

The study investigated if the water projects supplied continuous flow of water. Respondents were indifferent with a half expressing the opinion that projects provided continuous water supply. The other half felt that projects were not in a position to sustain a continuous supply of water in all seasons. The study observed that due to increased growth in the number of consumers many of the water projects were not in a position to match the demand and had resulted to water rationing so as to address the challenge. The study further revealed there was poor communication to the members on the circumstances under which rationing was necessary; as a result apathy had set in among the beneficiaries.

"…we think something fishy could be happening among the members of the committee, we see new members being admitted into our project every now and then without the our consent, this could be the reasons behind the water shortage and hence the frequent rationing (FGD ,Githiru WP)".

Sustainability of water projects was also examined in terms of the ability of projects to meet future water demands. Findings from the study indicated that there wasn't an outright consensus on this. Half of the respondents were of the opinion that their water projects could meet emerging water demands. This view was shared by respondents in projects that had continuous water supply who in the same vein had their project management committee being perceived as efficient. On the other hand the study found out some respondents felt that their projects weren't in a position to match the expanding water demand due exponential increase in population. In the circumstance they felt the only way out of this challenge was in future scaling efforts which was possible if the projects were to partner with external institutions like government and donors.

The study established that projects had the capacity to construct small scale projects that required simple technology and small scale financing that was available in the community. However this wasn't possible for projects that could manage to meet the ever expanding population that demanded complex water projects that required more advanced technology and huge capital

investment. In this scenario the study established the necessity for the community projects to engage the assistance of external institutions to fill this gap. This observation is in line with that of Kwanja, 2004 who observed that communities are good in mobilizing resources and managing projects that are nontechnical in nature but poor in projects that required sophisticated technology.

The study assessed dynamism of projects in terms of project membership. Participants felt that membership in their project had increased. The study attributed this phenomenon to transparency and efficient management. The study observed that increased membership occurred only in projects that were deemed to run transparently and efficiently. However when members perceived their management committee as corrupt they withdrew their membership. This sentiment was expressed by a water officer in an interview who said;

> *"…The membership of this project has been on the decline after a perception that some committee members had misappropriated the money the government donated for tank installation (*Water officer, Githiru)*".*

Sustainability of water projects was also measured in terms of the willingness of project members to pay for services rendered by the water projects. Participants expressed their willingness for continued payment for the services rendered by the water projects. The study noted that willingness for continued payment of services was directly linked to benefits accrued to members. The study captured this respondent who retorted;

> *"…Our water is metered and not expensive, we utilize this water to irrigate small kitchen gardens that earn us some money and therefore we very much are willing to continue paying" (FGD, Kiaguthu WP).*

Similar sentiments were expressed by the water officer in Kinaini water project who observed that payment of water services had picked up to 90% since he was seconded to the water projects. He felt that he had managed to build the capacity of the new management committee on prudent project management hence the confidence of the beneficiaries had increased.

Willingness of the majority of the water projects beneficiaries to pay for the water services indicated better project cost recovery that could ensure project sustainability. The study observed that water consumers were willing to pay for the water services so long as they are assured of a predictable supply. In projects whose supply ceased consumers indicated willingness to resume

payment if they were assured of supply. This clearly indicated that water consumers were ready to support projects as long as they associated them with benefits.

The study also examined if the participants were satisfied with services provided the water projects. Respondents were in agreement that they were satisfied with the services offered by the water projects. The study observed that project members associated high level of projects control, open project management with more project benefits; this made them to be more satisfied. This is affirmed by qualitative repossesses from project officers who observed that.

> *"…The conflicts and suspicions that existed before disappeared immediately members were allowed to choose their preferred management committee – since then the affairs of this project has been run transparently hence members satisfaction has increased a great deal with this project observed in the members concerning this project"(Water officer, Kinaini WP)*

The quantitative results were also affirmed by responses of the qualitative survey here a respondent was captured saying;

> *"… a lot of positive changes have been experienced since the implementation of this project, our wives and daughters are not burdened with the duty of spending the whole day fetching water instead nowadays they spend that energy on the farms where they produce other goods that has helped to improve the well being of our families" (FGD, Kiaguthu WP).*

The study also examined the changes realized since implementation of the water projects. The study observed that implementation projects had resulted into many positive changes. Access to domestic water resulted into significant changes which included improvement in the level of hygiene, reduced distance to water point which also saved on time. The saving on time to fetch water resulted in increased farm productivity because people put more time doing farm labour and livestock rearing. Participants in this region are small scale farmers whose depends on subsistence farming. When access to domestic water improved farmers were in a position to improve husbandly of their livestock by embracing zero grassing method of cattle rearing which depends on a standby water source, at the same time farmers were able to implements other forms of livestock rearing like poultry and piggery. These activities had resulted into increased food security and household income.

4.6 Community participation in decision making and sustainability of Community Water projects

This section dealt with the influence of Community participation in decision making on sustainability of Community Water projects. Participation of community of community in decision making is drawn from the Theory of Social Learning. Outcomes of social learning process are assumed to influence both the social process and the outcomes of the decision-making process. In this regards attributes like participation of members in project design, attendance of project meetings, contribution of members in meetings, control of members over major decisions, choice of committee members among others are key in this variable.

This variable had nine coefficients reflecting on the project information, participation in planning, meeting attendance, contribution of members in deliberations, information of members about major decisions, control of members in major project decisions, control of members over the choice of project committee members and whether decisions of project committee reflects those of members. Respondents were asked to provide answers on 9 Likert items in the questionnaire that were measured by a five point Likert scale. Where 5= strongly agree, 4= Agree, 3=Neutral, 2=Disagree and 1=strongly disagree. The mean of each item was computed to assess the extent to which respondent agreed with views expressed in the item. The mean of means was also computed to assess the extent to which respondents agreed with the level of their participation in decision making. The results are presented in the table 4.11

Table 4.13: Community participation in project decision making process

	Statements	SD	D	N	A	SA	MN	STD V
1	I was informed on plans to initiate/ revive the project	67 (32.4%)	16 (7.7%)	4 (1.9%)	39 (18.8%)	81 (39.2%)	3.25	1.755
2	I took part in the planning of the water	102 (49.4%)	21 (10.1%)	2 (1.0%)	33 (15.9%)	49 (23.6%)	2.55	1.728
3	I attend meetings of the community water project	10 (4.8%)	2 (1.0%)	10 (4.8%)	112 (54.1%)	73 (35.3%)	4.14	0.927
4	I talk/ make contributions during the project meetings	67 (32.4%)	13 (6.3%)	7 (3.4%)	71 (34.3%)	49 (23.6%)	3.11	1.628
5	My contributions influence decisions made about the project	65 (31.4%)	18 (8.7%)	14 (6.8%)	71 (34.3%)	39 (18.8%)	3.00	1.566
6	I am informed about major decisions concerning community water projects	21 (10.1%)	10 (4.8%)	11 (5.3%)	78 (37.7%)	87 (42.0%)	4.16	1.054
7	Community members have control over major decisions of the community water project	25 (12.1%)	24 (11.6%)	16 (7.7%)	59 (28.5%)	83 (40.1%)	3.72	1.371
8	Community members have the control over the choice of project Committee members	7 (3.4%)	7 (3.4%)	12 (5.8%)	65 (31.4%)	116 (56%)	4.33	0.975
9	Decisions made by the project committee reflect the views of the community	26 (12.6%)	16 (7.7%)	13 (6.3%)	63 (30.4%)	89 (43%)	3.84	1.384
	Mean of Means						**3.57**	**1.759**

The study sought the opinion of the community members on whether they had prior information about project initiation. The results recorded a mean score of 3.25 and a standard deviation of 1.755 this indicates that the respondents expressed the view that they were informed about project initiation. Further the study examined participation of the community in project planning. The result of the respondents had a mean of 2.55 meaning that majority of the respondents were in disagreement with this position; this means that the planning of the water projects was done by

only a few members of the projects. The study also examined the attendance of project meetings by the project beneficiaries. The mean score was 4.14 with a standard deviation of 0.927. The results show that majority of project beneficiaries were in agreement that they attended project meetings. In another item sought to find out if project beneficiaries contributed in project deliberations .The results indicated a mean of 3.11 with a standard deviation of 1.628 as is shown in table 4.11. The results presented an indifference opinion on respondents' view, while one half contributed during project meetings the other half. The study also sought to find the influence of member's contributions on projects decision making process. The mean was 3.00 this is neutral which means that half of the respondents felt that their contributions influenced decisions of the water projects. Another item sought to find out if members are informed on major decisions concerning the water projects. The mean was 3.72 which mean that majority of the respondents felt they were informed about major decisions that concerned community water projects.

Further the study tested if the Community members had control over projects major decisions**.** The mean was 3.72 which meant that majority of the respondents expressed the opinion that community members had control over the projects major decisions.

Item 8 tested whether Project members had control over the choice of project management committee members. A mean score of 4.33 and standard deviation of 0.975 was obtained. The result indicates that a majority of respondents were in agreement that community members had control over the choice of projects management committee members.

The study went on to test the opinion of community concerning decision made by the committee s in relation to their wishes**.** A mean of 3.84 and standard deviation of 1.384 was recorded. This indicate that majority of the respondents were in agreement that the resolutions passed by the project committee members reflected the views of the community members.

From the findings of the study indicated that the communities participated in project decision making process because most of the community members attended project meetings, were informed on major decisions concerning the water projects, community members had both the control members of the choice of project management committee members and that the resolutions passed by committee members reflected the views of the community. These were the areas of decision making process that enhance sustainability of community water projects.

Results also indicated that community water project faired averagely in decision making process in the of participation; community members having prior information about project initiation, contribution by way of talking during project meetings, and their contributions influencing major decisions about the water projects.

However the findings also indicated that community members participated less in the planning of the water projects. This was an area of weakness in this variable decision making process which compromised sustainability projects of community water projects.

This observation was subjected to further analysis by evaluating the mean of means of the 9 items that extricated community participation in decision making. The mean of means for the nine items was 3.57. The result indicates that majority of the respondents were in agreement that they participated in decision making process of the community water projects.

This finding indicates that respondents in this study were confident that there was community participation in decision making process and as such were in a better position to make informed decisions that could sustain their projects for a long time.

Participation in decision making process was enhanced by giving the community members prior information during the initial stages of the project. This gave them a chance to make decisions about the choice of the type of the project they could afford to support and where they wanted the project infrastructure to be placed. Attendance to meeting and allowing of the community to air their views during meetings made them feel that they owned the projects. Hence this boosted their willingness of sustenance of the community water projects.

The opinions captured in the quantitative data were also validated by responses captured in focus group discussions. Participants in FGDs revealed that community was informed prior to project initiation and given a hand to decide where to place the project infrastructure.

> *"…We were informed about when the project was to start and this gave us ample time to organize for money and also participated in identifying where we would build the water intake" (FGD, Zamwua WP).*

The findings are in line with those of a study by Carter, Tyrrel and Howsam (2009) who observed that information sharing is an essential component of participation by stakeholders,

during project initiation it allows project beneficiaries to have the relevant information about the available alternatives enabling them to arrive at the right choices.

Sharing of project information with project stakeholders during implementation could contribute to an increase in their support for project. This observation is in line Lessons from learned from an empirical study by Ediriweera, (2005) on the effect of information sharing on project the performance of rice growing project in Sri Lanka. The study found out that information sharing facilitated, generated, and galvanized stakeholders' support of the project.

On closer scrutiny, this study observed that ordinary community members were involved in the planning process indirectly through their elected management committee who either contracted this obligation to experts or carried out the process in conjunction with experts on behalf of the projects beneficiaries. This is supported responses of focus group discussions

> *"...Initial planning meetings was done by the project committee and the engineer from Caritas (Kiguthu,WP).*
>
> In Kinaini water project a committee member retorted
>
> *"...In our project the committees are implementers, but in most cases when the project is to be designed or there is a major change to be made on the design the designing is carried elsewhere and the committee only implements Kinaini WP).*

Evidently, there is a general agreement that community members were involved in project initiation, but apparently technical planning was done mainly by the experts in the water sector with minimal participation from the primary stakeholders, while in some of the cases the primary stakeholders were only involved only through their representatives.

Attendance of project meetings is important because it is in meetings that important matters affecting the project are discussed besides being a forum where members create a rapport among themselves, in the same vein attendance of meetings is also an indicator of the confidence of the members on their projects this view is supported Isham and Kahkonen, (2009) asserts that extent of participation of community in decision making process is determined in terms of the share of involvement of households in particular planning or construction activity which is indicated by the number of planning meetings attended. The study also noted that while in many of the projects, attendance was voluntary in some others it was a project rule and in which non

observance attracted penalty as is indicated by a participant in Kiaguthu water project FGD who was captured saying

> *"…attendance of meetings in our project is compulsory in -those members who miss to attend project meetings are fined Kshs 50 for every meeting missed besides giving valid reasons for their absence"*

The study observed that in some projects there was avoidance of holding meetings by project officials, this is an indication that project officials are not confident to face their members and perhaps be accountable to them. This sentiment was expressed by a participant in FGD in Kanjuri water project who said:

> *"Meetings in this project are rare and are called to inform members about financial crisis, therefore committee members are the ones making the decisions alone"*

Lack of meeting attendance by project stakeholders may diminish their interest in the project which could lead to lack of ownership of decisions process. This may result to apathy by members. This observation is in line with Isham and Kahkonen (2009) asserts that depth of participation is measured in terms of the number of planning meetings attended prior to construction, and if the households felt that they had an influence over project-related decisions.
However the value of meeting attendance is enhanced when individuals in the meeting talk and exchange their ideas. It is through this exchange that members are able to express their feelings about the project. Respondents in FGD from different projects were captured saying:

> *"…Yes I talk during project meetings" I can't go to a meeting and fail to talk" (FGD, Kihuri WP)…"Yes I do talk, either through complaining, passing information to committee members or even sharing of my feelings about the project "(FGD, Zamwua WP). "We engage with our project very much through talking and sharing of ideas- it is through the talks of members we are able to know about their problems and requirements-that is the reason we have made attendance of our meetings compulsory"*
> *FGD, Kiaguthu WP).*

Community members should be encouraged to talk in project meetings because it is in talking that quality ideas are developed which otherwise is not been possible.

However a significant number believed what they said was never taken on board in the projects decision making process. This observation was explicitly captured in different FGDs where participants remarked;

> *"Members views are always incorporated in every decision making in this project and that is the reason behind the progress you find in this project" (FGD, Muteithia WP). "…You know committee members are picked from those people who are knowledgeable and therefore most of the decisions in this project are made by committee members" (FGD, Hika WP).*

Projects in which views members were seriously put on board in the process of decision making resulted into better performance of projects as compared to others in which views of the members was ignored. Incorporation of beneficiaries views project decisions help to motivate beneficiaries towards their project because they feel valued and respected. The claim is supported by Rahema (1992) who avers that participation is linked with the freedom to exercise fee will, White (2011) who observed that genuine participation as an act which draws its strength from human compassion, unselfish motives, is sensitive to the feelings and worth of others .Motivation of project beneficiaries is a factor that contributes to project sustainability. This is line with observation of Carter, Tyrrel and Howsam, 2009) who avers that motivation is an essential component of project sustainability.

The study also examined if members of water projects were provided with information when changes were implemented in the water projects.

> "…*Information on major changes like cleaning of the tanks, replacing of old pipelines and water rationing is always passed to water consumers so that they can prepare on alternatives sources of water since such major changes usually disrupt water flow to the households" (FGD, Zamua WP).*

Providing information is a demonstration of respect. It also allows people to hold community representatives to account which improves project performance and sustainability. This assertion supports that of Crawford (2004) who observed that project information sharing with stakeholders plays to vital roles ie to demonstrate accountability for funds to project stakeholders and shore up performance by providing relevant information to facilitate sound

management decisions which increases the capacity of the project team to respond and manage which in turn translate into better project performance and thereby project "sustainability.

From the foregoing, project beneficiaries are informed when major decisions are undertaken in their water projects. This in itself demonstrates respect for project members from their projects management committees as well as an indicator of willingness of management committee to be held accountable for how they run the projects. Information is an ingredient of project success and can aggregate to project sustainability. When project beneficiaries are provided with project information they felt valued and were motivated to make positive contributions to their project. This observation is in line with of (Cleaver, 2001) who avers that a communication network is needed to ensure that beneficiaries are kept informed on matters affecting the project as a strategy of reinforcing their continued commitment towards the project. In order to improve on sustainability projects could perhaps device efficient mechanisms of communicating with the relevant stakeholders especially the beneficiaries.

These results indicate that where projects were doing well, had members who felt control over the decisions of their projects; this was vice versa in poor performing projects. This conclusion arrived at from observation made from two projects that seemed managed differently. Respondents retorted as follows;

> *"Committee members can't carry out a major activity without members' consensus therefore project members are the ones who control the project by mandating the committee on what to do" (FGD, Kihuri WP), "…This project is not controlled by members; major decisions are made by the chairman and a few of his committee members" (Water officer, Gaithuri WP).*

Participation of projects by households enhances their capacity to make informed decisions an can lead to project success besides boosting their confidence in the project and therefore the community feels confident when they realize they are at the top of decision making process. This perspective is supported by Isham, Narayan and Pritchett *(*1995) who observed that greater community control over project-related decisions during planning and construction was significantly associated with improved project effectiveness.

Quotes of the respondents in the qualitative survey indicate that it is the members who had the control over the choice of the committee.

> *"Since they are elected to represent our views most of their decision are in line with the wishes of the community members" (Participant, Kiaguthi WP),*

However members were indifferent in poorly performing projects where members felt to have lost control over the choice of management committee immediately they put the first team in office. A respondent was quoted saying;

> *"… Yes we are the ones who elected them to the office but they have overstayed in the office, and should allow others to be elected" (Respondent, Gaithuri).*

Results indicated that most respondents agreed that the resolutions passed by the project committee reflected the views of the community members. This implies that in many cases the project committee members make decisions that clearly reflected the wishes of the members they present.

> *"…We occasionally review their performance and accountability and in many of the occasions they have been found to be in tandem with members expectations, therefore I am in total agreement that most of the decision made by the committee members mirrors what the community wants" (Participant, Zamwua WP).*

There is like hood of increased participation in the project activities if the decision of the projects committee members reflects the wishes of the members. The views are in line with those of Chambers (1997) who avers that participation is low if decision making process and management is under the control of project members and high level when powerless and poor people are cooperatively and actively involved in all stages of the project

Observations made in this survey clearly indicates that members of water projects were actively involved in various facets of project decision making process which include among others project initiation, attendance of project meetings, information sharing, project deliberations and choice of committee members. These observations are consistent with those of Cooke and Kothari (2001) who identified participants' views, choices, needs and feelings as the indicators of community participation in decision making.

The results of quantitative data was further subjected to regression analysis for the purpose of testing the hypothesis on this variable

Hypothesis one: Community Participation in project decision making has a significant influence on sustainability of community water projects.

Hence hypothesis one was tested using the model

1; $Y_1=\beta_0 + \beta_1 X_1 \ldots + \varepsilon$

Where:

Y_1=sustainability of community water projects

X_1 = participation in decision making

β_0=Y-intercept (the constant term)

β_1= the coefficient the first independent variable.

ε_1 = error term.

The result of the test are represented if table 4.12

Table 4.14: Community participation in decision making

	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.545a	.297	.293	.1366163	.297	86.452	1	205	.000

a. Predictors: (Constant), Community Participation in Decision Making

Table 4.15: Coefficients of community participation in decision making

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.340	.041		8.194	.000
	Community Participation in Decision Making	.527	.057	.545	9.298	.000

The model represented a path coefficient R^2 which shows the proportion of variation in dependent variable explained by the regression model. Table 4.12 shows that community participation in decision making had a coefficient R^2 .293. Coefficient R^2 of value .293 indicates that 29.3% of the variations in water projects sustainability can be accounted for by the influence of community participation in decision making.

From data in Table 4.12, X_1 the independent factor contributed to R= 0.545 and adjusted R^2 was 0.293.

This indicated that with R of 0.545 there was a moderate positive linear relationship between participation of community members in decision making and sustainability of community water projects, the result also indicate a coefficient of determination R^2 of 0 .293, this means that community participation in decision making accounted for 29 .3% of the variation in the level of sustainability of water projects. This implied that 29.3% of the change in water projects sustainability could be explained by participation of the members' community projects in decision making. Therefore the study deduced that community participation in decision making has a positive influence on sustainability of community water projects.

According to Hair, Babin, Anderson and Tatham (2006) if the coefficients of the independent variables are not zero, the F-ratio should significantly be greater 1.00. In this case F-ratio =86.452 with a p-value <.000. Hence the simple regression equation $Y=b_0 + b_1X_{1+} \varepsilon$, can be explained as:

$Y=0.340 + 0.545\ X_1 + 0.041$.

Hypothesis that Community Participation in decision making has a significant influence on sustainability of community water projects was statistically significant.
The objective which sought to establish the extent to which community participation in decision making influenced sustainability of community water projects was based on the premise that participation of community in project decision making process influenced project performance which led to project sustainability.

The results of the study demonstrated that community participation in decision making had a moderate positive linear relationship with sustainability of community water projects community participation in decision making significantly influenced sustainability of community water projects at 5% level of confidence ($p< 0.001$).

The findings indicated there was a moderate positive linear relationship between community project participation in decision making and sustainability of community water projects. Increase in strength of community project participation in decision making resulted into increased project sustainability. Participation in decision making accounted for 29.3% of the level of project sustainability of community water projects. The regression equation explaining the relationship between the variables $Y= \beta_0 + \beta_1 X_1 \ldots + \varepsilon$ resulted into $Y=0.\ 340 + 0.545\ X_1 + 0.041$ in which an increase in participation of community in project decision making of one unit influenced increased level of sustainability of community water projects by 54.5%. The findings therefore supported the research hypothesis H_1 that stated that Community Participation in decision making had a significant influence on sustainability of community water projects

The indicators in this study were consistent with those of an empirical study by Isham and Kahkonen (2009) who observed that community participation in decision making is measured in terms of the share of households that reported having been involved in a particular planning or construction activity, the number of planning meetings attended prior to construction, and whether households felt that the community had the most influence over project-related decisions.

The findings of this study indicated that the communities participation in project decision making process was enhanced by household; attendance to project meetings, having prior

information about major decisions of the project, being in a position to control the choice of the project management committee and by the adherence of the management committee in making resolutions that reflected the views of the community members. However participation in project decision making process was impeded by when members; has less prior information about project initiation, contributed less by way of talking during project meetings and failure to incorporate members' views in major decision making.

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The results were consistent with the findings of a World Bank study done by Isham, Narayan and Pritchett (1995) who examined 121 rural water projects in 49 developing countries of the world. The studies examined the extent to which the degree of control exercised by community members over project-related decisions during planning and construction influenced project effectiveness. The findings indicated that greater community control was significantly associated with improved project effectiveness which in turn improved project sustainability. Prokopy (2005) too observed that household involvement in decision making was associated with indicators of better water project performance which resulted in improved project performance. However this study observed that household attendance of project meetings improved project sustainability. This was contrary to earlier findings by Prokopy (2005) who found that households' attendance of planning meetings before and after construction was not associated with improved project performance.

4.7 Community Participation in Resource Mobilization and Sustainability Community of Water Projects

Community participation in resource mobilization in the literature is closely linked to the question of project ownership and sustainability. Project resource mobilization as a variable consists of items like labour, money, materials and time. This variable consisted of six items reflecting the respondent's level of participation in mobilization of; labour, initial capital, operation & maintenance fund, external fund, materials from self and external sources. Respondents were asked to provide answers on each item that was measured by a five point Likert scale. Where 5= strongly agree, 4= Agree, 3=Neutral, 2=Disagree and 1=strongly disagree. The results are presented in Table 4.14

Table 4.16: Community Participation in Resource Mobilization

	Statements	SD	D	N	A	SA	MN	STDV
1.	I have done work for my community water project	32 (15.5%)	3 (1.4%)	3 (1.4)	36 (17.4%)	133 (64.3%)	4.14	1.448
2	I contributed money towards initial development of the community water project	9 (4.3%)	2 (1%)	1 (0.5%)	19 (9.2%)	176 (85%)	4.70	0.897
3	I contribute money towards the operations and maintenance of the water project	36 (17.4%)	5 (2.4%)	2 (1%)	26 (12.6%)	138 (66.6%)	4.09	1.530
4	I contributed materials to the community water project	170 (82.2%)	10 (4.8%)	4 (1.9%)	13 (6.3%)	10 (4.8%)	1.47	1.118
5	I assisted to source project finances from other stakeholders towards the community water project	172 (83.2%)	14 (6.8%)	3 (1.4%)	9 (4.3%)	9 (4.3%)	1.38	0.999
6	I assisted to mobilize project materials from stakeholders of the community water project	166 (80.2%)	16 (7.7%)	8 (3.9%)	7 (3.4%)	10 (4.8%)	1.45	1.055
7	I have allowed community water project to construct water pipes through my land	117 (56.5%)	9 (4.3%)	2 (1%)	17 (8.2%)	62 (30%)	2.51	1.832
8	The land on which water infrastructures including tanks is built belong to a member of the community	155 (74.9%)	9 (4.3%)	1 (0.5%)	12 (5.8%)	30 (14.5%)	1.81	1.504
9	Most of the resources needed for operations and maintenance of the water project is provided by the community	22 (10.6%)	11 (5.3%)	24 (11.6%)	82 (39.6%)	68 (32.9%)	3.79	1.255
	Mean of Means						**2.81**	**1.293**

Results in Table 4.14 indicate that the study assessed whether community members contributed any labour towards the water project. The results recorded a mean score of 4.14 and standard deviation of 1.448 indicate that majority of the respondents were in agreement that they contributed labour towards implementation of the water projects.

In terms of financial mobilization of project members towards the water projects the findings of the study recorded mean of score of 4.70 and standard deviation of 0.897 as shown in table 4.14. This revealed that the respondents were in agreement that they contributed some money towards the initial water projects. The study examined whether community contributed funds towards operations and maintenance of the water project. The analysis returned a mean score of 4.0 as shown in table 4.12 and standard deviation of 1.53.This indicated that most of the respondents

were agreement that they contributed funds to carry out operations and maintenance of the water projects.

Further the study established whether the community participated in contributing materials towards the water projects. From survey results returned a mean of 1.47 and standard deviation of 1.118 as shown in table 4.14. This indicate that majority of respondents were in strong disagreement that they never contributed materials towards implementation of the water projects.

The study assessed if the community members participated in sourcing of finances from external stakeholders. The findings indicate that most of the respondents' didn't participate in sourcing of finances from external stakeholders for the projects and is supported by a mean of 1.47 as shown in table 4.12.

In terms of how each of the individual community members participated in mobilizing project materials from other Project stakeholders, the study registered a mean score of 1.45 as is shown in table 4.14. The findings indicated that majority of community members were strong in disagreement that they didn't participate in mobilizing of finances from external project stakeholders. The study established if water pipes are laid through members land. The results recorded a mean score of 2.51 as shown in table 4.14. This meant that most respondent were of the view that the pipes were not laid through members land. It also sought to establish whether the land in which water projects tanks had been constructed belonged to community members. The findings returned a mean score of 1.81 and standard deviation of 1.504 as shown in table 4.14. This indicated that most of the respondents were in strong disagreement that most of the water infrastructure is constructed in members land. The study examined if community members participated in the provision of resources used in the running of the water projects. The results recorded a mean score of 3.79 with a standard deviation of 1.255. This means that majority of respondents were in agreement agreed that they participated in the provision of resources to run the water projects.

The means of nine items used to extract data on community participation in resource mobilization were aggregated and used to compute the mean of means that resulted to a mean of 2.81 and standard deviation of 1.293 this indicated that respondents were indifferent, whereas some participated in resources mobilization others didn't.

The study observed that community members were actively involved in mobilization of initial projects resources for them to be accepted to be members of the project. The resources came in form of labour and project capital.

Table 4.17: Resources for sustenance of water services

Most important resources	Frequency	Percent
Project finance	113	54.6
Big intake/storage	75	36.2
Human resource	10	4.8
Total	**207**	**100**

Table 4.15 indicates that the study sought the most important resource in the sustenance of water surfaces. Results on this items indicates that project finance as the most important resource followed big water storage or water intake then human resource in that order.

Table 4.18: Sources of project resources

Source of the resource	Frequency	Percent
Donors	25	12.1
Government	36	17.4
Donors and government	28	13.5
Community/donors/government	34	16.4
Community	84	40.6
Total	**207**	**100.0**

In table 4.16 the study sought the opinion of project beneficiaries on the sources of project resources. Results indicated that respondents believed that community beneficiaries were the biggest source at of project resources with a frequency of 40.6%, followed those who believed it was government 17.4 %, then those who believed it was a combination of community /donors/ & government 13.5% and finally those who believed it was donors was 12.1%.The findings indicated that project beneficiaries were the biggest source of project resources needed for sustenance of community water projects.

The quantitative results on community participation in resource mobilization were corroborated by some of the related themes explored from the qualitative data.

The study observed that members provided labour by clearing site where to build water intake, water tanks and dug trenches where to lay pipes. Members who for one reason or another could not avail their labour were offered alternative to convert labour to money, this practice continued to be applied even to new members who joined the projects later after the initial project implementation.

> "*…community contributed 42 days of labour however if you couldn't provide you contributed Kshs 42000 which was equivalent to 42 days of labour- this is the amount of money that is still demanded of a new member to the project" (Respondent , Muteithia WP).*

Resource mobilization is very vital in sustainability of projects because it makes members to feel that they own the project. The observation of this study affirmed the assertion of Isham and Kahkone (2009) who observed that community participation in resource mobilization is closely linked to the question of project ownership and sustainability.

The study observed that initial members in many project became members by contributing labour but those who come later after the project was in place were required to convert the labour hours into money.

The study observed some projects applied contribution of some money in admitting beneficiaries to project membership. This is the fund that was used to implement the projects during initial project development. However in some projects, the money contributed by the community was very little to cause any impact and required the intervention of the government. The study observed that in such instances the amount of fund the community contributed was so little to match either the Government or donors' contribution. This was also directly linked to community perception of project ownership which was also found to be low in cases where project beneficiaries' contribution was low. Perhaps this could also explain why sustainability in some projects was low.

> *"…The projects was given Kshs 27000 for survey by the area members of parliament, National government gave 32 million from the ministry of irrigation and the members contributed kshs 857,500" (FGD, Githiru, WP).*

When beneficiaries are involved in one way or another in mobilization of resources for their projects it increases their emotional commitment which is significant for participatory development. This observation is line with the assertion made by Isham and Kahkonen (2009) who observed that breath community of participation in a project is measured in terms of the amount of cash or labor contributed to the project. The more the amount of cash or labor or the community contributed meant more demand-responsive the community, hence the more the likely hood of project sustainability.

The study observed that project beneficiaries were aware that beside taking charge of operation there was need for them to take full responsibility of maintenance and repair of their projects facilities because of wear and tear which occurred as a result of continued usage. On the other hand the study noted that due to their low economic status where the average income was Kshs 5000 and below, they fixed at between Kshs 150-300 per month, this user fee is low and was affordable to most of the beneficiaries. The study observed that in the circumstance if the user fee was kept high it would result to high rates of default which could result to low sustainability.

> *"Each member contributes Kshs 300 per month for operations and maintenance" (FGD, Hika WP) "...Our water is metered and therefore consumers pay as per the volume of water used" (FGD, Kiaguthu WP) "...Every member is supposed to pay Kshs 150 per month to cater for opration and maintenance of the water system" (Water officer, Gaithuri WP).*

It is important that community contribute some money to meet cost recovery as this vital issue for financial sustainability of any water project. The observation of this study is in line with that of by Carter 2009 who said that better cost recovery ensures sustainability of water project schemes.

Contribution by project beneficiaries could save the project from being captured by dependency mentality in which case could prevent the project from sustaining itself after the donor withdraws the funding.

This observation was consistent with that of Ostrom (2002) who observed that Voluntary provision of labor, time, money and materials to project by project beneficiaries is a necessary condition for breaking patterns of dependency and passivity.

The study noted that the main material for water project is the pipes which must be fitted when they are of uniform size. Therefore technical requirement necessitated that project beneficiaries make their contribution inform of money which was later used to buy the project materials. In many other projects like Githiru and Kiaguthu the project rule required that the beneficiaries contribute labour while the Government or the donor contributed project materials. Therefore non contribution of materials by members was not by default but by design. Participant in qualitative survey retorted;

> *"Members were not required to contribute materials, instead after making the total project budget, the total sum was divided among members that each would contribute" (FGD, Muteithia WP)"…The project received initial project materials from the government through the ministry of water and irrigation and members were only required to mobize labour (FGD ,Githiru WP).*

The study found out that most of the respondents' didn't participate in sourcing of finances from external stakeholders; however it done on their behalf by the members of the management committee.

> *"…In the year 2000 the management committee members were sent to office of the Vice President of the republic of Kenya to seek for assistance – it is after this that the Vice president then Hon Proffesor George Saitoti helped to realise Kshs 2Million in a fund raising conducted at Ihururu"(FGD, Zamwua WP).*

The findings indicated that majority of community members didn't participate in mobilizing of finances from external project stakeholders. The reason behind the low participation was because the task of mobilizing finances from external sources was left to a few individuals who went to become project champions in form of project management committee members. The study also learnt that some of the project management committee members owed their positions in the community projects to their ability to mobilize resources from external sources on behalf of the other beneficiaries. The item was clearly clarified through quotes from respondents in FGD who said;

> "*…We mandated some members to seek materials from donors like UNDP, Sasini later on elected the same members to become project committee members.*

Evidently having project champions as members of the management committee enhanced project performance, this is a factor that positively impacted on project sustainability. Notably the study realized that the reason why most of the pipes are not laid in members land is they were designed to follow the routes/roads leading to the beneficiaries' homes hence there wasn't any need to lay them on members land. This assertion is confirmed by responses from water officer in Zamwua and a participant in FGD Kinaini water project who had this to say:

> *"Most of the water infrastructure like water tanks in this area is found on public utility land while most pipes follow the roads leading to beneficiaries homes"(Water officer, Zamua WP).*

However in situations where technical conditions couldn't allow water pipes to pass following the roads beneficiaries were very willing to allow them to be laid through their lands

> *"…Our lands are small and houses close to each other which necessitate most of the pipes to be laid through the members land "(FGD, Githiru WP).*

The study generally observed that what determined where the pipes passed had more to do with what was technically sensible rather than on the willingness of the beneficiaries to allow them laid through their lands.

The study found out that most of the water infrastructure are not constructed on beneficiaries land not because the individual beneficiaries were not willing donate some land but because public land was readily available for the purpose.

> *" …There was no need of beneficiaries to donate land since the tanks were located on a public land that was initially a livestock holding ground during the colonial times" (Water officer, Njeng'u- Nyaribo WP).*

The study explored the resource most crucial for sustenance of water projects and participants were in agreement that the most crucial resource was project finance, followed by water intake and then human resource. This observation is evidently supported by the views of this participant who said;

... finance is the most crucial resource because all others depend on it, then followed by a big water intake because if we had one we would get enough water not just for domestic use but even for irrigation purposes " (FGD, Zamua WP).

The study also sought the opinion of participants on the source of project resources. Participant responses indicated that the most of the project resources that are most crucial in putting up are sourced from the community project beneficiaries and not from the Government, donors or other stakeholders. The study captured this participant who retorted;

"...After the donor assisted us with the construction of the infrastructure the duty of operating and maintenance of the project was left to project members , to ensure that everybody is responsible we installed water meters for every beneficiary so that we could be in a position to make cost recovery for the services rendered to beneficiaries"(FGD, Kiaguthu WP).

This shows that there was a general feeling that community members had the responsibility of carrying out of operation and maintenance of the water projects. Willingness of the project beneficiaries is an indicator of project sustainability. This assertion is backed by Evans and Colin (2005) who observed that the level of willingness of users to provide the necessary resources to keep the system functioning which include time, money and labor may affect the level of sustainability of rural water system. On the hand project beneficiaries are only willing to pay for services commensurate with accrued benefits. This claim is also supported by Evans and Colin, (2005) who avers that water beneficiaries would be more willing to pay for operation and maintenance if they perceived significant improvements in services of the water system.

Hypothesis two: Community participation in project resource mobilization had a significant influence on sustainability of community water projects. The following model was adopted.

$Y_2=\beta_0 + \beta_2X_2+\varepsilon$

Y_1=sustainability of community water projects,

X_2 = participation in resource mobilization

Table 4.19: Community participation in project resource mobilization

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.474[a]	.224	.221	.1434695	.224	59.273	1	205	.000

a. Predictors: (Constant), Community Participation in Resource Mobilization

Table 4.20: Coefficients of community participation in project resource mobilization

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	.396	.043		9.270	.000
	Community Participation in Resource Mobilization	.568	.074	.474	7.699	.000

Dependent Variable: Sustainability of Community Water Projects

The Table 4.17 also shows that community participation in project resource mobilization had a coefficient R .474 while R^2 was 0.224. Coefficient of R is 0.474 indicated that there was a weak positive liner relationship between community participation in resource mobilization and sustainability of community water projects. The value of adjusted R^2 of 0.221 indicated that 22.1% of the variations in projects sustainability could be explained by community participation in project resource mobilization in Nyeri County. The final model is $Y=0.396 + 0.474X_1 + 0.043$.

Hypothesis that Community Participation in project resource mobilization has a significant influence on sustainability of community water projects was statistically significant. This meant that an increase in participation of community in project resource mobilization of one unit influenced increased level of sustainability of community water projects by 47.4%.

Quantitative findings of the objective to assess the extent to which community participation in resource mobilization influenced sustainability of community water projects through linear model indicated that the community participation in provision of project labour, initial project capital, and fund for operational and maintenance positively boosted participation in resource

mobilization. It further demonstrated that community participation in resource mobilization significantly influenced sustainability of community water projects at 5% level of confidence ($p<$ 0.001). The study found that that 22.3% of the variations in projects sustainability could be explained by community participation in project resource mobilization. The regression model explaining this relationship of resulted into $Y=0.396 + 0.474X_2 + 0.043$ which meant that an increase in participation of community in project resource mobilization of one unit influenced increased level of sustainability of community water projects by 47.4%. This therefore supported the hypothesis that Community Participation in project resource mobilization influenced sustainability of community water projects.

The findings that community participation in resource mobilization, confirms the assertion of most commentators' who said that it influenced sustainability of projects (Ostrom 2002, Reed 2003, Isham and Kahkone 2009, White 2011). This is also consistent with previous study on the relationship of community resource mobilization and sustainability of community projects. Haysom, (2006) carried out a study of the sustainability of rural water supplies in 38 villages in Tanzania on local financing and cost recovery. The study found a direct correlation between local contributions and project functionality in which 85% of communities that deposited local contributions into a water account were regularly operating and repairing their water systems. Communities that lacked water accounts had failed water systems.

However this study contradicted another by Harvey and reed (2007) on community water projects in Ghana, Kenya, Uganda and Zambia which indicated that whilst community management was an intentioned principle of encouraging project ownership and as a concept for shifting responsibility for ongoing project operation and maintenance(O&M), and hence sustainability to the community, findings of the study indicated that this didn't automatically led to a willingness to manage or finance a water supply over a prolonged period of time as facilities fell into disrepair soon after installation.

4.8 Community Participation in Institutional Collaboration on sustainability of water projects

Community Participation in Institutional Collaboration on sustainability of water projects in this context is used to indicate variables in which community has limitations in maintaining their

water systems and hence require some form of external assistance over the longer term from a range of institutions. The institutions include the national and local government, the private sector, NGOs and self-help associations. Communities require collaborating with external institutions to acquire finance, technical services and capacity for expansion. Respondents were asked to provide answers on each the five items that was measured by a five point Likert scale. Where 5= strongly agree, 4= Agree, 3=Neutral, 2=Disagree and 1=strongly disagree. The results are presented in the table 4.19

Table 4.21: Participation of Community in Institutional Collaboration

	Statements	**SD**	**D**	**N**	**A**	**SA**	**MN**	**STDV**
1.	Community water projects collaborates with other institutions in sourcing of project finances	43 (20.8%)	1 (0.5%)	23 (11.1%)	63 (30.4%)	77 (37.3%)	3.63	1.498
2.	Community water projects collaborates with other institutions in the provision of technical & extension services	63 (30.4%)	5 (2.4%)	18 (8.7%)	56 (27.1%)	65 (31.4%)	3.28	1.643
3.	Community water projects collaborates with other institutions in conducting research/surveys	38 (18.4%)	3 (1.4%)	53 (25.6%)	57 (27.5%)	56 (27.1%)	3.43	1.388
4.	Community water project collaborates with other institutions in capacity building	79 (38.2%)	4 (1.9%)	15 (7.2%)	67 (32.4%)	42 (20.3%)	2.95	1.641
5.	Community water project collaborates with other institutions in infrastructural development / in sourcing materials for expansion	41 (20.2.8 %)	1 (0.5%)	17 (8.2%)	75 (36.2%)	72 (34.9%)	3.66	1.462
	MEAN OF MEANS						**3.39**	**1.526**

This section consisted five items that were used to extricate information reflecting on community collaboration. The items included sourcing external finances, provision of technical services, research/survey, capacity building and infrastructure development. The results indicated in Table 4.19 indicate that respondents agreed that water projects collaborated with external institutions in sourcing of project finance, undertaking research and in expansion of infrastructure. However they were neutral that they collaborated in capacity building and provision of technical services.

The study assessed whether the water projects collaborated with external institutions in the sourcing of project finances. A mean of 3.63 and a standard deviation of 1.498 as illustrated in

table 4.19.The results indicate that respondents were in agreement that the community water projects collaborated with other institutions in sourcing of project finances from various stakeholders. Further the study investigated if the projects collaborated with other institutions in the sourcing of technical and extension services. The response registered a mean score of 3.28 and standard deviation of 1.643. This indicated that the respondents were almost equally divided over the issue, with one half confirming and another negating that that community water projects collaborated with external institutions in the provision of technical services.

The study explored whether the projects collaborated with external institutions in conducting survey and research. The results recorded a mean score of 3.43 and standard deviation of 1.388 as shown in table 4.19. The results indicated that a slight majority of respondents were in agreement that the community water projects collaborated with external institutions in conducting survey and research.

Projects were also examined in terms of if they collaborated with other institutions in capacity building. The mean score was 2.95 with standard deviation of 1.641. This indicated that the respondents were almost equally divided over the issue, with one half confirming and another negating that community water projects collaborated with other institutions in capacity building.
The study also explored if the water projects collaborated with external institutions in the development and expansion infrastructure. A mean score of 3.66 with standard deviation of 1.462 was recorded. The results of study indicated that majority of the respondents were in agreement that water the projects collaborated with external institutions in infrastructural development/expansion with the survey results.

Overall the findings from quantitative survey indicate that the community water projects embraced collaboration with external institutions in sourcing of project finance from external institutions. The projects also collaborated with external institutions in the provision of technical and extension services. The projects also collaborated in undertaking survey and research with external they also collaborated in the development and expansion of project infrastructure.
However the study noted that collaboration in capacity building was not fully embraced in almost half of the projects under the study.

The study computed the mean of means for the five variables that extracted community participation in institution collaboration variable and recorded a mean 3.4 and a mean standard deviation of 1.526. The result indicates that indicate that respondents were convinced that their water projects collaborated with external institutions in the sourcing of various resources that are necessary in the provision of water services.

The quantitative results on community participation in institutional collaboration were also corroborated by information obtained from related themes explored from the qualitative dataset using FGDs and semi structured interview.

Project collaboration with external institutions can enable a project to be in a position to access resources that are otherwise not locally available but very critical for project continuance. This is in line with observation underpinned in the study by Whittington and Davis and Iyer (2002) who carried out a study on some 400 rural water projects in Bolivia, Peru, and Ghana which established that demand-driven, community management model and institution collaboration in areas of technical advice, training and project financing from public agencies or NGOs led to improvement in project performance

The study observed that in many projects collaboration external source of funding was positively embraced. The study noted that in many of the projects the initial capital required to implement the water projects was so huge that community left on its own couldn't afford. In such cases the study observed that some projects such Kiaguthu and Njeng'u/Nyaribo sought project finances from organizations such as Caritas IFAD and UNDP. Other projects sought financial assistance from the government as is captured by the response here under

> *"…We received Kshs27, 000 from our local member of parliament for survey, Kshs 32 million by the Government, while members contributed Kshs 600,000" (FGD, Githiru WP)*

The findings of the study are also in line with lockwood (2002) who observed the limitations of community managed projects to raise the huge investment required for projects alone and the need of form of external assistance from national, local government as well as the private sector and NGO.

The study also found out that in some projects there existed poor governance in which case members of the project management committee had turned community project into their "milk cow" and as such never sought any external assistance as doing so would have invited a lot of accountability on the part of the project management committee and perhaps they feared being removed from their privileged positions. This is evidently indicated by quotes from two different respondents from Gaithuri water project.

> *"We are very hesitant to seek any money from external sources especially from the Government because experience has shown that when you do that, Government take over your project and start calling the shots, a situation we would hate to imagine "(Committee member in FGD, Gaithuri).*

Some community based projects lack well trained technicians to undertake major repairs and therefore it is imperative that they seek such services by collaborating with institutions where such skills reside.

Notably the study found that projects sought assistance of well trained technicians from other institutions like Tana Water Service Board in case there was major infrastructure breakdown. This was also confirmed through quotes captured in an interview;

> *"…I assist this project to undertake major repairs in instances where the project technicians are overwhelmed, however in cases where I not I am not in a position, I usually assist the project to procure a suitable technician from* Tana Water Service Board" *(Project officer, Zamwua WP).*

Collaboration between development partners is vital in ensuring the availability of skills and enhancing capacity of the project.

The study found that the projects that were observed to be performing well had in one way or another had some technical collaboration with an external organization. Collaborations ranged from carrying out major repairs, training of project staff to monitoring and evaluation. These observations supports those of Mosse (1998) who carried out a study on the effect external agents on community tank management in South India and found that active community involvement in the maintenance of community infrastructure is a factor of external agents and contributes to sustenance of projects. Collaboration between development partners is vital in ensuring the availability of skills and enhancing capacity of the project. This observation is reinforced by Mazango and Munjeri 2009) who carried out a case study of community water management who found out that in developing countries water and sanitation facilities only

worked well for long time if the service is managed jointly by community and external support agencies.

The study also established that community water projects collaborated in areas that dealt with carrying out research and project surveys on how well they could construct water project infrastructure

> *"…Caritas did most of the research surveys including where the intake was to be constructed- currently they are also in a process of assisting to locate where to construct another bigger intake " (FGD, Kiaguthu WP).*

External agencies are essential to provide marginal inputs and training to project staff and community members which is crucial in making the community make informed decision and for project maintenance. This observation is underpinned by Netshiswinzhe (2000) who demonstrated the need of financial training of water management committee. He noted that committees that don't have the capacity to do financial planning are not able to determine service tariffs and deal with non-payment and therefore training should broaden the local level of financial management capacities instead of focusing on the individual. Evidently it is important that community water projects should collaborate with institutions that have capacity in order to build capacity in areas where the same is small or is lacking.

The study found that some of the community waters project had appreciated the need to periodically upgrade the knowledge and skills of their workers and members so as to remain a float with emerging service demands. This assertion is supported by respondents from Muteithia, Zamwua and Kinaini WP.

> *"…Sometimes we are sponsored by Tana Water Service Board to go for bench marking to other community water projects where we have learnt better methods of irrigation farming and management of water related resources"(FGD Muteithia, WP).*

The study observed that despite community members appreciating the positive role played by collaborating in capacity building with other institutions the management committee never saw the need to implement it due personal related reasons related reasons. This is evidently given by this respondent from Kanjuri WP who had this to say:

"…there is no collaboration with outsiders; we think the management fears to be exposed if they open to outsiders of the fishy things they do" (FGD, Kanjuri WP).

Opare (2011) in a study of "oats" water supply scheme in Ghana observed that, if local capacity is adequately strengthened with external support prior to assumption of full community control of water supply systems it increases the chances of the projects sustaining themselves.

From the foregoing it is evidently observed that the water projects under this study were equally divided in collaboration in the area of capacity building with other institutions.

The results of the study indicate that most of the water projects have realized the need to collaborate with other institutions in expanding their infrastructure.

> *KWAHO assisted us to convert our water from diesel piped water to gravity flowing water- they also assisted us to lay bigger pipes as well in building the current water intake"(FGD, Kinaini WP).*

The study found that collaboration with other institutions come in handy in provision of resources and expansion which otherwise would be elusive if community was to be left on its own. This observation is in line with those of Whittington and Davis (2009) who observed that community management model and ongoing collaboration in technical advice, training and additional funding from public agencies or NGOs contributed to improvement in performance of community projects.

Third Hypothesis: H_3: Community participation in institutional collaboration has a significant influence on sustainability of community water projects, the following model was adopted

$Y_3=\beta_0 + \beta_3 X_3 \ldots + \varepsilon$ Where

Y_1=sustainability of community water projects,

X_3 =participation in institution collaboration

ϵ_3 = error term

Table 4.22:Community Participation of in Institutional Collaboration

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.473[a]	.224	.220	.1435363	.224	59.027	1	205	.000

a. Predictors: (Constant), Participation of Community in Institutional Collaboration

Table 4.23 :Coefficients of community Participation of in Institutional Collaboration

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
3	(Constant)	.498	.030		16.602	.000
	Participation of Community in Institutional Collaboration	.321	.042	.473	7.683	.000

a. Dependent Variable: Sustainability of community Water Projects

From data in Table 4.18 X_3 the independent factor contribute to R= 0.473 adjusted R^2=0.220. A of coefficient (R^2) of 0.220 as shown in Table 4.18, indicates that community participation in institutional collaboration account for 22.0 % of the variation in the level of sustainability of community water projects.

Hence the simple regression equation $Y= Y_3=\beta_0 + \beta_3X_3 \ldots+\varepsilon$, can be explained as Y=.498 + 0.473 X_1 + .030 which meant that an increase in participation of community in Institutional Collaboration of one unit influenced increased sustainability of community water projects by 0.473 units.

Hypothesis that Community Participation in Institutional Collaboration has a significant influence on sustainability of community water projects was statistically significant. This means an increase in participation of community in Institutional Collaboration of one unit influenced increased level of sustainability of community water projects by 47.3 %.

On the objective that sought to assess the extent to which community participation in institution collaboration influenced sustainability of community water projects, it was observed that that despite the many positive impacts of Community project model of service delivery have limitations in sustaining services delivery over the long-term. It is now an accepted practice that since majority of communality projects cannot maintain their systems alone, a form of external assistance (Institution collaboration) is required to sustain them over the longer term (Sara and Katz 1997, Netshiswinzhe, 2000; Rosensweig, (ed.), 2001; Lockwood, 2002). Findings indicated that community projects collaborated with external institutions in provision of project finances, technical and extension services, and in infrastructure development. The results were in line with those of Mazango and Munjeri 2009) carried out a case study of water management in a hyperinflationary environment in Nkayi district in Zimbabwe who found that community water project facilities performed sustainably if they were able to attract external assistance in form finances and capacity building from Government or NGOs.

However the results were contrary to those by Mugumya (2013) that investigated the effectiveness of networks and collaborations on community based management in rural water supply in Uganda. The study found out the impact of the collaboration was thin especially at the lower levels of service delivery which not only complicate opportunities for replication and scaling up of some of the good practices of NGOs, but also those that would stimulate community engagement.

The current study however found that community water projects performed better when they are jointly managed by community management committee and Government agencies or NGOS. Hypothesis that Community Participation in Institutional Collaboration had a significant influence on sustainability of community water projects was supported.

Table 4.24 : Joint community participation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df 2	Sig. F Change
1	.646[a]	.417	.409	.1249716	.417	48.432	3	203	.000

a. Predictors: (Constant), Participation of Community in Institutional Collaboration, Community Participation in Resource Mobilization, Community Participation in Decision Making

Table 4.25 Coefficients of Joint community participation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.198	.045		4.400	.000
	Community Participation in Decision Making	.349	.059	.361	5.938	.000
	Community Participation in Resource Mobilization	.300	.073	.250	4.122	.000
	Participation of Community in Institutional Collaboration	.147	.042	.216	3.471	.001

a. Dependent Variable: Sustainability of community Water Projects

Table 4.22 presented that joint community participation contribute to R= .646 and. The simple regression equation $Y_4=\beta_0 + \beta_1X_1+ \beta_2X_2+\beta_3X_3\ldots+\varepsilon$, can be explained as Y=.198+ 0 .361 X_1 +.250 X_2+ $X_3$0.216+ .045

Fourth Hypothesis H_4: Joint community participation has a significant influence on sustainability of community water projects; the following model was adopted,

$Y_4=\beta_0 + \beta_1X_1+ \beta_2X_2+\beta_3X_3\ldots+\varepsilon$

Where Y_1=sustainability of community water projects,

X_1 =participation in decision making,

X_2 =participation in resource mobilization,

X_3= participation in institutional collaboration

Since the p-value (0.000) is less than the level of significance (0.05), Hypothesis that joint community participation has a significant influence on sustainability of community water projects was statistically significant. Adjusted R^2 of .409 indicates that joint community participation of community in project decision making, resource mobilization and institution collaboration contribute 40.9 % of sustainability of community water projects. This contribution is more that the contribution of participation of community in project decision making, resource mobilization and institution collaboration taken independently which is 29.3 %, 22.1% and 22.0% respectively. Therefore joint influence of community participation was found to be more influential in contributing to project sustainability than the participation of community in one facet of the project. This is consistent with observation by Kleemeier (2000) carried who out an empirical study on Malawi rural piped water project and found that joint community participation in project decision making, resource mobilization and institution collaboration improved project sustainability by about 50% than when there is only one type of participation. When each of the variable in the project participation is regressed independently and then summed up their sum total contribution to sustainability is 73.4%, however when the variables of participation are regressed jointly their contribution to sustainability amount 40.9%. Evidently the strength of attribution of each of the independent variable seems to have decreased when the variables are considered jointly

The results on objective that sought to determine the extent to which joint community participation influence sustainability of community water projects indicates that joint community participation of community in project decision making, resource mobilization and institution collaboration contributed 40.9 % of sustainability of community water projects. The result indicated contribution of joint participation to sustainability of community projects is more than contribution of an independent variable. The contribution of each of the independent variables on its own i.e. participation of community in project decision making, resource mobilization and institution collaboration were 29.3 %, 22.4% and 22.4% respectively as compared to 40.9% of joint participation.

The results implied that community participation in project decision making allowed the community to get involved in the planning and budgeting of the projects. Through the process they were able to make choices of projects they were able and willing to support. Perhaps this

resulted to increased sense of ownership that made community project beneficiaries to take an active part in mobilizing project resources from within themselves. These observations are line with those of Chambers (1994); Ramaswami (2007) who averred that allowing project beneficiaries to take part in decision making process leads to effective community demand which is the is the foundation for understanding and prioritizing community and household water and sanitation needs. This results to water systems that reflect the needs of communities in which they are willing to pay and sustain.

4.9 Monitoring and Evaluation and Sustainability of Community Water Projects

The study conducted out a survey on how community water projects conducted the activities of Monitoring & Evaluation. This was done under the following sub- themes; the items that were monitored in the community water projects, methods used in data collection and the format used in dissemination of M&E reports and monitoring and evaluation practices.

4.9.1Items monitored in water projects

The study asked the respondents to indicate the items they thought were regularly monitored in their projects .The responses are captured in Table4.24

Table 4.26: Items monitored in water projects

NO	Items	Yes	%	No	%
1.	Volume of water flowing into tanks	38	18.4	169	81.6
2.	Flow of water to households	170	82.1	37	17.9
3.	Busts pipes and tanks	199	96.1	8	3.9
4.	Water theft by non members	128	61.8	79	38.2
5.	Water theft by non members	164	79.2	43	20.8
6.	Monthly payment by members	180	87.0	27	13.0
7.	Siltation and pipe blockage	192	92.8	15	7.2
8.	Use of water for purposes not allowed by project	124	59.9	83	40.1
	Total	**207**	**100**	**207**	**100**

The study established that the following items were the ones monitored in the water projects; flow of water to the households, bust pipes and tanks, water theft by non-members, wastage of water, the monthly payments by the members, siltation and pipe blockage and the use of water

for other purposes not allowed by project rules and regulations. However, the amount of water flowing into takes was not monitored. The number of respondents who indicate the items monitored in the water projects was also recorded as ; water flowing into community tanks 38(18.4%), flow of water to the households 170(82.1%), bust pipes and tanks 199(96.1%), water theft by non-members 128(61.8%), wastage of water 164(79.2%), the monthly payments by the members 180(87%), siltation and pipe blockage 192(92.8%) and use of water for other purposes not allowed by project the rules and regulations124 (59.9%). Quantitative responses were also reinforced by the verbal quotes from participant in focus group discussion who said:

> *"Water officers from the national Government assist in on conducting monitoring and evaluation of the some of the project items like burst pipes, volumes of water entering our tanks, flow of water into different project zones does the government undertakes the monitoring and evaluation" (FGD, Zamwua, WP).*

The findings of the study indicate that regular monitoring of the projects items and activities was conducted in most of the projects. This indicates the importance the communities in the study area placed in monitoring activities in their projects.

4.9.2 Methods of data collection in monitoring of project activities

The study asked the respondents to indicate the methods of data collection used in their water projects. The responses are captured in Table 4.2.3

Table 4.27 Methods of data collection in monitoring of project activities

No	Method	Yes or No	N	%
1.	Using word of mouth/Verbal reports	Yes	200	92.7
		No	15	7.2
2.	Written reports sent to members	Yes	17	8.2
		No	190	91.8
3.	Field visits	Yes	182	87.9
		No	25	12.1
4.	Check list	Yes	4	1.9
		No	203	98.1
5.	Use of camera	Yes	2	1.0
		No	205	99.0
6.	Calling through mobile phones	No	25	12.1
		Yes	182	87.9
7.	Forwarding Complaints to project officials	Yes	190	91.8
		No	17	8.2
8.	Giving information in project meetings	Yes	190	91.8
		No	17	8.2

The results the of study indicated that the following methods are used to collect M&E data, of the respondents 200(92.7%) indicated that there was use of word of mouth/verbal to collect and disseminate project reports, while 182(87.9%) respondents agree that projects data is collected by use field visits, 182(87.9%) indicated that they provided project data by calling through their mobile phones, 190(91.8%) of the respondents provided project information by forwarding projects complaints to the project officials while 190(91.8%) provided information during the project meetings.

However the findings revealed that 190(91.8%) disagreed that they project information is disseminated by use written reports sent to the members, 203(98.1%) of respondents disagreed that check list is used to collect project data while 205(99%) disagreed that there use of camera in data collection.

The results of the study found that the methods used for data collection are through; word of mouth/verbal reports, the field visits, making calls through mobile phones to collect data, forwarding projects complaints to the project officials and through giving information during the project information. However, projects do not use written reports sent to the members, check list and camera in collection of data.

> *"Cameras are not used in the data collections" (FGD, Kiaguthi) WP), "The workers record the daily activities and issues in the field while the line managers and skilled plumbers assess" (Water officer, Zamwua, WP).*

The study asked the respondents to indicate the format of dissemination of M&E .The responses are captured in Table 4.2.6

Table 4.28: Formats of dissemination of M&E project reports

No	Format	Yes or No	Number	%
1.	Verbal reports	Yes	192	92.8
		No	15	7.2
2.	Written reports	Yes	18	8.7
		No	189	91.3
3.	Verbal reports in meetings	Yes	185	89.4
		No	22	10.6
4.	Newsletters dispatched to members	Yes	3	1.4
		No	204	98.6

According to the study 192(92.8%) of the respondents disseminates the M&E reports verbally and 185(89.4%) verbally reports during the meetings. However, they do not use written reports 189(91.3%) and they also do not use newsletters dispatched to the projects members 204(983.6%).

The study found that community projects disseminate M&E reports verbally during project meeting. It was also found that written reports and newsletters are not used as means of disseminating reports to project stakeholders.

> *"I make my monthly report and compare notes with the report of the water officer from the national Government-there after I table the report to the committee*

members who discuss it and take the appropriate actions" (Water officer, Zamwua WP).

The study revealed that although the projects prepared written project reports, the method of disseminating project information in most of the project was in the form of word of mouth. The method was found to be adequate and efficient when you consider the size of the project and the way the project committee is selected. The study found that in most of the projects covered committee members were allotted according to the zones they resided therefore the was a possibility that every village had a committee member representing it. It is this committee member that villagers channeled their complaints or any information pertaining their water projects and it is also through the same channel they received project information, hence the effectiveness of this communication channel.

"*We do not require to write a detailed report or note to send to the members, if there any information that need to be communicated to a member we just write a small note and is delivered to a member by the member of the committee that zone"(FGD, Kiaguthu WP*)

4.9.4 Monitoring and Evaluation practices

The study examined the projects to find out how Monitoring and Evaluation practices were conducted .respondents were asked to provide answers on each item that was measured by a five point likert scale. Where 5= strongly agree, 4= Agree, 3=Neutral, 2=Disagree and 1=strongly disagree. The results are presented in the table 4.25

Table 4.29: Monitoring and Evaluation Practices

No	Statements	SD	D	N	A	SA	MN	STDV
1.	The water project has allocated enough resources to conduct M&E	25 (12.1%)	12 (5.8%)	58 (28.0%)	71 (34.3%)	41 (19.8%)	3.44	1.221
2.	Community is involved in designing the objectives/areas and criteria for conducting M&E	52 (25.1%)	29 (14%)	45 (21.7%)	54 (26.1%)	27 (13.1%)	2.88	1.386
3.	The project activities are monitored/inspected/supervised on regular basis	24 (11.6%)	12 (5.8%)	17 (8.2%)	110 (53.1%)	44 (21.3%)	3.66	1.210
4.	The persons involved in supervision/M&E activities have right skills	11 (5.3%)	13 (6.3%)	21 (10.1%)	108 (52.2%)	54 (26.1%)	3.87	1.040
5.	The methods used for M&E data/information collection are appropriate	29 (14.0%)	18 (8.7%)	58 (28.0%)	83 (40.1%)	19 (9.2%)	3.21	1.169
6.	Information generated through M&E is appropriately analyzed	24 (11.6%)	4 (1.9%)	50 (24.2%)	91 (44.0%)	38 (18.3 %.)	3.55	1.162
7.	M&E report is presented in a format that make meaning to the users	25 (12.1%)	7 (4.3%)	36 (17.4%)	96 (46.4%)	41 (19.8%)	3.55	1.162
8.	M&E generates quality data/reports that can support project decisions	24 (11.6%)	12 (5.7%)	37 (17.9%)	96 (46.4%)	38 (18.4%)	3.59	1.204
9.	M&E results are communicated/ disseminated to the relevant stakeholders/ institutions	22 (10.6%)	10 (4.8%)	33 (15.9%)	103 (49.9%)	39 (18.8%)	3.62	1.161
10.	There is timely dissemination of M&E results/ reports	24 (11.6%)	14 (6.8%)	43 (20.8%)	89 (43%)	37 (17.9%)	3.49	1.202
11.	Data generated in M&E activities is utilized to inform project decisions	24 (11.6%)	11 (5.3%)	29 (14.0%)	99 (47.8%)	44 (21.3) %	3.82	1.055
12.	Data generated through M&E has improved project decision making process	29 (14.0%)	6 (2.9%)	30 (14.5%)	94 (45.4%)	48 (23.2%)	3.61	1.268

The moderating influence of M&E was investigated on the basis whether the water projects allocated resources for undertaking monitoring and evaluation. The result obtained a mean score of 3.44 and standard deviation of 1.221.The result indicated that respondents were in agreement

the projects allocated enough resources to conduct Monitoring and Evaluation. Involvement of community members in designing the objectives and criteria for conducting Monitoring and Evaluation was examined. The results returned a mean score of 2.88 and standard deviation of 1.386. The results indicated that indicated that only a minority of the respondents felt they were involved in designing the criteria and objectives of conducting Monitoring and Evaluation. The further examined frequency in which monitoring of the project activities was being carried out. The result on this item was a mean score of 3.66 and standard deviation of 1.210 as shown in table 4.19.The result indicated of the that majority of the respondents were in agreement that monitoring activities in their projects were regular basis.

Skills of people involved in supervision of Monitoring and Evaluation was explored. The score on this item was a mean score of 3.87 and a standard deviation of 1.040. The result indicated that majority of respondents were in agreement that those involved in carrying out of monitoring and evaluation had the right skills. The study also examined the appropriateness of methods used in collection of Monitoring &Evaluation data. The item score was a mean of score of 3.26 and standard deviation of 1.162 as shown on table 4.19. The results presented an equal division in the respondents view. One half of the respondents believed that the method used in collection of Monitoring &Evaluation data was appropriate with the other half negating the position.

Further the study assessed the appropriateness of the method of M&E data analysis. It had a mean score of 3.55 and standard deviation of 1.162.The result indicated that majority of the respondents agreed that the data used for monitoring and evaluation was appropriately analyzed. The study examined if the monitoring and evaluation report was presented in format that made sense to users. The results recorded mean of 3.55 and a standard deviation of 1.162. This indicates a slight majority of the respondents were in agreement that the monitoring and evaluation report was presented in format that made sense to users. In another item the study investigated the perception of project stakeholders on the quality of Monitoring and Evaluation Reports in supporting decision making. This recorded a mean score of 3.59 and standard deviation of 1.204. The results indicate that majority respondents believed that Monitoring and Evaluation reports were of good quality enough to support project decision making process.

The study sought to find out if the M&E reports were disseminated to the relevant stakeholders. The response was a mean score of 3.62 and a standard deviation of1.161. The result implied majority of the respondents believed that the monitoring and evaluation results were disseminated to the relevant stakeholders. Another item examined if the reports from monitoring

and evaluation activities are disseminated on timely basis. The results returned a mean score of 3.49 with standard deviation of 1.202.The results indicated that a slight majority of the respondents in agreement that M&E results were released to the relevant stakeholders on a timely basis. The study also assessed if the results of data generated during M&E activity are utilized to inform project decisions. The results returned a mean score of 3.82 and standard deviation of 1.055. The result indicated that majority of the respondents agreed that the data generated in M&E activities was utilized to inform project decisions.

The study examined if the data generated from M&E activities has contributed to improvement in project decision making process.

The results of the finding recorded a mean score of 3.61 and standard deviation of 1.268. The results indicated that most of the respondents agreed that the data generated from M&E activities had contributed to improvement in project decision making process.

The study went further to compute the mean of means for the twelve variables that extracted Monitoring and Evaluation variable. The variable recorded a mean score 3.524 and a mean standard deviation of 1.186.

The result indicates that indicate that a majority of respondents were in agreement that Monitoring and Evaluation practices contributed to the improvement in the decision making processes of the projects which enhanced project sustainability.

The study also conducted FGDs with project participants and semi structured interviews with water project officer for the purpose of triangulating the quantitative data.

In the process of carrying M&E it is a good practice that some budget should be set aside so that the activity can achieve its desired outcome. This observation is supports that of Gyorkos (2003) who averred that a project M&E budget can be clearly delineated within the overall project budget to give the M&E function the due recognition it plays in policy performance, development and management.

Focus group discussion and interviews revealed that budgeting for monitoring and evaluation activities was customized as per the needs of individual project. The study observed that in some projects, M&E department functional and therefore allocated resources for it while in others there wasn't any functional department for M&E and therefore the activity was carried out informally. That notwithstanding the study found out whichever method was used results were being achieved. It was further found out because of employing innovative methods to collect

M&E data, some projects were able to cut on cost hence had allocated little resource to cater for M&E activities.

Some of the innovative methods employed by the projects included the use of committee members who volunteered to perform the duty on behalf of the project. This was captured from focus group discussion who remarked

> *"…We don't spend a lot of resources on Monitoring and Evaluation because our committee members are able to do this on voluntary basis" (FGD, Kiaguthu WP).*

Some other projects collected the data with the help of individual employed as line "patrollers" who beside collect data also assist to carry out operation and maintenance of the water system

> *"…We have employed 8 line patrollers who are perform the exercise of dairy monitoring of our water system and therefore we are able to get information about the system on daily basis" (Water officer, Zamwua WP).*

For an M&E system to be effective it is good practice that some planning should go into it. This assertion is supported by Taylor, and Balloch, (2005) who observes that an M&E plan that is adequately documented encourages project stakeholders what to do in terms of M&E activities before implementation of a project begins

The sought information as to whether project stakeholders adequately planned on the implementation of conducting M&E activities in their projects.

The study evidently found that this practice was adequately in place in some projects while it was completely lacking in others which in part explained the differences observed in the performances of projects. This observation was captured in the following participants who retorted;

> *"…before go out to the field to collect we usually hold up meetings in which we deliberate about what information is need to be collected ,then we design a small questionnaire and then we proceed to the field" (FGD participant ,Zamwua WP)…there isn't any formalized way of collecting project data in our project we just go out and just report on anything we observe that concerns the water project"(FGD participant ,Muteithia WP).*

The study also sought to find if the projects involved the stake holders in the designing the designing the criteria and objective of carrying out the M&E activity. Involvement of project stakeholders at an early stage of project monitoring and evaluation process could go a long way

in boosting the use of results generated. This observation supports those of Jones, (2011) who observed that it is a good M&E practice into bring stakeholder involvement at the early stages of the Evaluation process as it helps to build high profile champions and attract political agents interested in learning or using instruments to demonstrate effectiveness.

The findings of the study found the level involvement of designing the criteria and objective of carrying out the M&E activity differed from one project to another with many of the projects leaving the duty to be carried out a small group of committee and water experts from the ministry of water and irrigation. Project members are only invited to ratify what had been designed. In other projects the designing of the criteria is left to the management committee and members are not involved at all. Project officer from Kinaini water project was quoted in an interview saying;

> *"...I can confirm that regular data collection of the project activities because every fought night I must collect data from the project clerks analyze it and give feedback" (Water officer Kinaini, Wp).*

Good M&E practices require that data collection be made frequent for it could be useful, this assertionis in line with observation of Guijt ,(1999) who avers that frequent data collection enables managers and stake holders to track trends and understand intervention dynamics. Therefore the more often measurements are taken the more the accuracy of the data.
The findings of the study found out that there was regular collection of data pertaining to project in most of the community projects. The frequency of data collection differed from project to project ranging from a period of one week for big projects to a month for small projects. The implication is that project stakeholders were in a position to get up-to-date information concerning the status of their projects where data collection was frequent and hence improved project performance and vice versa

> "*…Project data is collected on a weekly basis" (Water officer, Kinaini WP)…"we conduct data collection on monthly basis" (Participant Hika WP).*

It is imperative that project M&E activities are conducted by individuals who are knowledgeable in this area because of the central role played by M&E in ensuring project success. The study

found that those involved in collecting the M&E data had some necessary skills and this could be attributed to the performance of the water system

> *"I am the one responsible for carrying out this exercise but since I can't manage to carry the exercise wholly on my own I have also trained the my line mangers and the members of the project committee hence we are s able to conduct the exercise successfully" (Water officer, Muteithia WP).*

While it is evidently true that some of those entrusted in conducting the data collection were not highly qualified, the study noted that there is need for training of individuals entrusted with data collection and handling at at the grass root level of management. This is in line with the observation of Gorgens & Kusek, 2010 who asserted that understanding the skills needed and the capacity of people involved in the M&E system and addressing capacity gaps is at the heart of the M&E system.

Good M&E practice require that the method applied for data collection be appropriate, this observation is in line with Nabris, (2002) who asserts that data collection methods need be appropriate , otherwise inappropriate methods of data collection could prove costly as they generate impractical and irrelevant results which impact the success of projects. In right of this observation the study examined the method used to collect M&E data in order to verify their appropriateness. The results indicated that respondents were divided in their responses with some indicating the appropriateness of the methods because they allowed the use of mother tongue in their interaction with the evaluators while others differed. A Participant from focus group discussion was captured saying;

> *"I don't think that the method they use is appropriate because at times those who collect data are always in a hurry and don't give us enough time to respond to their many questions- they should also give us time to ask the questions (FGD, Zamwua WP),"…The method they use is appropriate because they even allow us to answer their questions in mother tongue even though their questions are written in English" (FGD, Kinaini WP).*

From this data it can be deducted that although there is some level of agreement that the methods of data collection was appropriate while other respondents thought otherwise.

The researcher opines that proper analysis of M&E data is an important practice as it assures that the decision arising from the process are well informed and can result in making the project stakeholders have confidence in the monitoring activity. This observation was clearly brought out by a participant from Kiaguthu water project who said;

> *"…Yes data is analyzed well because when the report is given it is usually has no errors and can be trusted because it is backed with collect figures and enable us to clearly know what is happening in our project"(FGD, Kiaguthu WP).*

In order for M&E data to be used by the project stake holders it the report generated from it need to be presented in simple formats that they are able to interpret and drive meaning. In that vein the study evaluated if the data obtained from the M&E activities made meaning to them. The respondents in focus group discussion that said although the reports were made in technical language the presenters usually spared some efforts to clarify the difficult areas so that all the project stakeholders could understand. A respondent in FGD retorted;

> *"Yes projects reports are given in ways that members are able to understand – although the report is written in a technical language, the water officer reads the report to members in a language they are able to understand"(FGD, Zamwua WP).*

This study observed the need for M&E reports to be written in a format and language that can be understood by the users so as to lender them useful to the project stakeholders and as such the reporting could utilize a multiple of options based on stakeholder characteristics and information needs.

The study assessed the quality of the reports generated by the M&E activity in a view to measure its usefulness to the stake holders. The results of the findings indicated that reports generated were quality especially when it came to water rationing because they enabled the management would be in a position to decide how best to go about it without compromising the quality of their services.

The most important aspect of monitoring and evaluation system is feedback because it assists in correction of current mistakes and improvement of future decisions (Gorgens & Kusek, 2010).In line with observation of Gorgens and Kusek the study examined if the data generated was capable of supporting decision making. A participantt from FGD was captured saying;

"…reports generated by the data collected are good because they enable this committee to know how to relation water, who disconnect, which zone to increase size of the pipe so that consumers are able to receive enough water etc ((FGD, Njengu-Nyaribo WP)".

Evidently the result of the study obtained both quantitatively and qualitatively indicated that the data generated was capable of supporting decision making process. This is an indication that projects decision makers were in position to make data supported decisions.

Communication of the M&E results to the relevant stakeholders is a determinant factor of whether the monitoring and evaluation activity would have an impact on the project towards achieving results. Project stakeholders can only make informed decisions only when they have the relevant information. This study therefore sought to find out if the results of the M&E activity were disseminated to the relevant stakeholders. The findings of the study indicated that M&E reports were disseminated to various water sector stakeholders who included national government, county government, community members and donors. Dissemination of M&E reports to project members was done during project regular in some projects while in most projects it was done during annual meetings.

Timely dissemination of information is important in ensuring the relevant bodies are in a position to act without delay, otherwise delayed dissemination make the whole exercise of M&E irrelevant. The study assessed if there was timely dissemination of M&E data to the relevant stakeholders. The results of the study indicated that a slight majority of the respondents concurred that there was timely dissemination of M&E data especially because it was requirement of projects under water users associations. This sentiment was supported by a project water officer who was quoted saying; "…M&E reports are disseminated on time, this is a standard requirement for projects under water user associations hence in the process of observation this rule they oblige (Water officer, Zamwua WP)".

The efforts of M&E process could only be useful if its results are utilized to track and measure performance as well as inform project improvement and learning (Gorgens & Kusek, 2010. In line with that observation this study examined if the data generated from M&E process was

utilized by projects to inform decision making process .The results of the study indicated that the results of the M&E process were utilized to inform project decisions. Respondents indicated that they noted implementation of in their projects changes in their projects after ratifying project M&E reports. The goals of the finding lay in their utilization to inform project decisions. Without M&E information, things are done arbitrarily and one is unsure of whether a policy will fail or succeed (Kusek & Rist, 2004).This study was underpinned in the observation of Kusek & Rist, 2004 by examining if the results of the M&E processes were attributable to project results. The study observed that in some projects decision makers had endeavored to incorporate the M&E information in informing decision making process and its effects could easily be attributed by the project members. This is evidenced by narration of a respondent number in FGD in Kinaini WP who said;

> *We are able to make project decisions very fast; this is unlike in the past where disagreements and confusion would bog us down" (FGD, Kinaini WP).*

Sustainability of community water projects (Y_5) $=\beta_0 + \beta_1X_1+ \beta_2X_2+\beta_3X_3 + \beta_5(X_{1*} X_{2*} X_3 *X_5+ \varepsilon$

Where: β_0, β_1, β_2 β_3 and β_5 are the correlation coefficients; (Y_5) sustainability of community water projects is the dependent variable; (X_1,X_2, X_3)community participation in; decision making, resource mobilization and institutional collaboration respectively are the independent variables; X_5 is the moderating variable (M&E practices); + $\beta_5(X_{1*} X_{2*} X_3 *X_5)$ is the interaction factor between joint community participation and moderating variable (X_5) and ε is the error term.

Table 4.30: Model Summary of Influence of M&E on Joint Community Participation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.646[a]	.417	.409	.1249716	.417	48.432	3	203	.000
2	.685[b]	.469	.459	.1195283	.052	19.910	1	202	.000

a. Predictors: (Constant), Participation of Community in Institutional Collaboration, Community Participation in Resource Mobilization, Community Participation in Decision Making

b. Predictors: (Constant), Participation of Community in Institutional Collaboration, Community Participation in Resource Mobilization, Community Participation in Decision Making , M&E on joint participation

Table 4.31: Coefficients of influence of M&E on Joint Community Participation

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlation coefficient
	B	Std. Error	Beta			
(Constant)	.297	.048		6.130	.000	
Participation in Decision Making	.222	.063	.229	3.518	.001	.545
Participation in Resource Mobilization	.285	.070	.237	4.085	.000	.474
Participation in Institutional Collaboration	.096	.068	.142	1.421	.157	.473
M&E on joint participation	.339	.076	.493	4.462	.000	.607

Dependent Variable: Sustainability of community Water Projects

The result of the multiple regression analysis is shown in table 4.28. At step 1 of the analysis R square adjusted is .409 which indicates that joint community participation in decision making, resource mobilization and institutional collaboration account for 40.9% of sustainability of community water projects. At of the Step 2 indicates that when M&E is introduced on the relationship between joint community participation in decision making, resource mobilization and institutional collaboration on sustainability of community water projects, sustainability of the water projects is statistically significant at $t \geq 1.96$ and $p \leq .05$. Adjusted R square is .459 showing that approximately 45.9% of the variance in sustainability of community water projects

can be accounted for by the linear combination of M&E practices and joint community participation in decision making, resource mobilization and institutional collaboration. This indicates that when M&E practices is combined with joint community participation sustainability of community water projects increases by 5.0%.

In the model given in table 4.29 the multiple correlation coefficients r is .607 indicating that the combination of M&E practices and joint community participation has a moderate influence on sustainability of community water projects. Table 4.29 indicate when M&E is introduced on the relationship between joint community participation community participation, at $t \geq .1.96$ and $p \leq .05$ community participation in; decision making and resource mobilization are the only variables that are statistically significant. However community participation in institutional collaboration is not significant ($t = -1.47$ and $p=.157$). This indicates that community participation in institutional collaboration has no significant contribution on the interaction of M&E Practices on the relationship between joint community participation and sustainability of community water projects. The standardized coefficients for the ensuing regression equation for predicting the joint effect of M&E, community participation in decision making, resource mobilization and institution collaboration on social sustainability of community water projects are represented as:
Sustainability of community water projects = .297 + .229 decision making + .237 resource mobilization - .142 institution collaboration+ .493 M&E and joint participation.

However, since participation in institution collaboration was not statically significant then model representing Sustainability of community water projects = .297 + .229 decision making + .237 resource mobilization + .493 M&E *joint community participation.

Hence $Y=.297+ 0 .229X_1 +.237X_2+0.493 X_5 (X_1*X_2* X_3*X_5)$

The model indicated that a change in of one unit in community participation in decision making increased project sustainability by 22.9%, a change of one unit in community participation in resource mobilization increased project sustainability by 23.7% unit while a change of one unit in the interaction of M&E and joint community participation increased sustainability of community water projects by 49.3%.

It is evident that when M&E is introduced to the interaction between joint community participation in decision making, resource mobilization, institutional collaboration and

sustainability adjusted R square is .459 showing that approximately 45.9% of the variance in sustainability can be explained by this interaction. Sustainability of water projects improved from 40.9 to 45.9 which 5.0%. The model indicated that while when M&E is introduced to the joint community participation, community participation in a decision making and participation in resource mobilization are statistically significant while participation in institutional collaboration is not. The study had envisaged that M&E would moderate all the three variables of community project participation. However the findings indicated that interaction between M&E and participation in institution collaboration wasn't significant.

Results of interaction between M&E and community participation in decision making were significant. Results of this study indicated that the data from M&E enabled project management to get information about volumes of water drawn from source, daily needs of individual households, daily flow to individual households bust pipes and tanks water thefts monthly cost recovery, water bill defaulters complaints among many other project related issues. The study established the project management supported the M&E practices in projects by allocating some of the project funds for this exercise. Information produced by the M&E practice was disseminated to stakeholders in formats they easily comprehend and utilized. Hence the project stakeholders put to use the M&E information to make informed decision in the outlined areas of the project and perhaps this contributed to project sustainability. This observation is underpinned in the observation of Mackay (2007); Rist, Boily & Martin (2011) who averred that the nature and strength of an M&E information system enhances utilization of information which increase project performance and eventually its sustainability. The M&E practices enhanced efficiency of the project problem solving. The M&E systems provided timely information on which the water projects relied on to arrive at the desired solutions which went along way in enhancing performance of projects and hence their sustainability. This observation is in line with that of Lønborg and Rasmussen (2014) who noted that project Monitoring enables stakeholders get shared understanding of constraints facing the project hence are in a position to arrive at solutions that are informed by data which are likely to get support of all the project stakeholders.

For M&E practice to enhance tracking project accountability there is need to feed project information into it so as to help in tracking of project progress. This view supports that from UNDP (2000) that avers that Monitoring information should be fed into the project monitoring

and evaluation process to build up data bank that can be used to improve the selection and design of future projects besides improving the project, in line with this observation the study sought to investigate in M&E information was fed into the M&E process to track project transaction and enhancing improvements. In line with the study found that data from M&E was frequently used to make improvements in the projects that helped to enhance performance.

Kusek and Rist (2004) assert that M&E is a powerful tool that can be used to "help policy-makers and decision-makers track progress", When the project stakeholders are in consensus about an issue affecting their project there is like hood that they would be willing to commit their resources for the good of the project. This results to improvement in the level of project sustainability.

In this regard through the FGDs the study noted that the M&E system enabled the project stakeholders to make better decisions on use project resources. This ensured that the targeted benefits were realized hence the project beneficiaries were in position access the project. This factor enabled the project beneficiaries to become satisfied with their project, which is an indicator of project sustainability. This observation is underpinned by Carter, Tyrrel and Howsam, 2009) who averred that community motivation encourages community to utilize the new service when they become aware that the new service source is beneficial in terms of access, or proximity and safety.

The findings of the study linked the M&E to the accountability on the use of project resources with in turn led project sustainability. M&E enabled transparent application of the mobilized project resources that guaranteed that they were utilized for purposes for which they were initially intended. The findings are in consistent with those of a study by Phil (2015) on influence of participatory monitoring on performance of Village Saving & Loan Associations (VSLAs) Projects across 11 countries of Asia and Africa. The study observed that participatory monitoring and evaluation enhanced project accountability, better decisions making and a common undertaking among all the stakeholders, factors which he attributed to improved project performance.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, conclusion, recommendations and contribution to the body of knowledge. The purpose of this study was to investigate the influence of monitoring and evaluation practices, community participation and sustainability of community water projects in Kenya: A case of Nyeri County. This chapter presents the summary of findings, conclusion, recommendations and suggestions for further study into the research topic and related areas. The chapter ends contribution to the body of knowledge .

5.2 Summary of Findings

The study was designed to respond to five research questions and objectives that were later formulated into hypotheses and finally tested using various test statistics. Data was analyzed was both quantitatively and qualitatively.

5.2.1 Community Participation in Decision Making and Sustainability of Community Water Projects

The first objective sought to establish the extent to which community participation in decision making influenced sustainability of community water projects. The study found that community participation in project decision making process was enhanced by household; attendance of project meetings, having prior information about major decisions of the project, being in a position to control the choice of the project management committee and by management committee making resolutions that reflected the views of the community members. However community participation in project decision making process was hindered when households talked less during project meetings, had less information about project initiation and when views of project members were not taken into account in major decision making. The study further demonstrated that community participation in decision making significantly influenced sustainability of community water projects at 5% level of confidence ($p< 0.001$). The results indicated that an increase in participation in project decision by the community of one unit increased the level of sustainability of community water projects by 0.545 units. In essences this meant that there was a moderate positive linear relationship and that an increasing strength of community project participation in decision making resulted into increased project sustainability.

5.2.2 Community Participation in Resource Mobilization on Sustainability of Community Water Projects

The study assessed the influence of community participation in resource mobilization on sustainability of community water projects. The study established that the community participation in project resource mobilization significantly influenced project sustainability. Community should participate in mobilization of labour, initial project capital, and fund for operational and maintenance. The study noted that this type of participation boosted project performance and eventually led to project sustainability. The study demonstrated that community participation in resource mobilization of community significantly influenced t sustainability of projects at 5% level of confidence ($p< 0.001$). The study established that an increase in participation of community in project resource mobilization of one unit influenced increased level of sustainability of community water projects by 0.474 units.

5.2.3 Community participation in institutional collaboration and sustainability of community water projects

The study found majority of communality projects collaborated external institutions in form of the assistance they received. The study established that projects received external assistance in form project finances, technical and extension services, and infrastructure development. The study established that community projects didn't have the capacity to meet the future scaling efforts because of the huge financial and technical implications hence required the assistance of external institutions to fill the gap. The study further established that projects that practiced co-management realized higher level of sustainability than those that didn't. Therefore community participation in institution collaboration influenced sustainability of community water projects. The study demonstrated that community participation in institution collaboration significantly influenced sustainability of projects at 5% level of confidence ($p< 0.001$). An increase in participation of community in Institutional Collaboration of one unit influenced increased sustainability of community water projects by 0.473 units. This meant that community projects should ensure strong community participation in institution collaboration in order to realize increased project sustainability. The study demonstrated that joint community participation of community in project decision making, resource mobilization and institution collaboration significantly influenced sustainability of community water projects at 5% level of confidence ($P< 0.001$).

5.2.4 Joint Community Participation of Community in Project Decision Making, Resource Mobilization, Institution and Sustainability of Community Water Projects

The study demonstrated that joint community participation of community in project decision making, resource mobilization and institution collaboration significantly influenced sustainability of community water projects at 5% level of confidence (P< 0.001). An increase in participation of community in joint participation of one unit influenced increased level of sustainability of community water projects by 0.47 units. The result indicated contribution of joint community participation on sustainability of community projects was more than the contribution of a single independent variable. Thus Community participation in project decision making allowed the involvement of community in the planning and budgeting of the projects. Through this process communities were in a position to choose projects they were able and willing to support. This increased their sense of ownership and made community project beneficiaries to take an active role in mobilizing project resources from within. Allowing community to participate in decision making also enabled the project champions to take part in identifying suitable external institutions that enabled the projects access external assistance in form of project finances, technical assistance as well resources for infrastructural expansion.

5.2.5 Moderating Influence of M&E Practices on the Relationship between Joint Community Participation and Sustainability of Community Water Projects

The study analyzed the moderating influence of M&E practices on the relationship between community participation and sustainability of community water projects. It established that M&E practices had a significant moderating effect on the relationship between community participation in; decision making, resource and sustainability of community water projects.

When M&E is introduced into a model consisting community participation, in decision making, resource mobilization and institution collaboration as independent variables and sustainability of community water projects, participation in decision making and resource mobilization were found to be statistically significant at 5% level of significance (p<0.001).However no significant moderation effect of M&E was observed in the relationship between participation in institution collaboration and sustainability of community water projects. The study established the project management supported the M&E practices in projects by allocating some of the project funds for this exercise. Information produced by the M&E practice was disseminated to stakeholders in formats they easily comprehend and utilize. Hence the project stakeholders put to use the M&E

information to make informed decision in the outlined areas of the project and perhaps this contributed to project sustainability.

The study established that data obtained from M&E practice enabled community water stakeholders to be in a position to make informed project decisions such that they were able to mobilize appropriate project resources to implement and operate and maintain the water projects. On the other hand project monitoring and evaluation enhanced project accountability, better decisions making and a common undertaking among all the stakeholders a factor attributed to improved project performance and the observed increased level of sustainability of projects.

5.3 Conclusions

The study investigated the influence of M&E on the relationship between community project participation and sustainability of water projects. The study did this by examining influence of community participation in; decision making, resources mobilization and institution collaboration, on sustainability of community water projects. The study also analyzed the moderation influence of M&E practices on the relationship between the community participation and sustainability of community water projects.

Objective one sought to establish the extent to which community participation in decision making influenced sustainability of community water projects. The study established that there was a moderate positive linear relationship between project participation in decision making and sustainability of community water projects. The greater the participation of community in decision making (which included household; attendance of project meetings, having prior information about major decisions of the project, taking during project meetings , ability to control the choice of the project management committee) contributed to increased level of project sustainability.

The study established that community participation in resource mobilization influence sustainability of community projects. The study observed that community participated in mobilization of labour, initial project capital, and fund for operational and maintenance. The study noted that this type of participation boosted project performance and eventually led to project sustainability. The study established that an increase in participation of community in

project resource mobilization increased the level of sustainability of community water projects. The study also established that although community at times is required to contribute land in which to construct water project infrastructure it is not necessary in instances where public land is available as they are best suited there.

The study demonstrated that community participation in institution collaboration influenced sustainability of projects. The study found communality projects collaborated external institutions in form of the assistance they received. This collaboration came in form of project finances, technical and extension services, and infrastructure development. The study established that community projects that didn't have the capacity to meet the future scaling efforts because of the huge financial and technical implications hence required the assistance of external institutions to fill the gap. The study further established that some projects like Zamwua and Kinaini practiced co- management (a form institutional collaboration in project management) realized higher level of sustainability than those that didn't. This meant that community projects should ensure strong community participation in institution collaboration in order to realize increased project sustainability besides being in a position to meet future scaling effort.

The study demonstrated that whilst when considered singly participation of community in project decision making, resource mobilization and institution collaboration influenced sustainability of community water projects. Sustainability of projects was more when there was a joint form of community participation. The study established that community participation in project decision making allowed the involvement of community in the planning and budgeting of the projects. This made the communities to choose projects they were able and willing to support, increased their sense of ownership and made community project beneficiaries to take an active role in mobilizing project resources from within. Participation of community in decision making also enabled the project champions to take part in identifying suitable external institutions that enabled the projects access external assistance in form of project finances, technical assistance as well resources for infrastructural expansion.

It established that M&E practices had a significant moderating influence on the relationship between community participation in; decision making, resource and sustainability of community water projects. However M&E practices didn't have any significant moderation effect in the relationship between participation in institution collaboration and sustainability of community

water projects. The study established that project management supported the M&E practices in projects by allocating some of the project funds for this exercise. Information produced by the M&E practice was disseminated to stakeholders in formats they easily comprehend and utilize. Hence the project stakeholders put to use the M&E information to make informed decision in the outlined areas of the project and perhaps this contributed to project sustainability.

The study established that data obtained from M&E practice enabled community water stakeholders to be in a position to make informed project decisions such that they were able to mobilize appropriate project resources to implement and operate and maintain the water projects. On the other hand project monitoring and evaluation enhanced project accountability, better decisions making and a common undertaking among all the stakeholders a factor attributed to improved project performance and the observed increased level of sustainability of projects. However M&E practices seemed not to influence the decisions of the community champions in their choice and interactions with external institutions.

5.4 Recommendations

1. The study established that sustainability of community projects is a factor of the decision making process. Since the participation of community plays a significant part in influencing project sustainability, strategies that reinforce households' participation in projects should be explored. The strategies includes those that ensures that project beneficiaries are active in all the stages of project cycle should be encouraged .Project participants should participate in choice of projects, attendance of project meetings and also take an active role in project deliberations.
2. Some effort should be spent in equipping the beneficiaries with the relevant information as this will make them arrive at the right choices. This could achieved inform building the capacity of the project beneficiaries. When the beneficiaries are involved in decision making they are likely to give their physical as well as psychological support which is vital in influencing project sustainability.
3. Community water projects are a shared common property resource with some basic investment costs that are often borne by local communities. Hence projects should ensure that the target communities are encouraged to participate during project initiation in the form of mobilizing initial project finances, labour and materials. The study also found that demand by household to be connected to water is used to signal their willingness to support

the project and as such projects should ensure that the target communities are made to pay some initial project fee before being admitted to project. This has the effect of discouraging free riders and signals the readiness of project beneficiaries to provide support for operation and maintenance which is very important in ensuring project sustainability.

4. Research has shown that awareness on what it takes to produce water and have it delivered at the tap near or in households' has a positive effect on the willingness to pay. This study therefore recommends funds for O&M should be planned for before and responsibility shared out between the stakeholders. On the other household level beneficiaries should be sensitized about the cost of pumping, maintenance of lines and treatment of water supply in relation to the water tariff charged so as to create awareness on the need of user commitment. This has the effect of preventing financial problems during the O&M phase which are key attributes to sustainability.
5. The study has established that community projects have challenges in sustaining services over the long-term besides having challenges for scale up and as such they require some form of external assistance. This study therefore recommend that the communities projects should have supportive sector policies and regulations with well structured frameworks and clearly defined roles and responsibilities so that they are able to attract the necessary support from a range of institutions, from national and local government, to the private sector, NGOs or self-help associations which is vital in sustaining scaling up projects.
6. The study observed that some community projects like Zamwua and Kinaini have fully embraced the practice of co- managing their projects with government officials and were performing better than those that didn't, hence it is the recommendation of this study that the practice of co-management with public agencies along with private firm be embraced immediately after project implementation and for poorly performing projects so that the capacity of the community is enhanced before assuming the full management responsibility.
7. This study has demonstrated that, M&E practice moderates project community participation in decision making as well resource mobilization and such it enhances project sustainability. Therefore this study recommends that M&E practice is embedded in various shades of the project management such as decision making process, resource mobilization and collaborations so that it can aid in demonstrating accountability besides ensuring effectiveness of the projects.

8. Eight, the study has indicated that the influence of M & E project participatory variables like decision making , project resource mobilization and participation in institution collaboration. The attribution of influence of M & E Practice on of each of these variables stands out very clearly when each of the variables is considered independently but when considered jointly the strength of attribution of each of the independent variable to project sustainability decreases while others are rendered insignificant. Therefore this study recommends that items that affect project performance should be monitored and evaluated independently so that project management is clear about attribution of each on the project performance. This factor is important in aiding the project managers in making informed decisions as to where most efforts and resources for carrying out M&E functions should be expended.

1.12 Suggestions for Further Research

1. The study has noted that the services of the water sector in Kenya are a devolved function under the County Government in the 2010 constitution. Therefore this study recommends that future studies should examine how institutional collaboration in water services has been affected by devolution of water services from the central government to the county government in the new constitution.
2. The study established that some community water projects are attempting project co-management which recorded observed performance. Future studies should also explore the influence on performance of co–management of community projects with both the government and private agencies and perhaps develop suitable framework for each.
3. Delivery of water services has seen the emergence of new model and institutions responsible for managing the sector. Therefore a study is necessary to establish suitable frameworks that are able to address the emerging challenges that are associated with this shift.
4. There are diversified sources of portable drinking water for community water; as such future studies should consider how communities could harness appropriate technologies such rain-harvesting water technologies to build community water.

5.5 Contribution to body of Knowledge

This study examined the extent to which community participation: in decision making, resource mobilization and institution collaboration independently and jointly influence sustainability of community water projects and the moderation influence of M&E practices on this relationship. From the literature reviewed, it was apparent that previous studies have hardly examined the moderation of M&E practices on the relationship between community participation and sustainability of community water projects. The findings of this study thus provide significant contributions to the body of knowledge with some new findings as listed below.

The findings of this study are line with the theories against which the study was based. The study was underpinned in organization learning theory and the related theory of social learning. Findings of this study will go a long way in harnessing the use of these theories in understanding the process and the Practice of M&E. The outcomes of a social learning process are assumed to influence both the social process and the outcomes of the decision-making process (Argyris and Schon (1978).The study utilized the idea social learning theory that sees need for organization to learn in order to enhance its performance. According to these theory organizations that have ability to learn in complex and unpredictable environments and could enhance learning which leads to generation of new knowledge, technical and social skills as well as a change in cognitions and attitudes and could lead to better project management (Senge, 1995).

M&E practice in community projects enhances learning which lead to new kwowledge about projects management; improves technical skills of operating and maintenance of project infrastructure and improves the social skills of the project stakeholders such as interactions between participants which leads to improvement of project performance and hence sustainability. From the forgoing, the study theorizes that M&E practice moderates the relationship between project decision making process and sustainability of community projects.

UNDP (2005) observed that M&E practice taken as a tool for results result based management is principally oriented towards accountability hence explicitly aimed at changing the way the organization is managed, fostering a strategic orientation and application of culture of performance. Therefore this study theorizes that application of M&E in project management enables better management of project resources and leads to improved effectiveness that could lead to project sustainability.

This study empirically established that the M&E practice in project management shaped decision making process in community and this enabled community stakeholders to arrive at informed decisions that made projects to be managed around results this made projects achieve better outcomes. The study empirically revealed that M&E practice enabled transparent application of the mobilized project resources that guaranteed they were utilized for purposes for which they were initially intended. However the findings of the study established that moderation effect of M&E practice on community participation in institution collaboration is not significant. Therefore M&E practices moderates the relationship between decision making process, resource mobilization and sustainability of community water projects.

The findings of the study may find relevance in various organizations involved in developmental projects on the role played by the M&E practice in improving on decision making process and in ensuring accountability on the use of project resources; factors linked with project sustainability.

This study empirically established that the M&E practice in project management shaped decision making process in community and this enabled community stakeholders arrive at informed decisions that made projects achieve better outcomes. On the other hand the study empirically revealed that M&E practice enhances transparent application of the mobilized project resources for purposes for which they were initially intended. These the findings of the study may find relevance on various organizations involved in developmental projects on the role played by the M&E practice in improving on decision making process and in ensuring accountability of the use of project resources which could enhance project sustainability.

The results provide an understanding on the relationship between M&E practice and sustainability of community projects. Findings of this study indicate that M&E practice has a significant influence on project decision making process and accountability in use of project resources which leads to sustainability of community projects. Therefore the National, County Governments as well any other institution involved in community developmental activities should encourage formulation of policies that integrate the M&E practice in the implementation and management of community development projects because by doing so would not only improve on project performance but also help to realize project sustainability.

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APPENDICES

Appendix I:

LETTER OF CONSENT

Dear Respondent

SUBJECT: FILLING OF RESEARCH QUESTIONAIRE

I am a student of the University of Nairobi pursuing Doctor of Philosophy Degree in Project Planning and Management of the University of Nairobi. I am currently undertaking a research study on Monitoring and Evaluation Practices, Community Participation and Sustainability of Community Water Projects in Kenya: A case of Nyeri County.

The questionnaire attached is meant for collecting of information which will assist in the study. Kindly complete the questionnaire as honestly as possible. All the information you give will be held in utmost confidence and will not be used for any other purpose except for this study. Your positive response will be highly appreciated.

Yours Sincerely,

Fredrick N Muniu,
PhD Student, University of Nairobi

Appendix II:

QUESTIONNAIRE FOR WATER PROJECT BENEFICIARIES

Let me take this chance to thank you for accepting to take part in this study. I would like to ask you some questions that will help me understand how you participated in the planning, design, implementation, monitoring and evaluation of the water project as well as how you have benefitted and how much control you feel you have when you are making decisions about the project.

SECTION A: DEMOGRAPHIC INFORMATION

Questions		Response Code	NSTRUCTIONS
1.1	Name of the Community water project		name
1.2	When was the project Started?		Date, month, year
1.3	Gender of the respondent	Male=1,Female=0	
1.4	Age of the respondent	1=18-25, 2=26-35, 3=36-45, 4=46-55, 5=56 and above	Tick as appropriate
1.5	State your highest level of Education	1=No formal education; 2=primary(1-8); 3=Secondary(1-4); 4=College Diploma certificate 5=First degree and above	Tick as appropriate
1.6	What is your current occupation	1=farming; 2=employed; 3=Casual labour; 4=business; 5= Others(Specify)	Tick as appropriate
1.7	What is your approximate monthly income in Kshs	1=5000 and below 2=5001-10000 3=10001-15000 4=15001-20000 5=20000 and above	Tick as appropriate

SECTION B

COMMUNITY PARTICIPATION IN DECISION MAKING

This section will ask you questions on community participation in decision making in terms of project design, control over project decisions making, contribution in meetings and in the choice of project of representatives.

Using a scale of; 1=**strongly disagree, 2= disagree, 3=neutral, 4=agree 5=strongly agree**

Indicate the extent to which you agree with the following statements		**1**	**2**	**3**	**4**	**5**
2.1	I was informed of the plans to initiate/ revive the project					
2.2	I took part in the planning of the water project					
2.3	I attend meetings of the community water project					
2.4	I talk make contributions during the project meetings					
2.5	My contributions influence project decision making					
2.6	I am informed about major decisions influencing community water projects					
2.7	Community members have control over major decisions of the community water project					
2.8	Community members have the control over the choice of project Committee members					
2.9	Decisions made by the project committee reflect the views of the community					

SECTION C

(II).COMMUNITY PARTICIPATION IN RESOURCE MOBILIZATION

This section will ask you questions about community participation in resource mobilization in terms of finances, labour/skills and project materials

Using a scale of; 1=**strongly disagree, 2= disagree, 3=neutral, 4=agree 5=strongly agree**

Indicate the extent to which you agree with the following statements		**1**	**2**	**3**	**4**	**5**
3.1	I have done work for my community water project					
3.2	I contributed money towards initial development of the community water project					
3.3	I contribute money towards the operations and maintenance of the water project					
3.4	I contributed materials to the community water project					
3.5	I assisted to source project finances from other stake holders towards the community water project					
3.6	I assisted to mobilize project materials from stakeholders for the community water project					
3.7	I have allowed community water project to construct water pipes through my land					
3.8	The land on which water infrastructures including tanks is built belong to a member of the community					
3.9	Most of the resources needed for operations and maintenance of the water project is provided by the community					

Indicate the value of financial contribution you have made to your water project in the last one year in kshs…….

In your own words identify the resources you think is most important for implementing the water project.

..... ?

Comment on how the resources were

mobilized.....

SECTION D

(IV) PARTICIPATION OF COMMUNITY IN INSTITUTIONAL COLLABORATION

This section will ask you questions on how the community participates in collaborating with institutions like WASREB, WARMA, WSB, CDF County and National government in sourcing of project finances, Technical &extension services, research and development and in capacity building.

Using a scale of; **strongly disagree=1, disagree=2, neutral=3, agree=4 strongly agree=5**

Indicate the extent to which you agree with the following statements		**1**	**2**	**3**	**4**	**5**
4.1	Community water projects collaborates with other institutions in sourcing of project finances					
4.2	Community water projects collaborates with other institutions in the provision of technical and extension services					
4.3	Community water projects collaborates with other institutions in conducting research/surveys					
4.4	Community water project collaborates with other institutions in capacity building					
4.5	Community water project collaborates with other institutions in infrastructural development / in sourcing materials for expansion					

In your own words indicate how the community has been collaborating with other institutions in conducting the activities of the water projects…….

SECTION E

(M&E): MONITORING & EVALUATION PRACTICES

This section will ask you questions concerning the project Monitoring &Evaluation practices in terms the way community water project allocates resources for M&E activities, how the project activities are inspected and supervised, how it conducts data collection, data analysis, dissemination of reports and utilization of M&E results.

Items that are monitored in your project

Tick (√) the most appropriate		Yes	No
5.1	Volumes of water flowing into community tanks		
5.2	Flow of water to households		
5.3	Busts pipes and tanks		
5.4	Water theft by non members		
5.5	Wastage of water		
5.6	Monthly payment by members		
5.7	Siltation and pipe blockage		
5.8	Use of water for other purposes not allowed by project		

Indicate whether the following methods for data collection in monitoring project activities are used in your project.

Tick (√) the most appropriate		YES	NO
5.8	Using word of mouth/Verbal reports		
5.9	Written reports sent to members		
5.10	Field visits		
5.11	Check list		
5.12	Use of camera		
5.13	Calling through mobile phones		
5.14	Forwarding Complaints to project officials		
5.15	Giving information in project meetings		

Indicate by use of a tick (√) the format in which your project disseminate/presents M&E reports to project members

- Verbal reports [ ]
- Written reports [ ]
- Verbal reports in meetings [ ]
- Newsletters dispatched to members [ ]
- Others specify.....

Using a scale of; **strongly disagree=1, disagree=2, neutral=3, agree=4 strongly agree=5** indicate to what extent you agree with the following statements?

Indicate the extent to which you agree with the following statements		**1**	**2**	**3**	**4**	**5**
5.16	The water project has allocated enough resources to conduct M&E					
5.17	Resources allocated for M&E are made available in time					
5.18	Community is involved in designing the objectives/areas and criteria for conducting M&E					
5.19	The project activities are monitored/inspected/supervised on regular basis					
5.20	The persons involved in supervision/M&E activities have right skills					
5.21	The methods used for M&E data/information collection are appropriate					
5.22	The data obtained in M&E activities is appropriate					
5.23	Information generated through M&E is appropriately analyzed					
5.24	M&E report is presented in a format that make meaning to the users					
5.25	M&E generates quality data/reports that can support project decisions					
5.26	M&E results are communicated/ disseminated to the relevant stakeholders/ institutions					
5.27	There is timely dissemination of M&E results/ reports					
5.28	Data generated in M&E activities is utilized to inform project decisions					
5.29	Data generated through M&E has improved project decision making process					

SECTION G

WATER PROJECT SUSTAINABILITY

This section will ask you questions on project sustainability in terms of ability to meet operational cost, project working condition, maintenance of infrastructure, compliance with license and tariffs, Continuous water supply and ability to meet emerging demands.

Using a scale of; **strongly disagree=1, disagree=2, neutral=3, agree=4 strongly agree=5** indicate to what extent you agree with the following statements?

	Indicate the extent to which you agree with the following statements	1	2	3	4	5
6.1	I am able meet payment of my monthly water bills promptly					
6.2	The water project is able to pay salaries of workers on time					
6.3	The project is able to pay the required licenses and tariffs on time					
6.4	The water pipes and tanks are always in good working condition					
6.5	The project has the capacity to carry out major repairs on time					
6.6	The water provided by the project is free of dirt and germs					
6.7	The project provides continuous flow of water on regular basis					
6.8	The project has the room to meet emerging water demand					
6.9	The membership of the project has been increasing					
6.10	The way things are, I am willing to continue paying for the services provided to me by the project					
6.11	The way things are, I feel satisfied with the services of the community water project					

Comment on any significant change you have observed out of implementing the water project……

THANK YOU FOR YOUR COOPERATION

Appendix III:

FOCUS GROUP DISCUSSION GUIDE

Date……..

Time……

Place…….

Role of the member in the project	Age	Gender	Highest educational level	Designation in the project

INTRODUCTION TO FOCUS GROUP DISCUSSION

WELCOME

Thanks for agreeing to be part of the focus group. We appreciate your willingness to participate.

INTRODUCTIONS

Moderator; assistant moderator

PURPOSE OF FOCUS GROUP

The reason we are having these focus groups is to find out the influence of M&E practices, community participation and sustainability of community water projects. We need your input and want you to share your honest and open thoughts with us.

GROUND RULES

1. We want you to do the talking
2. We would like everyone to participate. I may call on you if I haven't heard from you in a while
3. There are no right or wrong answers
4. Every person's experiences and opinions are important. Speak up whether you agree or disagree. We want to hear a wide range of opinions.
5. What is said in this room stays here
6. We want folks to feel comfortable sharing when sensitive issues come up.
7. We will be tape recording the discussion
8. We want to capture everything you have to say.
9. We don't identify anyone by name in the report.
10. Responses to the questions will be kept anonymous.
11. Responses will only be used for the purpose of this study

FOCUS GROUP QUESTIONS

Discussion Topic	Key Concepts to be Explored	Guide Questions
1.Community participation in decision making	The extent of involvement of community in project in; The project design Control over project decisions Contribution in meetings Choice of project representatives	*How were the initial project design arrived?* *Who was involved in planning and why?* *What is the opportunity of the community in controlling project decisions?* *What is the mode of conducting project meetings* *What is the process of picking project representatives?*
2.Community participation in resource mobilization	Extent to which community is involved in mobilizing resources linked to Finance Labour/ skills materials	•*How the initial project resources were mobilized* •*The extent to which community is involved in contributing to project finances labour, materials and skills* •*The place of community in mobilizing resources for major repair or expansion*
3.Community participation in institutional collaboration	Extent to which community collaborate in: Financial mobilization Technical &extension services Research and development Capacity building	•*Which institutions collaborate with community water projects in areas to do with finances, technical and extension, M&E, and in building the project capacity?* •*What is the extent of collaboration in these areas?*
4. M&E practices	M&E practices and extent to which they influence project sustainability in: Resource allocation Data collection Data analysis Dissemination of results Utilization of M&E results	*What is the level of adequacy of the resources allocated to M&E activities?* *The appropriateness of data collection tools, frequency, analysis and dissemination of results* *The level of utilization of M&E data in decision making*

5.Sustainability of community water projects	Ability to meet operational cost Working condition of infrastructure Compliance with license and tariffs Continuous water supply Ability to meet emerging demands	*What is level the of effectiveness of the project in meeting operational costs ,in maintenance of infrastructure, and meeting of continuous water flow* *emerging water demands* *What level of the project compliance with licensing and payment of tariffs, in collecting money owed to it by beneficiaries*

THANK YOU FOR YOUR COOPERATION

Appendix IV:

INTERVIEW GUIDE FOR WATER OFFICERS

(I) COMMUNITY PARTICIPATION IN DECISION MAKING

Name of the of the project you are attached to	……
Year in which the project initiated was /revived	……..
Sub county: ……..	Location ……..

1. How are decisions made in the project? Give examples.
2. Who decides on the project plans, budgets, and activities? How?
3. Comment on household involvement in during project planning phase
4. Who would you say have the final control over the community project decisions?
5. Does the project hold meetings? How often?
6. Who normally attends these meetings *(and how many)*? How are they conducted?
7. How is the contributions during meetings - how are they followed up and planned?
8. Comment on the criteria for picking committees' members?
9. What is your opinion about decisions made about the project activities; do they reflect the wishes of the consumer?

(II) COMMUNITY PARTICIPATION IN RESOURCE MOBILIZATION

1. What financial and material resources does he project have for its day-to-day activities
2. How does the project mobilize financial labour and material resources? Give examples
3. What proportion of resources is from external sources?
4. What resources are mobilized from the community and/or other organizations? Give examples.
5. How, and in what forms did the project mobilize resources for construction of the infrastructure?
6. How are project operations and maintenance funded?

(III)COMMUNITY PARTICIPATION IN INSTITUTIONAL COLLABORATION

1. Describe the relationship between the project with the national and county government
2. Is the project registered with the government?
3. On what /activities do you interact with both the national and county government? How?
4. What government services do you utilize? Give examples.
5. Describe the relationship between the project and water institutions.
6. In which activities is the water project collaborating with external institutions?
7. State if the collaboration with external institutions is through any form of partnership agreement?

(IV) INFLUENCE OF M&E PRACTICES ON SUSTAINABILITY OF COMMUNITY WATER PROJECTS

1. Describe the project finances in terms adequacy and timely release to carry out M&E activities.
2. Give your opinion on the skills of the persons involved in M&E data collection, what about the appropriateness of the tools for data collection?
3. How would you rate the quality of data collected during M&E activities? What about the frequency and times of data collection?
4. How is M&E data analyzed? Is the method appropriate?
5. Are the M&E results presented in formats that make meaning to the users? Can it support decision making?
6. Describe how are the M&E results are disseminated to the relevant institutions/stakeholders? Is it timely?
7. Give your opinion if project M&E results are utilized to inform project decisions?

(VI) SUSTAINABILITY OF COMMUNITY WATER PROJECTS

1. Comment on the appropriateness and capability of the household to pay the prescribed water charges
2. Describe the capacity of the project to meet day today running of the water project
3. Comment on the manner in which project pays for the necessary tariffs and licenses
4. In your opinion what is the capacity of the collected money to carry out routine operation and maintenance
5. Describe how the project carries out major repairs when the water system breaks down?

6. What is the state of the project piping system and water tanks?
7. Does the project provide continuous supply of water to the project beneficiaries?
8. Describe the quality of water provided by the project to the consumers
9. Give your opinion on the ability of the project to meet emerging water demands
10. What has been the trend in terms membership of the project in the last three years
11. Comment on the satisfaction of consumer on the services provided by community water project

THANK YOU FOR YOUR COOPERATION

Appendix V

SECTION E (AS USED IN THE PILOT STUDY)

M&E PRACTICES

Using a scale of; **strongly disagree=1, disagree=2, neutral=3, agree=4, strongly agree=5;** Indicate the extent to which you agree with the following statements

	1	2	3	4	5
Budget support for M&E activities is adequate					
Community has capacity to conduct M&E activities					
M&E activities are conducted frequently					
M&E data and reports are very relevant to the project activities					
Data generated in M&E activities is utilized to inform project decisions					
M&E results are useful for project in obtaining support from partners					
M&E activities are very useful in realizing project sustainability					

SECTION E (AFTER REDESIGNING)

(M&E): MONITORING & EVALUATION PRACTICES

This section will ask you questions concerning the project Monitoring &Evaluation practices in terms the way community water project allocates resources for M&E activities, how the project activities are inspected and supervised, how it conducts data collection, data analysis, dissemination of reports and utilization of M&E results.

Items that are monitored in your project

Tick (√) the most appropriate Yes No

5.1 Volumes of water flowing into community tanks

5.2 Flow of water to households

5.3 Busts pipes and tanks

5.4 Water theft by non members

5.5 Wastage of water

5.6 Monthly payment by members

5.7 Siltation and pipe blockage

5.8 Use of water for other purposes not allowed by project

Indicate whether the following methods for data collection in monitoring project activities are used in your project.

Tick (√) the most appropriate	YES	NO
5.8 Using word of mouth/Verbal reports		
5.9 Written reports sent to members		
5.10 Field visits		
5.11 Check list		
5.12 Use of camera		
5.13 Calling through mobile phones		
5.14 Forwarding Complaints to project officials		
5.15 Giving information in project meetings		

Indicate by use of a tick (√) the format in which your project disseminate/presents M&E reports to project members

- Verbal reports [ ]
- Written reports [ ]
- Verbal reports in meetings [ ]
- Newsletters dispatched to members [ ]
- Others specify.....

Using a scale of; **strongly disagree=1, disagree=2, neutral=3, agree=4 strongly agree=5** indicate to what extent you agree with the following statements?

Indicate the extent to which you agree with the following statements		**1**	**2**	**3**	**4**	**5**
5.16	The water project has allocated enough resources to conduct M&E					
5.17	Resources allocated for M&E are made available in time					
5.18	Community is involved in designing the objectives/areas and criteria for conducting M&E					
5.19	The project activities are monitored/inspected/supervised on regular basis					
5.20	The persons involved in supervision/M&E activities have right skills					
5.21	The methods used for M&E data/information collection are appropriate					
5.22	The data obtained in M&E activities is appropriate					
5.23	Information generated through M&E is appropriately analyzed					
5.24	M&E report is presented in a format that make meaning to the users					
5.25	M&E generates quality data/reports that can support project decisions					
5.26	M&E results are communicated/ disseminated to the relevant stakeholders/ institutions					
5.27	There is timely dissemination of M&E results/ reports					
5.28	Data generated in M&E activities is utilized to inform project decisions					
5.29	Data generated through M&E has improved project decision making process					

Appendix VI: Research Permit

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471, 2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/16/42078/9622**

Date: **11th April, 2016**

Fredrick Ngotho Muniu
University of Nairobi
P.O. Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Monitoring and Evaluation, community participation and sustainability of community water projects in Kenya: A case of Nyeri County,"*** I am pleased to inform you that you have been authorized to undertake research in **Nyeri County** for the period ending **2nd April, 2017.**

You are advised to report to **the County Commissioner and the County Director of Education, Nyeri County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nyeri County.

The County Director of Education
Nyeri County.

THIS IS TO CERTIFY THAT:
MR. FREDRICK NGOTHO MUNIU
of UNIVERSITY OF NAIROBI, 0-10100
NYERI,has been permitted to conduct
research in *Nyeri County*
on the topic: *MONITORING AND EVALUATION,COMMUNITY PARTICIPATION AND SUSTAINABILITY OF COMMUNITY WATER PROJECTS IN KENYA: A CASE OF NYERI COUNTY*
for the period ending:
2nd April,2017

Permit No : NACOSTI/P/16/42078/9622
Date Of Issue : 8th April,2016
Fee Recieved :ksh 2000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 8541

CONDITIONS: see back page