DETERMINANTS OF SUSTAINABLE WATER SUPPLY PROGRAMME IMPLEMENTATION IN KENYA: A CASE OF MOMBASA WATER SUPPLY AND SANITATION COMPANY LTD

BY

DAVID NGUMBAO NDURYA

A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A MASTER OF ARTS DEGREE IN PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI

2016

DECLARATION

This research project report is my original work and has not been submitted to any other university or institution for examination.

DAVID NGUMBAO NDURYA

REG NO:

Signature ..... Date .....

This research project report has been submitted for examination with my approval as the University Supervisor.

MR. JOHNBOSCO KISIMBII
LECTURER, DEPARTMENT OF EXTRA-MURAL STUDIES
UNIVERSITY OF NAIROBI

Signature……. Date ……

DEDICATION

This work is dedicated to my loving mother, brothers, sisters and teachers. Thank you for your wonderful work.

ACKNOWLEDGEMENT

I wish to express my gratitude to the University of Nairobi for giving me the opportunity to undertake this course. To my supervisor, Mr. Johnbosco Kisimbii; thank you for guiding me through the entire project proposal.

To the course lecturers (Dr. Moses Otieno, Mr. Joseph Gatimu and Dr. Anne), staff in the department of Extra Mural Studies (Mr. Alex and Mrs. Caroline); your invaluable support enabled me to successfully go through this course.

I wish to thank my colleagues who were a source of encouragement enabling me to go through this course.

Last, I wish to thank God almighty for his health, provisions and protection throughout the times, seasons and moments of study for this degree.

TABLE OF CONTENTS **PAGE**

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

CWPs	Community Water Projects
FAO	Food and Agriculture Organization
GoK	Government of Kenya
ICAD	Institute of Civic Affairs and Development
ICT	Information Communication Technologies
M&E	Monitoring and Evaluation
MGDs	Millennium Development Goals
NAWASCO	Nairobi Water and Sewerage Company
NETWAS	Network for Water and Sanitation International
NGOs	Non-Governmental Organizations
SPSS	Statistical Package for Social Sciences
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund

ABSTRACT

Statistics around the world reveal that our fresh water supply is practically non-existent. Nearly 97% of the world's water is salty or otherwise undrinkable while another 2% is locked in ice caps and glaciers. The fact that only 1% of the earth's water is available for all of humanity needs such as agriculture, industrial and household needs brings to our attention that conservation of water requires our full attention if we hope to sustain our water projects . Therefore, the purpose of this study was to examine the determinants of sustainable water supply programme implementation in Kenya; a case of Mombasa Water Supply and Sanitation Services Company Ltd. The study was guided by four objectives that sought to: establish the influence of financial resources in the implementation of sustainable water supply programme in Mombasa County, establish the influence monitoring and evaluation in the implementation of sustainable water supply programme in Mombasa County, establish the influence of technology in the implementation of sustainable water supply programme in Mombasa County, and examine the influence of stakeholders in the implementation of sustainable water supply programme in Mombasa County. A descriptive research design was adopted for the study. The target population of 436 respondents and from this a stratified random sampling was employed to sample 87 respondents calculated at 20% as recommended by scholars like Kothari. A pilot study was conducted to check the instruments reliability and validity and the instruments were found to be valid and reliable. Data was collected using a structured questionnaire which was administered personally, via e-mails, enumerators and the drop and pick technique. Data was coded and analyzed using the SPSS version 20.0. The coded data was analyzed by use of descriptive (descriptive data) and quantitative (quantitative data) statistics comprising of frequency tables. The hypothesis was tested by use of Chi Square. 87 questionnaires were administered respondents. Out of the issued questionnaires, only 65 questionnaires were returned, fully filled and made the basic providers of primary information needed. 22 questionnaires were never returned. Therefore the response rate was 74.71%.The findings showed that, financial resources allocated for WSP implementation, the sources of finances, the various stages of monitoring and evaluation including the formative, summative and continuous M&E, modern technology integration in water supply, and the stakeholders like the community and the government have an influence in the implementation of the sustainable WSP. The study recommended that there is a need for MOWASSCO to identify various sources of finances, sufficient to run its projects and clear the debts it owes various bodies. Top management and other junior employees at MOWASSCO should embrace M&E at all levels and stages of operations by checking on areas that are deviating from the set objectives and corrections made. Modern technology should be integrated and continually advanced by procuring better technology, allocating more finances for technology and training both the employees and the consumers on the use of relevant technology. The stakeholders like the government, donors, NGOs and the local community also must be involved in all levels of addressing sustainable WSP implementation through resources mobilization, providence and management. Finally, the research recommended that similar study can be done on; other water service provider companies that split from the former Coast Water Services Board, the influence of community participation on the sustainability of the sustainable water supply programme by MOWASSCO and an evaluation of the same research in relation to the Sustainable Development Goals adopted from the previous MDGs.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Water, a natural resource, is life. Both fauna and flora entirely depend on water for their survival. This makes water development, management and utilization vital exercises in ensuring success of these sectors and survival of the country's citizens (WaterAid, 2011). According to UNFPA (2012) water is a finite natural resource necessary for the sustenance of life and ecological systems and a key resource for social and economic development.

Globally, water has been prioritized as a basic need and a human right, (Wagah*et al*, 2010). He insisted that across the globe, countries are reforming their water resource management in an effort to avail and sustain provision of adequate, safe and affordable water to all their consumers. According to the World Health Organization (WHO) statistics, it is estimated that about 1.1 billion people in the world do not have access to safe water (WHO, 2003; UN-HABITAT, 2011). The United Nation states that by 2025, 1.9 billion people will be living in countries or regions with absolute water scarcity, and two-thirds of the world population could be under stress conditions (UN-Water, 2010). According to Wagah*et al* (2010), the Africa region has the worst water crisis; owing to its financial woes. In fact, Africa's water supply and sanitation coverage stood at 62% for water supply and 60% for sanitation at the time.

The UN Millennium Declaration of 2000 set a target to halve the percentage of world's population without access to sustainable safe drinking water by 2015. This was a stepping stone towards full global coverage by 2025 as in the Global Water Partnership Framework for Action and the African Water Vision and in the Kenya Vision 2030 which aims to ensure water availability and access to all by 2030 (African Union, 2011). About 2.8 billion people (more than 40%) of the world live in river basins faced with some form of water scarcity and 1.6 billion people live in areas of economic water scarcity, where even though water is available, human, institutional and financial capital limit access to water (UN, 2010).

From the global perspective, all governments in Europe, USA, Australia and Latin America just like the rest of the world started long ago coming up with strategies of having the current water projects have the utilization of the vital resource while they took care of the future generation; thus the term sustainable water projects. Specific focus on the determinants of the sustainability

of water projects globally will focus on Australia. According to Murni, Juliane& Blair (2013), Australia is one of the driest inhabited continents on earth. The national water consumption rates are now generally considered to be unsustainable, with about a quarter of Australia's surface water management areas either approaching or exceeding sustainable extraction limits. The development of water reuse schemes/projects that were aimed at sustaining the effect of demand for more water in Australia has been generally slow in comparison to some other countries like Sweden and UK. It is only in the past few years that the Australian water agencies have begun to shift their focus of water management to a total water cycle approach as a strategy of sustainably checking the future of its water (Australian Bureau of Statistics, 2013). This has led to the development of strategies to reduce the overall amount of wastewater discharged to the ocean and rivers.

According to Murni, Juliane& Blair (2013), there are a number of factors that have been cited as driving forces behind the introduction of water reuse strategy in Australia as a strategy for water sustainability and are summarised as follows: Advanced technology that has predicted drought and prediction of possible further droughts from climate change, Population pressure and meeting the needs of a growing population, Demand from the general community to have greener water strategies and water conservation, Increased urbanisation of Australia's towns and cities, Increased industrial and agricultural needs, To allow conservation of higher quality water for suitable uses, Heightened awareness of the potential benefits of using recycled water in the agricultural industry, More advanced wastewater treatment processes been developed in universities, Reforms from the Coalition of Australian Governments (COAG) which have pushed Australian governments to seek further research on the public health, sanitation, sustainable water use and environmental risks of water recycling etc.

Across Africa, a number of studies have been done on the sustainability of communal water projects for example. According to International Institute for Environment and Development (IIED) report by Australian Research Centre for Water in Society (ARCWIS) (2012), up to US dollars 360 millions spent on building boreholes and wells was wasted as a result of poor maintenance of water supply points in 12 North African countries. An estimated number of 50,000 water supply points are non-functional across Africa; remarkably in Botswana, Burkina Faso, Ghana and Tunisia. The report further indicates that only one third of water points

constructed by NGO's in Senegal are working while 58% in Ghana are beyond repair. This is attributed to the fact that the Government and other development agencies do not consult local people on long term sustainability constructs such as operations and maintenance and financial management after termination of external financial support. The culture of constructing water points and then walking away without proper assessment on post implementation maintenance procedures is highly criticized (African Union, 2012). AMCOW (2011) has given a brief summary of water projects sustainability in Ghana and has argued that, Water projects sustainability depends on multiple factors .This includes the involvement of the community/community participation, significant stakeholders involvement, education of the community, M&E, financial resources base, project management and many more.

Regionally, sustainable water projects are better needed in Uganda more specifically in the arid and semi-arid northern parts of the country where the nomadic pastoralists live. The UNDP-World Bank Water and Sanitation Program (the Program) has for example been working to improve poor people's access to rural water supply (RWS) for over 15 years in northern parts of the country (World Bank, 2012). The Program benefits from a strong field presence in more than 30 countries and operates through its five Regional Water and Sanitation Groups. The Program's central office operates from the Transport, Water and Urban Department of the World Bank in Washington, DC. The Program assists in the design and supervision of many RWS projects worldwide. It also promotes systematic learning within and across projects, in order to continually improve the delivery of RWS. Finally, the Program supports policy development by drawing on lessons and undertaking analytical studies that are usually geared towards achieving sustainability.

A study called 'The Water and Sanitation Decade,' carried out by the DFID (2010) in 10 districts in Uganda in 2009/2010 has shown that achieving lasting benefits from water supply interventions involves much more than building facilities. It focused on the importance of involving the community in all aspects of service delivery, the use of appropriate technologies, and the role of governments as service promoter rather than provider. It also demonstrated the limitations of top-down and supply-driven approaches to delivering services. In many ways, the decade represented a transitional period in the RWS sector— moving from the traditional to a new approach of sustainable water programmes success in the country.

However, Moss (2010) indicates that badly constructed, poorly maintained and unprotected shallow wells, is the scenario today in Katine location in North East Uganda since 2007. AMREF developed sustainability strategies in Katine location of training local communities on operations and maintenances of new water points which has since been adopted in the other sub counties in Uganda. In an attempt to mitigate such scenarios, water and sanitation committees are set up to-date to monitor newly implemented boreholes/projects and are charged with the responsibility of consulting trained hand-pump mechanics if one breaks down. The committees also meet regularly with village health teams to discuss needs and the idea is that everyone who uses the boreholes and wells is bound to make financial contributions to their long-term upkeep.

In the vision 2030, the Kenya government aims to increase annual GDP growth rates to an average of 10% over the vision horizon. The 2030 vision for water and sanitation is to ensure that improved water and sanitation are available and accessible to all. The goal for 2012 was to increase both access to safe water and sanitation in both rural and urban areas beyond present levels (Republic of Kenya, 2012).

Government of Kenya (2013) continue to show that, water scarcity in the country has been an issue for decades, as only a small percentage of the country receives adequate rainfall. Kenya's natural water resources do not provide an adequate delivery of water to the various regions of the country and the country's water basins do not reach an equitable area of the country. This leaves most of the population without adequate fresh water. Rapid urbanization has also pushed poor urban dwellers to the slums, where there is no water. Kenya's water politics has brought about a divide between urban and rural areas in water services. Rural areas of Kenya are left without water while the urban areas hardly get enough. The Kenyan Government can hardly afford to develop water solutions because of the strained budget.

Women and children spend up to one-third of their day fetching water in the hot sun from the nearest fresh water source due to water shortage, (World Bank, 2010). This backbreaking work leaves roughly half of the country's inhabitants vulnerable to serious danger. Water pathogens are a huge health problem in Kenya, as the people have been left unprotected against epidemics such as cholera and parasitic worms. This according to Ministry of Water and Irrigation (2012) has forced all the communal water programmes, government and private water providers to accelerate their rates of water production and supply. However, the success of a number of WSP

in the country has been and is still dependent on a number of issues that include: Technology used in the production, managing and supply of the water (World Bank, 2013), financial resources and capital bases (OCHA, 2010), community participation, community education, stakeholders involvement and good will of the local consumers (Oraro, 2012) among others.

A study by Mwamburi (2013) shows that the Mombasa County has encountered persistent water problems due to many factors like rapid population growth and poor maintenance of existing water supply networks that have limited the future sustainable supply of water. Although the area is geologically rich in Groundwater which is often seen as an option, exploitation is limited due to salinity because of seawater intrusion (Malindi Inquiry Report, 2011).

Mwamburi (2013) continues to show that, ground water exploitation is also curtailed by pollution from numerous pit latrines and septic tanks in the town. Mombasa County therefore heavily depends on water sources from outside its jurisdiction for its potable needs. Its main sources of water supply are Mzima springs, Baricho water works, Marere and Tiwisupplying the Likoni area. Water from these reticulated supplies satisfies less than 50% of the demand hence it is of inadequate quantity. There are severe consequences for such drastic freshwater shortages because lack of access to clean water slows down the economy and strains development. This makes the economy suffer and increases global health problems, all these are looming dangers. For such to be averted, sustainable sewage management and water supply mechanisms have to be adopted although this heavily depends on issues like community participation, politics, stakeholders; views, finances and capital resources, expertise and strategic planning/leadership etc.

According to UWAZI (2014) the Mombasa Water Supply and Sanitation Company Ltd that previously operated under the umbrella body called the Coast Water Services Board (CWSB) has mission statement that seeks to provide safe, reliable, affordable water and sewerage services in an efficient and viable manner to the residents of Mombasa County. However, this can only be achieved when a number of factors have been put in place so as to enhance its continuity. Essential for example is Proper WSP planning, implementation and monitoring (WHO, 2012), proper allocation of both capital and financial resources (Mwamburi, 2013), transparent strategies and steps towards involving the stakeholders fully (World Bank, 2013), use of modern technology etc.

However UWAZI (2014) has cited a number of violated ideas that have left the county water supply and sewage management company go poor to poor in the services it provide. For example, the projects within the company have for a long time failed to survive beyond one year due to issues that include lack of proper monitoring tools/poor monitoring, work processes within MOWASSCO are not clearly defined or documented, poor involvement of stakeholders of whom some are political, poor technology, low level of employees 'expertise and many more. Most work processes therefore are not monitored and are unable to be evaluated. This and a number of issues are the areas that the research focused on.

1.2 Statement of the Problem

Statistics around the world reveal that our fresh water supply is practically non-existent. Nearly 97% of the world's water is salty or otherwise undrinkable while another 2% is locked in ice caps and glaciers, (World bank, 2010). The fact that only 1% of the earth's water is available for all of humanity needs such as agriculture, industrial and household needs brings to our attention that conservation of water requires our full attention if we hope to sustain our water projects(PRESA, 2011).

Ensuring a sustainable water supply for agriculture for example increases food production and helps alleviate the world's hunger. Water is essential to industry, to economic development and to creating livelihoods for the poor. A reliable water supply also helps poor households augment their income through productive domestic activities such as cultivating vegetable gardens or raising poultry. Without water, agriculture, industry, energy production and all other economic activities come to a halt (Jim, 2013).

Sustainability of a water supply system is the maintenances of an acceptable level of services throughout the design life of the water supply system. After the project completion, responsibility for management and ownership is given to the community. It has been identified that some projects become noticeably unsuccessful, even without any technical failures, while others have achieved their targets without much difficulties. Identification of underlying causes for performance of water supply projects is important for sustainable management of existing projects and new development projects (ADB, 2010).

In this regard the DFID (2011) in its report on Sustainable Livelihood in sub Saharan Africa shows that, over 57% of WSPs targeted in Africa between 2000 and 2005 couldn't sustain themselves beyond 2010. Mostly hit are WSPs being implemented in the slums like: Soweto, Dar salaam, Nairobi's Kibera slum and many more. Factors like corruption/embezzlement of funds, poor planning, poor monitoring and evaluation, limited financial allocation, poor community sensitization and education among others have been found to be limiting issues in the success of these programmes.

Besides DFID (2011) that did a research touching on WSPs sustainability in sub-Saharan Africa, other scholars have looked at sustainability; although this has been done at community levels. For example, Mwamburi (2013) did a research on factors affecting access of sustainable water supply in Kisauni Area; Mombasa County, Wanjiru (2014) did Determinants of Sustainability of Community Water Projects in Kieni East District; Nyeri County, Wesonga (2015) did a research on the Determinants of Sustainability of Donor Funded Water Projects: A Case of Water Resources Users Associations in Bungoma County Kenya and many more. From the few evidences above, it is noted that so far studies on the sustainability of the water process as a whole programme has not been focused on; more specifically in Mombasa County where the same is missing. Due to this realization, this research therefore intended to examine the determinants of sustainable water supply programme implementation in Kenya; a case of Mombasa Water Supply and Sanitation Services Company Ltd.

1.3 Purpose of the Study

The purpose of this study was to examine the determinants of sustainable water supply programme implementation in Kenya; a case of Mombasa Water Supply and Sanitation Services Company Ltd.

1.4 Objectives of the Study

This research study was guided by the following objectives:

i. To establish the influence of financial resources in the implementation of sustainable water supply programme in Mombasa County.

ii. To establish the influence monitoring and evaluation in the implementation of sustainable water supply programme in Mombasa County.
iii. To establish the influence of technology in the implementation of sustainable water supply programme in Mombasa County.
iv. To examine the influence of stakeholders in the implementation of sustainable water supply programme in Mombasa County.

1.5 Research Questions

The study was guided by the following research questions:

i. What is the influence of financial resources in the implementation of sustainable water supply programme in Mombasa County?
ii. What is the influence monitoring and evaluation in the implementation of sustainable water supply programme in Mombasa County?
iii. What is the influence of technology in the implementation of sustainable water supply programme in Mombasa County?
iv. What is the influence of stakeholders in the implementation of sustainable water supply programme in Mombasa County?

1.6 Research Hypothesis

The study was guided by the following alternative research hypothesis:

H_A: Financial resources have an influence in the implementation of sustainable water supply programme in Mombasa County.

H_A: Monitoring and evaluation influences the implementation of sustainable water supply programme in Mombasa County.

H_A: Technology has an influence in the implementation of sustainable water supply programme in Mombasa County.

H_A: Stakeholders have an influence in the implementation of sustainable water supply programme in Mombasa County.

1.7 Significance of the Study

First and foremost, it is expected that the findings of the study will be beneficial to the various services providers in the coast that were under The Coast Water Services Board (CWSB) parastatal that include: Mombasa Water Supply and Sanitation Services Company

(MOWASSCO), Malindi Water and Sewerage Company (MAWASCO), Kilifi-Mariakani Water and Sewerage Company (KIMAWASCO), Kwale Water and Sewerage Company (KWAWASCO), TAVEVO Water and Sewerage Company, Lamu Water and Sewerage Company (LAWASCO), and, Tana Water and Sewerage Company (TAWASCO). The above are going to get firsthand information on steps they need to take in ensuring that any project they undertake currently is capable of running to the future while benefiting the today's needs and taking care of the future needs of the people.

The second category includes the county government, national government, donors and other community members. These groups are meant to get information such as, the role of stakeholders, how they can positively contribute to the programmes and how they can adopt new ways that can see these projects in the programme benefit the future citizens while the needs of the current citizens are taken care of.

For researchers and academicians, this study would add to the existing body of literature thereby acting as a source of reference. In addition, this study would provide areas for further research where future scholars could explore to widen the knowledge base on water projects sustainability. The findings of this study would be important to scholars in the field of WSPs sustainability hence promote WSPs sustainability in the future.

1.8 Basic Assumptions of the Study

The study was carried out with the assumption that there were a number of projects that have been implemented by the MOWASSCO and their sustainability has been in question or some that are on way and sustainability strategies need to be developed. Another assumption under this study was that the information retrieved from respondents through questionnaires and non-structured interview schedules could meet the purpose of the study. Finally, the researcher was carried out with an assumption that the respondents could answer the questions with sincerity and non-subjectivity.

1.9 Limitations of the Study

The major limitation that faced the study was time limitation. Time for classroom work, research, that at work, that for the family and that of linkage between the supervisor at Mombasa campus and the respondents was highly in competition. However the researcher considered

taking a leave and created a personal time to link the supervisor and the respondents outside the normal schedule.

Financial resources were also a limitation. Limited resources delayed the achievements of the study. However this was overcome by getting extra funds from sources like bank borrowing and friends' support.

1.10 Delimitation of the Study

The study delimited itself by concentrating on the determinants sustainability water supply programme implementation. The scope of the study was the Mombasa Water Supply and Sanitation Services Company (MOWASSCO). The study also focused on only four objectives that touched on financial resources, technology, M&E and finally stakeholders. Enumerators were also used to distribute the questionnaires where necessary, interpret and at the same time they were used as translators in cases where the target could not understand some basic questions. The same enumerators were also used to sort data for analysis.

1.11 Definitions of Significant Terms

A stakeholder in a project can be defined as a person, group or organization with an interest in a project (UN, 2010).

Financial Resources - The money available to a business for spending in the form of cash, liquid securities and credit lines. Before going into business, an entrepreneur/company needs to secure sufficient financial resources in order to be able to operate efficiently and sufficiently well to promote success (Business Dictionary, 2014).

Monitoring and Evaluation (M&E) is a process that helps improving performance and achieving results. Its goal is to improve current and future management of outputs, outcomes and impact. It is mainly used to assess the performance of projects, institutions and programmes set up by governments, international organisations and NGOs. It establishes links between the past, present and future actions (United Nations, 2015).

Technology is the collection of techniques, skills, methods and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation. Technology can be the knowledge of techniques, processes, etc. or it can be embedded in machines, computers, devices and factories, which can be operated by individuals without detailed knowledge of the workings of such things (UN, 2010).

1.12 Organization of the Study

This research report is organized in three chapters. Chapter one is the introduction which includes the background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, statement of the problem, purpose of the study, objectives of the study, research questions, research hypothesis, significance of the study, delimitations of the study, basic assumptions and the definition of significant terms. Chapter two of the study consists of the literature review with information from other articles which are relevant to the researcher. Chapter three entails the methodology that was used in the research. Chapter four will present the analyzed data and a summary of the data thematically according to the objectives. Chapter five will present the summary of the findings, discussions conclusions and recommendation.

CHAPTER TWO

LITRATURE REVIEW

2.1 Introduction

This section summarizes the literature that is already in existence regarding the determinants of sustainable water supply programmes implementation in Kenya; a case of Mombasa Water Supply and Sanitation Services Company Ltd. It presents an overview of previous work on related topics that provide the necessary background for the purpose of this research. The work has been discussed under sub-topics in relation to the objectives, explanation of the concept of sustainability, a theoretical framework and a conceptual framework will be used also to show the variables to be considered in the research (the independent variables, the dependent and the moderating variables.

2.2 The Concept of Project Sustainability

Sustainability is a problem which faces almost all development, in industrialized countries as well as in the developing ones. In recent years the debate took on new urgency through the adoption of Agenda 21 at the Earth Summit conference in Rio de Janeiro in June 1992. In the global debate sustainability was considered primarily in terms of continuing to improve human well-being, whilst not undermining the natural resource base on which future generations will have to depend (Abrams, 2003 cited by Ahmad and Talib, 2011).

Sustainability as a concept in development projects is dated to 1980s and defining development and sustainability has been difficult. Brundtland Commission (1987) however defined sustainable development as “one that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This means that a sustainable project must meet the present as well as the future human needs and aspirations. It must be one whose outputs and services are maintained continuously over time and keeps that focus with its original goals and objectives. Projects are designed and implemented to achieve certain set goals. Some projects require that their activities be sustained over time to ensure continued flow of set outputs hence achieve desired change that could be social, cultural or economic. Water projects are implemented to ease accessibility of the community members to clean water and hence improve

their well-being (quality of life). Implementation of these projects is always successful but their sustainability poses a challenge(Bennett, 2010).

Mulwa (2004) points out that sustainability concerns around projects at national or community level encompasses different dimensions that include; social (ability of a project to restore peoples sense of worth, dignity and self-belief), economic (ability of the local people to identify, procure and use available resources-whether human or material and have no or limited dependency on external), environmental (sustainable use of resources and preservation of the environment-useful in water projects as people will conserve water catchment areas), structural and organizational (an effort of dominant institutions managing projects to become more responsive and sensitive to local needs and aspirations) as well as technological (an effort to develop appropriate technology and promote the use of indigenous knowledge) sustainability. A sustainable project should be able to address all these dimensions.

In their work, Tiwari & Bonaya (2011) have focused on water projects sustainability and argue that, water projects are influence by a number of factors which contributes to sustainability, namely capacity and skills of the Project, the complexity of technology chosen, support of government leadership, ability and willingness to pay, and adequacy of policies and legislation. They further continue to show that, the basic idea of project sustainability is that any project should be designed to produce a continuous flow of outputs, services, and outcomes for a long time over its useful or economic life. Some definitions infer to the continuation of benefits after development assistance has been completed.

According to Sittoni (2011) project results should be sustainable even where there are several risks to outputs and outcomes; the notion of building resilience to risk is part of the reason for focusing on capacity development activities in a project scope, and for identifying mitigating measures. The three aspects of sustainability include: continuation of benefits, likelihood that project results will be maintained, and resilience to risk. Sustainability depends on a continuing demand for what the project delivers. For projects that include a physical investment component, sustainability requires continued funding of operations, maintenance, and expansion. The funding can come from direct customers, other beneficiaries, or the government as owner of a project, or a combination of the three. It will depend upon both the beneficiaries' willingness to pay and perception of affordability, and the government's ability and willingness to charge. In

other words sustainability can also be measured by: stakeholders long-term commitment to project goals , availability of work plans , community project committees , operation and maintenance of project facilities and equipments, local communities provision of input , participation in need identification and project design, local committees participate in O&M management and financial decisions, adequate communication, sharing of project responsibilities, use of appropriate Technologies and availability of required competencies.

2.3 Theoretical Framework

The issue of sustainability of projects more specifically the water projects could be tied to two major theories as developed by various scholars. These theories can be discussed as follows:

2.3.1 Unified Theory of Acceptance

Unified theory of acceptance and use of technology (UTAUT) provides a refined view of how the determinants of intention and behavior evolve over time. It assumes that there are three direct determinants of intention to use (performance expectancy, effort expectancy and social influence) and two direct determinants of usage behavior (intention and facilitating conditions) (Venkatesh, et al., 2003). These relationships are moderated by gender, age, experience and voluntariness of use.

Empirical testing of UTAUT shows that performance expectancy, effort expectancy, and social influence have significant relationships with the intention to use technologies. Later studies found that social influence affect perceived usefulness and perceived ease of use (Lu, et al., 2005). However, in post adoption research, social influence on the continuance intention was inconsistent; some studies reported significant relationships, but other studies reported non-significant relationships (Chiu & Wang, 2008).

UTAUT is one theory that covers extensive individual difference constructs including gender, age, experience, and voluntariness of use as moderating variables. Even though there are some inconsistencies in previous studies on individual differences, scholars reported significant moderating effects by individual differences such as gender (Venkatesh, et al., 2003), age, prior experience and voluntariness of use. In relation to this study most firms are reluctant in fully

adopting information communication and technology has highly been influenced by age, experience, perceived complexity as well as social influence.

2.3.2 Public Interest Theory

The first group of regulation theories account for regulation from the point of view of aiming for public interest. This public interest can be further described as the best possible allocation of scarce resources is to a significant extent coordinated by the market mechanism is optimal (Campbell-Lendrum, Corvalán, and Neira, 2012). Because these conditions are frequently not adhered to in practice, the allocation of resources is not optimal and a demand for methods for improving the allocation arises. According to Chih- Yao, Yu-Teng and Kuo-Ting (2012) one of the methods of achieving efficiency in the allocation of resources is government regulation.

According to public interest theory, government regulation is the instrument for overcoming the disadvantages of imperfect competition, unbalanced market operation, missing markets and undesirable market results. In the first place, regulation can improve the allocation by facilitating, maintaining or imitating market operation. The exchange of goods and production factors in markets assumes the definition, allocation and assertion of individual property rights and freedom to contract. The guarantee of property rights and any necessary enforcement of contract compliance can be more efficiently organized collectively than individually (Posner, 2003).

Furthermore, the costs of market transactions are reduced by property and contract law. The freedom to contract can however, also be used to achieve cooperation between parties opposed to market operation (Christina, 2010). Agreements between producers give rise to prices deviating from the marginal costs and an efficient quantity of goods is put on the market. Antimonopoly legislation is aimed at maintaining the market operation through monitoring the creation of positions of economic power and by prohibiting competition limiting agreements or punishing the misuse thereof (Smith, Bradley & Jarell, 2005). Imperfect competition can also result from the special characteristics of the production process in relation to the magnitude of the demand in the market. At a given magnitude of demand average total costs would be minimized if the production were to be concentrated in one company (Christina, 2010).

Public interest theory explains regulation from viewpoints not restricted to imperfect competition and unbalanced market operation (Campbell-Lendrum, Corvalán, and Neira, 2012). For a number of reasons, markets may not exist for some goods for which the utility or the 'willingness to pay' exceeds the production costs (Christina, 2010). Markets might not exist as a result of information problems and transaction costs in the case of external effects and public goods. In these cases, regulation can improve the allocative efficiency of the economy.

2.4 The Influence of Financial Resources on the Implementation of Sustainable WSPs

Studies in the global seen, continental and local levels have been done focusing on the role of financial resources in the success or failure of projects. IRC (2011) for example has published a research on 'financing water in G8, and 8 poorest countries across the world.' According to the report, increasing people's access to sanitation and drinking-water brings large benefits to the development of individual countries through improvements in health outcomes and the economy. The impact of diarrheal disease on children is greater than the combined impact of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), tuberculosis and malaria; we also know that the provision of improved sanitation and drinking-water could reduce diarrheal diseases by nearly 90%. Latest estimates indicate that improvements in sanitation and drinking-water could reduce the number of children who die each year globally by 2.2 million. Huge savings in health-care costs and gains in productive days can therefore be realized by improving access to safe water and basic sanitation.

OECD (2011) however argues that, despite these clear benefits for human development, many countries seem to allocate insufficient resources to meet the Millennium Development Goal (MDG) target for sanitation and drinking-water. When compared with other sectors, particularly the other major social sectors of education and health, sanitation and drinking-water receive a relatively low priority for both official development assistance (ODA) and domestic allocations.

The importance of this finances and financing has been stressed by the work of Stockholm Environment Institute (2014). According to the research, the financing process, such as raising and maintaining adequate funding for water project facilities is of critical importance for sustainability. Insufficient financing is a major factor for poor maintenance, which is often cited as the main reason for failure. Availability of funds for recurrent costs is often also seen as a

major factor influencing the sustainable operation of water project intervention (The Millennium Development Goals Report, 2012). However availability of credit from development banks or private sources might be sought and this can be supplemented by partnerships consisting of community organizations, sponsors and at times the Government (The Times, 2011).

UN (2010) did a research on the role of financial resources in the sustainability of the scarce resources (water included) in China, Sweden, Canada, India and many more. According to the findings, the financing process, raising and maintaining adequate funds for water facilities and activities, is clearly of critical importance to sustainability. Insufficient financing is a major factor in poor maintenance which, in turn, is often cited as a reason for project failure.

In his research entitled Community development in Zimbabwe: the role of community based organizations, Muruta (2010) touched on the influence of resources and the community. According to him, the commitment of resources, particularly financial resources, by beneficiary communities is seen as an important indicator of the expected value of the project to these communities. Cost recovery contributes to sustainability not only through increasing resources available for sustaining and expanding benefits, but also by establishing relationships of accountability for resource use.

Another study on the stuck water projects in Eretria by The World Bank (2014) shows that financial questions in water projects just like any other development project in the country are intimately bound to many other factors, including context and technology . Choices regarding interventions are, to some degree, dependent on physical characteristics within the project area, such as length of pipeline or depth of drilling needed to reach potable water sources. These choices, in turn, determine capital requirements and recurrent financing needs.

Generally, OECD (2010) show that capital costs are equipment, labor, and material costs associated with initial project activities, including any and all construction activity. Recurrent costs are those associated with operation, maintenance, repair, and replacement of system components, and any ongoing health education or community extension activities related to the project have a great influence in the future of projects. The study by OECD (2010) continue to show that communities for example in Ghana and Egypt were made to understand for the survival of water projects in their communities, they must understand that they will be asked to

bear the repayment costs of services through user charges, household fees, or taxes imposed by a government agency or by a community management organization.

For projects to be sustainable in any country or community, it is important that anticipated recurrent cost levels be known to beneficiaries prior to their agreeing to take part in the project. In addition it should be understood that these recurrent costs are likely to increase as equipment ages and from inflationary pressures in the economy at large. In this regard it is important that a balance exist between a community's desire for WS&S services and its ability to pay for them (World Bank, 2014). This is supported by UNESCO (2010) in its report "Water, a Shared Responsibility," that focused in 5 countries' ASALs areas that included Kenya, Uganda, Somalia, Lesotho and Nigeria. When studying this, the report showed that, it is obviously important that the beneficiary community of various water projects have the capacity to generate the resources necessary to support the WS&S intervention. 'In-kind" contributions can be valuable additions to a project, but cash is required for many items including equipment and fuel (Chambers 2005). Beneficiary contribution to capital costs, either labor or money, may be a significant indicator of system sustainability. Contributions are likely to indicate a sincere desire for the benefits which accrue from water supply and sanitation interventions. However, a willingness to contribute to capital expenditures, in cash or inkind, does not of itself ensure sustainability (Yacoob, 1990 cited by Muruta, 2010).

A study by UWAZI report (2011) in over five water services provider in Kenya (Embu, Tana Athi, Kisumu, etc.) has shown that financial resources sources, amounts of money allocated and the willingness of the communities to pay either bills or capital money has a significant influence in the sustainability of projects. Where income levels are sufficiently high and/or continued subsidies are not assured, the depreciation and finance costs of repayment (principal and interest) or replacement (sinking fund) are also recurrent costs .All of these costs are largely dependent on technology choice, but project location, labor costs, and administrative costs also have an impact. Complete life cycle accounting methods should be used to ascertain the total costs involved. Such an approach will provide a solid understanding of the financial burden associated with technological choices and avoid surprises later in the operating life of the system.

A report by APS Consultants (2013) has shown that for sustainable projects, companies handling water and sanitation need to identify sources of finances and by any way continuous and streaming sources. The report continues to show that, the main sources of funding for Kenyan water institutions are three: government funds which constituted 58% of sector funding for example in 2008–2009, internally generated funds that amounted to 11% and donor contributions that made up 31% of the funds available. One third of the contributions by development partners are channelled through government budget, while the remaining two thirds are disbursed for specific projects. Of the estimated donor funding for 2008–2009 for example, 70% was in the form of loans, whereas grants represented 30%. Only 58% of the grant money committed by donors was actually disbursed in 2008–2009. This has left a number of projects fail due to the fact that loans at one point are required to be repaid.

According to Athi Water Services Board (2012), funding for measures aimed at improving access to water and sanitation in areas without adequate services – especially areas inhabited by the poor (Slums, ASALs, low GDP counties like Tana Delta, Kilifi etc.) – is provided by the Water Services Trust Fund (WSTF). The WSTF receives funds from the Government of Kenya and from donor agencies and directs them to the 362 poorest locations throughout the country (identified in collaboration with Water Services Boards).

However it is noted that, there are significant variations in the ability of water supply and sanitation institutions to finance their operations. In FY 2008–2009 for example, WASREB was the most independent as it generated 72% of funds internally. The Water Services Trust Fund, by its nature, had very limited self-generated funds and was supported by 2/3 by the government and by 1/3 by donor agencies. The financing of Water Services Boards, as already mentioned, showed great variations. None of the Boards managed to generate more than 20% of their funds. Donor agencies provided the majority of funds for Rift Valley WSB, Lake Victoria North WSB and Northern WSB, while the remaining WSBs received more funds from the government. From the statistics for example, with the exception of above mentioned, other bodies like those operating in the Kenyan coast lacked donor funding and instead got government funding that is limited, unpredictable and non-effective. This has for example crippled the initiation of sustainable projects in bodies like MOWASCO (Mumma et al ,2 011), others have been limited in the process of hiring expertise for future operation of projects (World Bank, 2014), lack of

funds streaming for the acquisition of modern technology, poor financing patterns that have negatively influenced procurement (UNDP, 2014).

2.5 The Influence Monitoring and Evaluation in the Implementation of Sustainable WSPs

Boakye & Nyieku (2010) while doing a research on Cost Recovery Analysis of Ghana Water Company Limited and Future Survival found that, projects can never move to other steps if they were never closely monitored and evaluated since this acted as the examination and marking point for progress. Formative, continuous and summative evaluation of the projects adds value for its future. Water projects are essentials providers and they tend to have high completion and any competed for project gets depleted or consumed very fast. In this note, they for example argue that for the water projects in Ghana to survive for the next century, at the final development process, monitoring and evaluation is particularly important to sustainability since it allows an ongoing review of project effectiveness.

According to Moraa, Otieno and Salim (2012), a key ingredient to sustainable management and development of WSPs in east Africa is to monitor factors specifically relating to sustainability and to establish checkpoints at appropriate intervals during and after project implementation. Examples of indicators to be monitored would be verifying that communities are maintaining an adequate O&M fund or that a contract remains in force for the supply of spare parts to regional distribution centers in the project area. Such indicators must be established early in the project and used in monitoring activities to assure that actions are carried out when needed and to the degree necessary.

According to Comprehensive Assessment of Water Management in Agriculture (2013), monitoring and evaluation should be carried out with the participation of the beneficiaries, giving them the opportunity to decide on the criteria of success. Evaluations should be used as a management tool to identify any deficiencies and to establish a course of action to remedy problems. Ultimately, they steer the project toward the goal of sustainability.

While studying the role of monitoring and evaluation and sustainability of community based water projects in Kenya, Uganda, Botswana, Lesotho, Egypt and Ethiopia, Lockwood and Smits (2011) found out that, monitoring and evaluation is about making sure that the work we do is the best we can do. It is vital that people involved in development have ways of finding out the

impact of their work from the points they serve; whether technical, financial, management etc. world bank (2013) argues that, sustainability in WSPs in Kenya foe example can be achieved via setting up funds that can enable a team to do interviews, questionnaires, and by observing the various employees or participators in which they work. This happens at all stages of a project, and helps to identify improvements for the future as well as things that are going well.

According to Millennium Community Development Initiatives (2010), monitoring can be as simple as going back to a well periodically to be sure it still works. It sounds easy, but it requires time and money (for things like fuel to travel from site to site). We believe it's essential to plan for and fund this work. Without it, we have no way of knowing if our investments ever pay off. The good news is that most often, we get to see lives changed when our teams go back and check up on water projects. Food and Agriculture Organisation (2012) reported that at an agreed time from when water first flowed in projects like Kindaruma and Mwea for example, the projects need to be assessed with some set of measures to find out the real impact of the work. This phase is about research, and is similar to monitoring and evaluation. However, it is crucially about sustainability and the changes in impact over time.

While studying the evolution of water projects in Bondo, APS Consultants (2013) found out that, in order to assess the impact of a project we need to know things like; the number of cases of water related diseases before and after the project, and over time; or, the number of children who no longer have to walk many miles to fetch water, and therefore are attending school. This work is always done in collaboration with the community, and involves discussion, workshops and many community visits; thus M&E. By doing this type of follow up over an extended length of time it is then possible to assess how our projects are changing people's lives for the better in the communities we work in(world bank, 2012) leading to acceptance and sustainability of the project, a phenomena otherwise termed as sustainability of water projects.

World Bank (2008; 2014) reported that the focus of monitoring and evaluation toolkit is monitoring and evaluation at the project level. However, many of the principles and techniques covered are generic and widely applicable also for programs at sector level and for policy work. Similarly, although the focus in terms of the provision of detailed guidance and examples is on agricultural water management (AWM) projects, and AWM components within other projects, the concepts and approaches covered are applicable to all. To be able to carry out monitoring the

following tasks are done. These are identify activities/indicators/outcome measures to be monitored, decide how the findings will be acted on, identify sources for monitoring data and data collection methods, schedule monitoring and design and pretest simple forms and questionnaires for recording information. To be able to carry out evaluation the following tasks are done. These are review project objectives and relevant project activities in terms of expected effects, identify indicators/outcome measures to evaluate, determine sources of data for evaluation and data collection methods and plan for data gathering including schedule and staff.

Nyanena (2006) cited in AWSB (2012) reported that, monitoring and evaluation are crucial to effective management of a Safe Water System project. There are many examples where information from monitoring or evaluation led to a significant change in a project that, one can see in retrospect, was essential to success. If a problem had not been identified, or not been identified until later, the project would have failed. In Pakistan, for example, ongoing monitoring of a project identified a problem with vessel breakage 6 - 12 months after distribution. On analysis the problem was due to ultraviolet light degradation of the plastic. The solution was to add UV light absorbers to the plastic of future vessels. In Madagascar and Mauritius, World Bank (2012) reports that water projects expanded from the city into a rural region affected by a cyclone. The only water source was a river with very turbid water. The dose of disinfectant recommended for clear piped water in the city was inadequate for the river water in the rural project.

According to Demombynes and Trommlerova (2012), monitoring and evaluation are crucial to effective management of a Safe Water System project. There are many examples where information from monitoring or evaluation led to a significant change in a project that, one can see in retrospect, was essential to success. If a problem had not been identified, or not been identified until later, the project would have failed. In Pakistan, for example, ongoing monitoring of a project identified a problem with vessel breakage 6 - 12 months after distribution. On analysis the problem was due to ultraviolet light degradation of the plastic. The solution was to add UV light absorbers to the plastic of future vessels. In Madagascar, the project expanded from the city into a rural region affected by a cyclone. The only water source was a river with very turbid water. The dose of disinfectant recommended for clear piped water in the city was inadequate for the river water in the rural project. The solution was to double the dose.

Adam (2006) cited in Donovat (2013) did a study called; towards an alternative society and observed that monitoring requires ongoing data collection during project implementation. Purposes of monitoring include: measuring progress of activities during implementation, using indicators, which usually relate to quality or quantity and a particular timeframe, highlighting which activities are being carried out well and which less well, providing information during implementation about specific problems and aspects that need modification, enabling managers to decide about allocation of resources and to identify training and supervision needs. Evaluation requires data collection before and after a given period of project implementation.

Mavin (2010) reported that the purposes of evaluation include: assessing whether the objectives have been achieved, looking at overall strengths and weaknesses and guiding design of future phases or follow-up projects. To plan for monitoring and evaluation, specify the information that will be needed, how it will be used for decision making and how progress and impact will be measured. Plans for monitoring and evaluation should be developed at the same time and integrated with plans for the whole project. At the beginning of the planning process, decide how monitoring and evaluation data will be acted on. Ensure that each piece of data collected has a purpose so that monitoring and evaluation is a meaningful practice that advances the project's goals and objectives. Monitoring will need to be more intensive in the early stages of the project. Once the project is established and running well, monitoring frequency can be reduced. Limit the items to be monitored to a manageable number that will provide the most useful information for the pilot project, and that will not require excessive personnel time and project money.

WASREB Impact Report (2012) has given a summary of the role of M&E in the sustainability of water projects in various parts of Kenya; Mombasa included. According to the report, the efficient and informed utilization of project M&E tools greatly affects project outcomes and therefore it is important to analyse their utilization in various projects. This in turn informs both project managers and stakeholders on areas of improvement for the achievement of better outcomes and completion. The report shows that, baseline survey/formative evaluation, continuous and summative M&E if well strengthened in the total inclusion of the projects parts, final deliveries that will lead to sustainability will be enhanced. In the coast region, WASREB (2012) in its report, Water and Sanitation Coverage has shown that little M&E in projects is done

and the process has not well been internalized with some contractors and employees feeling that its witch-hunting.

2.6 The Influence of Technology in the Implementation of Sustainable WSPs

Technology is the 21st driver of development in any community and in all sectors of the economy. According to Carlevaro & Gonzalez (2011) community members for example need to be empowered and therefore must be equipped with the necessary knowledge on how to operate, repair and maintain the water supply system as this will enhance sustainability of the project. Technology which fails to fulfill the needs of its users, which is poorly installed or which is difficult to maintain or repair, possess significant challenges for sustainability. Water Aid's recent sustainability study in Zambia, Afghanistan and Philippines highlighted, for example, the rapid corrosion of hand pump rising mains as a constraint to sustainable community water supplies (Len Abrams, 2003 cited in Haines et al 2010). There is no such thing as a maintenance-free technology yet even gravity water supply schemes, which were expected to provide sustainable services, have failed to live up to that promise. Hardware (including pumps, pipes, and spare parts) is sourced and procured by international agencies, governments, private providers and NGOs. The questions around who buys, what is procured and how quality of hardware is assured are all important for sustainability. In particular the links between the community, project handlers like engineers and the suppliers of spare parts are crucial.

In a study conducted in rural India and Central parts of China in 2013 by International Rivers Organization (2013) that focused Technical technological Challenges facing the sustainability of water projects revealed that approximately a third of India's hand pumps in rural water projects are either locally assembled and easy to use or imported with localized specifications while almost a half of those used in handling water in China are made from locally available experts. The largely publicly funded hand pump programme has been a remarkable success in China and more specifically in the town centres where the government has heavily introduced an improvement of the technology. Through the programme access to safe water increased from less than 10 per cent to 31 per cent in china and India between 2010 to 2013 December. This achievement was a result of Non-Governmental Organizations, NGOs using technologies and pumps that require village level operation and maintenance (VLOM). The Government of India (GOI) created demand so that private companies stepped in to produce the hand pumps and spare

parts. The GOI also trained engineers and mechanics to use and repair these new technologies at the community level so as to enhance ownership of community water projects (Mackenzie and Isha, 2005; GOI, 2013).

According to literature available in sub-Saharan Africa, appropriate technology is fundamental in order to make the water supply system sustainable. The selection of type of technology should consider the availability of spare parts and the socio economic situation of the community or the country. Communities or employees should participate in the selection of the technology, in order to operate and maintain the technology at the village level by the communities themselves. An example was the wrong choice of technology led to failure is the Kuyu-Rim water supply system in Ethiopia in 2009. The source is a spring and a piping system is used to serve another village community. The pipe did not fit with the water pump. The pressure of water pumped is much greater than the size of the pipe; as a result the pipe breaks.

A study by the Intergovernmental Panel on Climate Change (2010) shows that in Uganda for example, technology selection for water programmes in the northern parts has been entirely left on the government's hands. In the research, 121 respondents formed the sample population and the result showed that majority of the respondents about 85% mentioned that the technology was selected by the government office staff members. The remaining 5%, 3.8%, and 6.2% mentioned that the technology was selected by the community, local leaders and NGO staff members respectively for functional scheme.

A report by the Ministry of Water and Irrigation (2012) on the Technology Choice and sustainability of water and sanitation projects in five water companies in Kenya (Eldoret Water and Sanitation Company (ELDOWAS), Kisumu Water and Sewerage Company (KIWASCO), South Nyanza Water and Sanitation Company (SNWASCO), Gusii Water and Sanitation Company (GWASCO), and, Nakuru Water and Sanitation Services Company (NAWASSCO)) shows that, technology is essential for water production, water recycling, water transportation, water distribution, technology is essential in identifying areas for leakages/unnoticed pipes cracks, it is important for water billing etc.

Mukunga (2012) argues that, many studies and reports have documented the influence or effect of technology on sustainability of WSPs in Kenya's western Nairobi, coast and rift valley

regions. She has continued to show that, sector professionals have used a number of terms to describe affordable, simple technologies that could easily be adapted to local conditions and maintained by communities; among them- appropriate technology, progressive technology, alternative technology, Village level Operation and Maintenance (VLOM) technology, Intermediate technology, Village technology, Low -Cost technology, Selfhelp technology and even technology with a human face.

Brikke et al (2003) as cited by Kagondu (2013) suggested the use of "sustainable technology at the community and company level" and argued that projects must incorporate selection of appropriate technology and integrate Operation and Maintenance (O&M) into project development right from the start. According to him, an analysis of the performance of water systems in a variety of countries Kenya included found that performance was markedly better in communities where households were able to make informed choices about the type of system and the level of service they required. This was more successful in towns like Kigali-Rwanda and Nairobi- Kenya where a bit improved technology was used in monitoring the flow patterns of water, billing was done electronically, metre reading, and many more had integrated technology.

A study by UWAZI (2014) reported that among technical factors contributing to sustainability of services in the Coast Water Services Board (CWSB) parastatal that include (Mombasa Water Supply and Sanitation Services Company (MOWASSCO), Malindi Water and Sewerage Company (MAWASCO), Kilifi-Mariakani Water and Sewerage Company (KIMAWASCO), Kwale Water and Sewerage Company (KWAWASCO), TAVEVO Water and Sewerage Company, Lamu Water and Sewerage Company (LAWASCO), and, Tana Water and Sewerage Company (TAWASCO)), are technology selection, complexity of the technology, the technical capacity of the system to respond to the demand and provide the desired service level, the technical skills required to operate and maintain the system, the availability, accessibility and the cost of spare parts and the overall cost of O&M. World Bank (2013) has shown that, water can be enough for all the people more specifically those living next to the sea Mombasa included. It recommends that WSPs can be a reality in Kenya if technology is appropriately chosen for billing, monitoring the water distribution, recycling of the waters, technology for monitoring water theft, technology for monitoring faults in the channels etc. This is part of what the research was to address.

2.7 The Influence of Stakeholders in the Implementation of SustainableWSPs

Wikipedia describes a stakeholder in seemingly broad terms as: “anyone who has an interest in the project. Project stakeholders are individuals and organizations that are actively involved in the project, or whose interests may be affected as a result of project execution or project completion. They may also exert influence over the project’s objectives and outcomes.”

By this definition a ‘stakeholder’ includes those who may live far away from the environs of a sustainable development project, but who may take an interest nonetheless. Xinhua News Agency (2013) did a report on the role of the stakeholder in the sustainability of dam projects in China. It shows a stakeholder first as someone with interest and how the interest reveals itself in the project. For example, the construction of a dam in China may have little direct impact on someone living in the Bronx, but if that person takes an interest in the project from reading about it in the media then they automatically become a stakeholder. At first glance this may seem very unconvincing. This is because one may wonder why someone living in the Bronx should for example be a stakeholder for a project thousands of miles away in China just because they take an ‘interest’.

Similarly, but perhaps more convincingly, the employees of the company charged with constructing the dam are also stakeholders as they are ‘affected’ in one way or another (via job retention, promotion, salary, completion bonuses etc.). One can reasonably assume that these stakeholders will largely be in favor of the project. There is a further group of people who are stakeholders in such a project; those that commissioned it and have paid the contractor. Included here may be politicians (democratically elected or not), civil servants and parastatals but could also include other companies. These groups have their motives for wanting the project and thus along with the contractor they have a clear interest in its success.

WWF (2013) did a study on the stakeholders’ participation on sustainability of water projects in Africa and argues that stakeholders in water projects in the continent may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests. However, a number of studies have focused on numerous stakeholders in

the WSPs in east Africa for example but this research is going to focus on only 3 stake holders i.e., the community and the government

2.7.1 The Influence of the Community as Stakeholders in WSPs Sustainability

Participation of the community in projects influences the success of water and sanitation projects; when members of the community are involved, at the initial stages to up to a point when they are left to manage the project; identification and conceptualization (WHO, 2010). Scholars have argued that the community can be part of the project in many ways. For example, community participation in monitoring and evaluation is one way in which the community can become an integral part in a project and this can be defined as the collective examination and assessment of the program or project by the stakeholders and beneficiaries. Here, it takes into account the importance of taking local people's perspective into account and giving them a greater say in planning and managing the evaluation process. Local people, community organizations and other stakeholders decide together how to measure results(WHO, 2010),and what actions should follow once this information has been collected and analysed.

While studying the sustainability of water projects in Uganda, Odie (2012) argues that, participation can take different forms, including the initial expression of the demand for water and sanitation services by a community, the selection of technology by a given community and its sitting, the provision of labour, land and local materials, a cash contribution to the project costs, the selection of the management type and even the water tariff. It is thus the process through which demand-responsiveness is exercised, and empowerment achieved. Community involvement and participation is viewed as a tool for improving the efficiency of a project, assuming that where people are involved they are more likely to accept the new project and partake in its ongoing operation (The Millennium Development Goals Report, 2012). It is also seen as a fundamental right; that beneficiaries should have a say about interventions that affect their lives (FAO, 2011).

According to the World Bank (2012)'s report on Country Status Overview of Water Supply and Sanitation Kenya, a community that receives the services from water companies is core in the sustainability of various water projects. The report asserts that, community participation is a key instrument in creating self reliant and empowered communities, stimulating Water Project

Committees-level mechanisms for collective action and decision-making. It is also believed to be instrumental in addressing marginalization and inequity, through elucidating the desires, priorities and perspectives of different groups within a project area. This has been found to be true in counties like Bomet, Narok, Kisii and Tana River.

However, studies have shown that a number of areas have not fully included communities as major stakeholders in their projects, a factor that has led to their failures. For example, study by Nyaguthii and Oyugi (2013) on influence of community participation on successful implementation of Constituency Development Fund (water) projects in Kenya: case study of Mwea constituency shows there is low community members' participation in identification, implementation, evaluation and monitoring of Constituency Development Fund (water) projects, and there is need to improve on the same. This just like in any parts of Kenya has left such projects' future at a hang balance and eventually failing to continue providing the planned services.

2.7.2 The Influence of Government as a Stakeholder in Sustainable WSPs Implementation

According to Mulwa (2012) the government via its many agencies is a major stakeholder in projects that are aimed at providing essential commodities that if were left into private hands could bring conflicts of either monopoly or non-delivery. While studying the role of the government in ensuring water and sanitation services are effectively provided to the people in ASALs in Uganda and Kenya, Oregon (2011) argues that, the government sources for financial resources, capital resources, sources for donors, sources for personnel and many more.

WWF (2013) report of 2010 to 2012 shows that in the USA for example, the national govern and the county government in Illinois state allocated over $ 9.7 million to acquire new technology required to run and sustain the waste management and the water service programmes in this city that was seen to be having a population that was swelling rapidly. Another area where the government more specifically the county government greatly contributed was to add qualified personnel into the local experts, acquiring other capital materials like land and drainage facilities that could help the projects run.

According to World Water Assessment Programme (2010) there are government officials, bodies and other firms are related to projects are the people who can devise, pass, and enforce laws and

regulations that may either fulfill the goals of your effort or directly cancel them out. Studies in Nigeria, Lesotho, Mozambique, Uganda and Sudan have shown that the government plays a role in identifying and choosing the location and continual of a particular project (either politically or not), sourcing for resources especially financial resources, looking for the labour, contracting the relevant people for supplies and other activities, carrying out hedging and many more.

In Kenya, the experience is not any different. For example, the government allocates part of the nation budgets to water projects (Republic of Kenya, 2013), it vets part of the contractors who are either to supply new technology or carry out the work, do part of projects planning and sometimes monitor some of the projects (Republic of Kenya, 2012). WHO and UNICEF (2013) published a report on the Responsibility of the government for water supply and sanitation in Kenya. The report shows that the Kenyan government just likes other government, perform a number of activities. This includes policy formulation and sector co-ordination. Here, the Ministry of Water and Irrigation (MWI) is the key institution responsible for the water sector in Kenya. The Ministry is divided into five departments: Administration and Support Services, Water Services, Water Resources Management, Irrigation, Drainage and Water Storage, and Land Reclamation. Water supply is overseen by the Department for Water Services, whose functions include: formulation of policy and strategies for water and sewerage services, sector co-ordination and monitoring of other water services institutions. The Ministry of Water and Irrigation is also in charge of overall sector investments, planning and resource mobilisation.

Another report has linked the government into WSPs in the country by arguing that, Sanitation policy is in the hands of the Ministry of Public Health and Sanitation (MoPHS).This is done both the national and county governments. To harmonise the institutional framework for sanitation MWI and the MoPHS have developed a common Water Supply and Sanitation Concept with clearly defined sanitation targets. As of early 2011, the Minister of Water and Irrigation was Charity Ngilu, chairperson of the National Party of Kenya, which supported Prime Minister Raila Odinga. The Minister of Health and Sanitation was Beth Mugo of the Party of National Unity of President Mwai Kibaki. However this has changed in that the country has two categories of ministries with the most vocal one being that at county level. In Mombasa County, the ministry of water, irrigation and natural resources management, that of health and other

interested parties like the politicians play a significant role in the success or failure of the WSPs via various categories of roles played (WHO, 2014).

While studying the future of water projects in Tana delta, Kwale and Mombasa, Oyugi (2013) argues that Other Ministries also play a role in the water and sanitation sector. The Ministry of Education co-operates with MWI and MoPHS in the area of school sanitation by participating in Water and Sanitation Programme Committees. This brings in continuity of the services and activities of the various WSPs. The Agricultural Sector Coordination Unit deliberates on all issues related to agriculture, including irrigation which is overseen by MWI. The MWI also co-operates with the Ministries of Forestry, of the Environment and of Special Programmes to further the rehabilitation and maintenance of water towers.

Finally, the World Bank (2014) has focused on the role of Regulation and continuity of WSPs in various counties in the country starting with north eastern counties and finishing with the Kenyan coast counties. According to the World Bank, the regulation and monitoring of urban and rural water service provision is carried out by the Water Services Regulatory Board (WASREB). WASREB is a non-commercial state corporation established in March 2003 on the basis of the 2002 Water Act. Its functions comprise: issuing of licenses to water services boards and approval of Service Provision Agreements, developing tariff guidelines and carrying out tariff negotiations, setting standards and developing guidelines for service provision, publishing the results of sector monitoring in the form of comparative reports (such as the Impact Report). Environmental regulation in Kenya is carried out by the National Environment Management Authority (NEMA). NEMA was established under the Environmental Management and Coordination Act Nr. 8 of 1999 and became operational in July 2002. Its role is to promote the integration of environmental considerations into government policies, plans, programmes and projects. As regards the water sector in particular, NEMA is in charge of formulating water quality regulations .Through maintenance of environment and checks on the environment, the WSPs are perceived to be on the survival trend for the coming decades (World Bank, 2010).

2.8 Conceptual Framework

Independent Variables

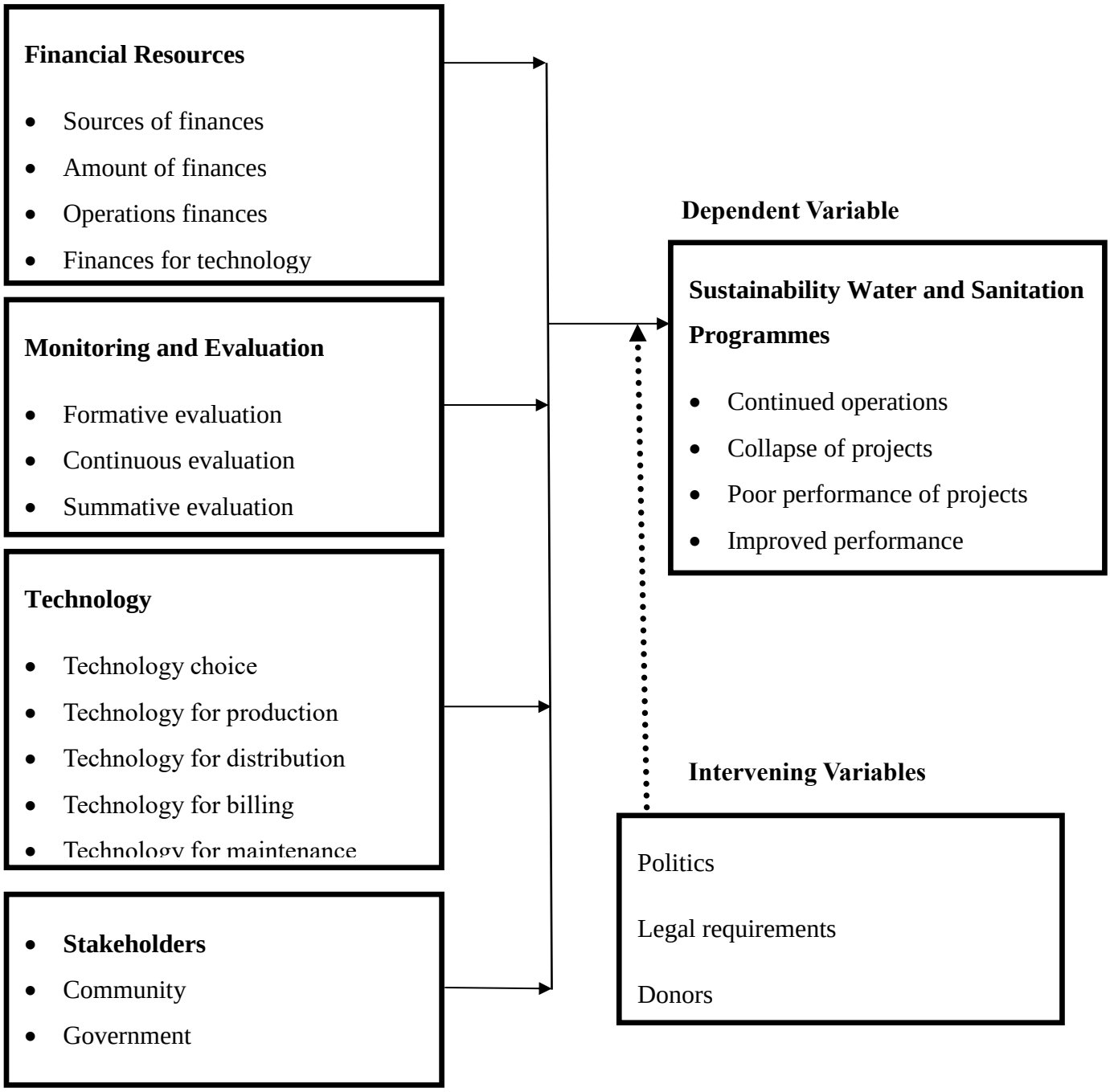

Figure 1: Conceptual Framework

The conceptual framework above has outlined the dependent, independent and intervening variables as discussed in the literature review and elaborated in the figure above. It helps one to understand the relationship between the variables of the study.

2.8 Summary of Literature Review

Water, a natural resource, is life. Both fauna and flora entirely depend on water for their survival. This makes water development, management and utilization vital exercises in ensuring success of these sectors and survival of the country's citizens (WaterAid, 2011). According to UNFPA (2012) water is a finite natural resource necessary for the sustenance of life and ecological systems and a key resource for social and economic development. Sustainability has been cited as one major problem facing projects in Kenya, more specifically water and sanitation projects/programmes. This has popped this research that has looked at two theories tied to the above research, literature has focused on the concept of projects sustainability, it has looked at financial resources, M&E, technology and stakeholders. The study has included a conceptual framework to give a summary of the work done.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methodology that will be used to conduct the study, focusing on research design, study location, target population, sampling procedures and sample size, research instruments, questionnaires, pilot study, reliability, validity, data collection procedure and methods of data analysis.

3.2. Research Design

Research design refers to the procedures selected by a researcher for studying a particular set of questions or hypothesis; this includes the researcher's choice of quantitative or qualitative methodology, and how, if at all, causal relationships between variables or phenomena are to be explored (Creswell, 2007). This research adopted a descriptive research design. Kasomo (2006) asserts that descriptive research design enables researchers to describe the events as they are or they appear at the same time providing an opportunity of investigation of why they occur. According to Wiersma (1999), descriptive research design is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way. The descriptive design was preferred as it explains the existing status of the two variables; it also enables one to generate information directly from the respondents (Mugenda and Mugenda, 2003).

3.3 Target Population

Target population can be defined as a complete set of elements (persons or objects) that possess some common characteristic defined by the sampling criteria established by the researcher(Kerlinger, 2002). According to Mugenda and Mugenda (2003) a target population can be defined as the entire group of people or objects to which the researcher wishes to generalize the study findings. From the information available in the MOWASCO HR department, there are 55 employees in the human capital and administration department, 135 in the engineering and strategy department, 226 in the business and customer care and finally 20 in finance. This makes a total population of 436 respondents.

Table 3.1 Target Population

Area	Population	Percentage
Human Capital	55	12.6%
Engineering	135	31.0%
Business	226	51.8%
Finance	20	4.6%
Total	436	100%

Source: MOWASCO HR Department (2015).

3.4. Sampling Procedure

Sampling is the act, process, or technique of selecting a suitable sample; specifically: the act, process, or technique of selecting a representative part of a population for the purpose of determining parameters or characteristics of the whole population (McNamara, 2009).Stratified random sampling was adopted in this study. Stratified random sampling gives results that are more reliable and detailed information. It generally applies if a population from which the sample is to be drawn does not consist of a homogenous group (Kothari, 2007), as is the case in the study. Stratified random sampling was employed because the researcher intended to solicit responses from each of the following groups:

The researcher then employed purposive sampling technique in each strata to select the respondents as this allowed for the selection of only those respondents with relevant information for the study. Mugenda and Mugenda (2003) argue that, in a research whose target population is less than 10,000, a sample of 10% can be considered for a study. However, other scholars like Cooper and Schindler (2008) argue that this can be increased to 20% or 30% so that it can take care of the non-respondents. In this relationship, our research used a sample calculated at 20% as shown below.

Table 3.2 Sample Size

Category	Human Capital	Engineering	Business	Finance	Total
Population	55	135	226	20	**436**
Sample size (20)	11	27	45	4	**87**
Total					

3.5. Methods of Data Collection

Primary data was collected using structured questionnaires consisting of both closed and open-ended questions. Mugenda and Mugenda (2003 define a questionnaire as an instrument used to gather data, which allows a measurement for or against a particular viewpoint. He emphasizes that a questionnaire has the ability to collect a large amount of information in a reasonably quick space of time. The questionnaire was administered through 'drop and pick later method' a variation of the mailed questionnaire. The questionnaire was divided into two parts, Part A and Part B. Part A was meant to capture the background information while Part B intended to capture data relevant to the objectives of this study.

3.6 Validity and Reliability of Research Instruments

Validity is a measure of how well a test measures what it is supposed to measure. It is the degree to which results obtained actually represent the phenomenon under investigation(Kombo, 2006). Reliability is the measure of the degree to which a research instrument yields consistent results after a repeated trial(Mugenda & Mugenda, 2003).

3.6.1 Validity of the Instrument

According to Michael (2010) validity is a procedure or an instrument (tool) used in research to measure the accurateness, correctness, truthfulness, or rightfulness of a phenomenon. It is the degree of accurateness of the instrument to measure what it purports to measure. There are four types of validity; predictive validity, concurrent validity, content validity and construct validity. Mugenda and Mugenda (1999) say validity refers to the accuracy and meaningfulness of inferences made based on the results obtained. The research employed content validity to measure the validity of the instrument. According to Cooper and Schindler (2008), content

validity means the subject matter or the amount of substance contained in something. It refers to the degree to which the research instruments or a tool measures what it should measure. Content validity enables data being collected to be reliable in representing the specific content of a particular concept. An instrument is designed then subjected to subjects of similar samples. Inferences are made and compared to the existing theories. The researcher critically considered each item to see if it contained a real representation of the desired content and if it could measure what it was supposed to measure. Developed instruments were presented to the supervisors and the research experts to evaluate the applicability and appropriateness of the content, clarity and adequacy of construction of the instrument from research perspective.

3.6.2 Reliability of the Instrument

Mugenda (2003) says that reliability is concerned with estimates of the degree to which a research instrument yields consistent results after repeated trials. The instruments were piloted on 10 respondents and the procedure repeated in two weeks. Reliability was determined by a test-retest administered to 10 subjects not included in the sample. Inputs from invaluable sources were obtained during the study that was useful in modifying the questionnaire before a final set of questions were produced. By use of Cronbach's formula, an alpha value of greater than 0.7 was considered acceptable(Cronbach, 1951).

3.7 Data Collection Procedure

A questionnaire was used since it was the best tool for this study. The questionnaire was prepared on the basis of a review of literature in Kenya and the rest of the world. Data collection tools were piloted and suggestions made before finalizing the questionnaire. The study utilized a self-administered questionnaire and equally referred to the existing secondary data. The researcher got a permit from the Graduate School and Ministry of Science And Technology. The researcher visited the sample, used enumerators to access some other respondents, and e-mailed a questionnaire to some respondent who were committed for one on one filling. Necessary prior appointments were made and the researcher emphasized that the information given was to be specifically be used for the study and it would be private and confidential and that names could not be necessary.

3.7 Methods of Data Analysis

The researcher examined what was collected from the field and made deductions and inferences. He tested any underlying assumptions; detected anomalies, underlying structures and exact variables. The findings of the researcher were analyzed using content analysis. This involved detailed description of the items that comprised the sample. In interpreting the results, the frequency which an item occurs was interpreted as a measure of importance, attention or emphasis. The specific classification system used to record the information for the research will be designated as content analysis which determined the frequency and trends with which concepts of the objectives were interpreted as a measure of direction. Quantitative data was analyzed using descriptive statistics such as means, percentages and frequencies. Data was subjected to SPSS package version 20.0.

3.8. Ethical Issues Observed

During the study the respondents were informed of their rights of either participating or refusing to participate in the study, they were informed that participation in the study was not compulsory and informed consent was sought from the respondents. The participants were informed of their right to remain anonymous and that their identity could not to be revealed in this study. All ethical issues were observed during the study.

3.9 Operational Definition of Variables

Research objectives	Independent variable:	Indicators	Level of scale	Level of analysis
To establish the influence of financial resources in the implementation of sustainable water supply programme in Mombasa County.	Financial Resources	Sources of finances. Amount of finances. Operations finances. Finances for technology.	Ordinal scale	Descriptive: Central tendency
To establish the influence monitoring and evaluation in the implementation of sustainable water supply programme in Mombasa County.	Monitoring and Evaluation	Formative evaluation Continuous evaluation Summative evaluation	Ordinal scale	Descriptive: Central tendency.
To establish the influence of technology in the implementation of sustainable water supply programme in Mombasa County.	Technology	Technology choice. Technology for production. Technology for distribution. Technology for billing. Technology for maintenance.	Ordinal scale	Descriptive: Central tendency.
To examine the influence of stakeholders in the implementation of sustainable water supply programme in Mombasa County.	Stakeholders	Community Government	Ordinal scale	Descriptive: Central tendency.

CHAPTER FOUR

DATA PRESENTATION AND INTERPRETATION

4.1 Introduction

The questionnaires were sorted and the correct ones that were fully filled considered while the ones that were never fully filled rejected. Data collected was keyed and analyzed by simple descriptive analysis using Statistical Package for Social Scientists (SPSS) version 20.0 software. The data was then presented through frequency tables and narrative analysis.

4.2 Response Rate

In the study, 87 questionnaires were administered respondents. Out of the issued questionnaires, only 65 questionnaires were returned, fully filled and made the basic providers of primary information needed.22 questionnaires were never returned. Therefore the response rate was 74.71%; making it valid.

4.3 Background Information

The research aimed at establishing the general basic information of the respondents in relation to gender, education, age etc. and the following results in the tables below reached at:

Table 4.1 Gender Composition of the Respondents

Sex	**Frequency**	**Percentage**
Female	15	23.1%
Male	50	76.9%
Total	**65**	**100%**

From the responses in the table above, male gender dominates. Male respondents made majority of the respondents at 76.9% while the female respondents who participated in the study made 23.1%. This was attributed to the fact that in Mombasa County, just like any situation in the LDCs, men are better educated and therefore command a great number of jobs in the parastatals.

Table 4.2 Age Distribution

Age	Frequency	Percentage
18-28yrs	10	15.35%
28 - 38 Years	20	30.8 %
38 - 48 years	25	38.5 %
48 years and above	10	15.35%
Total	**65**	**100%**

From the field results as shown in the table above,15.35% of the respondents were between ages18-28years,30.8% of the respondents were 28 - 38 years, 38.5% were of ages38 - 48 years while another 15.35% were respondents with ages48 years and above.

Table 4.3 Educational Levels of the Respondents

Education level	Frequency	Percentage
Secondary certificate	2	3.1%
Diploma/certificate	18	27.7%
Bachelors' degree	40	61.5%
Postgraduate degree	5	7.7%
Total	**65**	**100%**

Respondents with a secondary certificate were the least at 3.1%, followed by those with postgraduate degree at 7.7%, and then those respondents with the diploma or certificate qualification came in with 27.7% while the bachelor degree holders dominated with 61.5%. This is the true trending situation in Mombasa Water Company where almost everyone is seeking for degree and above education.

Table 4.4 Work Experience

Years	Frequency	Percentage
Less than 5 years	12	18.46%
5-10 years	38	58.46%
10-20 years	10	15.38%
21 years and above	5	7.7 %
Total	**65**	**100%**

18.46 % of the respondents were with less than 5 years of work experience, 5-10 years attracted 58.46% of the respondents, 10-20 years attracted15.38%, and those respondents who have 21 years and above had a percentage score of 7.7%.

4.4 Financial Resources

The research sought to find out the various issues that are surrounding financial resources and how this influences the implementation of WSPs and the following results were arrived at.

Table 4.5 Response on Financial Resources as a Determinant of WSPs Implementation

In a question where respondents were required to give a yes or no answer, they were asked if they thought that in their own opinions, financial resources have an influence in the implementation of sustainable water supply programme in MOWASSCO and the responses below arrived at:

Structural Difference	Frequency	Percentage
YES	60	85.71%
NO	10	14.29%
Total	**70**	**100%**

From the responses in the field, 60 respondents who represented 85.71% strongly supported the idea that financial resources determine the implementation of water supply programme by the

Mombasa Water company while the remaining 5 who made 14.29% felt that financial resources have no influence in the implementation of the programme.

When asked to give reasons for their answers, 80 of the respondents argued that finances could be used to hire better personnel, erect new relevant infrastructure, acquire better technology, acquire more equipment / machinery and many more that shall lead to sustainable water supply programme implementation in Mombasa county.

Table.4.6 Rating of Financial Resources on a Scale

On a scale, respondents were asked to rate the extent to which they agreed or disagreed with the following statements. The scale of use is 1-5 where: 1= strongly disagree; 2 = disagree; 3 =weakly agree; 4 =agree; 5 = strongly agree.

Statement	**1**	**2**	**3**	**4**	**5**
Sources of finances have an influence in the implementation of Sustainable water supply programme in MOWASSCO.	0	4	10	26	25
Amount of finances allocated for the implementation of sustainable water supply programme in MOWASSCO are limited and thus influence the process of implementation.	3	7	11	20	24
Funds allocated for normal operations at MOWASSCO are limited and thus influence the process of sustainable water supply programme implementation.	3	5	5	14	38
Financial resources from both the donors and government allocated for technology influence the success of sustainable water supply programme implementation at MOWASSCO .	0	3	7	13	42

From the responses that sought to show how the respondents agreed or disagreed with the role of financial resources in the implementation of WSPs in by MOWASSCO, 0 respondents strongly disagreed with the statement that sources of finances have an influence in the implementation of

sustainable water supply programme in MOWASSCO, 4 disagreed, 10 weakly agreed, 26 agreed while the remaining 25 strongly agreed.

In relation to the second statement that touched on the amount of finances allocated being limited and thus influence the process of WSP implementation attracted 3 respondents who strongly disagreed, 7 who disagreed, 11 who weakly agreed, and 20 who agreed while the remaining 24 strongly agreed. On average, over 76% of the respondents felt that the finances allocated for WSP is limited.

In relation to the third statement that read, funds allocated for normal operations at MOWASSCO are limited and thus influence the process of sustainable water supply programme implementation, attracted 3 respondents who strongly disagreed, 5 who disagreed, 5 who weakly agreed, and 14 who agreed while the remaining 38 strongly agreed.

Finally, on the last statement that read, financial resources from both the donors and government allocated for technology influence the success of sustainable water supply programme implementation at MOWASSCO, attracted 0 respondents who strongly disagreed, 3 who disagreed, 7 who weakly agreed, and 13 who agreed while the remaining 42 strongly agreed. On average, over 80 of the respondents supported the idea that financial resources remain to be a determinant of sustainable WSP implementation.

4.5 Hypothesis Testing on the Relationship between Financial Resources and the Implementation of WSPs

H_A: Financial resources have an influence in the implementation of sustainable water supply programme in Mombasa County.

H_0: Financial resources have no influence in the implementation of sustainable water supply programme in Mombasa County.

Table 4.7 Chi-Square Testing for the First Hypothesis

Observed value	**E**xpected	Difference	$(O-E)^2$	$\chi 2_C$ **(Chi-Square) value**
3	13	-10	100	100/13
7	13	-6	36	36/13
11	13	- 2	4	4/13
20	13	7	49	49/13
24	13	11	121	121/13
				$\sum [(O-E)^2/E] = 23.85$

$\chi^2_C = 23.85 > \chi^2_{0.05}$: 9.488 at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 23.85 is greater than the critical chi-square value at 5% level of confidence, we accept the alternative hypothesis and reject the null hypothesis. Therefore, we accept the hypothesis that financial resources have an influence in the implementation of sustainable water supply programme in Mombasa County and reject the hypothesis that says, financial resources have no influence in the implementation of sustainable water supply programme in Mombasa County.

4.6 Analysis of the Item on Monitoring and Evaluation

The study sought to examine the influence of monitoring and evaluation in the implementation of sustainable water supply projects in Mombasa County and the results given as shown in the various tables below.

Table 4.8 Monitoring and Evaluation's Influence

Respondents were asked if they thought that monitoring and evolution has an influence in the implementation of sustainable water supply programme and were required to respond with a yes or no answer and results were as shown in the table 4.8.

Response	Frequency	Percentage
YES	56	86.15%
NO	9	21.15%
Total	**65**	**100%**

From the field information, 86.15% of the respondents felt that monitoring and evolution has an influence in the implementation of sustainable water supply programme in Mombasa County by MOWASSCO. The remaining 9 respondents who made 21.15% felt that monitoring and evolution has no influence in the implementation of sustainable water supply programme.

In an open question, when the respondents were asked to give reasons for their answers, on average 87% of the respondents argued that, M&E is a way of checking whether the programme is running as stipulated in the plans and whether the objectives are being met. This way, the programme is able to identify areas that have deviated from the requirements and amendments made; leading to continued operations of the projects in the programme thus sustainability.

Table 4.9 Rating of Monitoring and Evaluation's Influence

Respondents were asked a question that required them to indicate to what extent they agreed or disagreed with the following statements in relation to monitoring and evaluation and the implementation of WSPs in Mombasa. The scale of use is that of 1-5 where: 1= strongly disagree; 2 = disagree; 3 =weakly agree; 4 =agree; 5 = strongly agree.

Statement	**1**	2	**3**	4	**5**
There is a pronounced and structured M&E process in MOWASSCO that has favored services delivery.	**26**	**20**	**19**	**0**	**0**
Formative evaluation is effective in MOWASSCO.	**30**	**19**	**10**	**5**	**1**
Continuous evaluation has been integrated and is effective at MOWASSCO.	**17**	**21**	**20**	**7**	**0**
Summative evaluation is embraced and regular in all the projects within the MOWASSCO long term programmes.	**21**	**20**	**17**	**5**	**2**

From the responses that sought to show how the respondents agreed or disagreed with the role of M&E in the implementation of WSP in by MOWASSCO, 26 respondents strongly disagreed with the statement that there is a pronounced and structured M&E process in MOWASSCO that has favored services delivery, 20 disagreed, 19 weakly agreed, while the rest attracted no respondents. On average, over 70.7% of the respondents disagreed with the idea that there is well pronounced and structured M&E at MOWASSCO for the WSP sustainability.

In relation to the second statement that touched on formative evaluation being effective on WSP implementation attracted 30 respondents who strongly disagreed, 19 who disagreed, 10 who weakly agreed, and 5 who agreed while the remaining 1 strongly agreed. On average, over 75.38% of the respondents felt that the formative evaluation is not effective.

In relation to the third statement that read, continuous evaluation has been integrated and is effective at MOWASSCO thus influencing the process of sustainable water supply programme

implementation, attracted 17 respondents who strongly disagreed, 21 who disagreed, 20 who weakly agreed, and 7 who agreed while the remaining 0 strongly agreed.

Finally, on the last statement that read, summative evaluation is embraced and regular in all the projects within the MOWASSCO long term programmes, had 21 respondents who strongly disagreed, 20 who disagreed, 17 who weakly agreed, and 5 who agreed while the remaining 2 strongly agreed. On average, over 63% of the respondents were for the idea that summative evaluation has not been very well in relation to sustainable WSP implementation by MOWASSCO. Generally, a mean percentage of 69.7% score of the respondents felt that MOWASSCO has not effectively implemented M&E that is expected to have a larger negative effect on the implementation of the sustainable WSP.

4.7 Testing of the Second Hypothesis

H_A: Monitoring and evaluation influences the implementation of sustainable water supply programme in Mombasa County.

H_0: Monitoring and evaluation does not influence the implementation of sustainable water supply programme in Mombasa County.

Table 4.10 Chi-Square Testing for the Second Hypothesis

Observed value	**E**xpected	Difference	$(O-E)^2$	$\chi 2_C$ **(Chi-Square) value**
26	13	13	169	169/13
20	13	7	49	49/13
19	13	6	36	36/13
0	13	-13	169	169/13
0	13	-13	169	169/13
				$\sum (O-E)^2/E = 45.54$

$\chi^2_C = 45.54 > \chi^2_{\alpha}$: 9.488 at 4 degrees of freedom and 5% level of confidence.

0.05

Since the calculated chi-square value of 45.54 is greater than the critical chi-square value at 5% level of confidence, we accept the alternative hypothesis and reject the null hypothesis. Therefore, we accept the hypothesis that monitoring and evaluation influences the implementation of sustainable water supply programme in Mombasa County and reject the hypothesis that says, monitoring and evaluation does not influence the implementation of sustainable water supply programme in Mombasa County.

4.8 Analysis of the Item on Technology

The respondents were asked a number of questions in relation to the role of technology in the implementation of WSPs and the responses were as shown in the following tables.

Table 4.11 Influence of Technology in WSPs Implementation

The respondents were given a question that asked them whether they thought that the integration of technology in the operations of the company has an influence in the success of the implementation of sustainable water supply programme and the responses in the table below given.

Response	Frequency	Percentage
Yes	62	95.38%
No	3	4.26%
Total	**65**	**100%**

In relation to the above question, 62 respondents who represented 95.38% felt that the integration of technology in the operations of the company has an influence in the success of the implementation of sustainable water supply programme. The remaining 3 respondents who represented 4.26% felt that technology has no effect in the implementation of sustainable WSP.

When asked to give reasons, on average, 96% of the respondents argued that with modern technology, MOWASSCO shall be able to increase its levels of water supply, reduce water theft through noticing illegal connections, check on water losses by remote sensing technology that can identify areas where leakages are occurring, desalinate more water from the ocean, improve the returns through electronic bills reading, management and payments.

Table 4.12 Rating of the Influence of Technology in WSPs Implementation

The research sought to seek the extent to which the respondents rated the influence of technology in WSPs implementation on a scale and the reports below were reached on.A scale of 1-5 was used where, 1= Strongly Disagree 2= Disagree 3= Weakly Agree 4= Agree 5= Strongly Agree. The results in the table below were given.

Statement	**1**	2	**3**	4	**5**
The choice of technology to be employed by MOWASSCO has an influence in the implementation of various said programmes.	**6**	**8**	**10**	**20**	**21**
Technology production has an influence in the provision of MOWASSCO services.	**2**	**7**	**10**	**25**	**21**
Lack of efficient technology for water distribution at MOWASSCO has been negatively influencing its programme implementation.	**1**	**4**	**10**	**27**	**23**
Technology for billing and rates collection has been an issue that has influenced the success of MOWASSCO programme implementation for long.	**2**	**11**	**17**	**21**	**14**
Technology for maintenance of the various apparatus and machinery used in services delivery has an influence in the implementation of MOWASSCO programme.	**3**	**5**	**7**	**16**	**34**

From the responses that sought to show how the respondents agreed or disagreed with the role of technology in the implementation of WSP by MOWASSCO, 6 respondents strongly disagreed with the statement that the choice of technology to be employed by MOWASSCO has an influence in the implementation of various said programmes, 8 disagreed, 10 weakly agreed, 20agreed and the remaining 21strongly agreed.

In relation to the second statement that read, technology production has an influence in the provision of MOWASSCO services had2 respondents who strongly disagreed, 7 who disagreed, 10 who weakly agreed, and 25 who agreed while the remaining 21 strongly agreed.

In relation to the third statement that read, lack of efficient technology for water distribution at MOWASSCO has been negatively influencing its programmes implementation had 1 respondent who strongly disagreed, 4 who disagreed, 10 who weakly agreed, and 27 who agreed while the remaining 23 strongly agreed.

In relation to the fourth statement that read, technology for billing and rates collection has been an issue that has influenced the success of MOWASSCO programme implementation for long had2 respondents who strongly disagreed, 11 who disagreed, 17 who weakly agreed, and 21 who agreed while the remaining 14 strongly agreed.

Finally, on the last statement in relation to technology that read, technology for maintenance of the various apparatus and machinery used in services delivery has an influence in the implementation of MOWASSCO programme, had 3 respondents who strongly disagreed, 5 who disagreed, 7 who weakly agreed, and 16 who agreed while the remaining 34 strongly agreed.

Generally, a mean of 84.12% of the respondents felt that technology has an influence in the implementation of sustainable WSP by MAWASSCO.

Table 4.13 Testing of Third Hypothesis

H_A: Technology has an influence in the implementation of sustainable water supply programme in Mombasa County.

H_0: Technology has no influence in the implementation of sustainable water supply programme in Mombasa County.

Observed value	**E**xpected	Difference	$(O-E)^2$	$\chi 2_C$ **(Chi-Square) value**
6	13	-7	49	49/13
8	13	-5	25	25/13
10	13	-3	9	9/13
20	13	7	49	49/13
21	13	8	64	64/13
				$\sum (O-E)^2/E = 15.08$

$\chi^2_C = 15.08 > \chi^2_{\alpha\ 0.05}$: 9.488 at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 15.08 is greater than the critical chi-square value at 5% level of confidence, we accept the alternative hypothesis and reject the null hypothesis. Therefore, we accept the hypothesis that technology has an influence in the implementation of sustainable water supply programme in Mombasa County and reject the hypothesis that says, technology has no influence in the implementation of sustainable water supply programme in Mombasa County.

4.9 An Analysis of the Stakeholders as the Determinants of WSPs Implementation

Respondents were asked a number of questions in relation to the stakeholder's influence on the implementation of sustainable water supply programmes in Mombasa County and the responses in the tables below arrived at:

Table 4.14 Response on Stakeholders

Respondents were asked whether they thought that stakeholders have an influence in the implementation of sustainable water supply programme in MOWASSCO and had the following responses:

Response	Frequency	Percentage
Yes	60	92.3%
No	5	7.7%
Total	**65**	**100%**

In relation to the above question that sought to seek whether stakeholders determine the implantation of WSP, 60 respondents who represented 92.3% felt that the stakeholders have an influence in the implementation of sustainable water supply programme by MOWASSCO. The remaining 5 respondents who represented 7.7% felt that stakeholders have no effect in the implementation of sustainable WSP.

When asked to give reasons on an open ended question, 94% of the respondents argued that with proper involvement of the local community, donors, government, CBOs, the employees and other stakeholders, projects become successful. Therefore MOWASSCO should invest on the locals because they are the immediate consumers of their water, they provide labour, land where

water pipes are installed, and they also provide locations for water reservoirs. On the other hand, the government and other donors should be involved since they are the ones who provide much funding and policies in relation to water supply and management.

Table 4.15 Degree of Support of Stakeholders in Relation to WSPs Implementation

Respondents were asked to support the degree to which they agreed or disagreed with the following statements. A scale of 1-5 where: 1= strongly disagree; 2 = disagree; 3 =weakly agree; 4 =agree; 5 = strongly agree was recommended and the results below were arrived at.

Statement	**1**	2	**3**	4	**5**
The surrounding community has been a major stakeholder to MOWASSCO through the providence of laborers, land, being consumers and many more.	8	10	6	21	20
The government through the various agencies has been a stakeholder that provides laws, guidelines, finances and other relevant products for MOWASSCO programmes implementation.	4	5	3	23	30

From the responses that sought to show how the respondents agreed or disagreed with the role of stakeholders in the implementation of WSP by MOWASSCO, 8 respondents strongly disagreed with the statement that the surrounding community has been a major stakeholder to MOWASSCO through the providence of laborers, land, being consumers and many more, 10 disagreed, 6 weakly agreed, 21 agreed and the remaining 20 strongly agreed.

In relation to the second statement that read, the government through the various agencies has been a stakeholder that provides laws, guidelines, finances and other relevant products for MOWASSCO programmes implementation had4 respondents who strongly disagreed, 5 who disagreed, 3 who weakly agreed, and 23 who agreed while the remaining 30 strongly agreed.

Generally, a mean of 75 % of the respondents supported the idea that stakeholders have an influence in the implementation sustainable WSP by MOWASSCO.

Table 4.15 Testing Hypothesis for the Fourth Objective

H_A: Stakeholders have an influence in the implementation of sustainable water supply programme in Mombasa County.

H_0: Stakeholders have no influence in the implementation of sustainable water supply programme in Mombasa County.

Observed value	**E**xpected	Difference	$(O-E)^2$	$\chi 2_C$ **(Chi-Square) value**
4	13	-9	81	81/13
5	13	-8	64	64/13
3	13	-10	100	100/13
23	13	10	100	100/13
30	13	17	289	289/13
				$\sum (O-E)^2/E = 48.77$

$\chi^2_C = 48.77 > \chi^2_{0.05}$: 9.488 at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 48.77 is greater than the critical chi-square value at 5% level of confidence, we accept the alternative hypothesis and reject the null hypothesis. Therefore, we accept the hypothesis that stakeholders have an influence in the implementation of sustainable water supply programme in Mombasa County, and reject the hypothesis that says, stakeholders have no influence in the implementation of sustainable water supply programme in Mombasa County.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study findings, discussions, conclusions and recommendation of the research. The chapter also contains suggestions of related studies that may be carried out in the future by various scholars.

5.2 Summary of Findings

Generally, from the findings in the field as shown in chapter four, a number of views have been given by the respondents and in most cases have supported the idea that financial resources, M&E, technology and stakeholders determine the implementation of sustainable WSP by MOWASSCO.

In relation to the first objective that sought to establish the influence of financial resources in the implementation of sustainable water supply programme in Mombasa County, the following results were arrived: 60 respondents who represented 85.71% strongly supported the idea that financial resources determine the implementation of water supply programme by the Mombasa Water company while the remaining 5 who made 14.29% felt that financial resources have no influence in the implementation of the programme. When asked to give reasons for their answers, 80 of the respondents argued that finances could be used to hire better personnel, erect new relevant infrastructure, acquire better technology, acquire more equipment / machinery and many more that shall lead to sustainable water supply programme implementation in Mombasa county.On average, over 80 of the respondents supported the idea that financial resources remain to be a determinant of sustainable WSP implementation.

In relation to the second objective which sought establish the influence monitoring and evaluation in the implementation of sustainable water supply programme in Mombasa County, the following results were arrived at:86.15% of the respondents felt that monitoring and

evolution has an influence in the implementation of sustainable water supply programme in Mombasa County by MOWASSCO. The remaining 9 respondents who made 21.15% felt that monitoring and evolution has no influence in the implementation of sustainable water supply programme. In an open question, when the respondents were asked to give reasons for their answers, on average 87% of the respondents argued that, M&E is a way of checking whether the programme is running as stipulated in the plans and whether the objectives are being met. This way, the programme is able to identify areas that have deviated from the requirements and amendments made; leading to continued operations of the projects in the programme thus sustainability.

In relation to the third objective that sought to establish the influence of technology in the implementation of sustainable water supply programme in Mombasa County, the responses were as follows:62 respondents who represented 95.38% felt that the integration of technology in the operations of the company has an influence in the success of the implementation of sustainable water supply programme. The remaining 3 respondents who represented 4.26% felt that technology has no effect in the implementation of sustainable WSP. When asked to give reasons, on average, 96% of the respondents argued that with modern technology, MOWASSCO shall be able to increase its levels of water supply, reduce water theft through noticing illegal connections, check on water losses by remote sensing technology that can identify areas where leakages are occurring, desalinate more water from the ocean, improve the returns through electronic bills reading, management and payments. Generally, a mean of 84.12% of the respondents felt that technology has an influence in the implementation of sustainable WSP by MAWASSCO.

Finally, in relation to the final objective (fourth) that sought to examine the influence of stakeholders in the implementation of sustainable water supply programme in Mombasa County, the following results were obtained. 60 respondents who represented 92.3% felt that the stakeholders have an influence in the implementation of sustainable water supply programme by MOWASSCO. The remaining 5 respondents who represented 7.7% felt that stakeholders have no effect in the implementation of sustainable WSP. When asked to give reasons on an open ended question, 94% of the respondents argued that with proper involvement of the local community, donors, government, CBOs, the employees and other stakeholders, projects become

successful. Therefore MOWASSCO should invest on the locals because they are the immediate consumers of their water, they provide labour, land where water pipes are installed, and they also provide locations for water reservoirs. On the other hand, the government and other donors should be involved since they are the ones who provide much funding and policies in relation to water supply and management. Generally, a mean of 75 % of the respondents supported the idea that stakeholders have an influence in the implementation sustainable WSP by MOWASSCO.

5.3 Discussion of Findings

From the findings in the field, summary of findings and the tests in the hypothesis, the general trend is that financial resources, technology, M&E and stakeholders have an influence in the implementation of the sustainable WSP by MOWASSCO.

In relation to the first objective that touched on financial resources, 60 respondents who represented 85.71% strongly supported the idea that financial resources determine the implementation of water supply programme by the Mombasa Water company. This is in agreement with The Millennium Development Goals Report (2012) that shows, the financing process, such as raising and maintaining adequate funding for water project facilities is of critical importance for sustainability. Insufficient financing is a major factor for poor maintenance, which is often cited as the main reason for failure. Availability of funds for recurrent costs is often also seen as a major factor influencing the sustainable operation of water project intervention. Also, from the study, when respondents were asked to give reasons for their answers, 80 of the respondents argued that finances could be used to hire better personnel, erect new relevant infrastructure, acquire better technology, acquire more equipment / machinery and many more that shall lead to sustainable water supply programme implementation in Mombasa county. This is supported by a study by UWAZI (2011) in over five water services provider in Kenya (Embu, Tana Athi, Kisumu, etc.), showing that financial resources sources, amounts of money allocated and the willingness of the communities to pay either bills or capital money has a significant influence in the sustainability of projects.

In relation to the second objective which sought establish the influence monitoring and evaluation in the implementation of sustainable water supply programme in Mombasa County,

86.15% of the respondents felt that monitoring and evolution has an influence in the implementation of sustainable water supply programme in Mombasa County by MOWASSCO. On average 87% of the respondents argued that, M&E is a way of checking whether the programme is running as stipulated in the plans and whether the objectives are being met. This way, the programme is able to identify areas that have deviated from the requirements and amendments made; leading to continued operations of the projects in the programme thus sustainability. There are a number of findings supporting the influence of M&E in the implementation of sustainable water programmes. For example, according to Boakye & Nyieku (2010), projects can never move to other steps if they were never closely monitored and evaluated since this acted as the examination and marking point for progress. Formative, continuous and summative evaluation of the projects adds value for its future. Water projects are essentials providers and they tend to have high completion and any competed for project gets depleted or consumed very fast. In this note, they for example argue that for the water projects in Ghana to survive for the next century, at the final development process, monitoring and evaluation is particularly important to sustainability since it allows an ongoing review of project effectiveness.

In relation to the third objective that sought to establish the influence of technology in the implementation of sustainable water supply programme in Mombasa County,62 respondents who represented 95.38% felt that the integration of technology in the operations of the company has an influence in the success of the implementation of sustainable water supply programme. When asked to give reasons, on average, 96% of the respondents argued that with modern technology, MOWASSCO shall be able to increase its levels of water supply, reduce water theft through noticing illegal connections, check on water losses by remote sensing technology that can identify areas where leakages are occurring, desalinate more water from the ocean, improve the returns through electronic bills reading, management and payments. Generally, a mean of 84.12% of the respondents felt that technology has an influence in the implementation of sustainable WSP by MAWASSCO. Supporting the argument on the role of technology is Carlevaro & Gonzalez (2011) who argue that technology is the 21st driver of development in any community and in all sectors of the economy. Therefore, community members for example, need to be empowered and therefore must be equipped with the necessary knowledge on how to

operate, repair and maintain the water supply system as this will enhance sustainability of the project.

Finally, in relation to the final objective (fourth) that sought to examine the influence of stakeholders in the implementation of sustainable water supply programme in Mombasa County, 60 respondents who represented 92.3% felt that the stakeholders have an influence in the implementation of sustainable water supply programme by MOWASSCO. When asked to give reasons on an open ended question, 94% of the respondents argued that with proper involvement of the local community, donors, government, CBOs, the employees and other stakeholders, projects become successful. Generally, a mean of 75 % of the respondents supported the idea that stakeholders have an influence in the implementation sustainable WSP by MOWASSCO. Supporting this is WWF (2013) that did a study on the stakeholders' participation on sustainability of water projects in Africa and argues that stakeholders in water projects in the continent may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests. These groups greatly influence the direction which the water projects will take in the future.

5.5 Conclusions

Based on the findings of the study, the researcher concludes that, financial resources allocated for WSP implementation, the sources of finances, the various stages of monitoring and evaluation including the formative, summative and continuous M&E, modern technology integration in water supply, and the stakeholders like the community and the government have an influence in the implementation of the sustainable WSP.

5.6 Recommendations

Based on the findings of the study, the researcher recommends, for sustainable implementation WSP by MOWASSCO, there is a need for the company to identify various sources of finances, sufficient amounts of money to run its projects and clear the debts it owes various bodies. This shall enable the programme of sustainable water supply be successful, meet the people's needs today while taking care of the needs of the future population.

The study also recommends that the top management and other junior employees at MOWASSCO should embrace M&E at all levels and stages of operations so that sustainable

WSP is achieved by checking on areas that are deviating from the set objectives and corrections made. Also, technology and stakeholders play a significant role in the implementation of sustainable water supply programme. Therefore, modern technology must be integrated and continually advanced by procuring better technology, allocating more finances for technology and training both the employees and the consumers on the use of relevant technology that can favour the continual improvement of services delivery by MOWASSCO. The stakeholders like the government, donors, NGOs and the local community must be involved in all levels of addressing sustainable WSP implementation through resources mobilization, providence and management.

5.7 Suggestions for Further Research

1. This study was carried at MOWASSCO only; a similar study can be done on other water service provider companies that split from the former Coast Water Services Board.

2. A study can be carried out to find out the influence of community participation on the sustainability of the sustainable water supply programme by MOWASSCO.

3. Finally, owing to the weighty of programmes sustainability, an evaluation of the same research again can be redone in relation to the Sustainable Development Goals adopted from the previous MDGs.

REFERENCES

APS Consultants. (2013). *Report on the Assessment of the Capacity of Water Actors to Effectively Participate in Water Sector Reforms in Bondo District*. KWAHO/UNDP Initiative. Nairobi: Alternative Programme Solutions [APS].

Athi Water Services Board (2012).*[AWSB] Athi Water Services Board Draft Informal Settlements Policy.* Nairobi: Athi Water Services Board.

Australian Bureau of Statistics. (2013). *Measuring Australia's Progress:* Inland Waters. Canberra: Author.

Australian Research Centre for Water in Society (ARCWIS).(2012). *Perth Domestic Water- Use Study Household Appliance Ownership and Community Attitudinal Analysis 1999- 2000.* Sydney: CSIRO Urban Water Program.

African Union.(2011). *Sharm El-Sheikh Commitments for Accelerating the Achievement of Water and Sanitation Goals in Africa. Declaration I. Assembly of the African Union,* Eleventh Ordinary Session, 30 June-1 July, Sharm el-Sheikh, Egypt. *www.africa-union.org/*

African Union.(2012).*Sharm El-Sheikh Commitments for Accelerating the Achievement of Water and Sanitation Goals in Africa. Declaration I.* Assembly of the African Union, Eleventh Ordinary Session, 30 June-1 July, Sharm el-Sheikh, Egypt. www.africa-union.org/

Ahmad, S.M. and Talib, A.N. (2011).*External factors that inhibit community participation in development,* International Journal on Economic and Resources, 1: 16-22.

AMCOW (African Ministers Council on Water). (2011). *AMCOW Country Status Overviews-Regional Synthesis Report. Pathway to Progress: Transitioning to Country Led Service Delivery Pathways to meet Africa's Water Supply and Sanitation Targets*. Washington, D.C: The World Bank/Water and Sanitation Program.

ApeliWesonga Christine. (2015). *Determinants of Sustainability of Donor Funded Water Projects: A Case of Water Resources Users Associations in Bungoma County Kenya.* School of Continuing and Distance Education.University of Nairobi.

Asian Development Bank (ADB). (2010). *Impact of Rural Water Supply and Sanitation*. Independent Evaluation Department, Pakistan.

Boakye, E. and Nyieku, L. E. (2010).*Cost Recovery Analysis of Ghana Water Company Limited (Gwcl): A Case Study of Sekondi-Takoradi Metropolis.* European Journal of Scientific Research,.46(1),119-125

Bennett, N. (2010). *Sustainable Livelihoods from Theory to Conservation Practice*: An Extended Annotated Bibliography for Prospective Application of Livelihoods. Victoria, Canada.

Campbell-Lendrum, D., C. Corvalán, and M. Neira. (2012). *Global Climate Change: Implications for International Public Health Policy.* Bulletin of the World Health Organization 85: 235-37.

Carlevaro F and Gonzalez C. (2011).*Costing improved water supply systems for low-income com munities: a practical manual. CDROM.* World Health Organization, Geneva.

Comprehensive Assessment of Water Management in Agriculture. (2013).*Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture.* London: Earthscan, and Colombo: International Water Management Institute.

Christina L. (2010).*Evaluation of NGO International Development and Humanitarian work, briefing on practices and debates in evaluation,* Water Aid.

Cooper and Schindler.(2008). *Business Research Methods*. 10th Edition, New York: McGraw Hill Irwin.

Creswell, J. W. (2007). *Qualitative inquiry & research design*: *Choosing among five approaches*. 2nd ed.; Thousand Oaks, CA

Cronbach, L. J. (1951). *Coefficient alpha and the internal structure of tests*.Psychometrika. 16, 297-334.

Demombynes, G., and Trommlerova, S.K. (2012).*What Has Driven the Decline of Infant Mortality in Kenya? Policy Research Working Paper 6057.* The World Bank, Africa Region.

DFID, (2010).*Sustainable Livelihood*. DFID, London.

DFID, (2011).*Sustainable Livelihood*. DFID, London.

El-Sadek, A. (2011).*Virtual water: An effective mechanism for integrated water resources man agement.*doi:10.4236/as2011.23033 for efficient utilization of scarce water resources in semi-arid regions of Rajasthan, India. Water Resources Management, 18: 219−235

EWASCO, (2012).*5th Annual General Meeting*. Embu: EWASCO.

Haines, A., R. S. Kovats, D. Campbell- Lendrum, and C. Corvalan. (2011).*Climate Change and Human Health: Impacts, Vulnerability and Public Health.* Public Health 120 (7): 585-96.

International Rivers (Organization). (2013). *Technical Challenges.* Retrieved December 3, 2013 form http://www.internationalrivers.org/files/attached-files/rrdecompt4.pdf

IPCC (Intergovernmental Panel on Climate Change).(2010).*Technical Paper on Climate Change and Water.*IPCC-XXVIII/ Doc. 13, Intergovernmental Panel on Climate Change, Geneva.www.ipcc.ch/meetings/session28/doc13.pdf.

IRC International Water and Sanitation Centre.(2011). *Lessons for Rural Water Supply.* Assessing progress towards sustainable service delivery, Ethiopia.

Kerlinger, F. D. (2002*). Foundations of Behavioral Research.* Delhi: Subject Publication

Kombo, D. K. and Tromp D. L. A. (2006).*Proposal and Thesis Writing an Introduction.* Makuyu, Kenya: Pualines Publications Africa.

Kvale, S. (2007).Doing interviews. Thousand Oaks, CA: Sage.

Kasomo, D., (2006). *Research Methods in Humanities and Education*. Egerton University, Kenya.

Kothari. (2007).*Research methodology: Methods and techniques*. (2nd ed): New Age International publishers. Delhi, India.

Lockwood, H. and Smits, S. (2011).*Supporting Rural Water Supply.Moving towards a Service Delivery Approach.* Practical Action Publishing Ltd. Warwickshire, UK

Malindi Inquiry Report.(2011). *www.ujamaakenya.org, www.mustkenya.or.ke.*

Marvin B, (2013).*Dependent disabled and dependent poor.*The University of Chicago Press.

Michael J. (2010*). Reliability and validity,* Western International University.

McNamara, C. (2009). *General guidelines for conducting interviews*. Washington, DC: USAID.

Millennium Community Development Initiatives. (2010): *Community Guide to Water Act 2002*. Nairobi Kenya.

Ministry of Water and Irrigation. (2012). *Annual Water Sector Review 2011-2012.* Nairobi, Kenya.

Moraa, H., Albert Otieno, A. and Salim, A. (2012).*Water governance in Kenya: Ensuring Accessibility, Service delivery and Citizen Participation* .Nairobi: Hub Research

Moss, J. (2010).*Water ethics and business.*Water Ethics Taylor & Francis. http://dx.doi.org/10.1201/9780203875438-c15

Mugenda, A. and Mugenda. (1999). *Research Methods:* Quantitative and Qualitative Approaches. Nairobi: Act Press.

Mugenda and Mugenda. (2003). *Research methods: Quantitative and qualitative approaches.* Acts Press, Nairobi, Kenya.

Mukunga, Faith (2012). *Influence of community participation on performance of Kiserian dam* (Unpublished thesis, Masters of Arts). University of Nairobi, Kenya.

Mumma, A., Lane, M., Kairu, E., Tuinhof, A. and Hirji, R. (2011).*Kenya, Groundwater Governance case study.* Washington, DC: World Bank

Murni Po, Juliane D. Kaercher and Blair E. Nancarrow. (2013). *Literature Review Of Factors Influencing Public Perceptions Of Water Reuse*. www.clw.csiro.au

Muruta S. (2010).*Community development in Zimbabwe: the role of community based organizations,* Southern Institute of peace building and development Ruwa, Zimbabwe.

Mwamburi K. Everlyne. (2013).*Factors Affecting Access Of sustainable Water Supply in Kisauni Area, Mombasa County, Kenya*.Department of Geography & Environmental Studies, Faculty Of Science of the University of Nairobi.

Mwangi Mary Wanjiru. (2014). *Determinants of Sustainability of Community Water Projects in Kieni East District, Nyeri County*.University Of Nairobi.Unpublished.

National Drought Management Authority. (2014). *Tana River-Monthly Bulletin, A National Population Conference, Managing Population to achieve vision 2030: Final Report*. KICC, 15-17th November, Nairobi Kenya.

Njagi, Kagondu. (2013, June 3). *Community dams aim to build water security in arid Kenya.* Retrieved December 2, 2013 from http://www.trust.org/item/20130603103952-mba98/

NyaguthiiE, and Oyugi A. (2013). *Influence of Community Participation on successful implementation of Constituency Development Fund Projects in Kenya: Case Study of Mwea Constituency.*University Of Nairobi.Unpublished.

Nyonje, Kyalo&Mulwa. (2012). *Monitoring and Evaluation of Projects and Program.* Aura Publishers, Nairobi, Kenya.

OCHA. (2010).*Water Scaricty and Humanitarian Action: Key Emerging trends and challenges*. OCHA Policy Development and Studies Branch.

Odie, M.S. (2012). *Community Related Variables Influencing Sustainability of Water Projects in district.* A Case of UNICEF Funded projects Under UNICEF WASH Programme, Kenya. M.A Thesis. University of Nairobi, Nairobi, Kenya.

OECD. (2011). *Environmental Policy: How to Apply Economic Instruments, The Organization for Economic Cooperation and Development*. Paris, France.

Oraro, E. J. (2012). *Determinants of Delays in Construction of Community Water Projects in district.* A Case of GOK UNICEF WASH Programme. M.A Thesis. University of Nairobi. Nairobi, Kenya

Oregon P. (2011). "*Project sustainability manual" How to incorporate sustainability into the project cycle.* Mark O. Hatfield School of Government, Portland State University Programme 2010- 2014, File 104. 806

PRESA.(2011). *Institutional and policy requirements for Sub-Sector Issue No 3*. Nairobi: Pressa.

Sittoni, T. (2011).*Water and Sanitation Program (WSP) Global Partnership on Output-Based Aid (GPOBA) Public-Private Infrastructure Advisory Facility (PPIAF) (2011).* Washinton, DC: World Bank

Stockholm Environment Institute. (2014).*Sustainable Pathways to Attain the Millennium Development Goals:* Assessing the Key Role of Water, Energy and Sanitation. Stockholm: SEI**.**

Tiwari, C. and Bonaya, A. W. (2011).*Professionalizing O&M - The Way Forward to Sustainable Rural Water Services in Kenya.* Nairobi: SNV Kenya

The Millennium Development Goals Report. (2012). *United Nations,* New York.

The Millennium Development Goals Report. (2012). United Nations, New York. *http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2012/English2012.pdf*. Accessed 2012

The World Bank. (2014). *The World Bank Group,*n.d. Web. 27 Nov. 2013. http://siteresources.worldbank.org/INTINVRES/Resources/DisplacementResettlementRehabilitationChinasoc203.pdf

The Times.(2011). *"Crops for a Drought."Times Online,* 27 November 2014. http://www.timesonline.co.uk/tol/news/uk/ article2951028.ece.

UN.(2010). *Water, a shared responsibility.The United Nations World Water Development Report-2 UNESCO and Berghahn Books*, Paris and London.

UNESCO.(2010). "*Water, a Shared Responsibility," the 2nd United Nations World Water Development Report.*United Nations Educational, Scientific and Cultural Organization, 2009.http://unesdoc.unesco.org/ images/0014/001454/145405E.pdf

United Nations.(2015). Development programme evaluation office - Handbook on Monitoring and Evaluating for Results.http://web.undp.org/evaluation/documents/handbook/me-handbook.pdf

United Nations Environment Programme (Organization). (2013, December 1).*Dams and Development Project.* Retrieved December 1 from http://www.unep.org/dams/WCD/

UNFPA (United Nations Population Fund). (2012). *"Water: A critical Resource".* UNFPA, New York.

UN-Water. (2010). *Coping with water scarcity*: a strategic issue and priority for system-wide action.

UNDP-World Bank. (2012).*The Millennium Development Goals Report*. New York, UN.

United Nations Development Programme [UNDP]. (2014). *Human Development Report 2006. Beyond Scarcity: Power, Poverty, and the Global Water Crisis.* London: Palgrave Macmillan.

United Nations Human Settlements Programme [UN-HABITAT.]. (2011). *Water and Sanitation Trust Fund Impact Study Series.Kenya Country Impact Study.* Nairobi: UN-HABITAT.

UWAZI, (2014).*It's our Water too!*Bringing greater equity in access to water in Kenya-Policy brief.

UWAZI report.(2011).*Mkukuta Annual Implementation Report (2006-2007).*Progress, Challenges and the way forward.By Anna Mwasha.

Wagah, G. G., Onyango, G. M. and Kibwage, J. K. (2010).*Accessibility of water services in Kisumu municipality, Kenya.* Journal of Geography and Regional Planning, 3(4), 114-125.

WASREB Impact Report.(2012). *A performance Report of Kenya's Water Services Impact Report.* Nairobi: WASREB

WASREB.(2012). *Water and Sanitation Coverage.* Sub-Sector Issue No 3. Nairobi: WASREB

WaterAid. (2011). *Sustainability Framework.*WaterAid's Website – www.wateraid.org/publications

Wiersma ,W. (1999*). Research Methods in education*: An Introduction. Itasca (USA): F.E. Peacock Publishers.

WHO.(2012).*Reducing Risks, Promoting Health Life*. World Health report Geneva.

WHO and UNICEF. (2013).*Joint Monitoring Programme for Water Supply and Sanitation*. WHO Library Cataloguing-in- Publication Data Internet: Accessed July 03 2012 from: http://en.wikipedia.org/wiki/Economichttp://daccess-dds-ny.un.org/do

WHO.(2014).*Meeting the MDG Drinking Water and Sanitation Target*.A mid-term Assessment of Progress. Geneva.

World Bank. (2010). "*Shoring Up Water Infrastructure."World Bank Website*, as accessed on 10 August 2014. http:// go.worldbank.org/I7M6HR9BP0

World Bank. (2011). *World Development Indicators*, 2005, http://books.google.co.uk/books?id=XuISLieRRrsC&dq

World Bank.(2012).*Country Status Overview of Water Supply and Sanitation Kenya*, Consultation draft. Nairobi.

World Water Assessment Programme. (2010). *The United Nations World Water Development Report 3:* Water in a Changing World. Paris: UNESCO Publishing, and London: Earthscan. www.unesco.org/water/wwap/wwdr/wwdr3/.

WWF.(2013). *Dam facts and figures*. wwf.panda.org. org. Retrieved November 23, 2013, from http://wwf.panda.org/what_we_do/footprint/water/dams_initiative/quick_facts

WWF.(2013). *Dam Solutions – Alternatives &mitigation.WWF.* Retrieved November 23, 2013, from http://wwf.panda.org/what_we_do/footprint/water/dams_initiative/dams/alternatives

Xinhua News Agency.(2013). *"Clean, Safe Water for All Chinese Rural Residents by 2015*." China.org.cn, 5 September 2010. http://www.china.org.cn/english/2006/Sep/180067.htm.

WHO.(2010). *Guidelines for Drinking-Water Quality*. World Health Organisation, Geneva.

Appendices

Appendix i:

Letter of Introduction

David Ngumbao

P.O Box (Private Bag)

Mombasa.

Dear participant,

My name is David Ngumbao and I am a student undertaking a Master of Arts Degree in Project Planning and Management at the University of Nairobi Mombasa campus. To fulfill the completion of this course, I am carrying out a study on the determinants of sustainable water programme implementation in Kenya with a specific bias to MOWASSCO. Since the matter affects the whole community of which you and I live, I am inviting you to participate in this research study by completing the attached questionnaire and answer the questions sincerely.

If you choose to participate in this research, please answer all questions as honestly as possible. Participation is strictly voluntary and you may decline to participate at any time. In order to ensure that all the information will remain confidential, you do not have to include your name. The data collected will be for academic purposes only.

Thank you.

Yours faithfully

…….

David Ngumbao

Appendix ii:

Research Questionnaire

Section A:

Background Information

(Use a tick where a box is left).

1. Your gender:

Male [ ]

Female [ ]

2. Your age bracket

18-28yrs [ ]

28 - 38 Years [ ]

38 - 48 years [ ]

48 years and above [ ]

3. Education level?

Secondary certificate [ ]

Diploma/certificate [ ]

Bachelors' degree [ ]

Postgraduate degree [ ]

4. Working Experience

a) Less than 2 year ( ) .b) 2-4 years ( ) .c) 4-6 years ( ) .d) 6 years and above ( )

Section B: Questions in Relation to the Objectives

I. Questions in Relation to Financial Resources

1. In your own opinion, do you think that financial resources have an influence in theimplementation of sustainable water supply and sanitation services programme in MOWASSCO?

Yes ( ) No ( )

2. With relevant evidences/examples, support your answer in one (1) above.

---

3. On a likert scale rating indicate the extent to which you agree or disagree with the following statements? Use a scale of 1-5 where 1= strongly disagree; 2 = disagree; 3 =weakly agree; 4 =agree; 5 = strongly agree.

Statement	**1 2 3 4 5**
Sources of finances have an influence in the implementation of sustainable water supply programme in MOWASSCO.	
Amount of finances allocated for the implementation of sustainable water supply programme in MOWASSCO are limited and thus influence the process of implementation.	
Funds allocated for normal operations of planned and impromptu activities in MOWASSCO are limited and thus influence the process of implementation.	
Financial resources from both the donors and government allocated for technology are greatly influencing the success of MOWASSCO programme.	

II. Monitoring and Evaluation

1. Do you think that Monitoring and Evaluation has an influence in the implementation of sustainable water supply programme in MOWASSCO?

Yes ( )

No ( )

2. Support your answer in 1 above with evidences.

---

3. Indicate to what extent do you agree or disagree with the following statements in relation to health and communal water projects implementation? Use a scale of 1-5 where 1= strongly disagree; 2 = disagree; 3 =weakly agree; 4 =agree; 5 = strongly agree.

Statement	**1 2 3 4 5**
There is a pronounced and structured M&E process in MOWASSCO that has favored services delivery. Formative evaluation is effective in MOWASSCO. Continuous evaluation has been integrated and is effective at MOWASSCO. Summative evaluation is embraced and regular in all the projects within the MOWASSCO long term programme.	

III. Technology

1. Do you think that the integration of technology in the operations in this company has an influence in the success of the implementation of sustainable water supply programme?

Yes ( )

No ( )

2. What are some of the reasons for your support of the answer in 1 above?

……

……

3. On a scale with:(1= Strongly disagree; 2 = Disagree; 3 =weakly agree; 4 =Agree; 5 = Strongly agree.) **,**show how you agree or disagree with the following arguments as they are linked to the influence of technology and the success of MOWASSCO programme.

Statement	**1 2 3 4 5**
The choice of technology to be employed by MOWASSCO has an influence in the implementation of various said programmes. Technology production has an influence in the provision of MOWASSCO services. Lack of efficient technology for water distribution at MOWASSCO has been negatively influencing its programme implementation. Technology for billing and rates collection has been an issue that has influenced the success of MOWASSCO programme implementation for long. Technology for maintenance of the various apparatus and machinery used in services delivery has an influence in the implementation of MOWASSCO programme.	

IV. Stakeholders

1**.** Do you support the idea that stakeholders have an influence in the implementation of sustainable water supply programme in MOWASSCO?

Yes ( )

No ( )

2. Support your answer in 1 above.

---

3. Name some major stakeholders you believe that have an influence in this company.

i. ……

ii. ……

iii. …….

iv. …….

4. Rate the extent to which you agree or disagree with the following statements. Use a scale of 1-5 where, 1= strongly disagree; 2 = disagree; 3 =weakly agree; 4 =agree; 5 = strongly agree.

Statement	**1**	**2**	**3**	**4**	**5**
The surrounding community has been a major stakeholder to MOWASSCO through the providence of laborers, land, being consumers and many more. The government through the various agencies has been a stakeholder that Provides laws, guidelines, finances and other relevant products for MOWASSCO programme implementation.					