FACTORS INFLUENCING SUSTAINABILITY OF WATER PROJECTS IN SLUM AREAS OF NAIROBI COUNTY: A CASE OF MAJI NI MAISHA WATER PROJECTS

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DECLARATION

I declare that, this is my original work and has not been presented for a graduate degree in any other university.

Signature_____Date_____

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This Research Project Report has been submitted for examination with my approval as university supervisor.

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DEDICATION

I dedicate this work to my mother Mrs. Gladys Banchiri Mochiemo, my brother Franklin and sister Geraldine for their support and encouragement that has always inspired me to work hard with determination in life.

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ABBREVIATIONS AND ACRONYMS

USAID	United States Agency for International Development
M&E	Monitoring and Evaluation
PM&E	Participatory monitoring and evaluation
RWS	Rural Water Supply
GOK	Government of Kenya
WSP	Water Supply Project
WS & S	Water Sanitation and Supply
NGO	Non Governmental Organizations Nairobi
CWP	Community Water Projects

ABSTRACT

The implementation of water supply projects especially in the rural areas has been the focus of successive governments in Kenya. Thus over the years many millions of dollars are invested by national governments and international donor agencies alike in sustainable water projects, however many fail to maintain the flow of expected benefits to the beneficiaries. The main purpose of the study was to investigate the factors affecting sustainability of water projects in Kenya with particular reference to Maji ni Maisha water project. The specific objectives of the study included the influence of project financing, community participation, governance and monitoring and evaluation on sustainability of water projects. The study used descriptive research design in collecting data for the study because it usually provides rich detail about the project. The target population comprised of two (2) project coordinators, ten (10) project managers and seventy eight (78) operational staff from Maji ni Maisha water projects in Nairobi County. The researcher used stratified random sampling. The data for the study was collected using the questionnaires. Quantitative data was analyzed using correlation and regression with the aid of Statistical Package for Social Sciences (SPSS17.0). The study established that water projects sustainability are influenced by financing, governance, community participation and monitoring and evaluation to high levels as project implementation and management require sufficient funding drawn from varying financial sources so as to ensure efficiency and timely procurement and maintenance of required skills, equipment and facilities. Governance is of importance in project management and performance as it provides a framework for project accountabilities and responsibilities. Community participation is essential in successful design, implementation, management, performance and sustainability of the project. There is lack of professional and technical supervision, low community participation in monitoring due to the inadequacy of data and general information. I recommend provision of general education and information and use of participatory tools such as participatory urban appraisal and many others are valuable particularly for initiating beneficiary participation processes for neighbourhood and design initiatives for local projects. The project management should effectively control use of resources by analyzing resource utilization on a regular and timely basis so as to be able to identify resource variances and inefficiencies early so that corrective action can be taken before the situation gets worse.

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

According to a report of USAID (2009) more than one billion people do not have access to safe drinking water and over 2.5 billion people have inadequate sanitation. In Africa around 300 million people do not have access of safe drinking water and 313 million have no access to sanitation. Hence national and county governments, local and international NGOs and other concerned organizations invest large sums every year for the implementation of Urban Slum water supply projects (Gebrehiwot, 2006). However, construction of water projects does not help if they fail after a short time.

1.1.1 The Concept of Project Sustainability

In order to make the investment in water supplies more effective, water projects should be sustainable (Gebrehiwot, 2006). According to Espinosa (2000) sustainability can be defined as the ability of a project to maintain its operations, services and benefits during its projected life time. While World Bank (2000) in a study of sustainability of integrated rural development projects, defined it in term of the percentage of project-initiated goods and services that is still delivered and maintained five years past the termination of donor resources.

Project Management Institute (2006) points out that there are several dimensions to project sustainability and depending on the nature of a sector or a project each of these dimensions has the capacity to influence project sustainability in one way or another. These dimensions include: continued operation and maintenance of project facilities; continued flow of net benefits; continued community participation, equitable sharing and distribution of project benefits, Institutional stability and Maintenance of environmental stability. IFAD (2006) acknowledges that consideration of all these dimensions is key to sustainability of projects. Experience suggests that weakening of any one of these has the potential to jeopardize the sustainability of the entire project, in the long run.

1.1.2 Factors that influence Project sustainability

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, adequacy of policies and legislation and factors controlled by the project like; training, technology, cost of the project and construction quality (Bhandari & Grant, 2007). Rudqvist and Woodford-Berger (1996) emphasis the importance of strengthening monitoring and evaluation in attaining project sustainability. In addition, some of the factors that affect the sustainability of Urban Slum water supply systems, are: lack of involvement of the community in selection of site and technology, implementation, operation and maintenance of the water source, lack of finances at the community level for operation and maintenance of water sources, use of complicated technology without proper capacity-building at community level (Gizachew, 2005).

1.1.3 Relationship between influencing factors and project sustainability

Enhancing the capacity of the community in planning, implementation, development and maintenance of Urban Slum water supply systems are the first step towards the sustainability development of Urban Slum water supply schemes (UNICEF, 1999). Involvement of the communities is crucial for the sustainability of rural water supply systems. As the community provides volunteer or low-cost labor during construction or contributes locally available materials, the sense of ownership increases and this involvement in the planning stage of the project may provide the local knowledge necessary to avoid using a water source that would be inappropriate for cultural reasons (UNICEF, 1999). If the operation and maintenance program of a water project is designed by the community, the project will function much better than when the program is designed by outsiders and the consequence will reduce the repair cost

In his view Kerzner (1998) points out that institutional development, beneficiary participation, provision for recurrent cost financing, adequacy of maintenance procedures, and accessibility of services to the intended target groups, together affect the

sustainability of a project. Other factors, such as external policies and institutional context, will also have a direct influence on project implementation, but are typically outside project control. For example, the sustainability of donor supported interventions is likely to be compromised in areas characterized by weak institutions, lack of markets, lack of income-generating opportunities, or in fragile states experiencing civil conflict.

Over the past three decades, experience has shown that water and sanitation activities are most effective and sustainable when they adopt a participatory approach that acts in response to genuine demand, builds capacity for operation and maintenance and sharing of costs, involve community members directly in all key decisions, develop a sense of communal ownership of the project, and uses appropriate technology that can be maintained at the village level. Also important are educational and participatory efforts to change behavioral practices (USAID, 2009). Involving the users in the planning, implementation, operation, protection and maintenance of water supply systems meaningfully is the key to sustainability. Community members' contributions might take the form of money, labor, material, equipment, or participation in project-related decision-making and meetings (Davis and Liyer, 2002).

1.1.4 Maji ni Maisha Water projects in Nairobi County

Access to Urban Slum water supply remains low in Kenya. In particular, access to piped water has only increased from 9 to 10 percent of Urban Slum households over the past eight years. Small community-based water providers are seen as part of the solution and are supported by the Water Sector Act of 2002, which introduced regulatory and tariff reforms. The Water and Sanitation Program (WSP) Africa began to work with a local microfinance bank, K-Rep Bank, to explore structures under which a commercial financier would be interested in providing loan finance to small community-based water providers. WSP carried out two case studies that identified a number of constraints, including affordability of capital investment, limited collateral available, and small water providers' limited capacity to develop projects. The studies, which were funded by the Public-Private Infrastructure Advisory Facility (PPIAF), led to a proposal for a pilot project targeting five districts around Nairobi. In 2006, the Global Partnership on Output-

Based Aid (GPOBA) approved US$1.15 million in grant funding for the scheme to be implemented by K-Rep Bank and supported by WSP.

The project aims to increase access to and efficiency in water supply services for the poor in rural and peri-urban areas of Kenya. Its Swahili name is 'Maji Ni Maisha' which means 'Water is Life.' Innovative financial structure "This project is facilitating access to finance for community-based water providers by blending output-based subsidies and commercial finance. It is the first GPOBA-funded project to use this combination of instruments, so we are eager to share the results," said Patricia Veevers-Carter, GPOBA Program Manager. Under the scheme, the financing is provided on a project finance basis. The community provides equity (20 percent of project cost) and K-Rep finances the remaining percent through a loan with a maximum tenor of five years. The longer tenor of the loan is made possible through the output-based subsidy which repays up to half the loan, typically after 18 months. It also makes the monthly repayments more affordable for the community. The subsidy is released once a subproject achieves the agreed "outputs" which include number of new connections and average monthly revenue.

1.2 Statement of the Problem

The implementation of water supply projects especially in the rural areas has been the focus of successive governments in Kenya. Thus over the years many millions of dollars are invested by national governments and international donor agencies alike in water project implementation. Despite ever increasing attempts to tackle the problem, many fail to maintain the flow of expected benefits to the beneficiaries. The government estimates that at any given moment a significant proportion of rural water supply systems may be inoperable or abandoned completely (GoK, 2010). It is estimated the failure rate may be as high as sixty percent (60%) of projects not meeting either partially or totally their stated objectives by the end of their duration (GoK 2009).

Given this troublesome situation, a rational conclusion would be that within water sector agencies, the application of strict project implementation practices is not adhered to. For

instance ADF (2005) report shows that about 33% of rural water supply projects in Ethiopia are non-functional due to lack of funds for operation and maintenance, inadequate community mobilization and commitment, less community participation in decision making as well as lack of spare parts. Harvey and Reed (2007) report showed that community issues like perceived lack of ownership, lack of education on water supply and sanitation, poor management system and limited demand are related to low sustainability rates of water supply systems (Harvey & Reed, 2007). As the level of investment in rural water supply by the increases, both through stand-alone and multi-sector projects, more precise information is needed about what factors contribute to, or undermine, long-term sustainability of projects.

In recent years there has been an increasing focus on, and understanding of implementation phases of rural water projects as part of efforts to make projects more sustainable successful and work more efficiently. The World Bank (1996) undertook research undertaken to try to understand the linkages between project implementation rules and sustainability. Garande (2005) in his study on project sustainability pointed out that the ,long term sustainability of projects may be undermined by a number of factors such as: the lack of follow-up support to help communities resolve disputes or to expand systems successfully as the population increases, the lack of affordable spare parts, the lack of technical skills to carry out preventative maintenance, a lack of understanding of hygiene linkages or the absence of refresher training courses . Carter, Tyrrel & Howsam, (1999) in their study acknowledged the necessity of examining what kinds of institutional arrangements have been put into place by projects for the post-construction phase, if these are being implemented, and whether they are working. However there has been no study of water projects that focuses on the post- project phase in Kenya so as to establish their sustainability in order to ensure that large investments in rural water projects are not being wasted. Therefore this research study sought to examine the factors influencing sustainability of Water projects in Nairobi County.

1.3 Purpose of the study

The purpose of the study was to investigate the factors influencing sustainability of Water projects in Nairobi County. A case of Maji ni Maisha Water projects.

1.4 Objectives of the study

The following specific objectives guided the study:

i) To determine the influence of financing on sustainability of Maji ni Maisha Water projects in Nairobi County
ii) To assess the influence of community participation on sustainability of Maji ni Maisha Water projects in Nairobi County
iii) To analyse the influence of governance on sustainability of Maji ni Maisha Water projects in Nairobi County
iv) To determine the influence of monitoring and evaluation on sustainability of Maji ni Maisha Water projects in Nairobi County

1.5 Research Questions

i) How does project financing influence sustainability of Maji ni Maisha Water projects in Nairobi County?
ii) To what extent does community participation influence sustainability of Maji ni Maisha Water projects in Nairobi County?
iii) What is the influence of project governance on sustainability of Maji ni Maisha Water projects in Nairobi County?
iv) How monitoring and evaluation influence sustainability of Maji ni Maisha Water does projects in Nairobi County?

1.6 Significance of the Study

The research study was significant to project managers and staff as it enabled them to appreciate and understand the importance of project sustainability and how they could be able to strengthen the project so as to achieve its sustainability. The findings of the study were significant to project beneficiaries as it enhanced their understanding of the importance of project sustainability and the need for their participation so as to advance the same. The study was of importance to project donors and sponsors who appreciated the importance of community participation, partnerships and monitoring in achieving project sustainability and worked to enhance these factors among others.

The study enhanced government officials knowledge and understanding on the role of community participation, partnerships, monitoring and evaluation in achieving project sustainability and apply the same to other projects initiated in Urban Slum areas. The study provided the background information to research organizations and scholars who will want to carry out further research in this area. The study also facilitated individual researchers to identify gaps in the current research in this area.

1.7 Limitations of the Study

The study collected data which was considered by some respondents as confidential hence were unwilling or be unable to provide direct answers to the questions asked. However, the researcher assured the respondents of the anonymity and confidentiality of the information given to ensure accurate responses.

1.8 Delimitation of the study

This study was narrowed to Slum areas of Nairobi County, because the slums have many water projects that do not operate to their full potential. The study focused on the influence of project governance, stakeholders' participation, project resources and project monitoring and evaluation.

1.9 Assumptions of the study

The research study assumed that the respondents would give accurate and honest feedback without any bias.

This research also assumed that the respondents understood and answered the questions in the questionnaire correctly and willingly returned the filled questionnaires and within the postulated timeframe without any external negative influence.

1.10 Definition of Significant Terms

Community Participation: Involvement of multiple stakeholders in the design and implementation of observing, systematizing and interpreting processes as a basis for joint decisions about their joint activities.

Evaluation: Refers to systematic assessment of completed projects so as to determine relevance, effectiveness, efficiency, impact and sustainability

Implementation Means ensuring that system development is completed and that the system functions adequately in a technical sense.

Monitoring Refers to the systematic and routine collection of information from projects for the purpose of learning, internal and external accountability and of taking informed decisions.

Project A temporary endeavor, having a defined beginning and end, usually constrained by date, funding or deliverables, undertaken to meet unique goals and objectives

Project Finance	Refers to financing of long term infrastructure project and public services based upon a non-recourse financial structure
Project Governance	Refer to the management framework within which project responsibilities, accountabilities and decisions are based and made.
Project Sustainability	Refers to the ability of a project to maintain its operations, services and benefits during its projected life time

1.11 Organization of the study

Chapter one provides an introduction to the background and stimulus for this research project. The scope and context of the research are defined, and the research questions and sub-questions stated. The key research objectives are stated together and thereafter the limitations of the research are discussed. In chapter two, literature which is related to and consistent with the objectives of the study, is reviewed. Important theoretical and practical problems are brought out; relevant literature on the aspects pertaining to factors influencing sustainability of Maji ni Maisha Water projects in Nairobi County. Chapter Three presents the methods that the researcher used to collect data, conduct analysis, present and discuss the findings of the study. This includes details on the research design, categories of respondents and approaches to data collection. Also the ways through which the different data sets were analyzed and presented will be discussed.

CHAPTER TWO
LITERATURE REVIEW

2

2.1 Introduction

In this chapter, literature, which is related to and consistent with the objectives of the study, was reviewed. Important theoretical and practical problems we are brought out; relevant literature on the aspects pertaining to the factors influencing sustainability of Maji ni Maisha Water projects in Nairobi County were discussed.

2.2 Review of Literature

Important theoretical and practical problems we are brought out; relevant literature on the aspects pertaining to the factors influencing sustainability of Maji ni Maisha Water projects in Nairobi County were discussed.

2.2.1 Water Projects Sustainability

Sustainability is the ability of a project to initiate a process by which benefits are maintained. .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.

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. 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

2.2.2 Influence of Financing on Water Project Sustainability

The financing process, such as raising and maintaining adequate funding for water project facilities is of critical importance for sustainability (Kanji & Greenwood, 2001). 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 (Fierbusch, 1990**).** 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 (Vene Klasen & Miller, 2002).

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 (Garande & Dagg, 2005). 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 (Yacoob, 1990**)**.

Financial questions are intimately bound to many other factors, including context and technology (Kanji & Greenwood, 2001). 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 (Bell & Morse 2004). 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 (OECD**,** 1999).

Communities 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 (Narayan 1995). 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, 2004).

It is obviously important that the beneficiary community 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 in-kind, does not of itself ensure sustainability (Yacoob, 1990**)**.

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 (Bell & Morse 2004). AII 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 (Garande & Dagg, 2005).

The community's idea of the benefits it expects must be clearly ascertained. Some communities may not consider improved water quality important, placing greater value on access to increased volume of water or opportunities to profit from the sale of water to others (Vene Klasen & Miller, 2002). Communities must understand that they will be asked to bear the costs of services through user charges, household fees, or taxes imposed by a government agency or by a community management organization. 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 (Fierbusch, 1990**)**..

Availability of funds for recurrent costs is often seen as a major factor influencing the sustainable operation of a. Without adequate funding, proper operation and maintenance is not possible. The recurrent funding mechanism should provide a direct link between the source of funds and the provision of services.

Availability of credit from development banks or private sources may be a determining factor when major breakdowns occur or system components need replacing (World Bank, 2004). Access to credit is a significant limiting factor for community organizations and special arrangements with the banking sector may be needed project (OECD**,** 1999). In cases where government agencies are responsible for operation and maintenance, they must be allocated the requisite funds. Too often, user fees are remitted to national

headquarters or the national treasury, and allocations are not enough to cover expenses project (World Bank, 2004)

Community-managed operation and maintenance eliminates suspicions that agencies at the regional or national level might be exploiting the community and not providing the necessary support. It also places responsibility in the hands of those directly affected by service levels and any breakdowns that occur (OECD**,** 1999). However, community management is only as good as the funds to support it, and the sustainability of project benefits depends ultimately on the ability of the community to provide these funds (World Bank, 2004).

In the current fiscal climate in many countries, it is unrealistic to assume the water sector as a whole can continue to attract subsidies justified for social reasons. Even in Urban Slum areas there is increasing support for the view that high existing water costs (pre-project) paid by consumers mean that willingness to pay is adequate to cover all the costs of simple systems (WASH, 1993). The key is to provide a range of options to match that demand. In the water sector as a whole, there is a move away from using infrastructure services provision as a means of redistributing income. Subsidies, although motivated for the best of reasons, often appear to inhibit the development of sound financial management practices and conservation of resources based on their economic value (World Bank, 2004).

2.2.3 Influence of Community Participation on Water Project Sustainability

Community participation has been identified as a primary determinant of project sustainability and its relationship to project effectiveness has been estimated both qualitatively and quantitatively (Mayoux, 2005). Participation by community members in the identification, design, implementation and especially management stages can be understood in terms of the need and motivation of the community, as well as an indicator of community structure and cohesion. Various models of how communities participate in development projects are described by Chambers (2005), and include the full range and depth of community participation, from simple consultation by the community elite to the

full and active participation of a representative cross-section of a village or set of villages (Chambers 2005).

According to Kumar (2002) part of the rational for using participatory processes in development activities is that, it is now widely recognized that projects have a much greater chance of success, in addition to achieving a much higher level of effectiveness when participatory processes are used (Bell & Morse 2004). Approaches used to achieve community participation are numerous and diverse in their objectives, operational strategies, and results. It is important to understand how different participatory strategies work and what they can be expected to accomplish from the perspective of both the beneficiaries and the extension agent (Garande & Dagg, 2005).

A communication network is needed to ensure that beneficiaries are kept informed on matters affecting the project (Cleaver, 2001). Information includes such diverse items as changes in government policies, updating on prices for equipment and materials, reinforcing health messages, cautions on epidemiological concerns such as cholera, and announcements of upcoming meetings (Stieglitz, 1998). The extension agent is a critical link in two-way communication. The agent gives the community news about developments in the sector, reinforces messages on the project, and receives information about how the community is functioning and whether it is satisfied with its project (Garande & Dagg, 2005).

The current suite of tools development practitioners now use to engage communities in the identification and development of improved water and sanitation initiatives include group interviews, transect walks, mapping and ranking exercises (IFAD, 2006). These tools and methods may be used as part of a development team's strategy to assess the community demand and how individuals conceptualize current and potential future water use (Bell & Morse 2004)

2.2.4 Influence of Governance on Water Project Sustainability

Inherent in effective managerial systems is the need to obtain and enforce accountability which is a requirement for sound administration (Allen, 2004). Managerial positions

should be able to operate within a sound administrative system, supported by equally sound managerial practices that promote accountability (Brooks, 2002). Transparency is crucial for the maintenance of democratic management. If the organization is able to gain access to the results achieved through organization action, managers would be sensitive to the success achieved as lack of success could have serious consequences on the bottom line and the perception of shareholders (Chamoun, 2006).

The most often cited governance issues can be summarized as: reoccurrence of gaps between policies and their implementation reflected in poor performance, declining faith of the local community over organization's capabilities to deliver project product and services, increased irregularities and corruption, absence of value-based, administrative and management practices (Edwards, 1998). Weak institutional governance, despite the abilities shown by the leaders in bringing management observed through low commitment to implementation including low service-orientation on the part of employees (Harrin, 2007)

Management stands out as a major skill area that determines whether a project succeeds or fails (PMI, 2006). In donor-assisted projects, the team leader is often an expatriate consultant, and his/her performance can make or mar the outcome. The team leader must be responsive to the contractor, donor, and host government, each with its own interests and agenda. Under conflicting pressures, the team leader and his local counterpart must be able to steer a course that leads the project towards the accomplishment of its objectives and somehow wins the cooperation of all (Brooks, 2002).

Successful implementation of projects is invariably related to a manager's ability to recognize and use informal procedures, relationships, agreements, and communication channels (USAID, 1998). Behind-the-scenes relationships and maneuvers explain why things work or do not work. The ability to capture and guide informal dynamics characterizes outstanding managers." Rigid project designs, or emphasis on more visible results such as a certain number of facilities constructed, can make this difficulty (Allen, 2004)

Similarly, experience of the WASH Project demonstrated that coordination and collaboration in WS&S projects often depend more on professional networking and personal relationships than on institutional and contractual relationships (WASH 1990). Honadle and VanSant (1995) have concluded that .project designs should not trap implementers in rigid blueprints that eliminate opportunities to incorporate and evolve informal processes. Instead, a flexible and evolutionary approach is necessary." The ability to adapt to changing priorities is important. Things seldom turn out exactly as expected during the planning and design phases; the execution of a project often calls for modifications (Chamoun, 2006).

Porter and McKibbin (1998) note that more organizations require ‘leaders’ that can mobilise the organisation’s talents in pursuit of its aims, develop a culture that considers change as an opportunity rather than a threat, regularly re-invent the organisation, effectively plan and implement change, and develop networks and alliances rather than administer the status quo. In today’s environment managers are required to continuously transform the organization, develop a strong relationship with both internal and external stakeholders, operate in horizontal rather than vertical chains and across cultural divides, empower employees, and develop networks and alliances (Harrin, 2007)

The ability to motivate and unite staff in pursuit of common goal and possessing vision and the ability to clearly articulate it are key dimensions of leadership (World Bank, 2004). Leadership emerges as the key quality and is what distinguishes a successful manager from a less successful manager. Vision also emerges as an important distinguishing factor because without vision it is the past rather than the future that drives the organization (Harrin, 2007). Moreover, vision is useful when the environment is unpredictable, in turnaround situations, or when a significant change in culture is desired because it helps to galvanize and energize the organization. Integrity and fairness, components of ethical behaviour, are further key managerial qualities, distinguishing the successful managers from less successful managers (Allen, 2004).

Programs and projects which integrate with, and build on, local management structures have better prospects for promoting sustainability of benefits than those which establish

new or parallel structures (Brooks, 2002). The capacity of local agencies to manage (or absorb) new structures, systems, ideas and funds is often not adequately assessed, and over-optimistic assumptions can be made. Getting the management structure 'right' requires an adequate institutional analysis during the project design phase and this requires specific knowledge, skills and field time (Garande & Dagg, 2005).

Program and project designs must take adequate account of the capacity of local administrative systems to support staff and service delivery (Chamoun, 2006). For example: if local staff are not getting paid regularly, are not paid a living wage, travel allowances are not available, and their performance is not rewarded in any way, then their ability and willingness to work on program/project activities must be assessed accordingly (Harrin, 2007). While projects may then intervene by providing special incentives, sustainable outcomes are unlikely in such situations (Brooks, 2002).

Competent managerial leadership should be encouraged to guide adaptations and achieve sustainable outcomes (Chamoun, 2006). Donor supported programs and projects must be designed and managed so that they permit some flexibility in implementation. Designs must sometimes be phased and allowed to evolve as lessons are learnt, field-level managers must be able to respond quickly to changing needs and priorities, and administrative or financial management procedures must not be made burdensome (PMI, 2006).

2.2.5 Influence of Monitoring and Evaluation on Water Project Sustainability

Monitoring and evaluation, is particularly important to sustainability since it allows an ongoing review of project effectiveness (Espinosa, 2000). Key ingredient 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 M/E 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 (Rudqvist & Woodford-Berger 1996).

Monitoring and evaluation should be carried out with the participation of the beneficiaries, giving them the opportunity to decide on $he 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 (Plastow & Pantuliano, 2001).

According to Vernooy (1999) the direct involvement of the local people and organisations in monitoring and evaluating their development is a step in increasing their self-help capacity, like in meeting the project purpose. However many sponsoring organizations do not develop a monitoring system with functions that build the capacity of project partners and intermediaries from the local population to reflect, analyse and take action; to increase accountability to partners, beneficiaries, managers and donors (Chamoun, 2006).

According to Bennett and Gilson (2001) monitoring and evaluation of Projects are usually constrained by limited resources, stakeholder's participation and the cost of undertaking the monitoring and evaluation process. However, the situation can be mitigated by strong and effective capacities at the national level to manage and coordinate project financing which adequately cover monitoring and evaluation up to the community level to identify, prioritize, successfully implement and sustain projects (Raark, 1990).

Monitoring and evaluation should be carried out with the participation of the beneficiaries, giving them the opportunity to decide on the criteria of success (Allen, 2004). Evaluations should be used as a management tool to identify any deficiencies and to establish a course of action (World Bank, 2000)

2.3 Knowledge Gap

According to Bennett and Gilson (2001) water Projects are usually constrained by the inadequacy of financial resources that are needed to implement the same. Due to the imperatives of budgetary policies it is difficult to establish and resource project structures and associated institutions essential for effective implementation and the achievement of goals, except over the long haul. However, the situation can be mitigated by strong and effective capacities at the national level to manage and coordinate project financing up to the community level to identify, prioritize, successfully implement and sustain projects.
According to Kerzner, Harold (2003) and Clements and Gido (2003) the main problems in project implementation are related to costs since project costs in most cases are underestimated or the project goes over the budget. However, both do not explain the role of cost planning as a component of project planning in the overall implementation of projects. They have not also clearly explained the importance of the project implementation team's ability to adequately plan and provide the supporting detail for the cost justifications and the timing for project fund expenditure and in monitoring the expenditure.

According to Chamoun, (2006) there is a lack of professional and technical skills due lack of stakeholders' participation in most projects and which in turn leads to poor project quality and prioritization. However these authors generalized projects whereas other projects are too small and simply do not require the large manpower of technical staff. However it's agreed that project teams must be able to adequately recruit and train its staff effectively and also offer competitive salaries that can attract the best staff.

Heerkens (2001) admits that there is a lack of professional and technical supervision, which has led to poor project quality. However, most research has contextualized the challenge which is enhanced by low community participation in project management due to the inadequacy of data and general information about the projects in Kenya.

According to (Besley, (2006) project governance is a critical element of any project since it provides a framework for the accountabilities and responsibilities associated with an organization's capital investments (projects). While the accountabilities and

responsibilities associated with an organization's business as usual activities are laid down in their organizational governance arrangements, the public sector project governance is marred by corruption and management malpractices which have not been addressed by most researchers.

Bhavesh, (2006) argues that in general, the more informal rapid Urban Slum appraisal techniques best suit the needs of project-level management; however, in monitoring and evaluation of operations, project design teams are generally giving insufficient attention to adequate planning of monitoring and evaluation systems, to setting priorities for information needs, and to estimating monitoring and evaluation staffing and support costs. Follow-up technical assistance and training efforts for project monitoring and evaluation staff are also found to be lacking in many cases. Technical advisers who are assigned monitoring and evaluation responsibilities often lack appropriate skills for evaluation and the pertinent experience.

Cooke-Davies (2002) and Pinto and Prescot (1988) note, there has been disagreement on a single set of determinants to predict project sustainability. Indeed Cooke-Davies (2002) indicated that a gap exists in project management and business literature with respect to the comprehensive factors supporting project sustainability (Cooke-Davies, 2002; Hyväri, 2006). This research study sought to obtain new knowledge with the intention of finding out the determinants of effective public project performance in Urban Slum areas.

2.4 Theoretical Framework

The theories underpinning the study comprised of and distributive theory and aggregative theory. Distributive Theory developed by Pezzey (1992) posits that **t**here are many different definitions of sustainability. Most of them share the notion that future generations should not be worse off than people living today. Underlying these definitions is the premise that all people, present and future, have the same right to a decent life, and the question posed by sustainability is how to allocate resources in a way to guarantee this basic right. A distributive theory cares about the distribution of welfare (or any other metrics) among the generations. It will not care about the size of the cake,

but about how it is sliced. According to the Brundtland commission (WCED, 1987), a sustainable development meets the needs of the present generation while still allowing future generations to meet their own needs. The Brundtland Commission's (WCED, 1987), definition of sustainable development stresses the consideration of the needs of the present generation and of future generations, and has prompted others (Beltratti, 1995; Munasinghe & Shearer, 1995) to promote equity as one of a number of objectives required for sustainability. Jacobs (1993) and Weiss (1995) state that sustainability requires consideration of the fairness of impacts both on the present generation and on future generations.

Aggregative Theory proposed by Marsh & Schilling (1994) calls for the maximization of intergenerational welfare, such as. making sure that the cake of welfare, taken over the present and future generations is as large as possible. In the concept of welfarism., the maximization of the sum of individual utilities is replaced by the maximization of a more general function of the individual utilities. The just distribution of resources is that which equalizes welfare among individuals .Rawls (1971) and Sen (1980) hold that resources are the appropriate base, but that there are different kinds of resources that are of varying importance for a theory of justice. Rawls (1971) holds that, despite individual tastes for goods, there are certain basic goods that all people would rather have more of than less. Examples are basic liberties such as the right to move freely, to choose a profession, or the possibility to participate in society. Sen (1980, 1999) holds that not the goods themselves are important, but what these goods can do for people, i.e., their „functioning for instance, the functioning of bread is to provide nourishment, the functioning of a bicycle is to provide transportation, or the functioning of a democratic election is to enable people to participate in the decision making

2.5 Conceptual Framework

The study was conceptualized in a framework explaining the relationship between the independent variables (factors) which include, project finance, community participation, management/governance issues and monitoring and evaluation and how they influence

sustainability of water projects which is the dependent variables (outcomes) as shown in the schematic diagram below 1.

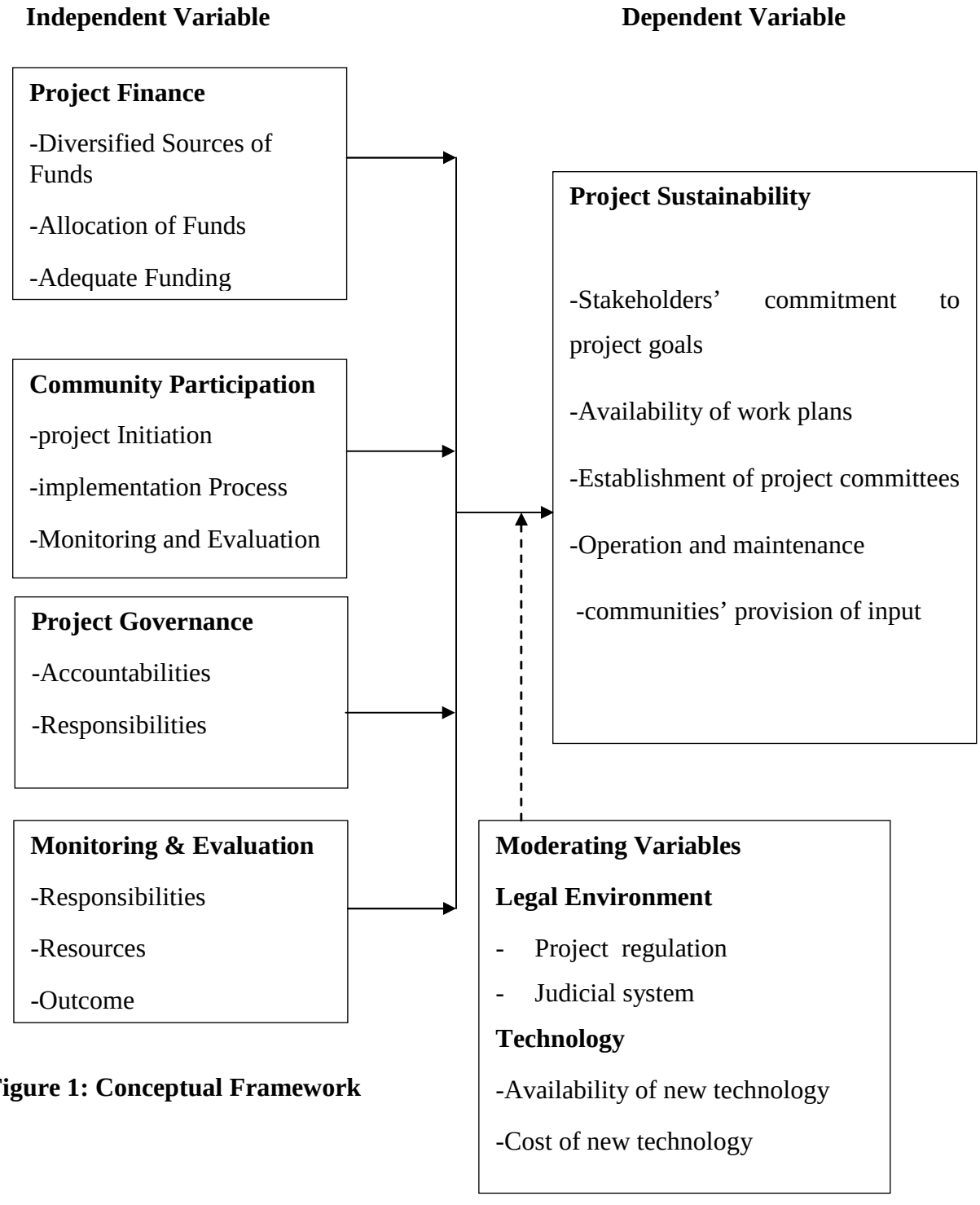

Figure 1: Conceptual Framework

2.6 Summary of the Reviewed Literature

Sustainability rate of Urban Slum water supply systems increases as a result of communities' owning and managing their water project, existence of management organization at the village level, protection of the water point, communities cost recovery for operation and maintenance, technology type and availability of their spare parts and recognition of women. Building a partnership with the communities that lead to improving the people's problem solving capacities and effective operation and maintenance (O & M) of water supply systems is crucial element for the sustainability of the water project. Availability of financing resources and provision of frequent support as a result of M/E is critical Budgeting sufficient funding for Urban Slum water supply systems is an important issue for sustainability and proper maintenance.

CHAPTER THREE
RESEARCH METHODOLOGY

3

3.1 Introduction

This chapter indicates the line of approach of the study. The first aspect deals with the method, population and sample of the study and second part provides the tools and techniques employed in the research. It also presents the procedure of the study; data organization and presentation are given in this section.

3.2 Research Design

Research design provides the glue that holds the research project together. A design is used to structure the research, to show how all of the major parts of the research project, the samples or groups, measures, treatments or programs, and methods of assignment all work together to try to address the central research questions (Cooper and Schindler, 2003). The study used a descriptive research design in collecting data from the respondents. Descriptive design portrays an accurate profile of persons, events, or account of the characteristics, for example behaviour, opinions, abilities, beliefs, and knowledge of a particular individual, situation or group (Burns & Grove 2003). The descriptive research design was preferred because it ensures complete description of the situation, making sure that there is minimum bias in the collection of data (Kothari, 2003).

3.3 Target Population

Target population refers to the entire group of individuals or objects from which the study seeks to generalize its findings (Cooper and Schindler, 2008). The target population comprised of two (2) project coordinators, ten (10) project managers and seventy eight (78) operational staff as indicated in the population frame provided by both WSP and K-Rep Bank. A population frame is a comprehensive itemized list of all subjects, which

comprise the study population, from which a sample is taken (Lacey and Gerrish. 2006).

Table: 3. 1 Target Population

Population Category	Population Size	Percentage
Project Coordinators	2	2.22
Project Managers	10	11.11
Operational Staff	78	86.67
Total	90	100

Source; WSP and K-Rep Bank, (2014)

3.4 Sampling Procedure

According to Trochim (2005), Sampling is the process of selecting units (people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen. Sampling design is a working plan or structure, which specifies the population frame, sample size and sample selection and how the sample size is estimated. The aim of the sampling design is to identify the characteristic of the population (Kombo & Tromp, 2006).

Sampling procedure is a technique the researcher uses to gather people, places or things to study (Mugenda, 2008) and in this case it refers to the procedure the researcher uses to select the final sample to study. A sample is part of the target (or accessible) population that has been procedurally selected to represent it and whose properties are studied to gain information about the whole. The general goal of all sampling methods is to obtain a sample that is representative of the target population.

The researcher used stratified random sampling which involved dividing the population into distinct non overlapping homogeneous subgroups (strata) according to

characteristics of roles and then a random sample will be selected within each subgroup (Divide the population into non-overlapping groups (strata) N1, N2, N3, ... Ni, such that N1 + N2 + N3 + ... + Ni = N. Then do a simple random sample of f = n/N in each strata). The researcher will use this method to ensure that each subgroup of interest is represented in the sample. This method was preferred because it generally produces more precise estimates of the characteristics of the target population; assures that the sample would be able to represent not only the overall population, but also key subgroups of the population, especially small minority groups (Kothari, 2003)

The researcher took 50% of the target population giving a sample size of 49 respondents consisting of project management and staff as shown in the sample frame on table 3.2 below. This sample size was considered representative and comprehensive in the coverage of the study objectives and economical in terms of time and money.

Table: 3. 2 Sample Size

Population category	**Population Frequency**	**Sample Size**
Project Coordinators	2	2
Project Managers	10	6
Staff	78	37
Totals	**90**	**45**

3.5 Instruments of Data Collection

Data is anything given or admitted as a fact on which a research inference will be based, (Oso & Onen, 2009). Self-completion questionnaires, involving closed-ended questions items, were the main instrument for gathering the study's data. According to Cooper and Emory (2008), a self - completion questionnaire is convenient as respondents could fill

them during free times or when workloads are manageable besides it is cheaper and quicker to administer,

The questionnaire contained demographic factors in the initial part, while the main body of the questionnaire focused on the factors affecting sustainability of water projects ; hence they focused on 1) project financing , 2) community participation 3), project governance 4) and project monitoring and evaluation Within each of these areas, each respondent will be asked to rate or rank on a scale on 1 (agree) (2) strongly agree (3) neither Agree nor Disagree (4) Disagree (5) Strongly Disagree on the contribution of the various aspects of the identified factors.

3.6 Validity and Reliability

Reliability and validity are important concepts in research. All measurements may contain some element of error; validity and reliability concern the different types of error that typically occur, and they also show how we can estimate the extent of error in a measurement.

3.6.1 Validity

To achieve content validity, questionnaires mainly consisted of questions on the variables. A measure of validity was also guaranteed by discussion of the instrument with experts and research supervisor and by ensuring high precision and minimal errors in the data entry. Content validity was further be ensured by consistency in administering the questionnaires.

3.6.2 Reliability

To further strengthen the reliability, a pilot study was conducted in order to ascertain and detect any ambiguities, questions that were not easily understood or poorly constructed and even those that were irrelevant. The pilot study was conducted on seven respondents from the target population who were not included in the final sample. The questionnaires were administered to the group and thereafter the feedback was obtained through debriefing them individually and comparing the results. The results of the pilot study

were analyzed using Cronbach alphas with a set lower limit of acceptability of Cronbach alpha 0.6.

3.7 Data Collection Procedures

The researcher personally administered the questionnaires containing mainly closed ended questions to the sample respondents. Each respondent receive the same set of questions in exactly the same way. Secondary data was also sourced to supplement the primary data. This was collected from the relevant sources which include reports, newsletter and unpublished data on project management.

3.8 Data Analysis

Data was chronologically arranged with respect to the questionnaire outline to ensure that the correct code was entered for the correct variable. Data cleaning was then done and tabulated. The tabulated data was analyzed using descriptive, correlation and regression statistics with the aid of Statistical Package for Social Sciences (SPSS 21.0).

The regression model was used to determine if there is a relationship between dependent and independent variables as presented in the equation below.

$$Y = \alpha + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5 X_5 + \varepsilon$$

Where;

Y = Sustainability

α = constant

$b_{1\text{-}4}$ = Regression Coefficients

X_1 = Project Financing

X_2 = Community Participation

X_3 = Project Governance

X_4 = Monitoring and Evaluation

ε = error term

3.9 Ethical Consideration

Prior Informed consent was obtained from the respondents before dispatching the questionnaires. Respondents were assured of the confidentiality of the information that they provided, meanwhile authority was sought from management to undertake research in the projects. The researcher also attached the authority to research letter from the university to the questionnaire to give further assurance.

3.10 Operational definition of variables

Table 3.3 Operationalization of variables

Objective	**Variable**	**Indicator**	**Measurement**	**Scale**	**Data collection tool**
	Project Sustainability	Sustainability	Rate of repair, maintenance & rehabilitation	Nominal	Questionnaire
To assess the influence of community participation on sustainability of CWPs	Community participation	Project identification, Planning, Implementation, completion, monitoring & evaluation	Rate of sustainability of community water project	Nominal	Questionnaire
To assess the influence of M & E on sustainability of CWPs	Monitoring & Evaluation	User acceptability Level of literacy	Project outcome	Ordinal	Questionnaire
To assess the influence of project Governance on sustainability of CWPs	Governance	Risk Management Accountabilities	Rate of sustainability of community water project	Nominal	Questionnaire and observation
To determine the influence that Project Financing on sustainability of CWPs	Project Financing	Availability of maintenance schedule, finance committee & spare parts	Rate of sustainability of community water project	Nominal	Questionnaire

CHAPTER FOUR
DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of study findings on the factors influencing sustainability of Water projects in Nairobi County in Kenya. This chapter analyses the variables involved in the study and estimates of the model presented in the previous chapter.

4.2 Presentation of the Findings

Data analyzed was summarized in line with the research objectives and appropriate frequency tables inserted for presentation. The analysis was conducted in order to assess how various factors influenced sustainability of community water projects in Slum Areas of Nairobi County. The analysis begins with a description of the demographic profile of the respondents, which gives the reader an insight into demographic trends typical of any representative sampling of community members and their leaders and presented in form of percentages and frequency Tables.

4.2.1 Response Rate

Out of the 90 issued questionnaires, 83 questionnaires representing 92.2% of the total questionnaires distributed were returned fully completed, while 7 questionnaires were not returned representing 7.8 % of the total questions distributed to the respondents. It can be inferred that the response rate was good. According to Mugenda and Mugenda (2003) a response rate of 70% and over is excellent for analysis and reporting on the opinion of the entire population.

Table 4.1: Response Rate

Response	Frequency	Percentage %
Filled in questionnaires	83	92.2
Unreturned questionnaires	7	7.8
Total	**90**	**100**

The findings below sought to establish the demographic characteristics of the study respondents.

Table 4.2 Demographic Characteristics

Demographic factors	Categories	Frequency	Percentage %
Gender	Male	50	60.2
	Female	33	39.8
Level of education	Secondary	15	18.1
	Diploma	33	39.8
	Degree	26	31.3
	Others	9	10.8
Respondent Categories	Project Coordinators	16	19.3
	Project Managers	27	32.5
	Project Staff	40	48.2
Years of Service	1-4years	79	95.2
	5-9 years	4	4.8

The findings shown on Table 4.2 indicated that majority (60.2%),(39.8%), (48.2%) and (95.2%) were, male , hold diploma qualification, were project staff and had worked for a period of between 1 to 4 years.

The findings revealed that the number of men who participated in the study was higher compared to that of women.

The findings also indicated that all a greater percentage of the respondents had attained tertiary education and thus competent enough.

4.2.2 Factors Influencing sustainability of water Project Sustainability

The findings on Table 4.3 below sought to examine the indicators of project sustainability. Based on the findings, majority (Mean = 3.64 and S.D = .254) of the respondents agreed that a proper indicator of project sustainability is Establishment of community project committees, whereas the least number of respondent, (Mean = 2.16 and S.D. = .123) agreed that it is Local committees participation in O&M management and financial decisions.

Table 4.3 Indicators of Project Sustainability

Project Sustainability	N	Mean	SD
Stakeholders long-term commitment to project goals	83	2.46	.170
Availability of work plans	83	2.50	.291
Establishment of community project committees	83	3.64	.254
Operation and maintenance of project facilities and equipments	83	3.14	.458
Local communities provision of input	83	2.40	.196
Local committees participation in O&M management and financial decisions	83	2.16	.123
Sharing of project responsibilities	83	2.20	.129
Availability of required competencies	83	2.32	.201

4.2.3 Influence of Project Financing on Sustainability of 'Maji ni Maisha' water project

The financing process, such as raising and maintaining adequate funding for water project facilities is of critical importance for sustainability.

The following findings examine the extent to which project financing has impacted on the sustainability of water project.

Table 4.4 Influence of Project Financing

	N	Mean	SD
Projects implementation require sufficient funding that ensures that purchases are done efficiently and timely	83	2.75	.206
Project requires varying financing sources for the project to be sustainable	83	2.96	.374
Increasing complexity in the projects with require increased financial input	83	2.57	.260
Varied financial sources make it easier to procure and maintain required skills, equipment and facilities to sustain the project	83	3.04	.232
Project sustainability require finances for O&M	83	2.43	.372

The study analysis indicated that most (Mean=2.96; SD=.374) of the respondents agreed that project requires varying financing sources for the project to be sustainable; whilst the least (Mean=2.43; SD=.372) number of respondents agreed that project sustainability require finances for O&M.

The findings shown on Table 4.5 below were used to determine whether financing influences sustainability of water projects in Nairobi County.

Table: 4.5 Influence of Financing on 'Maji ni Maisha' water project sustainability

Question	Scale	Distribution	
		F	%
In your opinion do project financing affect sustainability of water projects in Nairobi County	Yes	79	95.2
	No	4	4.8
	Total	83	100

Majority of the respondents represented by 95.2% stated that financing influences sustainability of water projects in, while 4.8% of the respondents indicated that financing does not affect the sustainability of water projects in Nairobi.

The findings shown on Table 4.6 below were used to determine the level to which financing influences sustainability of water projects.

Table 4.6 Level to which financing influences sustainability of 'Maji ni Maisha' water projects

Questio n	Scale	Distribution	
		F	**%**
In your opinion to what level of financing affect sustainability of water projects in Nairobi County?	High	50	60.2
	Moderate	23	27.7
	Low	10	12.1
	Total	83	100

Majority of the respondents represented by 60.2% stated that the level to which financing influences sustainability of water projects is high, 12.1% indicated financing influences

sustainability of water projects to a moderate extent, while 27.7% of the respondents indicated the level to which financing influences sustainability of water projects is low.

The research established that financing influences sustainability of water projects and that the level to which financing influences sustainability of water projects is high. The study findings concurs with those of Kanji and Greenwood, (2001) who established that the project financing process, such as raising and maintaining adequate funding for water project facilities is of critical importance for sustainability.

4.2.4 Influence of Project Governance on water project sustainability

The findings were used to determine the influence of project governance on the sustainability of water projects.

Table 4.7 Influence of Project Governance

Project Governance	N	Mean	SD
Managers of water projects face serious organizational and staffing problems, such as high staff turnover, low water sector salary scales, low morale and minimal performance incentives	83	2.61	.227
Too often water projects have shared accountability or is either left unstated or placed on inappropriate person.	83	3.04	1.036
Governance is important in the performance of projects as it provides a framework for project accountabilities and responsibilities	83	3.18	1.362
Project managers consider longer term sustainability of project	83	2.43	.103
Managers of water development projects have typically faced serious internal organizational and staffing problems	83	2.86	.177

According to the findings, majority of the respondents (Mean = 3.18 and S.D=1.362) concurred that; governance is important in the performance of projects as it provides a framework for project accountabilities and responsibilities, while the least number of respondents agreed that project managers look beyond the short-term objectives of the project and consider longer term sustainability of project. (Mean = 2.43 and S.D. = .103). The findings below were used to determine whether project governance influences water project sustainability.

Table: 4.8 Influence of Project Governance on water project sustainability

Question	Scale	Distribution	
		F	%
In your view does project governance affect sustainability of water projects in Nairobi County	Yes	80	96.4
	No	3	3.6
	Total	83	100

The study deduced that Project Governance was of great importance in the sustainability of water projects as evident in how the respondents rated this factor. The research study found out that project governance does influence water project sustainability and that the level to which governance influences sustainability of water projects is high. These study findings agree with the views expressed by PMI (2006) that project governance stands out as a major skill area that determines whether a project succeeds or fails and those expressed by Chamoun, (2006) that competent managerial leadership should be encouraged to guide adaptations and achieve sustainable outcomes.

The findings shown on Table 4.9 below were used to determine the level to which governance influences sustainability of water projects.

Table 4.9 Level to which Governance influences sustainability of water projects

Question	Scale	Distribution	
		F	%
To what level does governance influences sustainability of water projects in Nairobi County?	High	60	72.3
	Moderate	16	8.419.3
	Low	7	8.4
	Total	83	100

Majority of the respondents represented by 72.3% stated that the level to which governance influences sustainability of water projects is high, 8.4% indicated that governance influences sustainability of water projects to a moderate extent, while 19.3% of the respondents indicated the Level to which governance influences sustainability of water projects is low.

4.2.5 Influence of Community Participation on water project sustainability

The studies aim was to examine whether community Participation influences sustainability of water projects.

Table 4.10 Influence of Community Participation in sustainability of water projects

	N	Mean	SD
Beneficiary participation is essential in successful implementation and sustainability of the project.	**83**	2.61	.031
Local participation in project management decisions include actively participating in project initiation, implementation process and in monitoring and evaluation	**83**	3.04	1.170
Most local people, lack interest and initiatives in government sponsored projects	**83**	3.18	1.335
Project managers rarely involve the local community in important decision relating to project initiation and implementation	**83**	2.43	.289
There is a lack of professional and technical monitoring and evaluation skills within the local communities, which has led to poor project implementation outcome	**83**	2.07	.262

The study findings show that most of the respondents agree that; Most local people, lack interest and initiatives in government sponsored projects, (Mean = 3.18 and S.D. 1.335) whilst the least number of respondents represented by (Mean =2.07 and S.D. = .262) indicated that there is a lack of professional and technical monitoring and evaluation skills within the local communities, which has led to poor project implementation outcome.

The study below was used to determine whether community participation influences performance of water projects in Nairobi County.

Table: 4.11. Influence of community Participation on water project sustainability

Question	Scale	Distribution	
		F	%
Does community participation affect performance of water projects in Nairobi County?	Yes	75	90.3
	No	8	9.7
	Total	83	100

Majority of the respondents represented by 90.3% of the respondents stated that community participation does influences performance of water projects, while 9.70% of the respondents indicated that community participation does not influence performance of water projects. The study deduced that community participation was of paramount importance in the sustainability of water projects and this was evident in how the respondents rated this factor.

The study revealed that community participation does influences sustainability of water projects, and that the level to which community participation influences sustainability of water projects is high. The study findings confirms those of Mayoux, (2005) who found out that community participation is a primary determinant of project sustainability and its relationship to project sustainability can be estimated both qualitatively and quantitatively.

The study shown on Table 4.12 below was used to determine the level to which community participation influences sustainability of water projects.

Table 4.12 Level of influence community participation on project sustainability

Question	Scale	Distribution	
		F	%
To what level does community participation affect sustainability of water projects in Nairobi County?	High	63	75.9
	Moderate	5	6.0
	Low	15	18.1
	Total	83	100

Majority of the respondents represented by 75.9% stated that the level to which community participation influences sustainability of water projects is high, 6.0% indicated that community participation influences sustainability of water projects to a moderate extent, while 18.1% of the respondents indicated the level to which community participation influences sustainability of water projects is low.

4.2.6 Influence of Monitoring and Evaluation on water project sustainability

Table 4.13 shows the extent to which project monitoring and evaluation influences sustainability of water projects.

Table 4.13 Influence of Project Monitoring and Evaluation

Project Monitoring	N	Mean	SD
There is a lack of professional and technical supervision, which has led to poor project quality.	83	2.60	.212
There is low community participation in monitoring due to the inadequacy of data and general information	83	2.58	.214
Poor monitoring has led to abuse of funds and fostered a sense of impunity amongst the perpetrators.	83	2.88	.508
Since projects are spread across the capacity to monitor and evaluate these projects are inadequate	83	2.64	.367
There is minimal effort and goodwill to identify and develop local capacity to monitor and evaluate projects	83	2.43	.103

The study findings indicated that most of the respondents (Mean=2.88; SD=.508) leaned towards agree that poor monitoring has led to abuse of funds and fostered a sense of impunity amongst the perpetrators and least (Mean=2.43; SD=.103), agreed that there is minimal effort and goodwill to identify and develop local capacity to monitor and evaluate projects. The study deduced that Monitoring and Evaluation was important in sustainability of water projects.

The study shown on Table 4.14 below sought to establish whether monitoring and evaluation affect sustainability of water projects in Nairobi. 82.7% stated monitoring and evaluation does affect sustainability of water projects while 17.3% of them stated that monitoring and evaluation does not affect sustainability of water projects in Nairobi

Table: 4.14. Influence of Monitoring and Evaluation on Water Project Sustainability

Question	Scale	Distribution	
		F	%
In your view do monitoring and evaluation affect sustainability of water projects in Nairobi County?	Yes	77	92.8
	No	6	7.2
	Total	83	100

The study shown on Table 4.15 below was used to determine the level to which monitoring and evaluation influences sustainability of water projects.

Table 4.15 Level to which monitoring and evaluation influences sustainability of water projects

Question	Scale	Distribution	
		F	%
To what level does monitoring and evaluation affect sustainability of water projects in Nairobi County?	High	74	89.2
	Moderate	3	3.6
	Low	6	7.2
	Total	83	100

Majority of the respondents represented by 89.2% stated that the level to which monitoring and evaluation influences sustainability of water projects is high, 3.6% indicated that monitoring and evaluation influences sustainability of water projects to a moderate extent, while 7.2% of the respondents indicated the level to which monitoring and evaluation influences sustainability of water projects is low.

The study established that monitoring and evaluation does affect sustainability of water projects and that the level to which monitoring and evaluation influences sustainability of water projects is high. These study findings concurs with the views expressed by (Espinosa, 2000) that monitoring and evaluation, is particularly important to sustainability since it allows an ongoing review of project effectiveness

4.2.7 Test of Significance

The study below sought to establish if there is a relationship between project sustainability and finance, governance, community participation and monitoring and evaluation. Findings of the study on Table 4.16 below indicate a positive correlation coefficient (r) = 0.537 and coefficient of determination, (r2) =0.288 and adjusted r of 0.231 between finance, governance, community participation and monitoring and evaluation and project sustainability. The results of (r2) imply that the variations in finance, governance, community participation and monitoring and evaluation explain 23.3% percent of the variation in the project sustainability. On the other hand, the Adjusted R-squared shows that 19.7% (Adj R-squared=0.231) of the variance in the project sustainability can be explained by the variations in finance, governance, community participation and monitoring and evaluation.

Table 4.16 Model Summary

Model	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
1	.537[a]	.288	.231	1.036

The study used Analysis of Variance (ANOVA) was used to test the significance of the regression model as pertains to differences in means of the dependent and independent variables. The findings on Table 4.17 below shows that the ANOVA test produced F-value of 3.875 and $p<0.001$, thus the regression model is statistically significant in predicting how finance, governance, community participation and monitoring and evaluation top affect project sustainability.

Table 4.17 ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	15.281	5	5.547	3.875	.001[a]
	Residual	62.751	41	1.203		
	Total	77.032	46			

b. Dependent Variable: Project Sustainability

The study sought to establish the extent to which Finance (F), Governance (G, Community Participation (CP) and Monitoring and Evaluation (ME) predict Project Sustainability (PS) based on the following regression model:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$

Where;

Y= Project Sustainability

X_1= Finance

X_2= Governance

X_3= Community Participation

$X_{4=}$ Monitoring and Evaluation

β_{0-} β_4 = coefficient of the variables.

e = error term

Hence the regression model became:

$PS = \beta_0 + \beta_1 F + \beta_2 G + \beta_3 CP + \beta_4 ME + \varepsilon$

Table 4.18: Coefficients[a]

	Coefficients[a]				
Variables	B	Standard Error	Beta	T	P-value
(Constant)	1.674	0.691	0.000	2.425	0.000
Finance	1.020	0.507	0.230	2.012	0.004
Governance	0.216	0.105	0.204	2.057	0.001
Community Participation	1.038	0.439	0.127	2.068	0.003
Monitoring and Evaluation	0.253	0.125	0.103	2.024	0 .006

a. Dependent Variable: Project Sustainability

The results of the study were:

$PS=1.674 + 1.020 F + 0.216 G + 1.038 CP + 0.253ME + \varepsilon$

Therefore Table 4.18 shows that finance, governance, community participation and monitoring and evaluation have positive coefficients, implying that these independent variables positively predict project sustainability. Therefore taking all independent variables (finance, governance, community participation and monitoring and evaluation) constant at zero (0); project sustainability will be at 1.674. Therefore a unit increase in finance, governance, community participation and monitoring and evaluation will lead to 1.020, 0.216, 1.038 and 0.253 unit increases in project sustainability respectively

The results of the study further indicate that p-value of = ($p<0.004$) for finance, ($p<0.001$) for governance, ($p<0$ .003) for community participation and ($p<0$ .006) for monitoring and evaluation are less than the significance level of 0.05. The implications of these results is that there is a significant relationship between finance, governance, community participation and monitoring and evaluation and project sustainability.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS
5

5.1 Introduction

The purpose of this chapter was to discuss and draw conclusions and recommendations on the findings of the main objective of the study which was to examine investigating the factors influencing sustainability of Water projects in Nairobi County with particular reference to Maisha ni Maji Water project. The study focused on the influence of project governance, stakeholders' participation, project resources and project monitoring and evaluation.

5.2 Summary of Findings

The research established that financing affect sustainability of water projects in Nairobi as acknowledged by a majority (95.2%) of the respondents, while a majority (60.2%) indicated that the level to which financing influences sustainability of water projects is high. The study found out that projects implementation require sufficient funding drawn from varying financing sources that ensures that the efficiency and timely procurement and to maintenance of required skills, equipment and facilities to sustain the project The study also revealed that increasing complexity in projects necessitate increased financial input for the project to be sustainable.

The research study found out that project governance does influence water project sustainability as indicated by the majority (96.4%) of the respondents, while majority (72.3%) of the respondents indicated that the level to which governance influences sustainability of water projects is high. The study revealed that managers of water projects face serious organizational and staffing problems, such as high staff turnover, low water sector salary scales, low morale and minimal performance incentives. The study established that governance is important in the performance of projects as it provides a framework for project accountabilities and responsibilities. It also revealed

that project managers look beyond the short-term objectives of the project and consider longer term sustainability of project

The study revealed that community participation does influences performance of water projects, as evidenced by the response of majority (90.3%) of the study respondents, while most (75.9%) of the respondents indicated that the level to which community participation influences sustainability of water projects is high. The study also found out that beneficiary participation is essential in successful implementation and sustainability of the project and that local participation in project management decisions include actively participating in project initiation, implementation process and in monitoring and evaluation. The study also established that project managers rarely involve the local community in important decision relating to project initiation and implementation and that there is a lack of professional and technical monitoring and evaluation skills within the local communities, which has led to un-sustainability of water projects

The study established that monitoring and evaluation does affect sustainability of water projects as indicated by the response of most (82.7%) of the study respondents, while majority (89.2%) of the respondents indicated that the level to which monitoring and evaluation influences sustainability of water projects is high. The study found out there is a lack of professional and technical supervision, low community participation in monitoring due to the inadequacy of data and general information which has led to poor project quality. The study also revealed that water projects are spread across the county making it difficult to monitor and evaluate and that there is minimal effort and goodwill to identify and develop local capacity to monitor and evaluate projects

5.3 Conclusion of the Study

Water projects sustainability are influenced by financing to a high level as project implementation and management require sufficient funding drawn from varying financial sources so as to ensure efficiency and timely procurement and maintenance of required skills, equipment and facilities. The increasing complexity in projects design,

implementation and management has necessitated increased financial input so as enable the project to become sustainable.

Water projects in Nairobi County are highly influenced by project governance and in most cases water project managers face serious organizational and staffing problems, such as high staff turnover, low water sector salary scales, low morale and minimal performance incentives. Governance is of importance in project management and performance as it provides a framework for project accountabilities and responsibilities. Good project governance required managers to look beyond the short-term objectives of the project and consider longer term so as to ensure the sustainability of project

Community participation in the project design, implementation, monitoring and management highly influence the sustainability of water projects. Community participation is essential in successful design, implementation, management, performance and sustainability of the project. Community participation in water project includes actively participating in project initiation, implementation process in monitoring and evaluation and in management decisions. However project managers rarely involve the local community in important decision relating to project initiation and implementation, while lack of professional and technical monitoring and evaluation skills within the local communities has led to un-sustainability of water projects

Monitoring and evaluation of water projects in Nairobi County affect their sustainability to a greater extent, however there is lack of professional and technical supervision, low community participation in monitoring due to the inadequacy of data and general information which has led to some projects becoming un-sustainable. Water projects are spread across the county making it difficult to monitor and evaluate, this compounded by the minimal effort and goodwill exhibited by project managers in identifying and developing local capacity to monitor and evaluate projects

5.4 Recommendations of the Study

I recommend provision of general education and information and use of participatory tools such as participatory urban appraisal and many others are valuable particularly for

initiating beneficiary participation processes for neighbourhood and design initiatives for local projects.

The project management should effectively control use of resources by analyzing resource utilization on a regular and timely basis so as to be able to identify resource variances and inefficiencies early so that corrective action can be taken before the situation gets worse.

The Management of the water project should conduct appropriate project audit periodically to identify the organization risk area and their nature so as to reliably assess levels of risk with full understanding of the organization and its internal and external environment so as to enhance the project Governance.

The management should be undertaking effective monitoring and evaluation through active process of regular performance reviews and the commitment to: anticipate and influence events before they happen by taking a proactive approach; provide knowledge and information about predicted events; inform and, where possible, improve the quality of decision making, keep track of the identified financial risks, monitoring the residual financial risks and identifying new financial risks.

5.5 Suggestion for Further Research

1) The research study focused on Maisha ni Maji Water project in Nairobi county however there are other water projects in other counties which could have been included so as to ensure effective generalization of study findings.

2) In addition the study has only focused on the effects of four variables (Project Finance, Project Governance, Community Participation and Monitoring and Evaluation) on water project sustainability. Hence there is need for further research in this area to be undertaken with wider sample population and to identify other variables affecting water projects sustainability.

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APPENDICES

APPENDIX I: INTRODUCTORY LETTER

Dear Respondent

RE: FACTORS AFFECTING SUSTAINABILITY OF WATER PROJECTS

I am a masters student at Nairobi University pursuing Master of Arts degree programme in Project Planning and Management. Currently, I'm carrying out a research on the factors affecting sustainability of water projects in Slum arrears of Nairobi County. I kindly request you to fill in this questionnaire. The information collected will be used strictly for the purpose of this study and will be treated confidentially.

Thank you for agreeing to participate in the study.

Yours Faithfully

Edison Mochiemo

APPENDIX II: RESEARCH QUESTIONNAIRE

Please answer all the questions as best as you can.

1. What is your Gender?

Male [ ] Female [ ]

2. What is your age?

Between 18-25 [ ] Between 26-35 [ ]

Between 36-40 [ ] Between 41-50 [ ]

3. What is your highest level of education

Secondary [ ] College [ ] University [ ]

Others [ ] specify……

Project Sustainability

4. Please tick the numeric value corresponding to your personal opinion for each statement

	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly disagree (5)
Stakeholders long-term commitment to project goals					
availability of work plans					
Availability of work plans					

Establishment of community project committees					
Operation and maintenance of project facilities and equipments					
Local communities provision of input					
Local committees participation in O&M management and financial decisions					
sharing of project responsibilities					
Availability of required competencies					

PART 3: Project Financing

17 Please tick the numeric value corresponding to your personal opinion for each statement

	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly disagree (5)
Projects implementation require sufficient funding that ensures that purchases are done efficiently and timely					
Project requires varying financing sources for the project to be sustainable					
Increasing complexity in the projects with require increased financial input					
Varied financial sources make it easier to procure and maintain required skills, equipment and facilities to sustain the project					
Project sustainability require finances for O&M					

15. In your opinion do financing affect implementation of water projects in Nairobi County?

Yes [ ] No [ ]

18. In your opinion to what level of financing affect performance of water projects in Nairobi County?

High [ ] Moderate [ ] Low [ ]

PART3- Project Governance

7. Please tick the numeric value corresponding to your personal opinion for each statement

	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly disagree (5)
Managers of water projects face serious organizational and staffing problems, such as high staff turnover, low water sector salary scales, low morale and minimal performance incentives					
Too often water projects have shared accountability or is either left unstated or placed on inappropriate person.					
Governance is important in the performance of projects as it provides a framework for project accountabilities and responsibilities					
project managers look beyond the short-term objectives of the project and consider longer term sustainability of project					

Managers of Urban Slum development projects have typically faced serious internal organizational and staffing problems					

5. In your view does project governance affect implementation of water projects in Nairobi district?

Yes [ ] No [ ]

8. In your assessment to what level does governance influence implementation of water projects in Nairobi district?

High [ ] Moderate [ ] Low [ ]

PART 4 – COMMUNITY PARTICIPATION

12. Please tick the numeric value corresponding to your personal opinion for each statement

	Strongly agree (1)	**Agree (2)**	**Neutral (3)**	**Disagree (4)**	**Strongly disagree (5)**
Beneficiary participation is essential in successful implementation and sustainability of the project.					
Local participation in project management decisions include actively participating in project initiation, implementation process and in monitoring and evaluation					

Most local people, lack interest and initiatives in government sponsored projects					
Project managers rarely involve the local community in important decision relating to project initiation and implementation					
There is a lack of professional and technical monitoring and evaluation skills within the local communities, which has led to poor project implementation outcome					

10. In your view does beneficiary participation affect performance of water projects in Nairobi district?

Yes [ ] No [ ]

13. In your assessment what is the level of influence of stakeholder participation in implementation of water projects in Nairobi district?

High [ ] Moderate [ ] Low [ ]

PART 5- Project Monitoring and Evaluation

22. Please tick the numeric value corresponding to your personal opinion for each statement

	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly disagree (5)
There is a lack of professional and technical supervision, which has led to poor project quality.					
There is low community participation in monitoring due to the inadequacy of data and general information					
Poor monitoring has led to abuse of funds and fostered a sense of impunity amongst the perpetrators.					
Since projects are spread across the capacity to monitor and evaluate these projects are inadequate					
There is minimal effort and goodwill to identify and develop local capacity to monitor and evaluate projects					

20. In your view do monitoring and evaluation affect implementation of water projects in Nairobi district?

Yes [ ] No [ ]

23. In your assessment to what level does project monitoring and evaluation influence implementation of water projects in Nairobi district?

High [ ] Moderate [ ] Low [ ]

THANK YOU