

**ASSESSMENT OF MANAGEMENT PROCESSES INFLUENCING
THE FUNCTIONALITY OF RURAL WATER FACILITIES: A
CASE STUDY OF KORO SUB-COUNTY IN GULU DISTRICT**

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2011-MPH-RL-AUG-016

**A POSTGRADUATE RESEARCH DISSERTATION SUBMITTED TO THE
INSTITUTE OF HEALTH POLICY AND MANAGEMENT IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
OF MASTER SCIENCE OF PUBLIC HEALTH OF**

INTERNATIONAL HEALTH SCIENCES UNIVERSITY

DECEMBER, 2014

DECLARATION

I declare that this dissertation is my own original work and that to the best of my knowledge it has not been presented to other University or Institution for any other award.

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APPROVAL

This is to certify that this research report has been submitted for examination with my approval as the student's supervisor.

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

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SUPERVISOR

DEDICATION

It is my sincere desire to dedicate this research to my beloved father Oriokot John Stephen and mother Akiso Anna Rose whose endless support has been fundamental throughout my life. You have all made a long term contribution to my success.

Above all my wife Jesica Akareut for those encouragements that made me progress. I have no reservation whatsoever but to thank you for committed responsibility. Not forgetting my beloved son Echodu Abraham. I must say my success is yours.

ACKNOWLEDGEMENT

It won't go without say, that the production of this document has been so demanding and at the same time enjoyable learning experience. I feel obliged to recognize various stakeholders who made different contributions to make this work what it is today.

In the first place special thanks go to my supervisor, Mrs. Miriam Ondia for her commitment and professional guidance exhibited in building this paper to what it is.

I acknowledge Mr. Kilama Bosco, and technical staff of Gulu water department for their collaborative will to allow me access all the relevant information and also accepting to take part in the interview. Of course not forgetting development/NGO representatives from World Vision, NUDIEL, and the extension workers and women and men of Koro Sub County for foregoing their routine livelihood activities to take part in the interview without their views this paper could not be in the current form

My special acknowledgements go to my Data Collection Assistants Kilama Innocent, Ojok Simon, Okello Samuel and Akello Jacinta, who adhered to all the field conditions for the sake of generating data for this study. My gratitude is equally extended to Mr. Anguzu Geofrey for the statistical assistance he rendered during data analysis.

Many thanks are extended to my dear friends; Martin Mujjabi Mukasa, Otim Bomax, Ochora Justine, Lalam Florence, Laker Florence, Abdallah Nsobya Kiganda and Opolot Godfrey for their support during my studies.

Finally I acknowledge unlimited moral and social support from my lovely wife Jesica Akareut and son Echodu Abraham, who keep me energized to invest adequately in this academic asset to its final conclusion.

LIST OF ABBREVIATIONS

CAO	Chief Administrative Officer
CMBS	Community Based Management System
CPM	Community Participation and management
DWD	Directorate of Water development
DWO	District Water Officer
HPMs	Hand Pump Mechanics
IHSU	International Health Sciences University
KII	Key Informant Interview
NGOs	Non-governmental organizations
MWE	Ministry of Water and Environment
MDGs	Millennium Development Goals
JMP	Joint Monitoring Program
OHCHR	Office of the High Commissioner for Refugees
O&M	Operation and Maintenance
RWS	Rural Water Supply
RWSN	Rural Water Supply Network
UBOS	Uganda Bureau of Statistics
UN	United Nation
UNDP	United Nation Development Programme
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WRMD	Water Resource Management Department
WUC	Water User Committee
WSA	Water Supply Agencies
WSC	Water Source Committee

OPERATIONAL DEFINITIONS

For purpose of the study the following words will have these meanings:

Capacity refers to physical capacity, material capacity, along with knowledge, understanding of skills. Enables stakeholders to put in place their varying roles (Water policy, 1999)

Community refers to body of people having common rights, privileges, or intents or living in the same place under the same laws and regulations

Community Based Maintenance System (CMBS) refers to management structures that solicit community participation in planning and implementation of safe water supply systems. It gives responsibility for management and maintenance of water facilities to the community under the supervision and guidance of Sub County and district (National Frame Work for O&M, 2011)

Fishing out of pipes refers to removing pipes which have fallen into the drilled hole

Functionality refers to an indication of whether or not a water facility is working at a given point in time.

Management processes refers to the planning, organizing, leading, and controlling the efforts of the community members and mobilizing resources for purposes of maintenance water facilities.

Maintenance refers to activities aimed at keeping existing infrastructure in a serviceable condition e.g. by repairing pumps. It includes preventive maintenance which is regular inspection and servicing to preserve water facilities and minimise breakdowns, corrective maintenance. It means minor repairs and replacements of broken and worn out parts to sustain reliability of facilities and then crisis maintenance which means response to emergency breakdowns and user complaints to restore failed facilities.

Rural Water Supply (RWS) refers to provision of safe and clean water in rural areas through construction of protected wells, boreholes and springs.

Software activities refers to activities undertaken to ensure water facilities are functional and they include, coordination, advocacy, village meetings, training of private sector and water source committees as well as reactivation, and training of old committees, follow up visits and support to general rural water services (MoWE, 2010)

Sustainability refers to water supply facilities being maintained in a condition that ensures reliable and adequate supply of good quality water over a long period of time (Davis and Brikke 1995). A safe water source after construction has a life of 20 to 50 years when well managed (Rural Water and Sanitation Network, 2010)

Rural Safe Water Coverage refers to the percentage of population with access to an improved safe water source (i.e. water of good quality and adequate quantity, minimum of per capita consumption of 20 litres per day) within a walking distance of 1.5 kilometres

Safe and Clean Water refers to water that does not contain organisms or chemical or impurities and is not harmful for human consumption mainly from protected or improved water sources which include deep well, boreholes shallow wells, and protected springs. It is untreated but uncontaminated water from springs and sanitary wells (WHO, 2000).

Safe Water Management Guidelines refers to structures, systems, rules and acceptable behaviours while dealing with safe water supply in rural areas.

Water Source Committees (WSC) refers to members selected by the community, and are responsible for management and maintenance of a water facility and should collect and manage funds for repair and maintenance of water facilities.

Water Supply Agencies (WSA) refers to district water department, Sub county authority, NGOs, and CBOs which are involved in provision of supply of safe water to rural areas through funding, implementation and monitoring of rural water programmes.

Water supply facility (WSF) refers to a borehole, shallow well and a spring where community draws water from. In this study a water supply system is interchangeably used with water supply system

Operation refers to every day running and handling of the water facility .e.g. pumping of water (National Framework for O& M of Rural Water Facilities 2011)

ABSTRACT

Introduction: Uganda's domestic water policy calls for sustainable provision of safe water within easy reach, and based on management responsibility and ownership by users with effective use and functionality of the water facilities. This is in-line with the Millennium Development Goal 7 (MDG 7) which has a target 'to reduce by half the proportion of people without access to safe drinking water and basic sanitation by 2015'. The achievement of this goal is on track, but rural areas in developing countries across the world continue to remain severely disadvantaged with 780 million people not having access to an improved water supply. The challenge to rural water sustainability is highly recognized but it is jeopardizing the county's vision and the MDG achievements for safe water. For example only 2 out of 3 hand pumps installed in developing countries are working at a given point in time (RWSN 2010).

Objective: The objective of this study was to investigate the management processes influencing functionality of rural water facilities in Koro sub-county, Gulu district, as no such study has been carried out before. The study aimed at establishing, the compliance level of water agencies to rural supply management guidelines, the capacity of water source committees and hand pump mechanics to manage safe water facilities, and level of contribution of water users towards functionality of rural water facilities.

Method: This was a cross sectional study that involved 191 respondents who included water users, water user committees, and hand pump mechanics and water supply agencies. A total of 36 water sources were sampled comprising of 28 boreholes, 6 shallow wells and 2 protected springs. Data was collected by trained research assistants then entered in Epidata and exported to SPSS v16 for statistical analysis. The Pearson Chi-squared test was used to determine association between independent and the dependent variables. In all analysis, significance level of less than 5% was considered.

Results: Boreholes had a functionality rate of 73.2%, and shallow wells a functionality rate of 83.3%, while protected springs had a functionality of 100%.

The study shows that water users were contributing actively towards functionality of the water facility. 71.1% willing paid water user fees, 84.2%, selected water source committees, 89.4%, had set rules and regulations and 92.1% had attended meetings on management of water

facilities. However 28.9% of water users were unwilling to pay water user fees and sited issues like lack of transparency and accountability

In regards to the capacity of water source committees the findings show that 66.6% collect water user fees, 83.4% organize community meeting to address issues of water facilities, 88.9% mobilized community for routine cleaning, 89.9% reported defects on water facilities and 53.8% paid hand pump mechanics whenever they repaired water facilities. Loss of moral with time, lack of leadership skills, migration to other villages especially women when they are married, death and lack of refresher trainings were noted as gaps affecting performance of WSC

The ability of the hand pump mechanics to carry out maintenance is highly compromised by lack of skills in some key approaches especially fishing out fallen pipes and replacing plastic pipes. This is made worse by lack of tools as it was reported that only two tool kits are available for 6 hand pump mechanics.

Water supply agencies are hardly complying with their mandate of providing support to community based service providers and often lack capabilities especially resources to perform this obligation

Conclusions: The researcher recommends that there is need to; explore or develop accounting systems and ask community to adopt e.g. village savings and loan association (V SLA) or use sub county account to keep collected funds, equip care takers with skills, tools and equipment for maintenance, provide a monthly/ allowance for WSC/HPM, regularly reselect and train WSC, preferable after every 2 years, and make operations of WSC legal or formal, so that it is easy to monitor and control their work

Recommendation

To ensure that water sources continue to function, service providers, and water users need to be supported externally especially by local governments. For local governments to carry out their responsibilities as indicated in the guidelines they need to strengthen in terms of resources and capabilities otherwise indicators for measuring compliance of water supply agencies as regards to rural water supply need to revised in the current existing water policies and operation and maintenance framework.

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

This study was out to assess the management processes influencing the functionality of rural water facilities in Koro sub-county, Gulu district. This chapter introduces the study by looking into the following areas; background to the study, statement of the problem, objectives of the study, research questions, conceptual framework and justification for the study.

1.1 Background to the study

Maintaining the water sources already constructed is critical in increasing access to safe water because it increases functionality and sustainability of water facilities (WRI, 1998). Functionality is dependent on many factors ranging from availability of spare parts, to effective community management models to finance operation and maintenance. Functionality is therefore compromised when one or more of these factors fails or ceases to even exist. Sustainability of rural water supply facilities relates to whether services are being maintained in a condition that ensures reliable and adequate supply of portable water over a long period of time (Davis and Brikke 1995). A well maintained and functional rural water facility serves 100 to 300 people and supplies about 360 litres per hour equivalent to 3600 litres a day, with each person collecting at least 20 litres per day

However, the challenge in developing countries is to ensure that systems are adequate for community to manage their water facilities in a sustainable manner. Kleeimeir (2000) indicates that one out of four rural water facilities are broken down or poorly functioning in developing countries, yet the construction of new facilities can't meet the pace of failure of the old facilities in the same county.

Failure to properly to manage existing water facilities threaten access to safe water and if unchecked, the national goals of access to safe, adequate and reliable water supply in rural areas will not be achieved (Churchill 1987). According to Joint Monitoring Program (JMP) for water and sanitation, progress towards achieving target of reducing by half the proportion of people without access to safe water for drinking has been positive. It reports that by 2010, the target of access to safe drinking water was already met 5 years ahead of schedule. Despite positive progress about 780 million people still don't have access to safe water and a lot of disparities still exist among continents and Sub Saharan Africa lags behind (WHO/UNICEF, JMP, 2012).

In Uganda, the two thirds of the population (64%) with access to safe water are struggling to maintain their water facilities. In its struggle to increase access to safe for all its citizens, the Ugandan government is faced with two major problems; constructing new water facilities and maintaining those already constructed. More than a quarter of water sources constructed are not functioning. Non-functionality rate of water sources is estimated at 36%, and unhygienic conditions around the water environment which lead to contamination of water sources is reported in 67.5% of water facilities in the country (MoWE, 2011).

Failure of rural population to access safe water forces community to go for unsafe water sources, and consequently leads to ill health, loss of work time, reduced productivity and undermines the goal of improving quality of life (Montgomery, M et al 2007). Low access to safe water causes 1.8 million child deaths each year. For instance, due to diarrhea alone there are about 4,900 deaths globally each day, and loss of about 443 million school days each year from water related diseases (UNDP, 2006).

The reasons for failure of rural water facilities in Koro sub-county are not well known and despite various efforts from water sector and supporting partners like World Vision to use the community based management system water facilities continue to breakdown. Recognizing the gaps to non-functionality and the need to overcome them prompted the researcher to carry out the study so that interventions aimed at ensuring rural water facilities are continue functioning are designed.

1.2 Statement of the Problem

After the realization that sound management of water points is important in the delivery of safe water to the population, the Ministry of Water Lands and Environment (MoWE) encouraged the adoption of the community based management of water sources especially in rural areas in Uganda. The Community Based Management System emphasizes community responsibility and authority over development, operation and maintenance (O & M) of rural water facilities (MoWE, March 2004).

Although MoWE in collaboration with both international and local organizations is actively involved at the grassroots level to improve the situation of access to clean water, the supply coverage is still in its infancy in many parts of the country. The situation is made worse in rural areas, whereby the management processes directed to ensuring functionality of water facilities is complex as it involves coordination among many actors that include; community water users, water source committees, hand pump mechanics, and water supply agencies who should work hand in hand. However each of them seems to experience challenges in effecting their expected responsibilities.

There seems to be low level of management of rural water facilities. In Uganda, 35% and 32% of rural and urban water systems respectively are not properly functioning (MoWE 2010). However, if the current trends of lack of sustainability are allowed to continue, rural water facilities will be completely non-functional which significantly lowers the effective coverage

Without safe water people cannot live healthy and productive life. It is estimated globally that about 900 million people suffer from water related illnesses like diarrhoea, bilharzia, typhoid, hookworms and elephantiasis and about 2 million people die from these diseases each year.

1.3 Research objectives

1.3.1 General objective

To establish the management processes influencing functionality of rural water facilities in Koro Sub County, Gulu district

1.3.2 Specific objectives

This study was be guided by the following specific objectives

1. To determine the contribution of water users in influencing functionality of safe water facilities
2. To ascertain the capacity of water source committees in influencing functionality of rural water facilities
3. To ascertain the capacity of hand pump mechanics in influencing functionality of rural water facilities
4. To analyze the level at which water supply agencies comply with guidelines influencing functionality of water facility

1.4 Research questions

- 1 What contributions do water users make towards influencing functionality of safe water facilities?
- 2 What capacity levels do water source committees have in facilitating the functionality of rural water facilities?
- 3 What capacity levels do the hand pump mechanics have towards influencing the functionality of rural water facilities?
- 4 To what level do the water supply agencies comply with the guidelines on rural water supply?

1.5 Justification of the study

The Ministry of Water Environment recommends that 90% of improved water facilities in rural areas should be functioning and properly managed at a given point in time. However most districts in Uganda including Gulu have not achieved this target. The findings of this study will help;

Reduce the huge amounts of resources wasted when water facilities constructed in rural areas fall into disuse. Managing rural water facilities properly would make water supply sector more cost effective and would result into positive investment.

Increase access to safe water among the rural populations and improved quality of life. Properly managed water facilities increases access to adequate, clean and safe water and this enhances health and productive lives of people in rural areas.

Contribute to knowledge that could be used by rural water supply agencies, water professionals, and policy makers in promoting management of rural water supply

1.6 Conceptual framework factors influencing management of rural water facilities

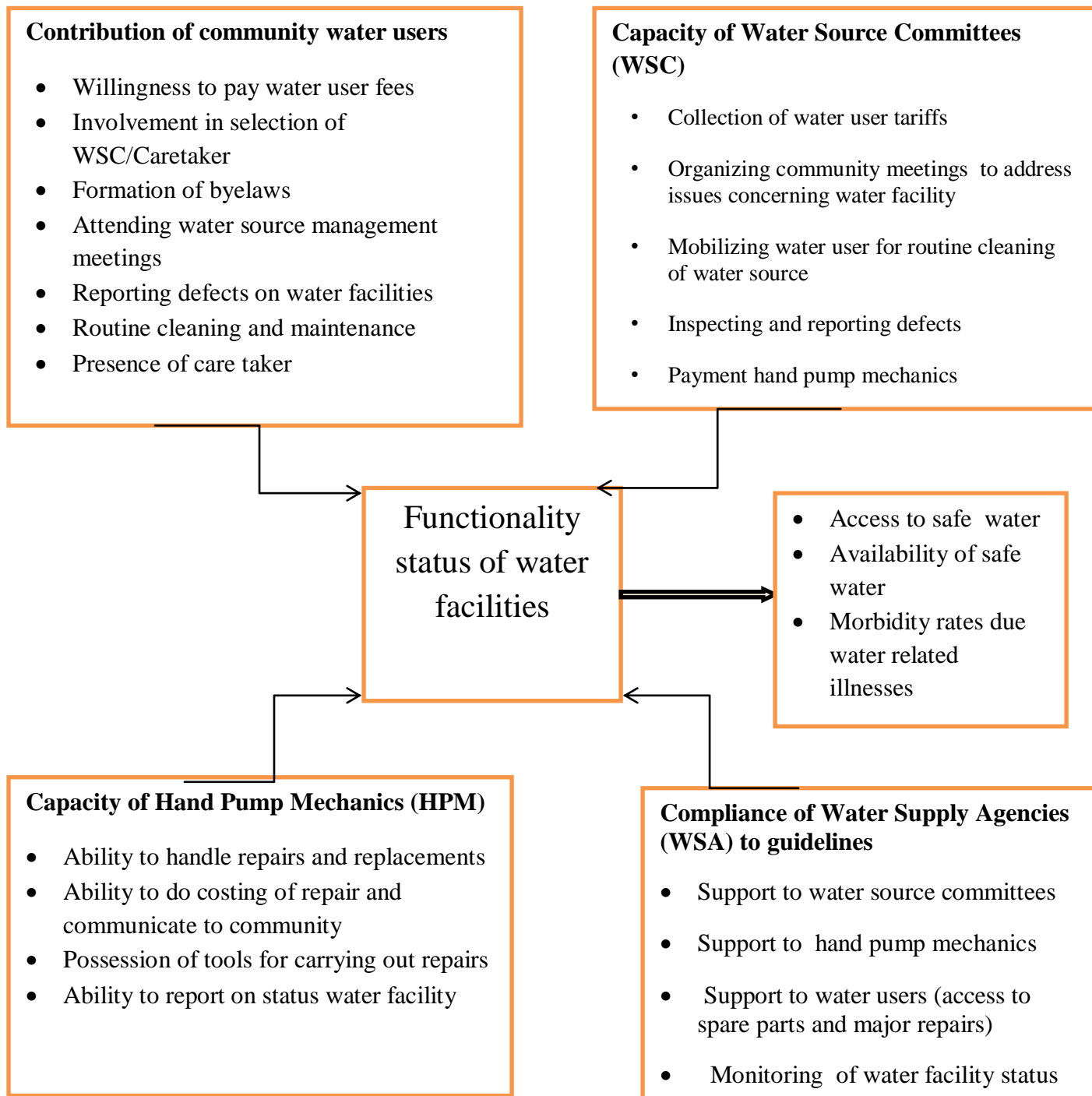


Figure 1 Conceptual Frame work

Description of the Conceptual frame work:

From the above conceptual framework, factors assumed to influence functionality of water facilities in rural areas include; contribution of water users in management of their facilities, capacity of WSC, capacity of HPMs and compliance of WSA to guidelines. The level of contribution of water users could be influenced by; willingness to pay water user fees, involvement in selection of WSC/Caretaker, involvement in formation of byelaws, attending water source management meetings, taking part in reporting and correction defects on water facilities, involvement routine cleaning and repair/maintenance..

The capacity of WSC could be influenced by; level of training of on their roles, ability to collect and management of water user fees, ability to Inspect, correct and report defects, ability to conduct community routine meetings, ability to mobilize community for repairs, routine cleaning and servicing of water facility, ability to motivate HPM to carry out routine servicing, and repair, ability to enact bye laws on O& M of water source.

The capacity of HPM could be influenced by; level of training of on their roles, Training on their roles and responsibilities, ability to handle repairs and replacements, ability hold meetings with water users/WSC, availability of tools for carrying out repairs/replacements, ability to collect and regularly update data on status of water facilities, ability to link to WSC/water users and other relevant stakeholders in rural water supply

The compliance of WSA to guidelines could be influenced by support the training water source committees and hand pump mechanics, supporting HPMs with tools and equipment, supporting water users to access spare parts, conducting routine supervision and monitoring.

These are all known to have a direct influence on the management of rural water facilities which in turn reduces access to safe water facilities, increases the use of unsafe water sources and consequently the prevalence of water related diseases

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter explores the literature related to the study pointing out the variables of the study under themes of: Overview of functionality status, Contribution of community towards functionality, Capacity of Water source committees in managing water facilities, Capacity of Hand Pump Mechanics in Managing water facilities, and Compliance of WSA towards water management guidelines

2.1 Overview of management and functionality of water sources.

The challenge of limited access to safe drinking water was brought to international attention with the slogan “*Water and Sanitation for All*” under the International Drinking Water Supply and Sanitation Decade (1981-1990). To further consolidate the efforts of the Decade and various donors that failed to yield quantifiable results of increasing access to safe water, the United Nations (UN) launched another initiative to tackle the ongoing water supply failures in developing countries. In 2000, the UN established the Millennium Development Goals to reduce poverty improve health and promote sustainability. Target 10 of Goal 7, ensuring environmental sustainability, sets a target to half the proportion of people in the world who lack access to safe drinking water by 2015 (UNDP 2011).

An important point to note is that as many as one out of four (25%) of rural water facilities are broken down in developing countries and yet the construction of new facilities cannot keep the pace of with the failure of old ones in some countries (Kleeimeir , 2000). Rate at which water facilities are failing to work in developing countries is so alarming (Mudege and Taylor 1996). According to Lockwood (2000) figures of operational failure of water facilities in developing countries ranges from 30% to 60%. The problem is more appalling in Uganda, where it is quite a common phenomenon to observe nonfunctional water sources without adequate protection, such as fencing in most parts of the country. 30% of rural water facilities in Uganda are not functioning (MoWE, 2010). However, the challenge in developing countries is to ensure that

systems are adequate for community water use, and that communities manage their water facilities in a sustainable manner.

No safe water supply can contribute to development of individuals and communities if it is poorly managed, it can only be available for a short period of time. However, reliable a water source is, you guarantee that it will break down one day. When a water source breaks down the questions that arise include who takes responsibility for repair, are correct spares parts available for repair, is money available for repair, are there people with correct skills to do the repair. These are management questions that look at how water sources are owned and managed after installation (Haysom, 2006).

The Assistant Administrator US Environment Protection Department, Benjamin Grambles once said that " *we know the worth of water when the well runs dry*". The question on the value of water comes when issues like quality, acceptability, affordability and quantity start showing up (National Academic Press US, 2007). Without safe water people cannot live healthy and productive life. It is estimated that about 900 million people suffer from water related illnesses like diarrhoea, bilharzia, typhoid, hookworms and elephantiasis and about 2 million people die from these diseases each year. Low access to safe water causes 1.8 million child deaths each year. For instance, due to diarrhea alone there are about 4,900 deaths globally each day, and loss of about 443 million school days each year from water related diseases (UNDP, 2006).

In Uganda Water policy incorporates the National Frame on Work Operation and Maintenance of rural water facilities (MWE/DWD, 2011). This framework provides guidance on the roles and responsibilities of all stakeholders involved in rural water supply from community to central bodies. The policy and its accompanying documents aim at increasing access to safe water to at least 77% of the population in rural in line with the MDGs. In principle, it is evident that the water policy and its accompanying documents appear to be highly effective in the attempt to achieve rural water management because the key components fundamental for

sustainability are evident within it. Despite this the extent to which the policy is being put into practice needs to be scrutinized, because the majority of water facilities in Uganda are poorly managed.

After acknowledging management of water facilities is quite important in delivering safe water to populations. MoWE encouraged community based management of water sources especially in rural areas. This system promotes demand driven supply approach that encourages community to apply to government for a water source, contribute to capital cost, elect water user committees of 7-9 members including women, whose roles are to develop operation and maintenance plan, collect and managed funds paid by community, and manage water facility every day affairs including paying HPMs for repairs (MoWE, 2006)

The CBMS approach makes the community solely responsible for operation and maintenance; however this has not achieved sustainability rates expected (Harvey, 2005). Although MoWE in partnership with local and international organization is actively involved in grassroots level to improve the situation of safe water supply, coverage is still low in many parts of the country. Currently the potential to manage rural water supply in Uganda is low leaving people without access to clean and safe water, yet many water supply systems are constructed at a high cost with public funds.

2.2 Contribution of water users/community in management of water facilities

The application of the concept of CPM on the water sector in Uganda increased in the 1980s when the idea of Village Level Operation and Maintenance system (VLOM) was initiated (Asiimwe and Nakanyike 2007: 267-268). Accordingly, this approach was employed with the support from UNICEF towards the government water and sanitation pilot projects, and later extended to cover all districts and became a national strategy, for example, under support by DANIDA (RUWASA) and UNICEF (WES). The VLOM approach empowered user communities to have responsibility over the management of water sources. In addition, the

approach ensured training and equipping of community members to repair and maintain their equipment. So the original approach of Community Participation eventually evolved and transformed into CM to define more citizen control and ownership of water supply.

According to Ferrer (1988) as in Mathbor (1990) emphasis is made on the following areas as crucial in a participatory water service delivery programs: Community Organization (CO), Community Management (CM), greater economic and social equality, better access to services for all, greater participation in decision making, and deeper involvement in the organizing process resulting from the empowerment of people. All these are aimed at achieving sustainability in the development projects.

Parry- Jones et al (2001) indicate that community satisfaction, with water facility determines their willingness to contribute for maintenance services and their future need for another water source. Community involvement in water projects or programs will equally affect sustainability.

As stated by (Haley, 2002) across the World, investigations shows that rural water and sanitation systems operate in the red. In 1999 a survey carried out indicated 64% of the 134 small communities that reported charging for water and sanitation services said they did not collect enough revenue to cover their costs; 37% of these utilities reported losses in excess of \$20,000. The total deficit across 94 small communities was roughly \$ 2.7 million in 1999. The rapid expansion in number of water points and the ageing of existing pumps has left many areas unable to meet simple maintenance requirements. Most water sources are not functioning because service users lack a sense of ownership for infrastructure and services. They also lack knowledge, resources and capacity to carry out repairs (Black 1985).

Community management approaches build capacities and willingness of the community to own and take responsibility in management of their own water sources even after implementing agency has left the community (Monarty and Schouten, 2003)

Capital contribution and water tariffs are very important for community participation and increase life expectancy of water pump they install a sense of ownership in community (Boreslin, 2003, Buman 2006). These software aspects provided during community educations are important in ensuring community understand their roles and responsibilities, and should be done alongside the hard ware activities. Monitoring and evaluation of water service must be carried so as provide water users and supporting stakeholders with necessary information to enhance sustainability (Parry-Jonnes et al, 2001)

Lack of participation of rural communities in planning, implementation and management, and weakness in operation and maintenance system are some of the reason water facilities in rural areas are falling out of use (Suthon and Muarry, 1998). Community participation during planning and project selection, design and installation can achieve increased sense of ownership on the part of the community. Institutional arrangements for managing water project are equally important (Nkongo Diana, 2009)

Ben Taylor (2009), conducted a study to identify the gaps affecting sustainability of water sources in Tanzania, and found out that 46% of the water sources were non- functional in rural areas, 25% of got spoilt within two years and this was due to low community participation and weak monitoring and regulatory structures. Half of the investment on water points got wasted leaving up to 755 people with safe water problems.

McPherson (1994) found out that half of the water facilities assessed in West Sudan were not operational at any point in time due to poor operation and maintenance practices. Similarly in Zambia, Dancan and Kimena, 1999, conducted a study on rural water and sustainability in Lusaka and found out poor operation and maintenance as the reasons why water points are non - operational.

Attaching a cost to water supply is a key component of an appropriate incentive for sustainability, efficiency and accountability of a safe water supply system (Varela-Ortega et al,

1998). RSU (1999), notes that WSC are in most cases active when water supply agency is still in the area, and inactive when the agency pulls away.

Ungeni (1993), indicates that water committees are very important because they act as a medium for the community to manage the way supply, they link the community to water supply agency, collect and manage water user fees/contributions and labor, organize and supervise maintenance done by caretakers and area mechanics, as a result the most government policies emphasize that each water supply facility must have a water committee

Newman *et al.*, 2007 in Bolivia, and Katz and Sara (1997) found that collection and proper management of water user fees was critical for sustainability of water facilities in Benin and Honduras.

According to Koriaing Timothy (2011) in carried out to assess community participation and organization in Nakapiripirit district showed that most water facilities where WSC organized meetings and had good records functioning compared to those were meetings where not held.

According to Munguti (2008) for water source organizers to effect behavior change and participation; they require some basic competencies in the area of knowledge, attitude and skills in organizing community

According to Marieke Adank *et al.*, 2013, functionality of water sources managed by selected WATSAN service providers and users was lower than those that did not have WATSAN service provide. Functionality was very much linked to performance of the WATSAN committees not there presence

2.4 Capacity of Hand Pump Mechanics to manage water sources

The private sector was almost completely uninvolved in the provision of goods and services for rural water until recently. The rapid expansion on the demand for water and the development of affordable hand pumps has increased involvement of the private sector (Paul and Robinson, 2000). Other reasons for increased involvement in the private sector include the removal of subsidies, the ability of the private sector to provide affordable and demand driven products, and being more flexible and innovative (Paul and Robinson, 2000).

Hand pump mechanics are operators selected by the community based on their previous experience maintenance work and lives in the community. They majorly conduct minor repairs and report major repairs beyond their capacity to the district water office. They charge between 15,000 to 25,000 Uganda shillings depending on the magnitude of work conducted. Maintenance activities they carry out include replacing bearing, tightening nuts, replacing chains and cylinders. In most rural communities, have taken advantage of community ignorance to hike charges (Harvey, 2002)

According the study conducted Harvey (2002), to assess of hand pump projects in Kenya, it was found that lack of tool kits and equipment, and refresher trainings are the challenges affecting their performance.

Reed (2004) conducted a study on sustainability of hand pump water projects in Africa and found out that availability and respective supply of tools kits and spare parts is a challenge affecting sustainability. Hard ware of water facilities needs to be accompanied with a well-functioning spare parts chain for sustainability (RWSN, 2009)

The capacity of private service providers like HPM is often hampered by lack knowledge, resources and capacity to carry out repairs (Black 1985). Ssentaba Simon (2009), in a study to assess sustainability also found out in Rakai district, 82% of HPM cited lack of tools to carry repairs as one of the major constraints

2.5 Compliance of water supply agencies to rural management guidelines

Water management guidelines refer to structures, systems, rules and acceptable behaviours while dealing with safe water supply in rural areas. According to IWSC (2003), policy has a great impact when it comes to promotion of rural water supply because it indicates government's commitment in providing safe water in rural areas and provides a frame work for implementation.

Major repairs, including replacement of pipes, are also a major concern at present, particularly rehabilitation of boreholes, which are very common all over the country. Under CBMS sub-counties and district are required to budget for and contribute towards the costs of major repairs when the need arise. The Water Policy and the Operation 2000-2007 (MoWE, 2000) requires that Government (Local and Central) in the short run supports the cost of major rehabilitation, where this is beyond community capacity. The District Water and Sanitation Conditional Grant (DWSCG) guidelines allow for 10% meeting some of major rehabilitation

The water supply system is under pressure to deliver sustainable safe water services to the most disadvantaged populations in rural areas with limited access to safe water. According Rural Water and Sanitation Network, when striving to meet the target for water in the MDGs, Africa alone develops 60,000 boreholes each year. This indicates that public funds are focused on construction of water supply infrastructure at the expense of capacity building, human resource development and monitoring for full sustenance (RWSN, 2010).

De-Abeuguerque et al, 2012 indicates that access to safe water is normally achieved in an incremental manner and is possible despite technical, economic and political constraints. It is therefore a duty of every government to take deliberate and targeted efforts towards meeting their covenant obligations of providing adequate and safe water to its population. Management and maintenance of safe water facilities is much more a management issue before it becomes

technical. Water supply agencies have an obligation to plan, allocate resources and provide guidelines to this noble responsibility

Parry-Jones et al, 2010, emphasizes that policy context within which rural water supply projects are implemented is important in providing a supporting environment that ensures sustainability because it prevents actors from employing different approaches and technologies that are fragmented. The challenge seen with water policies in most developing countries is that policies are poorly defined and this is made worse when donors and implementing agencies by pass government to set their own policies and rules for their own projects (Katz and Sara, 1998).

Policies impact on water programs directly because they define details and outline activities used in policy principles and guidelines, therefore enabling capacity development, appropriately sourcing of funding and monitoring progress (IWSC, 2003). In Tanzania for example policies and targets for water that were developed in 1970, led to substantial investment by donors in the water sector.

Muller (2002) indicates that rural water supplies need sound legal frame works to guide and provide confidence to all agencies working in the water sector, because it helps them determine their own plans and policies, and advance their activities as quickly as possible. A legal frame guide rural implementers of water policy and prevents water programs running a risk of violating societal norms and failing to address the objectives of which they were existence (IWSC2003).

In many countries there are laws protecting and providing for water rights of poor water users. The challenge is poor implementation because of the organizational capacity to do so, in some countries laws are non- existent, weak, or laws are not just well thought off. When thinking about water rights and water laws, it is important to make sure that relevant laws exist and institutions are developed to enforce the laws (MOFND, 2002)

Morgan (1993) acknowledges that, to properly implement water policies and legal framework, there is need for good institutional capacity and organizations arrangements to provide maintenance systems through ongoing financing and repair of water supply facilities. Unless a proven maintenance system is in place, no water facility should be provided because they no end up being unsustainable (Roark et al, 1993).

In most African countries, a local government is recommended to provide supervision to the rural water supply because they are close to communities. The challenge though, is that local governments lack the capacity to effectively perform this role and are under- funded (Brikke et al 1998). In Order to achieve properly management rural, it is important to build capacity at all levels, but most especially local government level to ensure support systems are in place for service delivery and maintenance (Reeds and Skinner, 2001). Lane (2004) in South Africa also found out that governments have the limited capacity to implement and finance the free, basic water policy

Parry-Jones et al, (2001), points out that there are three, core linkages that are fundamental for sustainability of rural water supply services. First is the training and capacity building of stakeholders on their roles as effectively as possible. Second is the flow of information across and between all stakeholders in order for them to make informed decisions and take appropriate action to ensure sustainability. The last linkage is the flow of physical resources that are needed and this should be free and flexible to meet the needs of stakeholders at a given point in time.

Management of water supply has responsibilities that range from technical, financial, and organizational and these vary from community to community. A partnership approach among community, governments, NGOs, and donors can provide sustainability, because responsibility is directed or allocated to those institutions, or individuals who can manage it best (Reed, 2002, Harvey and Skinner, 2001).

Massocend et al, (2010), conducted a study on sustainable access to safe water in Zamtar – Elcharkieh South Labenon and found out that there was poor operation and maintenance, distribution networks where aging, and low/inadequate education programmes contributed to non -sustainability and contamination of water points.

According to RSU, (1999), sustainability of rural water supplies depends on a number of factors. Other factors include lack of spare parts for many hand pumps, logistical problems for district maintenance teams, lack of comprehensive government policy on responsibilities of coordinating rural water supply sector Sustainability depends on key aspects of management and governance. The question of this study is that which of the factors and linkages above are crucial for solving the challenges of rural water supply management on the ground in Uganda

Gaps in knowledge have been identified particularly in relation to these factors in Uganda. There is enough evidence to suggest that while these issues have been extensively research in other countries, they have not been adequately researched in Uganda, this necessitates this research.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter deals with the methodology that was used in the execution of this study. It involved the following sections; study design, study site, study population, , study variables, sources of data, sample size calculation, sampling procedure, data collection tools, data collection techniques, data analysis procedure, quality control issues, ethical consideration, and limitations ,and plan of dissemination, of the study respectively.

3.1 Study design

The study design was a cross-sectional study employing both qualitative and quantitative approached. This study design was recognized as suitable for this study as it would enable data on management process influencing functionality of water facilities in which data could be collected at a single point in time.

3.2 Study site

This study was conducted in Koro sub-county, found in Omoro County in Gulu district located in Northern Uganda. Koro sub-county has a total of 6 parishes and 24 villages' with 7279 households and its population being about 31353. The sub county currently has a total of 40 safe water facilities. Majority of the population is engaged in peasant farming despite a small number engaging in semi-commercial farming like tobacco growing. A small proportion of people are also into businesses like bodaboda transport and roadside vending (*District development plan 2013/14*).

(See Maps Indicated in Appendix showing Northern Uganda locating Gulu district and Gulu Showing the location Koro sub-county)

3.3 Study population

The study targeted all safe water facilities in Koro sub-county that were functional and non-functional in order to comprehensively assess the management processes influencing the functional status. Along with their users

3.3.1 Accessible population.

All safe water facilities in the selected areas during the study along with their users

3.4 Study variables

This study was directed by the following study variables;

3.4.1 Dependent variable

The dependent variable was functionality status of the water facility.

3.4.2 Independent variables

The independent variables for this study were categorized as follows;

Contribution of community/water users towards functionality of the water facility; this comprised of finding out aspects such as; Willingness to pay water user fees, involvement in selection of WSC, formation of byelaws, attending water facility management meetings, reporting defects on water facilities, routine cleaning and presence of care taker

Capacity of water source committee in facilitating functionality; this involved assessing the ability to collect of water user tariffs/fees, ability to organize community meetings/accountability, ability mobilize water user for routine cleaning of water source, ability to inspect and report defects by WSC, and Payment hand pump mechanics

Capacity of Hand Pump Mechanics in influencing functionality of water sources; this involved assessing , ability to handle repairs, ability hold meetings with water users/WSC, possession of tools for carrying out repairs, ability to compute and report to community on costs of spares

Compliance WSA to rural water management guidelines; this involved assessing support given water source committees, support given to the hand pump mechanics, Support to water users (access to spare parts and major repairs), and monitoring water facility status.

3.5 Sources of data

The sources of data were community members who recognized as water users, water source committee's members, hand pump mechanics, and staff involved in water supply in rural areas. Data was obtained 191 respondents who categorized as follows, 108 households, 72 WSC members, 6 HPM and 5 categories of Key Informants (KIs)

3.6 Sample size determination

The number of water sources to be visited was determined using Yamane (1967) simplified formula

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

Description: n = required sample size

N = Population (total number of water sources in the sub county)

e = precision 5% (standard value of 0.05)

$$n = \frac{40}{1 + 40(0.05)^2}$$

$n = 36.36$ Water facilities

Therefore the total of water facilities considered was =36

3.7 Sampling procedure

3.7.1 Sampling of water facilities

Sampling for this study took place as follows

A census of all the 6 parishes and 24 villages in the sub county were considered. For the 10 villages that had one water facility that water facility was considered, for the 9 villages that had two facilities in each all the 2 were considered and for the four villages that had 3 water facilities only 2 were selected and all together management of the functionality of the 36 water facilities was assessed.

3.7.2 Sampling for the respondents

After selection of water facilities, the researcher went ahead to select actual categories of respondents to be interviewed. For all the sampled water points, 2 committee members were purposively sampled, care takers where compulsory followed by any other member of the committee. In addition 3 beneficiaries (water users) were conveniently sampled. A census of all the 6 HPM was taken and 5 Key Informants were purposively selected.

3.8 Data Collection techniques and tools

3.8.1 Data collection tools

Three semi structured questionnaires with closed and open ended questions and a Key Informant interview guide were used to collect data

3.8.2 Data collection techniques

Data was collected using researcher administered questionnaires to gets, responses from the community /water users. Another set of questionnaires was administered to water source committees, and the last set of questionnaires was administered to hand pump mechanics. Five Key Informant interviews were handled with the following categories of people District Water Officer (DWO), Hygiene and Sanitation Officer (HSO) World Vision, Field Coordinator (FC) NUDIEL, Health Assistant (HA) Koro and Community Development Assistant (CDO)

3.9 Data Analysis and Management

Quantitative data management

Completed questionnaires were handed over by the research assistants on a daily basis and these were double checked for missing data, completeness and corrections made immediately. This was followed double entry into EPI-DATA computer software and cleaning, and was exported then to SPSS for analysis.

Qualitative data management

The participants' responses were transcribed, coded and typed in Ms Word Themes and sub themes were generate. Data was then entered into a master sheet, coded and continuously analyzed

3.10 Data Analysis

3.10.1 Quantitative data analysis

The quantitative data collected was analyzed at two different levels:

At Univariate analysis; The quantitative data was analyzed, summarized and presented according to the scale of measurement while numerical data was summarized into means, and categorical variables were the analyzed and presented using tables.

At Bi-variate analysis; the relationship between management factors and functionality status was assessed using chi square test. Chi square test was used whenever the cell count was above 5. Variables with (p-values less than or equal to 0.05) was be considered to be significantly associated with functionality.

3.10.2 Qualitative data analysis.

Data was entered into a master sheet, coded and later analyzed. The participants' responses were transcribed and typed in Ms Word Themes and sub themes were generated and analyzed.

3.11 Quality Control Issues

Proper selection and training of research assistants in data collection methods so as to bring quality data, this covered areas such as proper administering of the questionnaire, question interpretation & translation into local language

The research assistants that participated were selected interns at Water Office and Health Office and they were quite fluent in both English and the local language spoken in the area.

Pretesting of the data collection tools was carried in Ongako sub-county and four water facilities used before final administration in Koro sub-county in orders to ensure validity and reliability

Cross checking all the tools for accuracy and completeness were done after delivery of the administered tool

Coding, double entry and cleaning of data was done during the study to eliminate errors

3.12 Ethical Considerations

Approval and clearance was obtained from the Institute of Health Policy and Management of International Health Sciences University research before proceeding with the proposed study.

Clearance was sought from the District Water Officer to conduct the study in the selected areas in the district.

Interviews were performed after explaining the objectives of the study together with its implications and obtaining verbal consents from the respondents. The respondents however held the right to withdraw from participation at any stage during the interview process.

Security, Privacy and confidentiality of individuals and information were preserved throughout and after the study. The respondents in this study were rendered anonymous.

3.13 Limitation of the study

This study experienced the following limitations.

The study did not look into detail on other factors quality of water besides functionality; for example quality of water and reliability of water facilities due to limited resources

3.14 Dissemination of the findings

Three spiral bound copies will submit to University for examination and after passing them, two hard bound copies will be submitted to University library. One hard bound copy will be given to the District Water Office; another will be given to HSO-World Vision, and finally Koro Sub-county Office

Recommendations made from the findings will be disseminated to the water supply agencies, water source committees, hand pump mechanics, water users and other stakeholders on how to provision of functionality of rural water supplies

CHAPTER FOUR PRESENTATION OF RESULTS

4.0 Introduction

This chapter presents the results of the study arranged in the following sub-sections; demographic information of household heads, contribution of community in managing water facilities, capacity of water source committee in maintaining water facilities, Capacity of Hand Pump Mechanics to manage water facilities, and compliance of water supply agencies to rural water management guidelines

4.1 General information

4.1.1 General information of the interviewed community water users

Table 1: General information of water users

Characteristic	Frequency	Percentage (%)
Sex		
Males	52	47.4
Female	56	52.6
Sub Total	108	100
Age of respondents		
18-25	18	17.9
26-33	24	20.5
34-41	18	17.9
41 and above	48	43.7
Sub Total	108	100
Marital status		
Married	80	76.9
Unmarried/single	20	17.9
Divorced	8	5.2
Sub Total	108	100
Education level		
Primary	68	66.7
Secondary	26	23
Tertiary	10	7.7
Others	4	2.6
Sub Total	108	100
Tribe		
Acholi	108	100

Most community water users interviewed were female 52.6% (56/108) and 47.4% (52/108) were males. In terms of age distribution 17.9 % (18/108) were between 18-25 years, 20.5 percent (24/108) were between 26-33 years, 17.9 (18/54) percent were 34-41years and 43.4 % were above 40 years

Most respondents were married 76.9% (80/108) followed by distantly by unmarried 17.9 % (20/108) while 5.4 % (8/108) were divorced.

Regarding the highest level of education completed the study results showed that most respondents 66.7% (68/108) had attained primary education only, followed by 23 percent (26/108) who had secondary education while 8.3 percent (10/108) had tertiary. It is important to note that 2.8 % (4/108) of community water users within category of others had attained community trainings. Regarding the tribe all100 % (108/108) of respondents were Acholi

4.1.2 General Functionality Status of Water Facilities

Table 2: Relationship between functionality and type of water facility

Type of water facility	Water functionality status		Percentage of non-functionality
	Functional	Non Functional	
Borehole	20	8	28.6
Shallow well	5	1	16.7
Protected spring	2	0	0.0
Total	27	9	22.6

The status of water facilities was observed were as follows: Out of the 20 boreholes sampled 8 were not functioning indicating a non-functionality rate of 28.6%, out of 5 1 was not functional

indicating the non-functionality rate of 16.7% of the shallow wells were not functioning while all the springs were functional.



Figure 2: Non -functional shallow well in Obwola village

4.2 Community water users' contributions in influencing functionality of water facilities

Table 3: Payment of water user fee by households

Willingness to pay water user fees	Frequency	Percent
Yes	78	71.1
No	30	28.9
Total	108	100.0
Interval of payment	Frequency	Percent
Once month	92	85.2
Whenever source breaks down	16	14.8
Total	108	100.0

The study findings revealed that 71.1% of households pay user fee and 28.9% do not pay with the payments.

Furthermore, the interval for payment was follows; once a month (85.2%) and when water source breaks down (14.8%)

Involvement in selection of water source committees

Table 4: Selection of water source committees

Involved in selection of WSC	Frequency	Percent
Yes	108	100
No	0	00
Total	108	100.0

The selection of WSC was 100% responsibility of community members as revealed by findings with most water sources (84.2%) having WSC.

Formation of byelaws / regulation for management of water facilities

Table 5: Formation of byelaws on management of water facilities

Involved in selection of WSC	Frequency	Percent
Yes	100	92.1
No	08	00
Total	108	100.0

It is also paramount to note that 92.1% of community members make byelaws/regulations for managing the water sources

Reporting identified defects in water facilities

Table 6: Reporting identified defects in the water facility

Reported defects in water facility	Frequency	Percent
Yes	90	89.5
No	18	11.5
Total	108	100.0

The study findings revealed most households (89.5%) reported defects on water supply facility which was done sometimes when water users attended meetings on management of water source whenever called upon by LC1 or WSC

Presence of care taker

Table 7: Presence of a care taker

Caretaker present at facility	Frequency	Percent
Yes	74	68.4
No	34	32.8
Total	108	100.0

In addition, majority household (68.4%) reported their water source to have a caretaker with 66.7% of caretakers being present at least three times and above in week.

4.2.1 Association between contributions of water users and functionality of water facilities

Table 8: Relationship between contributions of water user with water facility functionality

Contributions of water users		Water source functionality		Total	P-value
		Functional	Not functional		
Paying water user fees	Yes	26 (88.9%)	46 (65.5%)	72 (71.1%)	0.179
	No	4(11.1%)	32 (34.5%)		
Involved in selection of WSC	Yes	34 (88.9%)	62 (82.8%)	96 (84.2%)	0.828
	No	0 (0%)	12 (15.8%)		
Involved in setting rules and regulations /byelaws	Yes	28(88.9%)	68 (89.7%)	96 (89.4%)	0.500
	No	0 (0%)	12 (6.9%)		
Attending meetings to discuss management issues	Yes	34 (100%)	68 (89.7%)	102 (92.1%)	0.315
	No	0 (0%)	6 (10.3%)		

There was no statistically significant difference in the percentage of functional (100%) and non-functional (82.8%) water facilities where water users attended meetings, $\chi^2 (1, N = 108) = 1.011, p = 0.315$.

There was no statistically significant difference in the percentage of functional (88.9%) and non-functional (82.8%) water facilities where water users selected WSC, $\chi^2 (1, N = 108) = 0.379, p = 0.828$

There was no statistically significant difference in the percentage of functional (88.9%) and non-functional (88.9%) water facilities where water users made rules and regulations for operation and maintenance of water facilities, $\chi^2 (1, N = 108) = 1.387, p = 0.500$

There was no statistically significant difference in the percentage of well functional (88.9%) and non-functional (65.5%) water facilities where water users reported to pay water fee, $\chi^2 (1, N = 108) = 1.824, p = 0.179$

4.2.2 Relationship between payments of user fee by households with availability of care takers at water sources

There is a strong positive correlation between the water user fee contribution by household and the presence of caretaker at water sources in the Koro Sub County, $r (108) = 0.565, p < .001$, one-tailed.

Table 9: Relationship between payments of user fee by households with availability of care takers at water sources

		Water user fee	Care taker
Water user fee	Correlation Coefficient	1.000	.565**
	Sig. (1-tailed)	.	.000
	N	108	108
Care taker	Correlation Coefficient	.565**	1.000
	Sig. (1-tailed)	.000	.
	N	108	108

1. Our Spearman's rho is .565, so it's a strong correlation between water user fee and presence of care taker at water source.
2. Our significance is .000, so we can reject the null hypothesis.
3. Our N is 108, so we have 108 cases.

4.3 Capacity of water source committee in facilitating functionality of water facilities

The researcher proceeded to establish the capacity WSC have to facilitate functionality of water facilities. The ability of the WSC to collect and manage water use fees, organize meetings with communities, maintain environmental hygiene around the water facility were assessed

Ability to collect user fees

Table 10: Ability to collect water user fees by WSC

Collection of water user fees	Frequency	Percentage
Yes	48	66.7
No	24	33..3
Sub total	72	100

Most WSC (66.7%) reported to be collecting user fee from the community members. The collections are made as follows; 47% monthly, 32.1% whenever system breaks down while 20.9% collect weekly.

Ability to organize meetings with community members

Table 11: ability to organize community meeting

Organize meetings with community members	Frequency	Percentage
Yes	60	83.4
No	12	16.6
Sub total	72	100

A good percentage of WSC (83.4%) confirmed holding meetings to discuss water management issues. Furthermore, the frequency of meeting is as follows; weekly (15.8%), monthly (57.9%), after 3 month (15.8%), after 6 month (5.3%) and once a year (5.3%). Most WSC (84.6%) organized meetings with community members to discuss management issues for the water facility with most meetings (63.6%) being held within a month, 22.7% after 3 month, 9.1% weekly while 4.5% after 6 month.

Ability to mobilize water users for routine cleaning of the water facility

Table 12: Ability to mobilize for routine cleaning of the water source

Mobilized water users to clean the facility	Frequency	Percentage
Yes	64	88.9
No	8	11.1
Sub total	72	100

A majority 88.9% of WSC reported to have participated and mobilized water users for routine cleaning of water sources.

Ability to inspect and report defects in the water facility

Table 13: Ability to inspect and report defects

Inspection and Reporting defects in water facilities	Frequency	Percentage
Yes	64	88.9
No	8	11.1
Sub Total	72	100

Majority of WSC (88.9%) report defects that arise on water supply facility

Figure 3: *Non- functioning borehole in Abili village*



Remuneration of hand pump mechanics

A report by the water source committees indicated that;

“More than half of WSC (53.8%) paid HPM whenever they repaired the system while 11.5% WSC were paying HPM after every 3 month. Less than half (38.5%) of WSC had agreements with HPM on repair and routine servicing”

4.3.1 Relationship between the roles of Water Source Committee with Functionality of water sources

Table14: Relationship between the roles of Water Source Committee with Functionality of water sources

Roles of WSC		Functionality of water source		Total	P-value
		Functional	Non functional		
Collecting user tariffs	Yes	40 (78.9%)	8 (28.6%)	48 (64.5%)	0.017
	No	11 (21.1%)	13 (71.4%)	24 (34.6%)	
Organizing meetings with water users to discuss management issues	Yes	40(78.9%)	20 (100%)	60(84.6%)	0.187
	No	12 (21.1%)	0 (0%)	12 (15.4%)	
Mobilization water users for cleaning	Yes	42 (84.2%)	22 (100%)	64 (88.5%)	0.264
	No	8 (15.8%)	0 (0%)	8 (11.5%)	

A higher percentage of Functionality (78.9%) occurred with collection of user fee than non-functionality (28.6%), $\chi^2 (1, N = 72) = 5.736, p = 0.017$.

There was no statistically significant difference in the percentage of Functionality (78.9%) and Non Functionality (100%) for water facilities where community meetings are held by WSC, $\chi^2 (1, N = 72) = 1.742, p = 0.187$.

4.4 Capacity of Hand Pump Mechanics to manage water facilities

Ability to conduct repairs of water facilities

Table14: Repairs HPMs could perform

Repairs correctly performed	Frequency	Percentage of those able to properly repair
Replacing metallic pipes U2	06	100
Replacing plastic pipes U3	01	16.8
Fishing pipes (removing dropped pipes)	00	00
Replacing cylinder/overhaul	06	100
Replacing bolts, nuts and greasing	06	100
Sub total	06	100

All (6/6) HPM (100%) reported the ability to correctly replace U 2 pipes, replace cylinder/overhaul, and replace bolts and greasing. However, it is important to note that none of HPMs reported to having the ability to fish/remove pipes that have drop in to dilled hole and 16.6% acknowledged that they could properly replace U 3 plastic pipes.

Ability to organizing community meetings to discuss maintenance issues

Table 15: Conducting meetings with water users to discuss maintenance issues

Meetings with water users to discuss issues of maintenance	Frequency	Percentage
Yes	02	33.3
No	04	67.7
Total	06	100

The study findings indicate that 33.3% (2/6) of HPMs called for meetings with WSC/water users to discuss issues of water maintenance. However, 100% of these meetings were organized when the water source breaks down not routinely.

Ability to Report on functionality status of water facilities to the Sub County or District Water Officer

Table 46: Reporting on functionality status

Reporting on functionality status of water facilities	Frequency	Percentage
Yes	05	83.3
No	01	16.7.7
Total	06	100

Majority of HPMs (83.3%) were reporting on functionality status of water facilities in their area of jurisdiction.

Possession of tools and equipment for repair services

Table 57: Possession of tool kits and equipment

Possess tools	Frequency	Percentage
Yes	00	0
No	06	100
Total	06	100

All HPMs (100%) did not possess tool kits but could access to tools kits from the sub county to perform work. However, it is important to note that the sub county had 2 sets of tool kits which are being shared among the six HPMs. Very important to note is that the following key tools; fishing tools, pipe vice, rod dye, pipe dye needed for plastic pipes were completely lacking in the 2 sets of tool kits available. Most HPMs (83.3%) were using their personal bicycles for work.

General constraints faced by HPM if executing the duties

All hand pump mechanics where experiencing challenges

Table 6: Constraints faced by HPMs in maintaining water facilities

Constraint	Frequency	%
Inadequate tools	6	100
Community not willing/able to pay HPM	5	83
Community lack funds to buy spare parts	3	50
Lack of transport	6	100
Lack of PPE	2	33
Lack of adequate skills on some technology e.g. replacement of plastic pipes and fishing pipes	6	100

Major challenges reported to be affecting work were lack of tools 100%, unwillingness/inability of the community to pay for repair services provided 83%, lack of appropriate transport means 100% and inadequate skills in some technology especially replacement of plastic pipes and fishing out of fallen pipes.

4.5 Compliance of Water Supply Agencies to rural water management guidelines

They key informants were asked about to name some laws they have enacted on management of water facilities and the following were some of the responses;

“We currently have no ordinance or sub county bye- laws on management of water, we only depend on those bye-laws formed by community for their individual water sources”.

Remarked one respondent from the district

Another respondent from the sub county had this to say....

“There are bye-laws yet as there is laxity by the sub county officials to enact laws”.

They key informants were also asked if they provide support to communities with major repairs and rehabilitations repairs beyond community capacity their and the responses were as below.

“Whenever it comes to major repairs beyond communities’ ability to handle we forward the matter to the district water office for assistance or connect them to potential partners” said one respondent from the sub county.

“Yes we plan and budget for them but case by case, in most cases we prioritize those that in dear need, especially schools and health centres. This is due to limited funding.” Said a respondent who happen to be from NUDIEL

They key informants were again how they have made spare parts available and affordable for water users that need them to conduct repairs and the responses were as below

‘We have not done anything to make spare parts and affordable for water user yet s’ said one respondent who happen to be from World Vision.

‘The district is planning pipes to procure pipes and sell them at a subsidized price to waters user who cannot afford expensive pipe, currently we have not done anything’. The KI from the district water office said.

“For the case of pipes there is nothing we have done nothing as a sub county we normal refer the water user to the district water officer who provides if in stock” Said the KI from the sub county

They key informants were also asked if they provide support for ongoing or refresher training for water source communities and the responses were as below.

“Yes we do provide refresher training at least once after 2 years or when needed” Said one respondent from World Vision

“We do provide refresher training only when it is required and depending on the performance of water source committees.” Said a respondent who happen to be from district

“Yes we carry out refresher training whenever need arises or when there is financial support and material from the sub county or partner.” Said a respondent who happen to be from Sub County

They key informants were also asked if they support HPMS tool kits and refresher training to up their skills and the responses were as below.

“No we have not given tool kits for Hand Pump Mechanics, neither supported any refresher training” Said a KI from World Vision

“We provided tool kits to some HPMS but a majority don’t have they just borrow or share and as for refresher training conducted one in 2011 for selected HPM.” Said a respondent who happen to be from district

“Tool kits are still a challenge as we have only two tool kits that were provided by UNICEF being shared among the six HPMS and even the two tool kits don’t have all the tools especially for the new technologies. As for the refresher training we don’t the funds to conduct yet.” Said a KI e from Sub County

They key informants were also asked if they monitored functionality of water facilities and service providers and the responses were as below.

“Functionality of water sources and service providers is monitored but quarterly not continuously as expected due inadequate funds.” Said a KI who happen to be from district

“We conducted follow-ups quarterly for water source committees and monitor them annually”
Said a KI who happen to be from NUDIEL

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

This chapter discusses the findings from the study as per the research objectives. Presentations are in the following subsections; Contributions of community users influencing functionality of water facilities, Capacity of water source committee in facilitating functionality water facilities, Capacity of Hand Pump Mechanics in influencing functionality water facilities, and Compliance level of Water supply Agencies to management of water facilities.

5.1 Contributions of community users in influencing functionality of water facilities

Concerning willingness to pay water user fees the study findings reveal that a good number of water users pay fees, however there are those who never pay at all, some pay only when the water source breaks down, while others are just forced to pay. The reasons for non-payment included inactive WSC, lack of transparency and accountability from WSC, and lack of money of among some households. This study finding replicates findings by Harvey and Reed (2007), who found out that in rural communities, it is a common practice that efforts to contribute O&M funds are always insufficient and even if they exist, they often cannot enable community to manage exceptional expenses like replacements. The findings also agree with Parry- Jones et al (2001) that indicates that community satisfaction with water services provided determine the willingness of the community to contribute for maintenance services and their future need for another water source.

Concerning involvement in selection of WSC, formation, of bye laws, and attending meetings this study found no big difference in functionality in water facilities where water users, selected WSC, set rules and regulation, and attended meetings with those that did not select WSC, set rules and regulations and attend meetings despite high level scores (more than 80%) reported in each of this contributions. This may be due the fact that mere presence of plans, WSC, regulations, and user funds does not translate into functionality of water facilities if they are not operational. It could also be that water facilities were water users did not participate in selection

of WSC, developing plans, and paying fees were being managed differently (e.g. managed by individuals who are responsible and care better for water facilities). This result agrees with the findings of the studies done by Marieke Adank et al., 2013, which found that functionality of water sources managed by selected WATSAN service providers and users was lower than those that did not have WATSAN service providers. This study however was focused on collective community participation, working and structures of individual service providers were not explored and so research into the private management of water facilities may be necessary.

Concerning presence of the presence of the care taker findings in this study revealed that there is positive relationship between the water user fee contribution by household and the presence of caretaker at water sources. This may be due to the fact that care takers availability of care takers builds confidence among user because as they observe him/her carrying out inspections to identify areas that need repairs and reports, they keep the water source clean, perform minor repairs and identify and keep the spares need for servicing. Care takers also keep records for all repairs, keep the tool box and supervise activities around the catchment area (MoWE, 2010, 139). The study findings here agree with the findings of SsentAba Simon (2009) in the study to assess performance of the current Community based management system in management of rural water supplies in Rakai district, Koryiang Timothy (2011) in the study conducted in Nakapiripirt district which found that presence of care takers increases functionality and consequently community participation

5.2 Capacity of water source committee in facilitating functionality water facilities

Concerning collecting water user fees, findings in this study suggested that collection of water fees by WSC was significantly associated with functionality. This could be due to the fact water facilities that collected money were able to meet O& M costs and there maintained their facility very well. This study finding is in line with the findings of the study conducted by Newmanet al., 2007 in Bolivia, and Katz and Sara (1997) in Benin and Honduras that found that collection

and proper management of water user fees was critical for sustainability of water facilities. Collecting water user ensures that community members have fund secured in case of an abrupt breakdown of their water facility. This money helps buy the spare parts and also pay the hand pump mechanics that carries out the repairs.

Concerning calling for meetings with water source users to address issues of water facility, this study, findings show no significant difference in functionality in water facilities where WSC held meetings and kept records and those where WSCs did not held meetings and kept records. This does not mean meetings don't matter, it could be because having meetings without putting what is agreed in this meeting into practice cannot result in to functional and this could have been the case for water facilities where meeting are not held. It could also be that the quality of the meetings does not influence behavior due to lack adequate skills and knowledge to organize, since most WSC could not produce minutes of the previous meetings when asked. The study findings however contrasted with the findings by Koriaing Timothy (2011) in Nakapiripirit district, in Uganda which found out that most water facilities where WSC organized meetings and had good records functioning compared to those were meetings where not held.

Concerning mobilizing community members for routine cleaning findings show that the mobilizing community to clean and maintain the water facilities was not significantly associated with functionality of water facilities. This does not mean that mobilizing water users to take part in environmental hygiene is not important, it is very important especially in ensuring that surrounding is hygienic and prevents contamination of the water. Functionality and mobilization may not be significantly associated because WSC lack adequate leadership and mobilization and leadership skills or that water users don't attach value to environmental hygiene of water facilities due to lack of knowledge on the importance maintaining environmental hygiene around the water source. The KIIs with district officials also reported inadequate mobilization

and leadership skills among WSCs and lack of ownership as major reasons for poor hygiene around the water source and non-functionality. According to Munguti (2008) for water source organizers to effect behavior change and participation; they require some basic competencies in the area of knowledge, attitude and skills in organizing community. This study however did not attempt to find out how WSC mobilized community during routine cleaning, it assessed what they reported to do.

5.4 Capacity of Hand Pump Mechanics in influencing functionality water facilities

Concerning the ability to conduct repairs results of this study revealed that HPMs have limited skill and knowledge in carrying out some repairs specifically replacing plastic pipes and fishing out pipes that have fallen in to the drilled hall. This could be due to the fact they have not gotten any training on this approaches ever since they were selected. This limited skill could be the reason most water sources are not functioning, because this means that water facilities that require fishing out pipes and replacing plastic pipes cannot be repaired by HPMs in Koro sub-county. Water Facilities which remain unrepaired due to lack of knowledge and skills by HPM live the community with no alternative but to go for unsafe water sources or walk long distance to fetch clean water. This finding is in line with the findings by Harvey (2003), in a study carried out in Kenya to assess sustainability of hand pump projects that found out that HPM did get ongoing training to up their skills to cope with changing technology. This study suggests that continuous training of HPM especially on new approaches could increase competence and therefore functionality of water sources in Koro sub-county. Some water facilities have corrosive water and require plastic (PVC) pipes which resistant corrosion yet most HPM have limited skill on how replace galvanized pipes with PVC.

Concerning possession of tool kits, findings in this study shows that HPM don't possess tool kits, there are only 2 tools kits being shared by 6 hand pump mechanics. This could due to fact tools are expensive for the HPM to acquire. Inadequacy of tools affects the ability for HPM to

response to breakdown immediately especially those that require replacement of pipes and cylinders and this can live community without water for days or even month. This study agrees with a study conducted by Ssentaba Simon (2009), which found out in Rakai district, 82% of HPM cited lack of tools to carry repairs as one of the major constraints. This study suggests that each hand mechanic must possess a tool kit so that emergency brake can be handled immediately, other waiting for his fellow HPM to first complete or run up and down to borrow.

Concerning organizing regular meetings with the community to discuss aspects of maintenance of water facilities, only 33.3% of the HPM have ever called for meetings and this happen when a break down had occurred. This implies that HPM don't hold any meetings with WSC and water users to prepare them for any future failures in facility. Community users need to know how much it will cost to replace for example a cylinder, a pipe or fish out pipes and the best person to provide this information is the HPM. Communicating costs and causes of failures of water facilities early enough makes the community prepared and also appreciates the value of paying water user fees. This study suggests that HPM need to be close to water users and sensitize them regularly and even write agreements/plans binding them to carry out routine servicing of water facilities and updating the water users accordingly in meetings, probably after every 3 month.

5.5 Compliance level of Water supply Agencies to management of water facilities

Concerning putting in places laws to ensure functionality of water facilities, results of this study revealed that WSA did not put in place an ordinance or byelaws to support management of water facilities. This could be due to the fact they there is limited ability develop laws by WSA as clearly reported by Health Assistant who noted that byelaws are to be made politicians are relaxed in making laws for management of water facilities. The inability to put in local laws to support proper implementation of water policies could be to non- functionality of water sources. Some community members are very stubborn and need to be forced to contribute especially

contributing funds for operation and maintenance of water facilities if those contributing are to continue doing it. Having laws against mismanagement of funds by WSC, or overcharging community for repairs by HPM increases community involvement and therefore functionality of water facilities. This finding is in line with the findings by Brikke et al (1998) found out that local governments lack the capacity to effectively perform their roles and are under-funded. Reeds and Skinner, (2001) recommended that in order to achieve properly management rural water, it is important to build capacity at all levels, but most especially local government level to ensure support systems are in place for service delivery and maintenance

Concerning giving support to water users on repairs that are beyond their capacity, the findings in this study show that WSA provide limited support to community when it comes to major repairs beyond community abilities. The sub county doesn't budget at all for major repairs while the district water office and partners support water facilities that are poor conditions. This could be due inadequate funding, and the high number of water facilities that need rehabilitation. This finding agrees with the findings by Lane (2004) in South Africa who found out that governments have the limited capacity to implement and finance the free, basic water policy.

Concerning subsidizing and making spare parts available for water users, the findings in this study reveal that the WSA have not put place any mechanism to make spares parts available and affordable for water users as recommended in the policy guidelines. This could be due to the fact supply of spare parts is commercially driven by private who the district has little control over and lack of fund for district to procure and stock spares. Spare parts especially pipes are very expensive and cost about 80,000=, and are not readily available in rural areas. This implies that a borehole for example needs an overhaul/general servicing (putting new pipes and a cylinder) a community might need between 800,000 to 1,000,000 to pay this service. This money in most cases is not available in the community and the WSA is expected to give a hand

by either providing the pipes freely and selling them cheaply so that the water facility is repaired and the community continue to use the facility but WSA are not subsidizing on the costs of spare parts and leaves the community unable to raise money without clean water. The researcher suggest that community users need external help if water facilities are to continue functioning, so WSA should design strategies to make spare parts affordable and accessible, they could lobby, plan, advocate for more funding to enable them stock spare parts and sell them at a fair price to water users.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This chapter draws conclusions and gives recommendations from the study findings.

6.1 Conclusions

In regards to water users contributing towards functionality of the water facility, they did well in paying water user fees, selecting water source committees, set rules and regulation and attending meetings on management of water facilities. However not all water users pay water fees willingly due to lack of transparency and accountability, and inactive water source committees

In regards to the capacity levels of water source committees in facilitating functionality of water facilities, they did well in organizing community meetings to address issues of water facilities, mobilizing community for routine cleaning, and reporting defects on water facilities. However they did not well in collecting water user fees and paying hand pump mechanics whenever they repaired water facility. In addition to this loss of moral with time, lack of leadership skills, migration to other villages especially women when they are married, death of members and lack of refresher trainings were noted as gaps affecting performance of WSC.

Regarding the capacity levels of the hand pump mechanics towards influencing functionality of water facilities, they did well in some repair activities like replacing galvanized pipes, nuts, bolts, cylinders and reporting defects. However, the hand pump mechanics did not well in repair activities like replacing plastic pipes, fishing out of fallen pipes due to lack of skills. They also did not possess tools kits and conducted less community meeting.

Regarding compliance levels of Water supply agencies to management guidelines geared towards functionality of water facilities, the agencies interviewed are hardly complying with their mandate of providing support to community based service providers and often lack capabilities especially resources to; build the capacity of water source committees and hand pump mechanics, conduct majors repairs, provide spare parts in subsidized prices and conduct continuous monitoring

6.2 Recommendation

To ensure that rural water facilities are properly managed and continue to functioning, water users, WSC, HPM and WSA, which are very vital in community based management system, require improvements. Recommendations are given for each of the above conclusions

There is a need to continuously sensitize the water users on the importance of contributing for maintenance especially contributing user funds. Behavior change is a gradual process and some people may not be bothered or not convinced and need reminders. There is also need to empower community to demand for accountability from WSC and explore or develop accounting systems and ask community to adopt. For example village savings and loan association (V SLA) or use sub county account

There is need to regularly select and train WSC for continuous functionality of water facilities. Regular selection of WSC, preferable after every 2 years provides for a mechanism of checking if members are still interested in serving, since this is a voluntary service. The sub county and district water office should be responsible for regular selection. There is needed to make the operations of water source committees legal or formal, so that it is easy to track and discipline WSC that mismanage community funds. Signing memorandums of understanding with Sub County and district will legalize their operations. Legalizing operations of WSC at policy level equally needs to studied further, so that WSC are made to operate like village health teams since they also serve many households

Before introducing new technology in to the community, HPM need to be trained first. Refresher trainings to up the skills of HPMS are very critical if they are to competently handle repairs. There is also need to avail each HPM with a tool kit and equipment if he/she is to respond to maintenance works immediately. The sub-county or district could purchase tool kits and lend to HPM on loan or make them hire at a fair price.

There is need to absorb the HPM in to water sector, by putting in place clear structures of operation and monitoring, including monthly remunerations if they are to remain motivated and functioning.,

For WSA to properly take up their functions of planning, supervising, regulating, monitoring and supporting rural water facilities to ensure functionality there is need to strengthen them in terms of resources and capabilities. More funding needs to give to the local government, and avenues for WSA to source more funding need to identified and recommended. The capacity of the WSA to lobby for resources, and enact laws to management of water facilities needs to build.

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APPENDICES

APPENDIX I: BUDGET AND WORKPLAN

BUDGET FOR DATA COLLECTION ANALYSIS AND REPROT WRITING

S/N	Item	Quantity	Frequency/days	Unit cost	Amount
1.	Stationery	1 reams of photocopying paper	Once	20,000	40,000
2.	Fuel for data collectors	10 liters	5 days	4,000	200,000
3.	Subsistence allowance for research Assistants	6 people	5 days	50,000	1,500,000
4.	Fuel for Supervisors	20 liters	3 days	4,000	240,000
5.	Supervision allowance	2 people	3 days	50,000	300,000
6.	Typing, printing, photocopying and binding				200,000
7.	Miscellaneous				100,000
Total					2,590,000

ACTION PLAN FOR PROPOSAL WRITING, DATA COLLECTION, ANALYSIS /REPROT WRITING AND SUBMISSION OF FINAL REPORT

ACTIVITY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
Proposal writing									
Data collection									
Data analysis/Final report writing									
Submission of report									

APPENDIX II: CONSENT FORM

The purpose of the study is to assess the management challenges to functionality of rural water facilities in Koro Sub County, Gulu District.

The study involves household heads, water source committees; hand pump mechanics, sub county leadership, district leadership and NGO staff providing rural water services.

The study requires you to give your views regarding the current state of functionality of rural water supply system in your area, weakness/gaps encountered in managing rural water supply and suggestion to improve sustainability of rural water supply. Participation in the study interview is purely voluntary and it will not affect you in any way.

The information given will be treated with confidentiality such your name will not be associated with your answers. If there is any information regarding the study that you may need in future you may obtain reference from the Gulu district water office.

Thank you for your cooperation

The researcher has fully explained to me the purpose of the study and I have fully understood. I have learnt the findings of this study will benefit the people of Koro Sub county and Gulu at large.

Signature of participant

Signature of interviewer

Date.....

Date.....

APPENDIX III: QUESTIONNAIRE FOR HOUSEHOLD HEADS
RESPONSIBILITIES OF THE WATER USERS IN MANAGEMENT OF RURAL WATER
SUPPLY

District _____ **Sub-county** _____

Parish _____ **Village** _____

Name of interviewer: _____ **Position of interviewer:** _____

Date of Interview: _____ **Time of interview** _____

Respondents Code _____

A. Demographic characteristics of respondent		
1 Sex : Male-1 Female-2	2 Age _____ <i>Record Complete years</i>	
3 Marital status : 1=Married 2=Divorced 3=Unmarried/Single 4= Others (specify).....	4 Highest level of education: 1= Primary 1= Secondary 3= Tertiary 4= Others (Specify).....	5 Tribe: 1= Acholi -1 2= Langi -.2 3= Others Specify.....
6	What is the main source of drinking water for your household?	1= Borehole 2= Shallow well 3= Protected spring 4=River/open well/pond
7	Is your water source functioning?	1= Yes 2=No

8	If not functional, for how long has the water facility been in this state?	_____ (Days)
9	What efforts have you made to ensure the water source is repaired	1= Reported to WSC/HPM 2= Contributed repair fees 3=Attended meetings called by WSC/HPM 4=Mobilized other households to contribute for repair 5=others (specify).....
10	How often does your water facility break down?	1=Weekly 2=Once a month 3=After Every month 4=Once a year 5=Never broken down
11	On average, how many litres of water does each person in this household use per day?	1=20 litres and above 2=Less than 20 litres 3=I don't know
12	How far do you go to collect water	_____ KM
13	Can you show me, the water source you are using currently? <i>Observe the condition of the water source</i>	1=Working 2=Not working 3= Fenced 4=Not Fenced 5=Good apron/retention wall 6=Spoilt apron/retention wall 7=Soak pit present 8=Soak Pit not present

		<p>9=Clean Surrounding</p> <p>10=Dirty/busy surrounding</p> <p>11=Good yield</p> <p>12=Low yield</p>
B. Awareness of the community on their responsibilities		
14	In your opinion, is rural water facility management important?	<p>1=Yes</p> <p>2= No</p>
15	If yes, how important?	<p>1= Prevents water facility from breaking down</p> <p>2=Increases access/ use of safe water</p> <p>3=Prevents contamination of water facility</p> <p>4=Makes the facility clean and strong</p> <p>5=Increases the life span water facility</p> <p>6=Others</p> <p>(specify).....</p>
16	Who is responsible for management of water facilities?	<p>1=Water Users/community</p> <p>2=Water Source Committees</p> <p>3=Hand Pump Mechanic/Masons</p> <p>4= District and NGOs who provided</p> <p>5=Central Government</p> <p>6=Others</p> <p>(specify).....</p>
A. Participation in planning and decision making		
17	Do you as water user s have management and operation plan for the water facility?	<p>1=Yes</p> <p>2=No</p>

18	Do you attend meetings called by LCI or WSC/HPM on management of water source?	1=Yes 2=No
19	How many meetings on management of water source have you attended	_____
20	Who selects water source committees	1=Community members 2=LCI/Sub Village Chief 3=Sub county workers 4=I don't know
21	Does your water facility have a WSC?	1=Yes 2=No 3= I don't know
22	Who makes rules and regulations on O & M of rural water facilities	1=Community members 2=LCI/Sub Village Chief 3=Sub county workers 4=I don't know
23	Have you made some rules and regulations on O & M for your water facility?	1=Yes 2=No 3= I don't know
24 Who	Who sets water charges/user fees to be paid	1=Community members 2=LCI/Sub Village Chief 3=Sub county workers 4=I don't know
B. Financing O & M/-Paying water user fees		
25	Does your household pay water user fee?	1=Yes 2=No
26	If yes, How much does your household pay	1=Less than 500/=

		2=500/= to 1000/= 3=More than 1000..... 4=Never paid
27	At what intervals does your household pay this amount?	1=Weekly 2=Monthly 3=Quarterly 4=After 6Month 5=Once a year 6=When the water source breaks down
28	Do you willingly Pay this amount or you are forced to pay	1= Willingly pay 2=Forced to par
29	Have you ever failed to pay water user fee?	1=Yes 2=No
30 If	If yes, why did you fail to pay?	1=Money was misused by WSCs members 2=Lack of accountability/transparency from WSCs 3=Waters Source was not working 4=Water source polluted 5=I didn't have money 6=Others (specify).....
C. Reporting and maintenance responsibilities		
31	Do you report defects that arise from your water supply facility?	1=Yes 2=No
32	If yes, Who do you report the defects to?	1= LCI of the village 2=WSC 3=HPM

		4=Extension Worker 5=District Water Officer 6=Supporting NGO
33	Who cleans and maintains the water facility?	1=Care taker 2=Community users 3=WSC
34	Do you participate in routine clean- up or maintenance of your water facility	1=Yes 2=No
D. Other issues in rural water management		
35	What type of external support services do you receive to enable you effectively manage your water facility?	
36	In your opinion, what do you think are the critical factors that are important in ensuring that the water supply facility is function?	

THANK YOU VERY MUCH –THE END

APPENDIX IV: QUESTIONNAIRE FOR WATER SOURCE COMMITTEES

CAPACITY OF WATER SOURCE COMMITTEES TO MANAGE RURAL WATER FACILITIES

District _____ **Sub-county** _____

Parish _____ **Village** _____

Name of interviewer: _____ **Position of interviewer:** _____

Date of Interview: _____ **Time of interview** _____

Respondents Code _____ **Water Source Name** _____

A. Status of water source and training of WSC member		
1	What is the type of water source are you a committee member for?	1= Borehole 2=Shallow well 2= Protected spring
2	Is it functioning?	1= Yes 2=No
3	If not functional, for how long has the water facility been in this state?	_____ Day)
4	For how long have you worked as a water source committee member?	_____ Years
5	Did you get the initial training to prepare you for your role as a WSC?	1=Yes 2= No
6	Have you got any addition trainings or refresher trainings to help you meet your role as a WSC?	1=Yes 2= No
B. Participating in planning and decision making		

7	Do you as committee members have management and operation plan for the water facility?	1=Yes 2=No
8	Do you often meet as committee members to discuss water facility management issues?	1=Yes 2=No
9	If yes, how often do you meet to discuss water facility management issues? <i>Ask for minutes of the meetings</i>	1=Weekly 2=Monthly 3= After 3 month 4=After 6 month 5=Once a year
10	Do hold meetings with community members to discuss management issues for the water facility	1=Yes 2=No
11	If yes, how often do you meet with water users to discuss water facility management issues? <i>Ask for minutes of the meetings</i>	1=Weekly 2=Monthly 3= After 3 month 4=After 6 month 5=Once a year
12	Who makes rules and regulations on O & M of rural water facilities?	1=Community members 2=Water Source Committee 3=LCI/Sub Village Chief 4=Sub county workers 5=I don't know
13	Have made some rules and regulations on O & M for your water facility?	1=Yes 2=No

		3= I don't know
14	Who sets water charges/user fees to be paid	1=Community members 2=LCI/Sub Village Chief 3=Sub county workers 4=I don't know
15	Have you set charges/user fees for O & M of your water facility?	1=Yes 2=No 3= I don't know
A. Collection of water user fee and management of funds collected		
16	Do people in your community contribute towards the following waters management services?	1=Initial investment cost 2=Operation and maintenance costs 3=Don't contribute at all 4=I don't know
17	Do you collect water user fee from the water users?	1=Yes 2= No
18	How much money does the committee have in its account/collection?	1=Shs 2=I don't know
19	At what intervals do you collect water user fee?
20	Are water users willing to pay water user fee?	
21	Are these funds available for repair of the water source when it breaks down?	1=Yes 2= No 3=I don't know
22	What measures have you put down to	

	prevent mismanagement of funds collected from you by WSC? <i>List up to three major responses</i>	
B. Reporting/correction and linkage to HPM/Plumbers		
23	Do you report defects that arise from your water supply facility?	1=Yes 2=No
24	If yes, Who do you report the defects to?	1= LCI of the village 2=WSC 3=HPM 4=Extension Worker 5=District Water Officer 6=Supporting NGO
	How do you engage the area handpump mechanics?	1= Through reports 2= Through meetings 3=Others (specify)..... 4=Never engaged
25	How often do you pay handpump for their services?	1= Monthly 2= After every 3 month 3=Whenever they repair/replace 4=Never paid 5= I don't know
26	Isthere an agreement /MOU between Water Source Committee and HPM on repair and routine servicing of the water facility	1= Yes 2=No
C. Mobilizing community for routine cleaning and maintenance activities		

27	Are water users routinely mobilized to clean and service the water facility?	1=Yes 2=No
28	Who mobilizes community for routine cleaning and servicing for the water facility	1=Caretaker 2=Water Source committee 3=LCI/Village Chief 4= Others (specify).....
29	How often, are community members mobilized for cleaning and servicing of the water facility	1=Weekly 2=Once month 3= After 2month and above
30	Does the water facility you are responsible have a care taker?	1=Yes 2=No
31	If yes, how many times a week are they present at the water source?	1= One a week 2= Twice a week 3= Three times and above 4=Never present 5=I don't know
D. Other general issues critical in water source management		
32	What type of external support services do you receive to enable you effectively manage your water facility?	
33	In your opinion, what do you think are the critical factors that are important in ensuring that the water supply facility is well managed?	

THANK YOU VERY MUCH –THE END

**APPENDIX V: QUESTIONNAIRE FOR HAND PUMP MECHANICS/MANSONS
CAPACITY OF HAND PUMP MECHANICS/ MASONS TO MANAGE RURAL WATER
FACILITIES**

District _____ **Sub-county** _____

Parish _____ **Village** _____

Name of interviewer: _____ **Position of interviewer:** _____

Date of Interview: _____ **Time of interview:** _____

Respondents Code _____

A. Training of on their roles and responsibilities		
1	How many safe water sources do have in your area of operation?	_____
2	How many are not functioning?	_____
3	For how long have you worked as a hand pump mechanic?	_____ Years
4	Did you get the initial training to prepare you for your role as a WSC?	1=Yes 2= No
5	Have you got any addition trainings or refresher trainings to help you meet your role as a WSC?	1=Yes 2= No
B. Ability to handle repairs and replacement of damaged parts in rural water supply		
6	Can you correctly repair and replace damaged or faulty parts in a water facility?	1=Yes 2=No
7	If yes, are you able to carry out? <i>Read the responses given</i>	1=Pipe replacement 2=Servicing/Over haul 3=Fishing 4= Bolt Replacement

		5=Greasing 6= Cylinder Replacement 7=Others (specify).....
C. Holding meetings with water users/Water source committees		
8	Do you hold meetings with water users/WSC to discuss issues of repairs, replacements and routine servicing for their water facilities?	1=Yes 2=No
9	If yes, how often do you meet with water users to discuss issues of repairs, replacements and routine servicing for their water facilities?? <i>Ask for minutes of the meetings</i>	1=Weekly 2=Monthly 3= After 3 month 4=After 6 month 5=Once a year
E. Availability of tools and Equipment		
10	Do you have tools and equipment you need to carry out work?	1=Yes 2=No
11	If yes, do you currently have these tools?	1=Brushing bearing 2= Socket Spanner 3=Bobbin 4=Open ended spanner 5=U-seal 6=Fishing tool 7=Others (specify).....
12	Do you currently have the following equipment?	1=Bicycle 2=Personal Protective Equipment 3=Stationery(Books, data collection forms) 4=Others (specify).....

13	How did you acquire the tools and equipment?	
F. Collection and update of data on status of water facilities		
14	Do you collect and update data on rural water facilities in the area you work?	1=Yes 2=No
15	If yes, what kind of data do you collect?	1=Total number of water source 2= Functional and Non-functional facilities 3=Active and Non water WSC/water users 4=Paying and non-paying communities 5= Others (specify).....
16	How do you use data collected?	1= Planning 2= Reporting 3=Follow up 4= Others (specify).....
G. Link to WSC/water users and other relevant stakeholders in rural water supply		
17	Are you paid after work?	1=Always paid 2=Sometimes paid 3=Never been paid
18	Who pays for your services	1=Community 2=Water agency 3=Sub county 4=Others (specify).....
19	Do you have an agreement /MOU between you	1= Yes

	and Water Source Committee on repair and routine servicing of the water facility?	2=No
H. Other general issues critical in water source management		
20	What problems do you face in the maintenance of your water facility?	
21	What type of external support services do you receive to enable you effectively manage your water facility?	

THANK YOU VERY MUCH –THE END

**APPENDIX VI: KEY INFORMANT GUIDE FOR WATER SUPPLY AGENCIES
COMPLIANCE OF WATER SUPPLY AGENCIES TO MANAGEMENT GUIDELINES
FOR RURAL WATER FACILITIES (District Water Officer/Assistant District /Water
Officers, Water Officers World Vision & NUDIEL, Health Assistants- Koro, Community
Development Officer-Koro)**

A. Availability of guidelines and Capacity of leaders in rural water management

1. Which management guideline do have and how are they are they disseminated?
2. Which O & M laws on water supply have put in place to manage rural water facilities?

B. Financial back up support for management of rural water facilities

3. Do you have adequate funding for management of rural water supply?

C. Training and motivation of water source committees

4. How do you support water source committees to perform their roles and responsibilities?

D. Training and motivation of Hand Pump Mechanics/Plumbers

5. How have supported HPM to work?
6. Is there any working document/memorandum of understanding between hand pump mechanics and you?

E. Access to spare parts and back up support for major repairs

7. How have you made spare parts available and affordable for water user?
8. How do manage major repairs beyond community capacity?

F. Supervision and monitoring of rural water facilities

9. How often do you supervise and monitor functionality of water sources?

APPENDIX VII MAP OF NOTHERN UGANDA SHOWING THE LOCATION OF GULU



APPENDIX VIII MAP GULU DISTRICT SHOWING THE LOCATION OF KORO SUB-COUNTY

