

**INFLUENCE OF COMMUNITY PARTICIPATION ON
SUSTAINABILITY OF WATER AND SANITATION PROJECTS
IN MACHAKOS COUNTY, KENYA**

BY

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**A Research Project Report Submitted in Partial Fulfillment of the
Requirements for the Award of the Degree of Master of Arts in Project
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DECLARATION

This is my original work and has not been submitted in any university or college for examination.

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This research project report has been submitted for examination with the approval of my university supervisor.

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DEDICATION

I dedicate my work to my friends Loise Syekonyo and Fridah Komu for the moral support they have given me all through the period of my study.

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LIST OF ABBREVIATIONS

UNDP-United Nations Development Program

WHO - World Health Organization

CDF- Constituency Development Fund

MDG- Millennium Development Goals

WSP-Water and Sanitation Projects

SPSS-Statistical Package for Social Sciences

CBOs-Community Based Organizations

NGOs-Non-governmental Organizations

ABSTRACT

The purpose of the study was to investigate the influence of community participation on sustainability of water and sanitation projects in Machakos County, Kenya. The study sought to examine the extent to which community participation in planning influences sustainability of water and sanitation projects; to determine how community participation in leadership influences sustainability of water and sanitation projects; to assess the extent to which community participation in monitoring and evaluation influences sustainability of water and sanitation projects; to determine how community participation in management skills influences sustainability of water and sanitation projects in Machakos County. Relevant literature was reviewed on the topics of project sustainability and community participation, particularly community participation in planning, leadership, monitoring & evaluation and management skills and how they influence sustainability of water and sanitation projects. The study employed descriptive survey research design. The total target population was 1025. A study sample of 280 water projects was considered. These were selected using systematic random sampling technique. Questionnaires were used to collect quantitative data from the respondents. Reliability of the questionnaires was tested using the split-half method. Quantitative data collected was analyzed using Statistical Package for Social Sciences (SPSS) V21. Results of the study were interpreted using descriptive statistics: frequency distribution, mean, and percentages as well as inferential statistics. This study generated information that showed that sustainability of water and sanitation projects in the research area was influenced by community participation in planning, leadership, monitoring and evaluation and management skills. The findings of this study will be beneficial to various stakeholders including the community members, county government through the water and sanitation department among others. Specifically, the study generated insight in helping improve the sustainability of water and sanitation projects through active community participation. Based on the study findings, the researcher recommended for enhancement of community participation in planning, leadership, monitoring and evaluation and management skills to enhance sustainability of water projects. The study recommends other studies to be conducted on the challenges facing the sustainability of water and sanitation projects in Kenya as well as on the role of women in enhancing the sustainability of water and sanitation projects in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Projects sustainability is one of the most critical aspects for all grassroots, national and international development agencies. (Nokes and Sean 2007) describe a project as a set of coordinated activities with a specific start and finish time pursuing a specific goal with constraints on time, scope and resources. According to the 2013 Human Development Report (UNDP, 2013), it recommends that to walk in the human development pathway, people should engage fully in activities that reform the lives and they should be able to participate in policy making process and results. According to (Hurtton et al 2007) water is the most important natural resource indispensable for life and at the same time the backbone for growth and prosperity for mankind. The research released in early 2013, according to the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP), 36 per cent of the world's population 2.5 billion people lack improved sanitation facilities and 768 million people still use unsafe drinking water sources.

When thinking of project sustainability, three things must be born in mind; the community, project results and external assistance (Luvenga, Kirui, Oino, and Towett, 2015). A project is sustainable if the community/beneficiaries are capable on their own without the assistance of outside development partners to continue producing results for their benefit for as long as their problem still exists (Luvenga et al., 2015).

Participation is a rich concept that varies with its application and definition. Hence, participation should not be explained with a single definition or interpretation (Oakley, 1991a, p114). Participation has been defined by (Brager, Specht, and Torczyner, 1987) as a means to educate

citizens and to increase their competence. It is a vehicle for influencing decisions that affect the lives of citizens and an avenue for transferring political power. (Armitage, 1988) defined citizen participation as a process by which citizens act in response to public concerns, voice their opinions about decisions that affect them and take responsibility for changes to their community. Westergaard (1986) defined participation as “collective efforts to increase and exercise control over resources and institutions on the part of groups and movements of those hitherto excluded from control”. This definition leans toward a way for making sure community participate.

Major development organizations including multilateral agencies like the World Bank and the International Monetary Fund have arrived at a near consensus that projects cannot be sustainable and long-lasting unless community’s participation is made central to the planning and management of projects (Kumar, 2002). Water projects failure possess a problem that can be self-perpetuating. (Vanloon and Droogers, 2002) in their study on Water Evaluation and Planning System in Kitui, points out that bad experience on unsuccessful water projects in the past alienate people and make them likely to be hostile towards future initiatives. Hence the need for involvement of the community in the planning and implementation of water and sanitary projects to ensure that they are hands on to ensure that the chances of failure are minimal due to introduction of accountability of the community.

Despite there being a universal recognition for the importance of safe water in poverty alleviation and socio-economic development globally, the access to safe drinking water remains low and this is attributed to many water supply systems not being sustainable. (Smith and Marin 2005) states that worldwide, about two million people struggle daily for access to safe and sufficient water. According to (Nerubucha, 2011), Kenya is a water scarce country and it is therefore important to ensure that water resources are continuously monitored, assessed and evaluated in order to plan

for water security. However, the situation in water and sanitation possess the question of sustainability of projects to enable operation in full potential.

Achieving sustainable water supply remains one of the goals of Third World Countries. In Africa, many water projects have been done by the governments, development partners and the communities though most of them do not last more than five years after commissioning (Water Supply & Sanitation Collaborative Council, 2012). Community based water management system evolved in 1980's. It emerged as a response to the international crisis of water scarcity and dwindling resources. Water management systems that embraced a participatory approach empowered communities to provide, protect and safeguard their own water resources. In this respect, a community based water management system would be concerned with the community's involvement in the planning, design, implementation, and maintenance of a water project or program. These offered greater chances of effectiveness, efficiency, functionality, sustainability and improvement of livelihood of the projects (Green et. al., 1994)

1.2 Statement of the Problem

Poor sustainability of projects therefore deprives beneficiaries returns expected from these investments, (Luvenga et al., 2015). (Sutton, 2004) in his survey carried out in 11 countries in sub-Saharan Africa, observed that The United Nation's Millennium Development Goals (MDG's) that aim at halving from 1990 figures the proportion of people without access to water and sanitation by the year 2015 have been important in galvanizing global attention and support for water and sanitation.

Studies have been conducted on water project sustainability which includes: a study by (Ngetich, 2009) who observed that most water projects did not function to full capacity and recommended for more study to be done on the influence of project location on sustainability of water projects. A study by (Kainda, 2012) observed that community contribution and awareness were paramount to water projects sustainability. A study by (Habtamu Addis, 2012) observed that most water project decline in performance shortly after external support is withdrawn and recommended that further study be done on factors that influence sustainability of such projects in other rural parts of other countries in Africa in order to bring a generalization of the findings.

Although the CDF Act (2003) and water Act (2002) seems to institutionalize community based approaches and more importantly in the water sector, this is basically a new paradigm in Kenyan development perspectives considering that since independence communities have not been encouraged to do much in terms of their development; they have been made to wait for the government to do things for them. These studies; (Rimbera, 2012), (Ali Jatan, 2012), (Mbajiwe, 2009) and (Airo, 2009) point out lack of project sustainability due to low level of community awareness, approaches used by developers and lack of proper feasibility study but these; (Lengaplani, 2010) and (Wawire, 2007) point out community participation, project location, training on technology used and community capital contribution as factors leading to lack of sustainability. A study which investigates community participation in community based projects could therefore help in better understanding of how community participation in projects influences sustainability of the water and sanitation projects.

1.3 Research Purpose

The purpose of this study was to establish the role that community participation plays in ensuring sustainability of water and sanitation projects in Machakos.

1.4 Objectives of the Study

The study was guided by the following objectives;

- i. To examine the extent to which community participation in planning influences sustainability of water and sanitation projects in Machakos County.
- ii. To determine how community participation in leadership influences sustainability of water and sanitation projects in Machakos County.
- iii. To assess the extent to which community participation in monitoring and evaluation influences sustainability of water and sanitation projects in Machakos County.
- iv. To determine how community participation in management skills influences sustainability of water and sanitation projects in Machakos County.

1.5 Research Questions

The study sought to answer the following questions;

- i. To what extent does community participation in planning influence sustainability of water and sanitation projects in Machakos County?
- ii. To what extent does community participation in leadership influence sustainability of water and sanitation projects in Machakos County?
- iii. To what extent does community participation in monitoring and evaluation influence sustainability of water and sanitation projects in Machakos County?
- iv. To what extent does community participation in management skills influence sustainability of water and sanitation projects in Machakos County?

1.6 Significance of the Study

This study would be of significance to the community, donors, policy makers, researchers and the government. Findings from this study could be used by CBOs, implementing partners, donors,

international NGOs and the government to address sustainability challenges and in planning better ways of implementing sustainable community projects.

Lessons drawn from this study can be used to inform policy debates on participation sustainability nexus as well as influence policies on community participation in development projects. These policies may be at the community, organizational or national level.

This study adds to literature on the subject of community participation and project sustainability in Kenya. Academic researchers, scholars and research organizations may find this study useful as it may provide them with information as well as assist in identifying gaps for further studies.

1.7 Limitations of the Study

The researcher faced a challenge of time and inadequate finance to carry out the study in the County. Cost such as transport cost and printing of questionnaires forced the researcher to dig in their savings account to facilitate the process. Another limitation was the respondents' being illiterate or busy or not giving sincere information while being interviewed due to sensitivity of the information required which could lead to inaccurate data analysis and as a result wrong conclusion on the study. The study involved one respondent from the sampled water projects which may not be a good representation of all the other water projects beneficiaries. The study was also limited to public water projects only leaving out private water projects.

1.8 Delimitation of the Study

The study focused on the influence of community participation on sustainability of community water and sanitation project in Machakos County. The key respondents were one committee member from each project who was near the various water projects in Machakos County.

There were many water and sanitation projects and beneficiaries but the study was delimited to only 280 water and sanitation projects and beneficiaries where the results from these were generalized to the whole of the County projects and beneficiaries. This is because the study could not target all the water beneficiaries due to time and financial constraints.

1.9 Assumptions of the Study

The researcher assumed that respondents would be available and willing to answer questions and that the answers were correct and truthful.

1.10 Definition of Significant Terms

Community Participation: This is the involvement by the community in the creation, content and conduct of projects designed to change their lives. It is an active process by which communities influence the direction and execution of a development project with a view to enhancing their well-being. Community participation requires recognition and use of local capacities and avoids the imposition of priorities from outside.

Monitoring and Evaluation: Monitoring is a continuing function that aims primarily to provide the management and main stakeholders of an ongoing project with early indications of progress, or lack thereof, in the achievement of results. Evaluation can be defined as the systematic and objective assessment of an on-going or completed project and its design, implementation and results. The aim is to determine the relevance and fulfillment of objectives, efficiency, effectiveness, impact, and sustainability.

Project Implementation: This refers to execution of activities designed at the planning stage. The plan is actualized and implemented by the people of Machakos community.

Project Planning: This is a communication process where people with different views and ideas share on how a desired situation should look like in the County and how they are likely to get there and how to express these ideas together and reach a consensus.

Project Sustainability: This is the capacity of a project to maintain services and benefits to the community without detrimental effects even after special assistance such as financial, technical and managerial has been phased out. It is the probability that a project shall continue long after the outside support is withdrawn.

1.11: Organization of the study

This project was organized into five chapters:

Chapter one focuses on the introduction of the study, the background of the study, statement of the problem, the purpose of the study, research questions, and significance of the study, delimitations, limitations and assumptions of the study. It also defined significant terms as they are used in the study.

Chapter two was the review of literature which is based on planning, leadership, monitoring and evaluation and management skills. It also focuses on the independent, dependent variables and moderating variable and how they relate to each other which were shown in the conceptual framework.

Chapter three focuses on research methodology which covers research design, target population, sampling procedure, data collection instruments, methods of data collection, validity and reliability of the instruments, ethical considerations and operational definition of the variables and methods of data analysis.

Chapter four focuses on data analysis, presentation and interpretation whereas chapter five focuses on summary of findings, conclusion, discussions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

A theory as a set of interrelated concepts which can be used in the study, definitions, prepositions that have been put forth to explain or predict a scenario under study (Brown and Cooper (2011), This chapter discusses literature related to the influence that community participation has in ensuring sustainable water projects. The literature is reviewed from books, journals, academic publications, the internet, newspapers and government statistics.

2.2 Planning and Sustainability of Water and Sanitation Projects.

After a consensus has been reached on the most appropriate interventions for a particular community problem, stakeholders can proceed with planning the interventions. (Hague et al., 2003) has defined participatory planning as a set of processes through which different groups of people with their various interests engage together in reaching an agreement on a plan coming to work. Planning is a communication process where people with different views and ideas share on how a desired situation should look like and how they are likely to get there and how to express these ideas together and reach a consensus. Through communication people can achieve the commitment necessary to sustain the decision taken by them. Planning therefore implies control of the process, (Chikati, 2009). In the planning stage of a project cycle, the problem is discussed further by focusing on project design and costing of activities, the budget, resource mobilization, implementation plan and schedule, expected completion date, and evaluation plan, (Barasa and Jelagat, 2013). Planning involves clearly formulating objectives of each intervention, describing how each intervention will meet the desired objectives, identifying the roles and responsibilities

of the participants in the project, estimating which resources are needed, establishing a time frame and establish a monitoring and evaluation system, (Lefevre et al., 2000).

The higher the degree of community participation in a project, the greater is the need for care in planning at the community level. This also means that communities that accept a higher level of community participation need greater support in their activities from the regional and national offices of the development agency. Two areas where a particularly high level of support is needed are manpower (Skilled) and training. Both areas have been major constraints to progress in the past (WHO 1986).

With regard to planning at the community and individual project levels, major emphasis is placed here on attention to detail. Experience has shown that great care at the time of planning leads to more successful implementation of projects. Therefore, there should be explicit statements in the national plans regarding who is to make decisions on issues that are not already dealt at the national level. It is also important to ensure that there is consistency between decisions made at the community/project level and those made at the higher level so that unrealizable expectations are not generated and impossible demands are not placed on either communities or agency officials (WHO 1986).

Initiating action, this occurs when beneficiaries are able to take the initiative in terms of actions/decisions pertaining to a project. Initiative implies a proactive capacity and the confidence to get going on one's own. When beneficiary groups engaged in facility development identify a new way of running the facility and respond to it on their own, they are taking the initiative for their development. The intensity of community participation in this case may be said to have

reached its peak because this move is qualitatively different from their capacity to act or decide on issues or tasks proposed or assigned to them (Mansuri, 2003).

At the project implementation stage, critics have been quick to point out that there is often a limited number of members of the community participating in such schemes. In addition, their participation is generally restricted to simple matters, such as provision of labour and cost sharing, and not with the important issues faced during the process of decision making as it relates to project initiation and execution (Park, 1996). Furthermore, there often is lack of competent voluntary leaders. Indigenous leaders cannot afford to devote enough time and energy to the task. Community-based activities, therefore, tend to lose momentum in many small sized community units.

According to (Hague et al., 2003), participatory planning can be initiated by any of the parties involved in the project and the forms it will take and the timetables are likely to be negotiated and agreed amongst participants. The process is rooted in the recognition that a community is pluralist and there are legitimate conflicts of interest that have to be addressed by the application of consensus building methods. Participatory planning is aware culturally and sensitive to differences in power. The different parties need to exchange information to explore areas of common ground and compromise and to find ways of reducing the extent and intensity of disagreements; this promotes sustainability of community projects.

2.3 Leadership and Sustainability of Water and Sanitation Projects

In an evaluation of community development projects funded by the Agha Khan Rural Support Programme in Northern Pakistan (Khawaja, 2003) research found out that the projects that involved the community in management were better maintained than projects managed by the local government. (Khawaja's, 2003) study suggests that since community managed projects are better

maintained, they are also more sustainable than those managed by local governments. Narayan (1993) analyzed lessons from 121 rural water-supply projects funded by different agencies in 49 developing countries in Africa, Asia and Latin America. He found that participation was the most significant factor contributing to project sustainability

(Beyene et al, 2006) observes that community participation can be categorized into aspects and these included; Time/interest where individuals participation in project work could range from participating largely as an observer (as an audience member or source of moral support) to contributing skills and leading community participation efforts. These can range from attending community meetings and even voting for committee members on the low side and on the higher side a person can serve as a committee member. The second aspect is labour where a community member can choose to donate manual/physical labour, be a committee member or even offer skills to give services to the community members. As community members increase their quality and quantity of participation in projects, communities transit from relatively passive to more proactive state. Community participation in activities such as; collection and analysis of information; definition of priorities and setting of goals; assessing of available resources; deciding on and planning programs and designing strategies to implement such programs and defining responsibilities among participants; managing and monitoring programs and evaluating results and impact involve high level of community participation. Active involvement of the community in need assessment facilitates proper problem/need diagnosis hence clear definition of the problem in many ways. The community should as well participate in the project planning process where objectives, pre-requisites inputs, output organization, participant clearances are defined, costs and earnings calculated, financial plan prepared, expected results analyzed, socio-economic and environmental impacts estimated and provisional as well as final project document prepared.

Community Based Planning (CBP) is important as it attempts to make planning and resource allocation systems more responsive to local people's needs. This improves quality of services while deepening democracy through promotion of community action and involvement in planning and managing local development as it leaves the community empowered. Active community participation improves the match between community needs and what the community obtains from a project. According to the International Association of Public Participation (IAPP), of all the empowerment principles, active participation is the most important as it leads to higher rates of resource acquisition and yield better results, higher levels of volunteerism and a brighter community spirit.

Active community participation also enhances and leads to actualization, maintenance and sustainability of their projects. Through community participation, community members gain ownership and skills for a collective action that enhances sustainability of projects (Olukotun, 2008). The researcher concurs with (World Bank 1981), (Olukotun 2008), (Mbajiwe 2009), (Rimbera 2012) and others that community participation enhances skill development and sense of ownership that leads effective implementation and sustainability of projects.

2.4 Monitoring and Evaluation and sustainability of Water and sanitation Projects

(Sera and Beaudry, 2007) reports that Monitoring and Evaluation (M&E) are important management tools used to track progress of a project and facilitate decision making. (United Nations Development Programme, 2002) has defined monitoring as a function that is continuous that its aim primarily is to provide the management and main stakeholders of an ongoing intervention with early indications of progress, or lack thereof, in the achievement of results. (Shapiro, 2002) defines monitoring as the systematic collection and analysis of information as a project progresses. Monitoring has also been described by International Federation of Red Cross

and Red Crescent Societies (2011) as the routine collection and analysis of information to track progress against set plans and check compliance to established standards. Evaluation on the other hand has been defined as the systematic and objective assessment of an on-going or completed project, program, or policy, and its design, implementation and results, with the aim of determining the relevance and fulfilment of objectives, efficiency, effectiveness, impact and sustainability, (International Federation of Red Cross and Red Crescent Societies, 2011). Evaluation is the comparison of actual project impacts against the agreed strategic plans. It looks at what was set out to be done, what was accomplished, and how it was accomplished. It can be formative; taking place during the life of a project or organization, with the intention of improving the strategy or way of functioning of the project or organization. It can also be summative; drawing learnings from a completed project or an organization that is no longer functioning, (Shapiro, 2002). According to (Lefevre et al., 2000), the main purpose of an evaluation is to enable project participants to make decisions that will help the project reach the desired results rather than solely to assess the impact of an intervention or the lack of it.

The principles of participation are rooted in Paulo Freire's psychosocial method in which people discussed their own life situation, identified their problems and planned for transformation,(Mulwa, 2008) and the Mahatma Gandhi's principles of self-help (Mansuri and Rao, 2004) The principles requires developers to focus on creating critical awareness through experience based learning, reflection on the peoples' own life situations and finding out what to do with its inadequacies, planning for collective action to transform whatever is un desirable, acting to change the situation and finally identifying failures and successes from actions taken so that it informs the next plan of action (Ibid,2008) It is a reversal from centralized standardization to local, diversity, and blue print to learning process, (Chambers, 1994)

According to the (World Bank, 2010), community participation in M&E is critical in project sustainability since: it offers new ways of assessing and learning from change that are more inclusive and more responsive to the needs and aspirations of those most directly affected; is geared towards not only measuring the effectiveness of a project, but also towards building ownership, empowering beneficiaries, building accountability and transparency and taking corrective actions to improve performance and outcomes. Participation in M&E has much less meaning if population members and local stakeholders have not been involved much earlier in the project cycle, (ALNAP, 2009).

2.5 Management Skills and Sustainability of Water and sanitation Projects

According to (Kulgan, 1994) as cited by (Mwangi, 2007) community participation refers to taking part in the formation, implementation and management of initiatives by community members. It is the presence of process by which community members' opinions and views affects decision making at community level, (Grishvilli 2003). Good participation needs to be informed and organized. Participation of community members in development initiatives creates awareness, motivates, organizes actors and helps draw out priorities to help build long term capacities to manage and negotiate, improve accountability by bringing different actors in a good relationship.

One of the factors that could have resulted in breakdown and non-sustainability is lack of community training of water supply projects in developing countries (Ademiluyi and Odugbesan, 2008). They further point out that even where full community participation or management is planned from the start, community-level committees and care takers may lose interest or trained individuals may move away. This can be a particular risk if community level organization is on a voluntary basis. (Mengesha A., Abera K. and Mesganaw F., 2003) in their study on sustainability of drinking water supply projects in Rural of North Gondar, Ethiopia recommend that building

adequate skills and capacity to maintain water sources is an essential factor to sustain the water system.

(Robert Owen, 1771–1851), sought to create a more perfect community. At New Lanark, and at later communities, such as Oneida in the USA, and the New Australia Movement in Australia, groups of people came together to create utopia or international utopia communities, with little or no success. *The Peaceful Revolutionist*, a journal by (Josiah Warren, 1798 – 1874), attributed this to lack of ownership of the communal activities.. The (Gulbenkian Foundation, 1986) was a key funder of commissions and reports which influenced the development of Community Developments in the UK from the latter sixties to the 80's. This was formally set up in 1991 as the Community Development Foundation. A commission of inquiry was established in 2004 by the Carnegie UK Trust whose major work was to look into the future of rural community development examining issues such as land reform and climate change. Carnegie funded over sixty rural community development action research projects across the UK and Ireland and national and international communities of practice to exchange experiences. This included the International Association for Community Development. According to Spence, (1996), this model was tried with total failure in Kenya. Development projects were developed by the colonial government without any community involvement in the early stages of decision making, hence the failure of projects implementation.

2.6 Theoretical Framework

Various theories have been formulated on community participation where the community members are given a lead role in project implementation process. The theory used in this study is Empowerment theory.

2.6.1 Empowerment Theory

This study was anchored on empowerment theory by Perkins Douglas and Zimmerman Marc (1995). Empowerment involves enabling individuals and the community through participation with others to achieve their goals. Participation, control and awareness are essential parts of empowerment. Sustainable development is only likely if the idea of empowerment and its practical institutionalization in the law, the educational process and the machinery of government become a reality, (Titi and Singh, 2001).

Empowerment is a construct that links individual strengths and competencies, natural helping systems and proactive behaviors to social policy and social change (Rappaport, 1981, 1984). Empowerment theory links individual well-being with the larger social and political environment. The various definitions of empowerment are generally consistent with empowerment as an intentional ongoing process centered in the local community, involving mutual respect, critical reflection, caring, and group participation. Cornell Empowerment Group (1989) has defined empowerment as a process through which people have greater access and control over resources that they lacked an equal share. It is a process by which people gain control over their lives, democratic participation in the life of their community (Rappaport, 1987) and a critical understanding of their environment (Zimmerman, Israel, Schulz, Checkoway, 1992).

Theories of empowerment include both processes and outcomes suggesting that actions, activities, or structures may be empowering and that the outcome of such processes result in a level of being empowered (Swift & Levin, 1987). Individuals can seek self-empowerment through processes such participation in community based projects. Decision making and shared leadership are some of the tools that could be used to ensure empowerment at the organizational level. Some of the

other Empowering processes that could be included in the community level could include collective action to access the government and other community resources. Community-level empowerment outcomes might include evidence of pluralism, and existence of organizational coalitions, and accessible community resources. Empowerment suggests that activities such as people coming together to achieve goals, and group efforts to gain access to resources, and some critical understandings of the sociopolitical environment are basic components of the construct.

2.7 Conceptual Framework

The conceptual framework seeks to illustrate the variables that influence community participation on sustainability of water and sanitation projects. The independent variables include; Planning, Leadership, Monitoring & evaluation and Management skills. On the hand, the dependent variable is Sustainability of water and sanitation projects. This relationship is affected by the Government policies which is a moderating variable and will not be measured in this study because it does not affect the dependent variable directly.

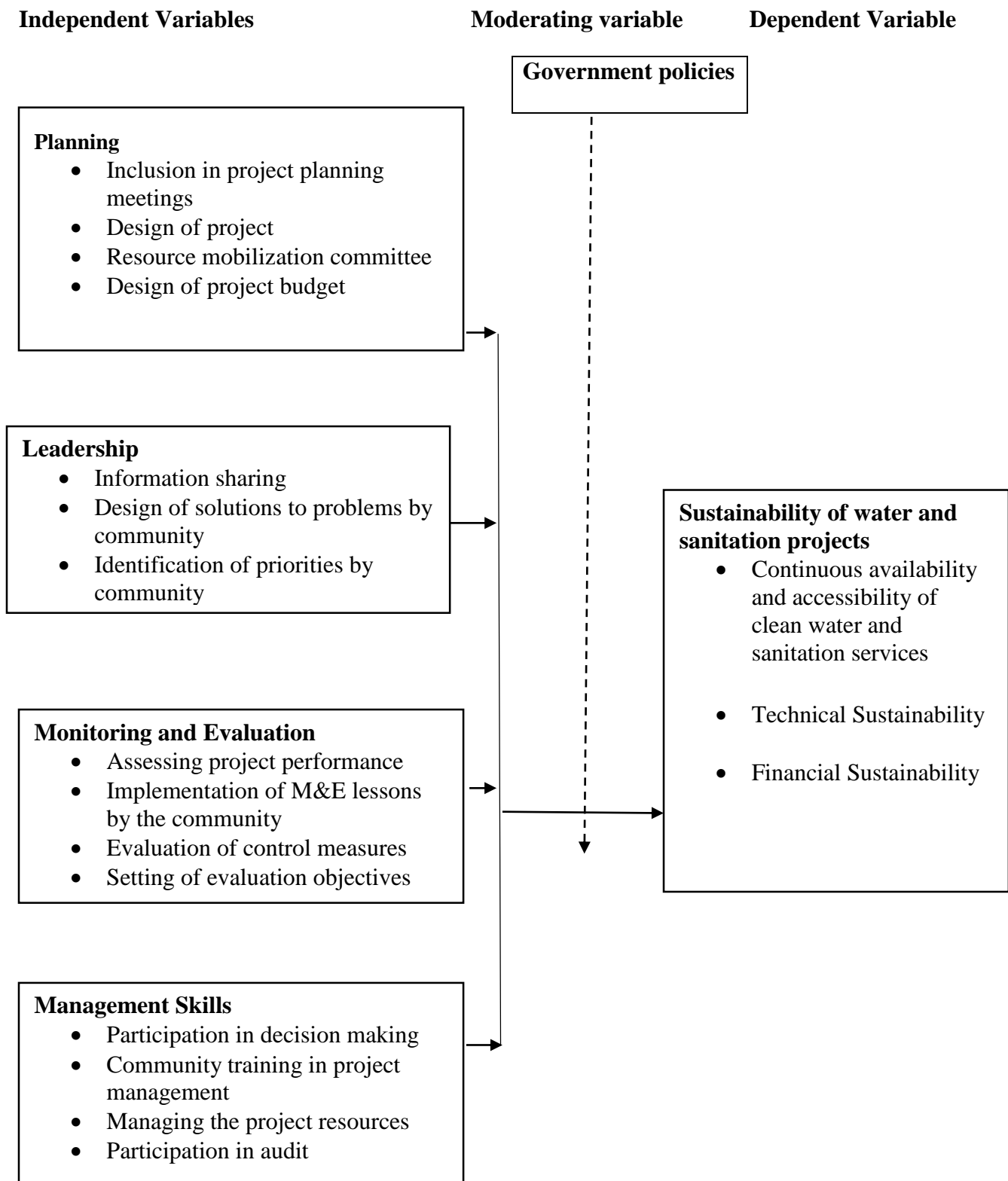


Figure 1: Conceptual Framework

2.8 Knowledge Gaps

This chapter has outlined literature reviewed from existing secondary sources according to the variables of the research and the conceptual framework which formed a basis of the study. Community ownership of water projects is negatively influenced using inappropriate technologies, unavailability of spare parts, lack of local maintenance and operational capacity, lack of local community education and participation, ineffective community demand, lack of co-ordination of sector agencies and water facilities being sited from the beneficiary households. In the literature of other studies, they have highlighted on the influence of community participation, institutional capacity building and project management practices.

The Project management strategies indicators identified are financial management of projects, organizational planning, strategic planning of water projects, ability of community members to sustain their projects through contributions towards operations and maintenances, management of skilled water operators and leadership. It is also indicated that application of project management strategies such as strong constitution, strategic planning and effective financial management is below average in the community managed water projects. Community participation involves capabilities and calling of communities to bear responsibility, influence and determine the nature of project during its life cycle to ensure long term solutions.

The identified indicators in the literature review of community participation are community participation in decision making, community contribution, representation, responsibility, social factors and informed choice. It has also shown that the level of involvement of communities in water projects activities is still low in most developing countries especially in rural areas. Human capacity development is important through specialized training and education of project managers,

staff, community members and the whole project team. The identified indicators for community training and education include level of awareness, types of training, relevance of training and number of trainees. Lack of community education is one of the factors which could lead to breakdown and non-sustainability of water supply projects. The aim of conserving water resources is to ensure adequate quantity and satisfactory quality supply to the community.

The identified indicators for water conservation practices included water quality, conservation intervention measures and types of catchment protection interventions and level of water sources reliability. Limited water resources conservation could lead to non-sustainability of water resources. It has been indicated and observed that while water resources conservation level is still low among rural communities, it greatly determines the reliability and sustainability of water projects. The literature reviewed showed there was knowledge gap of studies done locally to investigate the determinants of sustainability of community managed water projects in Machakos County. This indicated that there was a local knowledge gap on water projects sustainability issues in Kenya.

2.9 Summary of Literature Review

(Baker, 2000) asserts that despite the billions of dollars spent on development assistance year after year, there is very little known about the actual impact of projects on the poor and this implies that sustainability of such development is still a great challenge. External support on CWPs often does not consider post impact evaluation of the projects. The literature reviewed reveal that in spite of what is known about the value of enhancing sustainability and what has been instituted by different institutions, there are still indicators of poor and even no sustainability of CWPs. This means that further studies can unearth some of the factors that contribute to this.

It emerges from the reviewed literature that CWPs are established to provide beneficial effects (access to clean water) to the target communities. However, there is little that has been done regarding influence of community participation, community education and training on technology used, project location and community capital contribution on project sustainability. Literature reviewed reveals the need for further studies on the factors that influence sustainability in order to achieve generalization of results.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This Chapter specifies the nature of the research design and the population to be studied. It covers the research design, population, sampling frame, sample and sampling techniques, instruments, data collection procedure and data processing and analysis.

3.2 Research Design

Research design is the general plan of how one goes about answering the research questions (Creswell, 2003). It is a method that provides a framework through which the researcher gathers and presents data. This study adopted a descriptive survey research design. Bryman and Bell (2003) state that a descriptive design seeks to get information that describes existing phenomena by asking questions relating to individual perceptions and attitudes. A descriptive research design is more investigative and focuses on a particular variable factor. Descriptive studies portray the variables by answering who, what and how questions (Bernard, 2011). This design is analytical and often singles out a particular subject and goes into detail in describing them. This research design helped in gaining information about the influence that community participation has in the performance and sustainability of community based water projects in Machakos County. It determined the relationship between the variables; community participation in planning, leadership, monitoring and evaluation and management with sustainability of water and sanitation projects in Machakos County.

3.3 Target Population

Population is the entire group of individuals or items under consideration in any field of inquiry and have a common attribute (Kothari, 2004). Target population should be explicitly and

unequivocally defined otherwise statements about the target population after the analysis of data will not be trustworthy (Mugenda and Mugenda,2003)

This study was conducted in Machakos County. The target population was beneficiaries of water and sanitation projects in the County. The total number of complete water projects in the County was 1025 which serve a population of 157,000 people.

Table 3.1: List of water projects in Machakos Sub-Counties.

Sub-County	Water projects
Masinga	134
Yatta	139
Mwala	232
Matungulu	115
Kangundo	88
Kathiani	74
Machakos	160
Mavoko	83
Total	1025

3.4 Sample and Sampling Procedure

A sample is a sub-set or part of the target population. Sampling is a process of selecting subjects or cases to be included in the study as the representatives of the target population (Mugenda & Mugenda, 2006).

3.4.1 Sample Size

A sample size is a set of observations drawn from a population by a defined procedure (Creswell, 2003). Ngechu (2004) drew attention to the importance of selecting a representative sample through making a sampling frame. From the population frame the required number of subjects,

respondents, elements or firms are selected in order to make a sample. The sampling plan describes the sampling unit, sampling frame, sampling procedures and the sample size for the study.

The equation for the total sample size was:

Sample size = $n(N) / (n + N-1)$

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2}$$

Where:

z is the z score

ϵ is the margin of error

N is population size

\hat{p} is the population proportion

From Z tables; a confidence level of 95% gives a z score of 1.96. A margin of error of 5% and a population proportion of 0.5 will be used.

$$\frac{1.96^2 \times 0.5 \times (1-0.5)}{0.05^2}$$

$$n=384.16$$

$$n=384.16$$

$$\frac{384.16 \times 1025}{384.16+1025-1}$$

$$384.16+1025-1$$

$$\text{Sample size} = 393764/1408.16$$

$$\text{Sample size} = 280$$

Table 3.2: Sample Frame

Sub county	Water projects	Sample Size for Strata
Masinga	134	37
Yatta	139	38
Mwala	232	63
Matungulu	115	31
Kangundo	88	24
Kathiani	74	20
Machakos	160	44
Mavoko	83	23
Total	1025	280

3.4.2 Sampling Technique

The study used stratified sampling method to obtain the subgroups of the water projects in the County to be targeted and use simple random sampling to select the respondent from each water project. The sample size for this research will be 280 water projects where by in each water project a questionnaire was administered to a project management committee member from the community who is also water and sanitation beneficiary of the project.

3.5 Research Instruments

The study used both primary and secondary data. The researcher used questionnaire as the research instrument. Kirakowski (2008) defines a questionnaire as a method for the elicitation, recording and collecting of information. The study utilized questionnaire that was developed for generating information on key variables of interest from the targeted respondents in the study. The researcher also focused on the review of existing information about the study areas and collect qualitative data through in-depth interview from respondents who ought to be conversant with the subject through various interactions and experiences. The questionnaire used close ended questions. The closed ended questions focused on a three and a five-point Likert scale where respondents were required to fill according to their level of agreement with the statements. The questionnaire was

framed in accordance with the objectives of the study. Secondary data was obtained from literature sources or data collected by other people for some other purposes. Review of published literature such as journals articles, published thesis and textbooks was very useful. These sources were reviewed to give insight in the search for primary information.

3.6 Validity and Reliability of the Instruments

To increase the validity and reliability of the data collected using questionnaires, the researcher based the questions solely on the objectives of the research. The researcher ensured that the questions were not leading and that they were closed ended. The questionnaire design and questions were reviewed by peers and the supervisor.

3.6.1 Validity of the Instruments

Validity is the degree to which the sample of the test item represent the content that is designed to measure, that is, the instrument measures the characteristics or trait that is intended to measure (Mugenda & Mugenda, 2008). Data need not only to be reliable but also true and accurate. If a measurement is valid, it is also reliable (Creswell, 2003). The research adopted content validity which refers to the extent to which a measuring instrument provides adequate coverage of the topic under study. The content validity was achieved by subjecting the data collection instruments to an evaluation group of participants who provided their comments and relevance of each item of the instruments and the experts indicate whether the item is relevant or not.

3.6.2 Reliability of the Instruments

Reliability is the extents to which a research instrument gets the same results each time it is given to the same subjects (Mugenda and Mugenda, 2003). The measurement of reliability provides consistency in the measurement variables (Kumar, 2000). In order to test reliability in research, three methods are widely used which are the ‘test re-test’ method, the ‘split-halves’ method and the ‘internal-consistency’ method (Collis and Hussey, 2003). Cronbach alpha is the basic formula

for determining the reliability based on internal consistency (Kim and Cha, 2002). The standard minimum value of alpha of 0.7 is recommended Gupta (2004) as the minimum level for item loadings. Higher alpha coefficient values mean there is consistency among the items in measuring the concept of interest. A reliability coefficient of 0.701 was obtained. The recommended reliability coefficient is any value between 0.7 and above. The instrument was therefore considered reliable.

3.7 Data Collection Procedure

The researcher sought permission from relevant authorities after the proposal approval and an introductory letter from the University of Nairobi department of Open Learning. A self-administered questionnaire was given to each respondent and picked later. The study incorporated both qualitative and quantitative data. Qualitative data was applicable since meanings were based on expressions through words and analysis was conducted through the use of content analysis. Quantitative data was applicable since meanings were derived from numbers and analysis that were conducted through the use of diagrams and statistics. Secondary data was obtained through desk review of relevant records and information obtained on community participation and sustainability of water projects in Machakos County.

3.8 Data Analysis Technique

Data collected was analyzed using Statistical Packages for Social Sciences. Data processing was carried out through editing, coding and classification whereas simple statistical methods were utilized to analyze the quantitative data by aid of SPSS Software and Pearson correlation analysis. Data results were presented in tables to give a clear picture on the findings.

3.9 Ethical Considerations

This study observed four critical ethical norms that include amongst others: Confidentiality which requires protection of confidential information from respondents, Consent which requires

voluntary participation of respondents in the study. Honesty which requires honest reporting of data, results, methods and procedures and the avoidance of fabrication, falsification, or misrepresentation of data were also considered. Respect for intellectual property which requires proper acknowledgement or credit through referencing and citations for all contributions to research by other researchers.

3.10: Operational Definition of Variables

Research Objective	Type of Variable	Variable	Indicator	Data Collection Method	Type of Analysis
To examine the extent to which planning influences sustainability of water and sanitation projects in Machakos County	Independent	Planning	<ul style="list-style-type: none"> • Inclusion in project planning meetings • Design of project • Resource mobilization committee • Design of project budget, cost, scope, implementation schedule and M&E plan by the community 	Questionnaire	Descriptive
To determine how leadership influences sustainability of water and sanitation projects in Machakos County	Independent	Leadership	<ul style="list-style-type: none"> • Information sharing • Design of solutions to problems by community • Identification of priorities by community 	Questionnaire Secondary data	Descriptive
To assess the extent to which monitoring and evaluation influences sustainability of water and sanitation projects in Machakos County	Independent	Monitoring and Evaluation	<ul style="list-style-type: none"> • Assessing project performance • Implementation of M&E lessons by the community • Evaluation of control measures • Setting of evaluation objectives 	Questionnaire Secondary data	Descriptive
To determine how management skills influences sustainability of water and sanitation projects in Machakos County	Independent	Management Skills	<ul style="list-style-type: none"> • Participation in decision making • Community training in project management • Managing the project resources • Participation in audit 	Questionnaire	Descriptive
Sustainability of water and sanitation projects	Dependent	Sustainability of water and sanitation projects	<ul style="list-style-type: none"> • Continuous availability of clean water • Technical Sustainability • Financial Sustainability 	Questionnaire	Descriptive

CHAPTER FOUR

DATA ANALYSIS, PRESENTATIONS AND INTERPRETATION

4.1 Introduction

The purpose of this study was to investigate the role that community participation plays in ensuring sustainability of water and sanitation projects in Machakos County, Kenya. This chapter contains; demographic information of the respondents, presentations and interpretations of the research findings. The presentation was done based on the research questions.

4.2 Questionnaire Response rate

The following table shows the response rate obtained for the study.

Table 4.1: Questionnaire Response Rate

Respondents	Sample size	Response rate	Percent
Water Beneficiaries	280	202	72.1

The response rate of questionnaire return was 202(72.1%) for the respondents of all the research instruments that were administered. This gave the total number of research instruments as 202 that were fully filled by the respondents making the total response rate to be 72.1% as shown in table 4.3. According to Mugenda & Mugenda, (2003), a response rate of 50% is adequate for analysis and reporting, a response rate of 60% is good and a response rate of 70% and over is very good. This implies therefore that the achieved rate was representative of the target population and was adequate and good enough to enable the researcher generate a conclusive report.

4.3 Demographic Characteristics of Respondents

This involved looking at the personal characteristics of respondents based on their gender, age bracket, educational level and years of residence in Machakos County.

4.3.1 Distribution of Respondents by Gender

The distribution of gender of respondents can be presented in table 4.2 as follows.

Table 4.2: Gender of Respondents

Gender	Frequency	Percent
Male	113	55.9
Female	89	44.1
Total	202	100.0

Results on gender of respondents show that 55.9% were male while 44.1% were female (table 4.2). The balanced responses from the participants indicate the extent to which community members are involved in sustainability of water and sanitation projects in Machakos County. In this case, all the respondents were willing to share their views on their participation on sustainability of these projects.

4.3.2 Distribution of Respondents Age Bracket

Furthermore, the respondents were asked to give their age bracket. Table 4.3 shows their results.

Table 4.3: Age of the Respondents

Age of the Respondents	Frequency	Percent
Below 24 years	20	9.9
25-29 years	28	13.9
30-34 years	42	20.8

35-39 years	35	17.3
40-44 years	36	17.8
Over 44 years	41	20.3
Total	202	100.0

On the age category, 42 (20.8%) were aged between 30-34 years, 41 (20.3%) were aged between over 44 years, 36 (17.8%) were aged 40-44 years, 35 (17.3%) were aged 35-39 years while 28(13.9%) were aged 25-29 years. Only 20 (9.9%) of the respondents were aged below 24 years old. The result suggests that the study collected information from a wide section of age category thereby validating the responses of the study.

4.3.3 Distribution of Respondents by Education Level

The study also sought the educational level of the respondents in various water and sanitation projects as presented in Table 4.4.

Table 4.4: Educational Level

Education Level	Frequency	Percentage
Primary	35	17.3
Secondary	84	41.3
Certificate	58	28.8
Bachelor's Degree	25	12.5
Total	202	100

Education level was also necessary in order to understand the literacy level of the respondents which could probably influence their understanding on influence of community participation on sustainability of water and sanitation projects in Machakos County. According to the findings, majority of the respondents (41.3%) had secondary

level of education, 17.3% had primary level education while 28.8% had certificate level of education. Additionally, 12.5% had degree level of education. This was an indication that the majority of the respondents had either attained primary education or secondary education and was therefore knowledgeable enough to give the required data.

4.4 Community Participation in Planning and Sustainability of WSPs

The first objective was to find out the influence of community participation in planning on the sustainability of water and sanitation projects. The responses were rated on a five point Likert scale where: 1 - Strongly Disagree 2 - Disagree 3 - Neutral 4- Agree and 5- Strongly Agree. The means were generated from SPSS and were presented in table 4.5 below.

Table 4.5: Planning and Sustainability of WSPs

Statement	Mean
Participated in meetings for planning on water projects	3.87
Community's ideas and contributions incorporated in the design of water projects	3.90
Community agreed on the proposed location of the various water kiosks and sanitation blocks	4.10
The community participated in coming up with the cost and budget for the project	3.50
The community mobilized resources	3.71
The community was involved in coming up with monitoring and evaluation plan	3.57
The community was involved in coming up with a plan for implementing water projects	2.97
The water project has been helpful to the community	3.17

From the study, community members participated in meetings for planning on water projects as indicated by a mean of 3.87 and their ideas and contributions got incorporated in the design of water projects (m=3.90). The community members also agreed on the proposed location of the various water kiosks and sanitation blocks (m=4.10) as well as participated in coming up with the cost and budget for the project (m=3.50). The findings further revealed that the community mobilized resources as agreed by a mean of 3.71. The members also agreed that they were involved in coming up with monitoring and evaluation plan (m=3.57). The respondents further neither agreed or disagreed that the community was involved in coming up with a plan for implementing water projects (m=2.97) and that the water project has been helpful to the community (m=3.17)

4.5 Community Participation in Leadership and Sustainability of WSPs

The second research objective sought to establish the extent to which community participation in leadership influenced the sustainability of water and sanitation projects in Machakos County. The responses were rated on a five point Likert scale where: 1 - Strongly Disagree 2 - Disagree 3 - Neutral 4- Agree and 5- Strongly Agree. The means were generated from SPSS and presented in table 4.6.

Table 4.6: Leadership and Sustainability of WSPs

Statement	Mean
Information is being shared with the community members	3.54
Community has been involved in designing of solutions to problems	4.12
Community has been given the opportunity of identification of priorities of the water projects	3.92
There is appointment of leaders from the community	3.76
Leadership has been transparent with its operations	3.11

Leadership of the water project has impact on the performance of water project	3.88
Community is informed on the objectives of the water project	3.72
Participation of the community in leadership enhances performance of water project	4.12

The respondent's response in all the issues related to community participation in leadership on sustainability of water and sanitation projects were analyzed. Members agreed that information was being shared with the community members (m=3.54) and that community has been involved in designing of solutions to problems (m=4.12). The community members were being given the opportunity of identification of priorities of the water projects as agreed by mean of 3.92 and also there was appointment of leaders from the community (m=3.76). The findings further revealed agreement among respondents that leadership of the water project had impact on the performance of water project (m=3.88), community is informed on the objectives of the water project (m=3.72) and participation of the community in leadership enhances performance of water project (m=4.12). Respondents however remained neutral on whether leadership had been transparent with its operations (m=3.11).

4.6 Community Participation in Monitoring and Evaluation and Sustainability of WSPs

The third research objective was geared towards to finding out how community participation in monitoring and evaluation influences sustainability of water and sanitation projects. The responses were rated on a five point Likert scale where: 1 - Strongly Disagree 2 - Disagree 3 - Neutral 4- Agree and 5- Strongly Agree. The means were generated from

SPSS and are as illustrated in table 4.7 which shows the results obtained from the study on monitoring and evaluation.

Table 4.7: Monitoring and Evaluation and Sustainability of WSPs

Statement	Mean
The community participated in assessing project performance	3.22
Benefits from the project are enjoyed by most community members	2.99
Lessons learnt from assessing projects have been implemented	3.66
Community has been involved in the audit of the finances from the water project	2.67
Participation in monitoring and evaluation enhances performance of the project	3.71
Community has been made aware of the tools used in monitoring and evaluation	2.10
There is constant evaluation of the water project procedures and management	3.11
Community being involved in developing strategies to better performance of project	3.00

Results on monitoring and evaluation showed that the community members participated in assessing project performance neutrally (m=3.22). Respondents neither agreed nor disagreed that the benefits from the project were enjoyed by most community members (m=2.99). However, they agreed that lessons learnt from assessing projects were being implemented (m=3.66). From the findings, the community had been neutrally involved in the audit of the finances from the water project (m=2.67). Further, the participation of the community in monitoring and evaluation enhanced performance of the water projects as

agreed by a mean of 3.71. Nevertheless, the respondents disagreed that the community had been made aware of the tools used in monitoring and evaluation (m=2.10). The respondents were also not sure whether there was constant evaluation of the water project procedures and management (m=3.11). The respondents also remained neutral on whether the community had been involved in coming up with strategies to better performance of the water project (m=3.00).

4.7 Community Participation in Management and Sustainability of WSPs

The study sought to establish the influence of community participation in management skills on the sustainability of the water and sanitation projects. The respondents were requested to indicate their level of agreement on the extent to which various management skills affected the sustainability of the water and sanitation projects. The responses were rated on a five point Likert scale where: 1 - Strongly Disagree 2 - Disagree 3 - Neutral 4- Agree and 5- Strongly Agree. The means were generated from SPSS and are as illustrated in table 4.8.

Table 4.8: Management and Sustainability of WSPs

Statements	Mean
Community has been involved in decision making concerning the water projects	4.01

Community has been involved in the management of project resources	3.88
Members of the community has been involved in the audit of various accounts of the project	3.79
The community has been trained on project management	3.69
The community has been able to manage the water project	3.71
The water from the project has been available throughout the period from the completion of the project	3.66
Finances from the water project have been managed well	3.77
Involvement of community in the management of water project has impact on its sustainability	3.65

From the findings, the majority of the respondents agreed that community members has been involved in decision making concerning the water projects (M=4.01), community has been involved in the management of project resources (M=3.88) and members of the community has been involved in the audit of various accounts of the project (M=3.79). In addition, the study revealed that the community has been trained on project management (M=3.69), the community has been able to manage the water projects (M=3.71) and that the water from the project has been available throughout the period from the completion of the project (M=3.66). Also, finances from the water project had been managed well (M=3.77) and the involvement of community in the management of water project had impact on its sustainability (M=3.65).

4.7 Correlation Analysis

Pearson correlation was used in the study to understand the factors influencing community participation on sustainability of water and sanitation projects in Machakos County

Table 4.9: Correlation Analysis

Person Management	Sustainability of water and Sanitation project	Planning	Leadership	monitoring and evaluation
Sustainability of Water and sanitation projects	1			
Planning	.466**	1		
Leadership	.523**	.309*	1	
Monitoring and evaluation	.282*	0.224	.267*	1
Management skills	.336**	.782**	0.157	.289*
1				

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

* Correlation is significant at the 0.05 level (2-tailed).

As indicated in Table 4.9, a strong positive correlation was found between planning and management skills as indicated by a correlation of 0.782. This implies that proper designing of planning process significantly results to better management skills thus effective project implementation.

The findings show a strong positive significant correlation between leadership and sustainability of water and sanitation projects with a correlation of 0.523. This shows that appropriate planning by taking into attention planning aspects such as community involvement, risk assessment can result to effective implementation of water and sanitation projects

The findings also show strong positive correlation of 0.466 between planning and Implementation of water and sanitation projects. This implies that the more effective planning is the better the chances of implementing effective water and sanitation projects. Furthermore, the findings reveal a strong positive correlation between project implementation

and management skills with a correlation of 0.336. This indicates that good management skills can significantly influence the effectiveness of project implementation.

The findings show a strong positive significant correlation between monitoring and evaluation and project implementation with a correlation of 0.282. This suggests that better monitoring and evaluation results to effective implementation of projects.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS, DISCUSSIONS AND
RECOMMENDATIONS

5.1 Introduction

This chapter focuses on the summary of the study findings, conclusions, recommendations, and suggestions for further research and contributions to the body of knowledge. These are presented based on the objectives of the study, research questions and the findings. The purpose of the study was to investigate the influence of community participation on sustainability of water and sanitation projects in Machakos County.

5.2 Summary of Findings

The purpose of the study was to investigate the influence of community participation on sustainability of water and sanitation projects in Machakos County. The objectives of the study were to; to examine the extent to which community participation in planning influences sustainability of water and sanitation projects in Machakos County; to determine how community participation in leadership influences sustainability of water and sanitation projects in Machakos County; to assess the extent to which community participation in monitoring and evaluation influences sustainability of water and sanitation projects in Machakos County and to determine how community participation in management skills influences sustainability of water and sanitation projects in Machakos County. Questionnaires were used to collect data which was descriptively analysed using percentage and frequencies. The analysed data was presented using tables and figures. Based on the findings, the following summary can be made.

From the analyzed data related to objective one, the respondents agreed that there was participation of community members in meetings for planning and their ideas got incorporated in designing of projects. The study further found out that there was agreement on proposed location for projects and community mobilized resources. Their involvement in planning was also evidenced in coming up with monitoring and evaluation plan.

The second objective sought to determine the extent to which community participation in leadership influenced sustainability of water and sanitation projects. The study revealed that most of the community members shared information and were involved in designing solutions to problems. Communities were also given opportunity for identification of projects and there was appointment of leaders from the community. They also agreed that leadership of water projects impacted on the performance of projects.

The third objective of the study wanted to find out the extent to which monitoring and evaluation skills influences sustainability of water and sanitation projects. Results showed that the community members participated in assessing project performance and those lessons learnt from assessing projects were being implemented. The participation of the community in monitoring and evaluation was also found to enhance performance of the water projects as agreed by majority.

The fourth objective of the study was to determine the extent to which community participation in management influence sustainability of water projects. Data was analyzed related to this objective and revealed that there was involvement of community members

in decision making and that they were involved in management of project resources. Community members were also involved in audit and were trained on project management. There was also good financial management and involvement in management impacted on sustainability of water and sanitation projects.

5.3 Discussion of the Findings

The study found out that the involvement of community members in planning, leadership, monitoring and evaluation and management influenced sustainability of water and sanitation projects in Machakos County. This section presents a discussion of the findings and compares and contrasts these findings with other scholarly studies done on the same area.

First, in relation to objective one, the study found out that planning in terms of participation in meetings and contribution of ideas was done and this had great impact on ensuring sustainability of water and sanitation projects. The findings are in line with Chappel, (2005) who urged that by their support, community ensures the success of a project through collective efforts to increase and exercise control over resources and institutions on the part of groups and movements of those hitherto excluded from planning.

In relation to leadership skills, several literatures reviewed have recognized the role of effective community participation in leadership in water and sanitation projects sustainability. According to Kathleen O`Brien (2011) effective leadership is very important in addressing myriads and complex problems and challenges facing various organizations. They further observed that secret behind group project sustainability is effective leadership. Their observations have been corroborated by this study finding. When asked whether they

participated in leadership, most respondents responded in the affirmative meaning majority of them would achieve project sustainability courtesy of effective leadership.

In relation to the third objective which sought to examine the influence of community participation in monitoring and evaluation on the sustainability of water and sanitation projects; on average, most of the respondents agreed with the idea that M&E influences the sustainability of water and sanitation projects. This study is in agreement to this is Njuguna (2014) who studied on factors influencing sustainability of donor funded projects: the case of water and sanitation projects in Laikipia east district, Laikipia County, Kenya. In his study, he has tried to show how M&E can help water projects like any other projects to be sustainable. According to him, in management of projects, monitoring can be used to improve the way governments and private organizations achieve results and ensure project sustainability. This can be ensured through investing in strengthening a national monitoring and evaluation system is important as it will eventually save resources that may otherwise be spent in inefficient programs or overlapping activities supported by different partners (Global Fund, 2012).

In regard to participation on management and sustainability of projects, the study established that those who managed the water project responded adequately to concerns whenever raised. The people were appointed to manage the water project were effective. The study also found out that there is sufficient technical expertise to manage the projects and resources which enhanced sustainability. The communities were satisfied with the overall management of the water project and were able to manage the projects. The findings are corroborated by Weinberg (2008) who said that community based projects are complex

and require multifaceted management skills. A project manager (PM) has to manifest not only project management related skills but also technical and expertise as required by the project (Thite, 2001). Project management activities include but are not limited to defining project scope and requirements gathering, managing resources and relevant training issues within a project, advising about technical architecture, identifying specific and general project management practices and escalation procedures, estimating project schedule and budget, ascertaining and managing risks within a project and preparing risk mitigation (Kirsch, 2000).

5.4 Conclusions

From the study findings it can be concluded that the community participation in terms of in planning, leadership, monitoring and evaluation and management influenced sustainability of water and sanitation projects in Machakos County.

From the findings of the study, it can be concluded that community participation in planning had great influence in ensuring sustainability of water and sanitation projects. There was participation of community members in meetings and their ideas were incorporated during design of the projects. They also participated in mobilization of resources and coming up with budget and cost. The participation in these aspects of planning influenced sustainability of water and sanitation projects.

The study concluded that community participation in leadership is crucial in ensuring sustainability of water and sanitation projects. This was revealed by the findings which indicated that there was appointment of leaders from the community, this participation impacted on performance of water projects and information sharing was encouraged. Members were also adequately allowed to input in decision making. From the findings of

the study, it can therefore be concluded that community participation in leadership skills influence the sustainability of water and sanitation projects in Machakos County. This was confirmed by majority of respondents who reported that effective community participation in leadership was an important element in group project sustainability.

The study concluded that participation of community members in continuous review of project activities, lessons learnt are being properly documented for improvements and that deviations in project activities being properly corrected enhanced sustainability of water and sanitation projects. Therefore, lack of proper participation of community members in monitoring and evaluation inhibits the sustainability of water and sanitation projects in Machakos County.

The study concluded that those who managed the water project responded adequately to concerns whenever raised. The people appointed to manage the water project were effective. The study also found out that there is sufficient technical expertise to manage the project, there is sufficient human resource for sustainability of the project and the community is satisfied with the overall management of the water project. The study concluded that the management qualities that affected the sustainability of the water and sanitation projects were technical expertise, managing resources among others.

5.5 Recommendations

The study makes various recommendations based on the findings.

First, community members whether influential or not be involved in identification of the planning of water and sanitation projects. Holistic participation of all stakeholders in all project cycles, decentralization of decision-making to the lowest appropriate level is crucial for all community projects. This demands responsive approach and their inclusion at the forefront of decision-making and management. Community participation in planning has been identified as a tool of helping communities focus their energy and mobilize resources in order to solve their own problems. When community members identify, plan and share tasks involved in projects with professionals, and are involved in decision making on the activities that affect their lives, projects initiated are more likely to achieve their objectives sustainably.

Secondly, the level of community participation in leadership should be increased to enhance the sustainability of the water projects in the county. This should be at all stages of project cycle.

Thirdly, the study therefore recommends that community members should be allowed to participate in monitoring and evaluation at all stages of water and sanitation projects. The monitoring and evaluation activity should not be left to external team and project team alone but rather inclusion of citizens is necessary in order to ensure sustainability of these projects.

Finally, the members of the community should be involved in the management of water and sanitation projects. The water projects should however be managed by highly competent personnel to increase its efficiency and sustainability.

5.6 Suggestions for Further Studies

This study was on influence of community participation on sustainability of water and sanitation projects in Machakos County, Kenya. The study recommends other studies to be conducted on the challenges facing the sustainability of water and sanitation projects in Kenya as well as on the role of women in enhancing the sustainability of water and sanitation projects in Kenya.

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APPENDICES

APPENDIX I: TRANSMITTAL LETTER

FROM:

EUNICE MUSANGI MARY,

P.O BOX 100-90103,

WAMUNYU.

0716817526

Dear Respondents,

RE: PARTICIPATION IN RESEARCH

I am a post graduate student at University of Nairobi pursuing Masters of Arts in Project Planning and Management. I am carrying out a research on influence of community participation on sustainability of water and sanitation projects in Kenya: A case of water and sanitation projects in Machakos County as part of requirements of the Award of this Degree. You have been sampled as part of my respondent to help me acquire information which will help me understand the water and sanitation projects sustainability in your area.

I therefore humbly request you to respond the questions as asked in the questionnaires.

I assure you that the information provided will be solely used for academic purpose of this study.

Thank you in advance

Yours faithfully,

Eunice Musangi Mary,

L50/86470/2016.

APPENDIX II

QUESTIONNAIRE FOR COMMUNITY MEMBERS

Instructions

Please answer each question as objectively as possible

Tick appropriately [√]

Information given will be treated with confidentiality.

Part A: Personal Information

1. Gender:

Male

Female

2. Age

Below 24 years

25-29 Years

30-34 years

35-39 Years

40-44 Years

Over 44 Years

3. What is your education level (state the highest level)?
 Primary Secondary Certificate
 Bachelor's Degree Other (Specify) _____

4. How many years have you been a resident of Machakos County?
 Less than 4 years 5-9 years 10-14 years
 Over 14 years

Part B: Community Participation in Planning and Sustainability of WSPs

The following activities relate to planning and implementation of community projects. Please indicate your level of agreement with the statements in relation to Water project, using the scale: Strongly Agree (5); Agree (4); Neutral (3); Disagree (2) and Strongly Disagree (1)

		5	4	3	2	1
1	Did you participate in meetings for planning on water projects in Machakos County					
2	The community's ideas and contributions were incorporated in the design of water projects in Machakos County					

3	The community agreed on the proposed location of the various water kiosks and sanitation blocks within Machakos County					
4	The community participated in coming up with the cost and budget for the project					
5	The community mobilized resources (for example money, materials, labour, land etc.) towards realization of the project					
6	The community was involved in coming up with a plan for measuring performance and impact of the project (monitoring and evaluation plan).					
7	The community was involved in coming up with a plan for implementing water projects in Machakos County					
8	The water project has been helpful to the community					

Part C: Community Participation in Leadership and Sustainability of WSPs

Please indicate your level of agreement with the following statements about your community’s participation in leadership and sustainability of water projects in Machakos County. Please use the scale: Strongly Agree (5); Agree (4); Neutral (3); Disagree (2) and Strongly Disagree (1)

		5	4	3	2	1
1	Information has been shared with the community members					

2	The community has been involved in designing of solutions to problems by the County					
3	The community has been given the opportunity of identification of priorities of the water projects					
4	There has been appointment of leaders from the community					
5	The leadership of the water project has been transparent with its operations					
6	Leadership of the water project has impact on the performance of water project					
7	The community has been informed on the objectives of the water project					
8	Participation of the community in leadership enhances performance of water project					

Part D: Community Participation in Monitoring and Evaluation and Sustainability of WSPs

Please indicate your level of agreement with the following statements about your community's participation in monitoring and evaluation of water project. Please use the scale: Strongly Agree (5); Agree (4); Neutral (3); Disagree (2) and Strongly Disagree (1)

		5	4	3	2	1
1	The community participated in assessing project performance					
2	Benefits from the project are enjoyed by most community members					
3	Lessons learnt from assessing projects have been implemented					
4	The community has been involved in the audit of the finances from the water project					
5	Participation of the community in monitoring and evaluation enhances performance of the water project					
6	The community has been made aware of the tools used in monitoring and evaluation					
7	There has been constant evaluation of the water project procedures and management					
8	The community has been involved in coming up with strategies to better performance of the water project					

Part E: Community Participation in Management Skills and Sustainability of WSPs

Please indicate your level of agreement with the following statements about management skills in water and sanitation projects. Please use the scale: Strongly Agree (5); Agree (4); Neutral (3); Disagree (2) and Strongly Disagree (1)

		5	4	3	2	1
1	The community has been involved in decision making concerning the water projects					
2	Community has been involved in the management of project resources					
3	Members of the community has been involved in the audit of various accounts of the project					
4	The community has been trained on project management					
5	The community has been able to manage the water project					
6	The water from the project has been available throughout the period from the completion of the project					
7	Finances from the water project have been managed well					
8	Involvement of community in the management of water project has impact on its sustainability					

Part F: Sustainability

Please indicate your level of understanding of the following statements about sustainability of water and sanitation projects in your area.

Yes (3) No (2) Not sure (1)

		3	2	1
1	Is there continuous availability and access of clean water from your structure?			
2	Does the County water officers visit regularly and offer technical support when the structure breaks down?			
3	Does the water project get financial aid for sustainability?			