THE EFFECT OF COMMUNITY PARTICIPATION ON THE PERFORMANCE OF GRAVITY FLOW SCHEMES AMONG HOUSEHOLDS IN MANAFWA DISTRICT

BY

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Declaration

This is to declare that this work has never been submitted to any university or institution of higher learning by any individual for any academic award.

Signed…… Date…../……/……..

Reg no…….

Approval

This dissertation was compiled under our close guidance and supervision, it is now ready for submission with our approval.

Signature Date

…… …….

Dr. Dan Oryema
Supervisor

Signature Date

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Mr. Bwanika Godfrey
Supervisor

Dedication

This dissertation is dedicated to my family, dear wife Eunice Ayot, dear son Desmond Daniel Okello and Daughter Elizabeth Donna Apollo, for their moral support and understanding throughout the study times.

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I wish to extend my sincere gratitude to my supervisors; Dr. Dan Oryema and Mr. Bwanika Godfrey for their insight, encouragement and general sense of direction provided to enable me complete this work. Their wide experience and knowledge were instrumental in shaping the direction of this study. All UMI lecturers who contributed to my vast knowledge in management and research also deserve my gratitude.

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List of abbreviations

DWD	: Directorate of Water Development
MWE	: Ministry of Water and Environment
NGOs	: Non-Governmental Organizations
NWSC	: National Water and Sewerage Corporation
O&M	: Operation and Maintenance
UNESCO	: United Nations Education, Scientific and Cultural Organization
UNICEF	: United Nations International Children Emergency Fund
WWAP	: World Water Assessment Programme

Abstract

The purpose of the study was to examine the relationship between community participation and performance of gravity flow schemes among households in Manafwa district. This research was prompted by partial functionality of gravity flow schemes in Manafwa district. A number of researches on community participation and sustainability of water sources have been carried out in Uganda none has linked community participation and performances of gravity flow schemes in Manafwa. Data was collected from 176 respondents using questionnaires, interview guide and observation check list and these were both qualitatively and quantitatively collected and analyzed. The study findings were positive and statistically significant relationship between community participation in planning, implementation and monitoring vis-à-vis performance of gravity flow schemes. The outstanding conclusions are; there is a significant influence of community participation in planning in terms of attending meetings, identification of locations of the water sources and direct participation in needs assessment on the performance of gravity flow water scheme. Secondly, there is a significant influence of community participation in implementation in terms of contributing money, local materials, labour and land during and for use during construction on the performance of gravity flow schemes. As regards monitoring, the communities report to the authorities whenever there is any mal-function such as burst, leakages of the gravity flow schemes and are always willing to support any activity involving inspection of sites and hence improving performance of gravity flow water schemes. The study recommends that Community participation in planning, implementation and monitoring for the gravity flow water supply needs to be strengthened by involving community members in all stages for their own benefit and since they have a role to play in the performance of these gravity flow scheme.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The Government of Uganda in her efforts to improve the living conditions of her population has been involving communities in development projects using the legal and institutional framework. These development projects include construction of new water sources using development funds under the district water and sanitation conditional grant, peace recovery and development programme, Northern Uganda Social Action Fund II and funds from development partners under water and sanitation sector every year. These water sources often function for one to two years and when they break down community members are not willing to contribute towards their maintenance.

Basing on the above, the research examined the relationship between community participation and performance of gravity flow schemes in households in Manafwa district. This chapter presents information concerning this topic in the following sections: background of the study, problem statement, purpose, objectives, research questions, hypotheses, conceptual framework, significance, justification, scope and operational definitions.

1.1 Background to the Study

1.1.1 Historical Background

Community participation arose as a concept in the mid-1960s in order to empower communities, especially women, to manage their environment using the participatory rural appraisal (PRA) that enabled communities to understand local realities and determine priorities (UNICEF, 1992). It was not adopted by the international drinking water supply and sanitation decade until the mid-eighties after it became apparent that governments and donors could no longer afford totally

centralized operation and maintenance systems for water resources planners began to realize that in order to share the responsibilities for maintenance, beneficiaries or users would have to be involved in some way in the on-going maintenance of their own community systems (UNICEF, 1999).

In Uganda community based management was introduced in the rural domestic water supply (UNICEF,1986) and in 1999 it became part of the official national water policy prescription and related legislations

All these water projects adopted a decentralized, community-based approach to water delivery, which had been advocated by development organizations and NGOs in the past decade in response to systemic failures of supply-oriented water projects in the 1970s and 1980s. The community based approach adopts a demand-responsive focus on what users want and what they are willing to pay. It is based on the premise that water is an economic good, and should be managed accordingly. Services should be provided according to users' preferences and willingness to pay and managed at the lowest appropriate level, with users involved in planning and implementation of projects. Water projects that follow the community-based approach, government and NGO officials are typically expected to design and construct the water systems with users and there after users are typically expected to be responsible for the operation and maintenance (O&M) of constructed services (Jonathan Isham and Satu Kähkönen,1999)

Rural Africans have the lowest level of access to clean water and sanitation facilities compared to other developing areas of the world (UNESCO-WWAP, 2003). In Mali, a country in the Sahel, problems of water scarcity have become even more severe since the droughts of the 1970s and 1980s. A lack of access to water affects agricultural productivity, food security and people's livelihoods (Akuoko-Asibey, 1997).

1.1.2 Theoretical Background

The resource mobilization theory of social movements developed in the 1970's by McCarthy & Zald (1977) was used in this study. The resource mobilization theory of social movements examines structural factors, including a group's available resources and the position of group members in socio-political networks, to analyze the character and success of social movements. According to resource mobilization theory, participation in social movements is a rational behavior, based on an individual's conclusions about the costs and benefits of participation, rather than one born of a psychological predisposition to marginality and discontent Ultimately, the resource mobilization theory of social movements helps to explain the formation of social movements, the process of social mobilization, and the politics of social movements.

According to the resource mobilization theory, community members can mobilize resources, from inside and outside their community to achieve goals (Jenkins, 1983). Communities can mobilize both material and non-material resources and the material resources include money, organizations, manpower, technology, means of communication, and mass media, while non-material resources include legitimacy, loyalty, social relationships, networks, personal connections, public attention, authority, moral commitment, and solidarity (Fuchs, 2006).

Communities' participation in the management of natural resources has been shown to lead to a number of benefits, including increased effectiveness and acceptability of management actions (Esman and Uphoff, 1984), increased trust between communities and agencies (government and Non-governmental) and reduced transaction costs and hence good performance through maintenance.

Communities should actively participate in planning, implementation, and monitoring of community activities if they are to achieve their goals; otherwise, they will not achieve them

(Schouten and Moriarty, 2003). Community participation creates trust, attachment to, sense of ownership and care for community projects to the members (McCarthy & Zald,1977). Basing on the notion of trust, attachment to, sense of ownership and care for community projects, the theory was considered applicable to this study because this meant that good performance of gravity flow schemes will be as result of community participation in planning, implementation and monitoring in water supply systems.

1.1.3 Conceptual Background

Participation is an approach through which beneficiaries and other stakeholders are able to influence project planning, decision-making, implementation and monitoring phases (Mwakila 2008).

Community participation is a development process based on dialogue, consultation with and empowerment of people in a community to identify their own problems, decide how best to overcome them, and make plans or seek appropriate solutions and assistance (UNICEF,1999) .

Community participation in planning is the extent to which community members are involved in discussing ideas and determining decisions related to community based water systems including inviting members to attend meetings related to water systems, allowing members to freely contribute ideas, listening to members' ideas and considering members' ideas in the final decisions related to the water system (kasiaka,2004).

Community participation in rural water supply planning entails the contribution of cash, land, or materials toward the construction of the system; participation in key decisions about the project, such as the level of service to be provided to households; and the contribution of labor (e.g., in completing civil works) during system construction (Sara J. Marks and Jennifer Davis, 2012).

Community participation in implementation is the extent to which community members are involved in executing activities aimed At achieving desired goals related to community based water system including contributing money for managing the water facility, contributing the necessary materials for constructing the water facility, contributing labour for constructing and general management of the water facility, sparing time to attend to any necessary issues related to the water project (Schouten & moriarty,2003).

Community participation in monitoring is the extent to which community members are involved in watching over activities aimed at checking the progress towards desired goals related to community based water systems including regular inspection of the water sites and water facility, ensuring security of the water facility and reporting to the concerned authorities the functionality status of the water facility (Harvey & Reed, 2007)

1.1.4 Contextual Background

Water is required by a community for domestic and other purposes. The main sources of water supply to communities in Uganda are surface waters in rivers, reservoirs, lakes, canals and ponds, and groundwater in shallow and deep aquifers (Ministry of Water and Environment design manual 2013). The water supply to the communities are done through different technologies which include springs, shallow wells, deep boreholes, dams, gravity flow systems, pumped water supplies, bulk water transfer systems, rock catchment and rain water harvesting.

Gravity flow schemes are among the technology options being used to supply safe potable water in many countries in the world. A gravity flow scheme is a type of water supply technology that conveys water from a higher elevation to a lower elevation without the use of external force (Ahmed & Rahman,2000).

A gravity-fed water supply from a small upland river, stream or spring, impounded within a protected catchment, is an example of a sustainable water supply technology requiring no treatment. An additional benefit is that, using the force of gravity, water can be transported by pipe network to tap stands placed near to homes, reducing the work involved in carrying water.
The capital costs of gravity-fed schemes are, on average, higher than the costs of schemes that obtain water from underground sources. This is due mainly to the cost of long pipelines from the upland sources down to the villages and partly to the cost of providing storage tanks. However, running costs are usually low; maintenance includes simple tasks such as replacing tap washers and cleaning screens. Reliability is usually high and consequently the level of service is good. The components of a gravity-flow scheme are the source (stream, spring, catchment, dam or intake), main pipeline, storage and break-pressure tanks, distribution pipelines and tapstands (Water Aid, 2013).

In the rural areas and Rural Growth centers of Uganda, water facilities are owned and managed by local communities through community based management system and private operators, supported by the Local Governments and Ministry of Water and Environment (MWE, 2013). As of the year 2013, 309 pipe water supply including gravity flow schemes had been completed, serving approximately 57% of the people in rural areas and rural growth centers (Ministry of Water and Environment performance report, 2013).However operation and maintenance of these gravity flow schemes are being questioned as a study conducted by umbrella organizations under Directorate of Water Development (DWD, 2013) indicate that 60% are either not functioning well or broken down.

In the large towns and major urban centres of Uganda, water supply and sewerage services is run and managed by National water and sewerage Corporation (NWSC) which is a parastatal owned by government of Uganda. The principal work of the corporation is to operate and provide water

and sewerage services in areas entrusted to it under the water Act. By the end of year 2014, the corporation has been operating in 122 towns providing services to 6.8 million people in the towns of Kampala, Jinja/Njeru, Entebbe, Tororo, Mbale, Masaka, Mbarara, Gulu, Lira, Fortportal,Kasese,Kabale,Arua,Bushenyi/Ishaka,Soroti,Iganga,Lugazi,Malaba,Mukono,Hoima, Masindi,Mubende,Kaberamaido,Mityana,Luwero,Wobulenzi,Apach/Aduku,Paidha,Rukungiri,Kanungu,Kabwohe,Kalisizo,Kaliro,Ibanda,Lyantonde,Kamwenge,Kigumba,Bweyale/Kiryandongo ,Bombo,Kisoro, Pader, Nebbi, Sironko and Kitgum (Ministry of Water and Environment,2014).

1.2 Problem statement

Community participation is done through the community based management system in which communities identify their needs, make decisions on type of technology and the location of water sources in their village meetings, provide land for construction of water sources, provide local construction materials and labour during construction in order to ensure good performance of water sources to the community (Ministry of water and Environment, District implementation manual, 2014).

Manafwa district has been using the community based management system to form water management committees for the water facilities constructed within the district in order to ensure continuous performance of the water sources.

Despite this community management arrangement system being in place, a study conducted by Directorate of Water Development, 2013 shows the performance of gravity flow schemes in Manafwa district remain a very big challenge with less than 50% of users collecting fees for operation and maintenance as a result the schemes are partially functional.

A number of researches on community participation and sustainability of water sources have been carried out in Uganda; such as; “sustainability of water supply in rural growth centres in

Eastern Uganda, which revealed that the private operators were not re-investing the proceeds to sustain the supply of water, where electricity bills had accumulated due to non-remittance of money. Another one was about management functions and sustainability of water sources in Katosi, Mukono District, which revealed that for the project to be sustainable, the community had to have a hand by contributing towards its operations and maintenance. However, none has linked community participation to performance of gravity flow schemes. If nothing is done, the low percentage performance of these gravity flow schemes will continue being a challenge and possibly collapse of the gravity water supply system. The consequence will be spread of water borne diseases responsible for 50% of morbidity in children and women (World Health Organization,2003). Therefore, this study provided the knowledge and understanding on how community participation affects performance of gravity flow schemes in Manafwa.

1.3 Purpose of the Study

The purpose of the study was to examine the relationship between community participation and performance of gravity flow schemes among households in Manafwa district.

1.4 Research Objectives

The specific objectives were the following;

i. To examine the relationship between community participation in planning and performance of gravity flow schemes among households in Manafwa.
ii. To establish the relationship between community participation in implementation and performance of gravity flow schemes among households in Manafwa.
iii. To determine the relationship between community participation in monitoring and performance of gravity flow schemes among households in Manafwa.

1.5 Research Questions

The research questions to guide this study were;

i. What is the relationship between community participation in planning and the performance of gravity flow schemes among households in Manafwa?

ii. How does community participation in implementation affect the performance of gravity flow schemes among households in Manafwa?

iii. What is the effect of community participation in monitoring on the performance of gravity flow schemes among households in Manafwa?

1.6 Research Hypotheses

The hypotheses that were tested were;

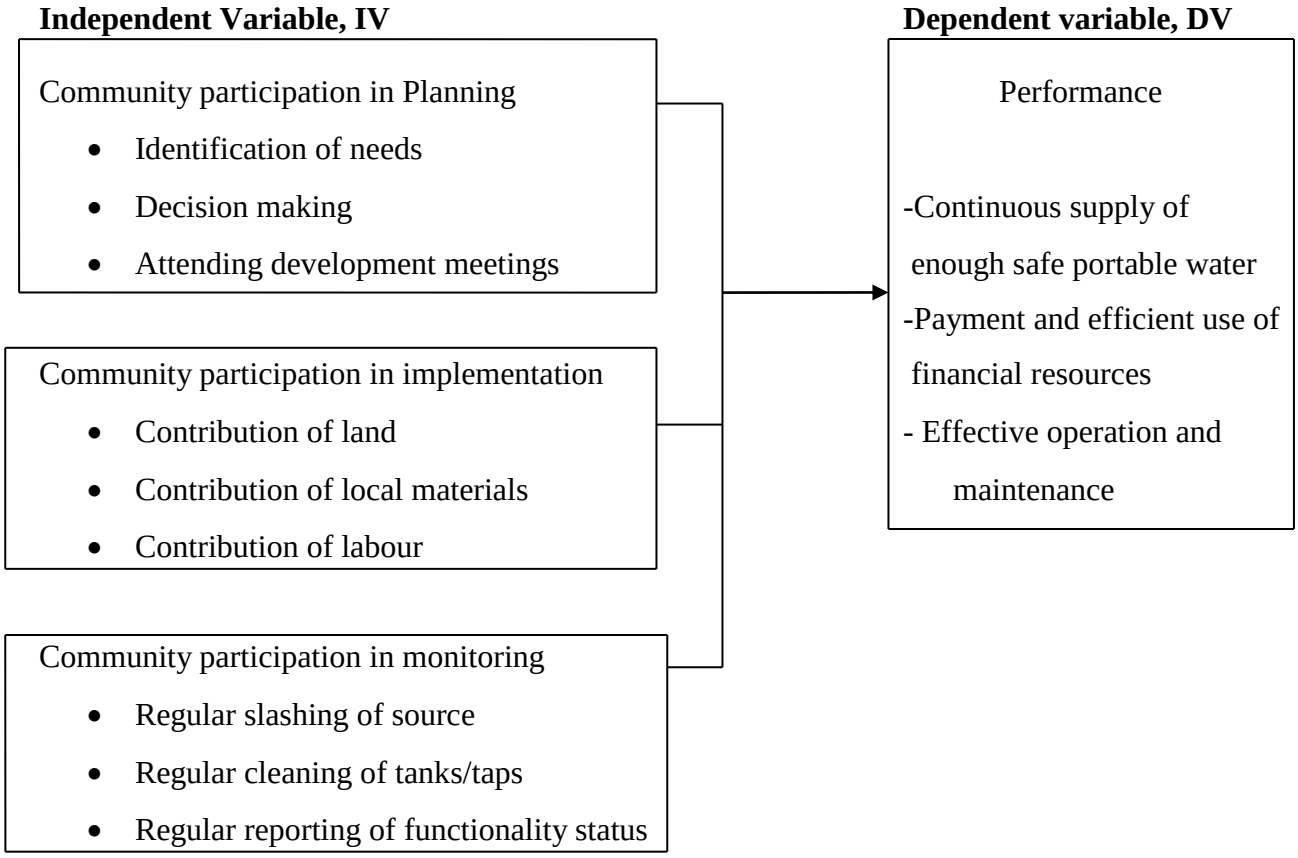
i. There is a significant relationship between community participation in planning and the performance of gravity flow schemes among households in Manafwa.

ii. Community participation in implementation significantly affects performance of gravity flow schemes among households in Manafwa.

iii. Community participation in monitoring significantly affects the performance of gravity flow schemes among households in Manafwa.

1.7 Conceptual Framework

The conceptual framework is showing the relationship between community participation in planning, community participation in implementation, community participation in monitoring as the independent variable and performance as the dependent variable.



Source: Adopted and modified from Cubillo (2003)

From the conceptual framework above, it can be hypothesized that Community participation in planning (through identification of needs, decision making, attending development meetings),community participation in implementation (through contribution of local materials, contribution of land, contribution of labour) and community participation in monitoring (through regular slashing of the source, regular checking on the tap stands, regular reporting on the flow of water) could lead to improved performance of the gravity flow schemes while the reverse can be true if community do not participate in planning, implementation and monitoring among households in Manafwa.

1.8 Significance of the Study

The study may be useful to the local authorities in the study area and Ministry of Water and Environment through its recommendation, the local authorities and Ministry of water and Environment can have a shift in its policy towards planning, implementation and monitoring of

water sources technologies so as to improve the functionality of gravity flow schemes in households in Manafwa. In addition the study may serve as a source of reference to other researchers who will be interested in further research on community participation and performance of gravity flow schemes in Manafwa.

1.9 Justification of the Study

The government of Uganda and development partners through development programs like Poverty Eradication Action Program (PEAP), Peace Recovery and Development Program (PRDP), Northern Uganda social action fund II (NUSAF II) have spent lot of resources in bringing services closer to the communities. The completed projects often do not serve the population as per the intended objectives and period and as a result become waste of resources. This has often discouraged the development partners from further investments in community projects especially water and sanitation facilities because the community members are not willing to contribute towards their maintenance and continuous functionality of these water sources is always a concern when soliciting for further funding.

The Government of Uganda and development partners have adopted a wide range of participatory approaches to ensure that community members participate in their water projects on top of investing a lot of resources in provision of safe water facilities. Despite these attempts, the performance of these water facilities is still a big challenge with cuts, burst, leakages and vandalism affecting the flow of clean safe water to the communities. The research studies done were conducted in water projects in the rural growth centres of Uganda and other areas but not in Manafwa district. This therefore calls for investigation to ascertain if community participation enhances performance of these water sources. The study intends to generate knowledge on community participation and performance of gravity flow schemes in Manafwa district.

1.10 Scope of the Study

This section presents the geographical scope, time scope and content scope, including an over view of the areas of study, time frame and subject matter.

1.10.1 Geographical Scope

The study was conducted in the district of Manafwa. This district has many gravity flow schemes struggling with operation and maintenance issues and thus affecting their functionality.

1.10.2 Content Scope

The content of the study included community participation in planning, community participation in implementation, community participation in monitoring of gravity flow schemes and performance of these gravity flow schemes among households.

1.10.3 Time Scope

The study considered the period 2005-2013. It is the period when the concept of community involvement in management of water sources was emphasized and the percentage of funds meant for community mobilization was increased from 8% to 11% (Ministry of Water and Environment,2007) and all water sources constructed including gravity commissioned and handed over to community.

1.11 Operational Definitions

Community is a group of people living together in an area with a common interest, values, culture, norms and needs

Gravity Flow scheme is a set of planned, designed pipeline that coveys water from higher elevation to a lower elevation without the use of external force (MWE design manual 2013)

Implementation is Carrying out, execution or practice of a plan, a method or design for doing something.

Monitoring is the extent to which community members are involved in watching over activities aimed at checking the progress towards desired goals related to community based water systems including regular inspection of the water sites and water facility, ensuring security of the water facility and reporting to the concerned authorities the functionality status of the water facility

Participation is a process through which all members of the community or organization are involved in and have influence on decisions related to development activities that will affect them.

Performance is the accomplishment of a given tasks measured against a set known standards within a specific period of time.

P**lanning** is the process of setting goals and objectives, developing activities and strategies, outlining tasks and schedules to achieve these goals.

CHAPTER TWO:

LITERATURE REVIEW

2.0 Introduction

The purpose of the study was to examine the relationship between community participation and performance of gravity flow schemes among households in Manafwa district. The chapter presented the literature reviewed concerning community participation and performance of gravity flow schemes and this information was presented in five sections. Section 2.1discusses in depth the theory upon which the study was based. Sections 2.2, 2.3 and 2.4 discussed literatures systematically following the three objectives of the study and section 2.5 summary of the literature reviewed.

2.1 Theoretical Review

The study was based on the resource mobilization theory of social movements developed in the 1970's by John D. McCarthy & Mayer N. Zald (1977).The theory focused on how communities are mobilized to form lobbying groups to pursue their desired goals using the available resources in their locations. Resource mobilization theory of social movements explained how social movements mobilize resources, from inside and outside their movement, to reach goals (Jenkins, 1983).

According to resource mobilization theory, participation in community activities and resources contribution is based on perceived benefits that outweigh the costs of participation. In this study, community members have physical and non-physical resources which are mobilized and used to achieve desired goals of ensuring proper performance of gravity flow schemes. The physical resources include land, money, local construction materials like sand, aggregates, hardcore while

the non-physical may include labour and time offered in slashing of sources, cleaning of tanks, reporting functionality status. These resources are mobilized and used through fostering community members' participation in activities such as planning, implementation and monitoring aimed at achieving the desired goals such as ensuring continuous functionality of community based water supply systems.

Harvey and Reed (2007) described forms of community contribution as identification of needs, decision making on the type of technology, selection of technology, financial contributions, provision of labour, materials and selection of management system. The theory argues that community participation even at the lowest level of involvement is a requirement for continuous functionality (McCarthy & Zald, 1977).

Community participation in water supply systems in developing countries shows willingness of community members in maintaining their water supply through dedicating more time and resources towards the performance of these water sources (Brett A. Gleitsmann,2007).

According to Mwakila 2008, direct participation of community members in management of their resources instill a sense of ownership, eventually leading to effectiveness, increased trust between communities and agencies, reduced transaction costs, sustainable use and management of resources.

Kasiaka, 2004 also contends that community participation is considered a prerequisite for successful implementation and sustainability of community based projects through promoting community resource ownership.

According to Gamson (1975) & Schwartz (1976), communities participate in activities to produce a collective goal precisely because they are aware that the good would never be produced if everyone sat back and waited for someone else to do something.

2.2 Community Participation in planning and performance of gravity flow schemes

"If we accept that communities exist, then it becomes meaningful to talk of them owning and sharing things and then to speak of the equity with which these are owned or shared. Equity includes both a sense of equality and a sense of being entitled to a share in ownership. Equity is crucial to community management. It implies that, although communities are diverse, everyone in the community should profit in the same manner from a water supply system. It accepts that communities must mean more than rich getting together to buy themselves an expensive water supply system. To deal with this view of community means to acknowledge diversity'' (Schouten and Moriarty, 2003).

In planning for water supply in poor communities in the developing world, technological design specifications have been dominated by the donor and implementing agencies, while communities have been typically left out of this critical design and planning phase. Emerging perspectives in the last decades have compellingly indicated that technology adoption and sustainable management of water supply innovations are determined by complex social forces and social relations that shape people's choice of technology, and water use behaviours (Vincent, 2003) as cited by Brett A. Gleitsmann (2007). Singh.(2005), for example, in a recent case study of a community water supply program in India crystallized the importance of overlapping socio-cultural factors (gender, ethnicity, caste, religion) as critical determinants of exclusion and access to water supply innovations. This suggests that for water supply management to be sustainable, local people must be encouraged to negotiate, communicate, learn and arrive at joint decisions

that reflect community choices and preferences. In view of the above, such an inappropriate technology is common in Uganda, because when the system breaks down, there is nothing in place for continuity, as such, being susceptible to failure. This therefore calls for an-in-depth study on community participation in Gravity flow schemes.

During the last two decades it has been recognized that water supply improvements alone do not bring optimum health and development impact in developing countries. Other complementary activities needed are better sanitation provisions, changes in hygiene provisions and linkages with other livelihood inputs. Community participation in water projects is certainly very important. There is need for inclusive approach avoiding marginalization of the poor. This can be gained through programmes that are series of integrated activities directed to the establishment and continuous functioning and use of water supply services. The challenge of a programme is social, organizational and administrative. It is important that agencies and partners work together with communities group and users and plan their activities on a mutual agreement (Ministry of Water and Environment, 2011).

To meet long-term health benefits of environmental engineering it is important to enhance the demand for better water use, sanitation and hygiene. The new systems have to be and remain better than the alternatives in terms of economic and social costs and benefits. Program teams have to seek the values of local experiences and viewpoints to understand what local people really want and can use and sustain. The community water supply designs should be *holistic*, so as to meet all the basics needs of people, *expandable*, in view of community growth with access to the community improved water supply, and *upgradeable*, in view of a socio-economic growth and a need of later upgrading. *Standardization*, even if often more cost-effective, is not always a good choice because it can imply competition between different brands, poor incentive for the

involvement in the private sector and the technology may not respond to the needs and preference of the users (Ministry of Water and Environment :2011).

Other studies have shown that change in water use behaviours and sustainable management of water supply is more likely when diverse community members authentically participate in decision making, negotiation and concerted action related to water supply innovations (Narayan, 1993) as cited by Brett A. Gleitsmann,(2007) . Vincent (2003) put it most aptly when she suggested that hydrological projects be channelled alongside the promotion of participatory processes and democratic partnerships in order to bring about poverty focused actions for water management. There is overwhelming convergence in the view that sustainability of water supply innovations such as hand pumps is engendered when diverse community stakeholders and local institutions are included as partners and take a central role in decision making for innovations design planning and management (Mangin, 1991; Williams, 1998;Bah, 1992) as cited by Brett A. Gleitsmann (2007) and this research study will be finding out whether this statement is true or not .

The project beneficiaries cannot own the project if they have not been involved in participatory planning and therefore this normally has an impact on the project success (Rosenberg, 2004) as cited by Brett A. Gleitsmann (2007). A study by Kerman & Hanges (2002) indicates that communities' involvement in planning greatly affects the performance of water projects. In view of above, there seems to be a challenge of participation by the community members, which leaves a lot to be desired. Failure to create an ownership scenario where community members are given a leeway to have a direct hand as primary beneficiaries negates the aspect of sustainability. This therefore calls for an in-depth study on community Participation in planning and performance of gravity flow schemes.

Although a lot of efforts have been put to ensure that rural water supply sources are maintained, the issue of identification of needs has not been addressed, yet it is key towards performance of these water sources (WaterAid, Uganda, 2003). The needs and concerns of all community members involved in the project should be taken care off during planning and implementation phases (ADF 2005). Realistic proposals and budgets should be developed and decision made by all community members, local leaders and government extension staff during the meetings. In view of the above, failure to identify the needs leads to roll of projects that do not reflect local priorities, in this case water project, which may not be their salient need.

Community participation is essential at the following stages: during the planning basic parameters are explained to community representatives, to make them understand the options available with their advantages and disadvantages; at the implementation stage community men and women can take charge of the material transportation to site and of training execution and quality control. Men and women in the communities themselves can also carry out routine operation and maintenance. The community should then be involved in developing the local rules for new water resource management. Artificial recharge methods can be classified in two broad groups: direct methods and indirect methods. Direct methods are subdivided into surface spreading techniques and sub-surface techniques. Indirect methods adopt the technique of induced recharge (pumping wells, collector wells and infiltrating galleries). They require highly skilled manpower for aquifer modifications and groundwater conservation structures (National Water and Sewerage Corporation, 2007).

Community participation carries with it feelings of ownership, and builds a strong base for the intervention in the community. If people are integral to the planning of how water is to be utilized in their community, then that intervention will be theirs. They have a stake in it not only as its beneficiaries or staff or sponsors, but as its originators. They'll do what they can to see that

their water source succeeds, given that every member of the community will be satisfied with the developments (Aggarwal, 2000).

Community participation helps to ensure that the intervention will have more credibility in all segments of the community because it was planned by a group representing all segments of the community. If people know that others with the same point of view and experience as theirs were instrumental in making the intervention of ensuring that they map and develop their water sources, while considering the environmental and health aspects of the community, they'll assume that their interests were attended to. This leads to harmonious existence and organized settlement patterns in localities and responsive farming activities in rural areas (Fetterman, 1996).

Community participation provides for an opportunity for often-disenfranchised groups to be heard**, a**nd teach the community that they have important things to say concerning how water should be utilized in their locality. Rural community members can have a direct hand in accessing water for their domestic and farming activities, access to clean and safe water and settlements with all the amenities in place. In addition, community members can have a say on the management of water sources and the surrounding land to ensure food security and protection of water catchment areas (Mekong, 2007).

Areas within the community or planning area that will experience future growth and development must have a plan for water management in addition to land use and water use. The community profile should provide satisfactory site assessments and projections of water flows and loadings for any such areas. Water treatment level requirements may be determined based on these projections and those of land and water use, as well as the overall site conditions. After the treatment levels have been determined, and the areas delineated and mapped, the potential for

success of a decentralized or centralized approach may be contemplated and a decision made as to what range of alternatives will need to be developed (Mekong, 2007).

Laws and regulations concerning public involvement are an integral part of many aspects of the water management planning process. An active public involvement effort based on these regulations is one of the best ways to identify community concerns during planning. The level of effort needed for public involvement will depend on the costs and scope of the planning effort, the past political and social history of the community, the public's understanding of the water issue, and other related factors. For small projects with minimal financial impact, public involvement efforts can be relatively modest, strictly following the regulations and targeting affected owners of the said water sources. For larger projects with broader impacts, an entire community may need to be consulted, and several different levels of public involvement will need to be implemented. In addition to an active Water user Committee, there most often is a need for outreach to community and homeowners groups, and ongoing consultation with concerned members of the public in addition to the normal public meetings, hearings, and document comment periods. In communities that are unaware of or unconcerned about water problems, there may be a need to conduct outreach and education before a participatory planning process can even begin. For planning issues that cross community boundaries, there may be a need for broad involvement and active mediation among competing interests (Schermerhorn, 2004)

2.3 Community Participation in implementation and performance of gravity flow schemes

Schouten & Moriarty (2003) defines community participation in implementation as the extent to which community members are involved in executing activities aimed at achieving desired goals related to community based water system including contributing money for managing the water facility, contributing the necessary materials for constructing the water facility, contributing

labour for constructing and general management of the water facility, sparing time to attend to any necessary issues related to the water project. Schermerhorn (2004) defines community participation in implementation as the extent to which community members are involved in carrying out, executing, or practicing of a plan, a method, or any design for doing a community project activity. This study will establish whether community members are involved in these contributions, carrying out, executing, or practicing of a plan, a method, or any design for doing a community project activity.

According to community resource hand book for water and sanitation(2007),communities are supposed to be involved in the implementation of water supply projects through the water user committees and by getting involved, the community members are expected to know the contract price, expected duration of the contract, the roles and responsibility of each party involved in the contract. The community should provide land for the construction of the water source and pipeline routes and also sell the locally available materials necessary for the construction to the contractor. The contractor is expected to provide employment to the community members in order to empower them economically and equip them with skills. In view of the above, in most cases community members lack the necessary professional and basic skills which are a requirement for working with the contractors. This makes them not to have a technical understanding of the design, because of not participating and the resultant is sustainability problems long after funding has ceased.

Community participation in implementation is among the major strategies used to ensure community project success and there is a linkage between community participation in implementation and outcome of community project including performance of community based water supply systems (Smit & Cronje, 2001). Community projects that have higher participation of community members in its implementation always experience higher success rate than those

with low participation of community members (Konzil & McGrath, 1996). This is because of the sense of ownership instilled in community members that make them work hard for the project success. Choo & Boze (2007) found that allowing community members to effectively participate in implementation of community water project increases the chances of their performance.

Bussin (2002) expresses different opinion arguing that community participation in implementation may lead to project success if the members' involvement is restricted to non-technical aspect of the project other than the technical aspect. However, it is not always that community participation increases the success of water projects, because the project implementation may have loopholes leading to shoddy and substandard work through connivance with community leaders, hence affecting sustainability.

Communities often find it difficult to obtain the capital to construct improved water supplies. Usually the central or local governments organize and finance multi-communities programmes and the fund may be partly revolving, using repayments or earlier loans. The communities are always asked to submit proposals for a loan or a grant, or a combination of both, for construction of their water sources. Communities are not homogeneous entities, they often consist in the middle classes and the poor, marginalized groups. To help and support all the groups it is important to identify all of them at the very start of the project and to ensure their equal participation. All the groups should participate to the formulation of the preliminary plans to the program level. Projects must be based on the existing water supply already available for the community (Ministry of Water and Environment, 2006).

For community water supply systems groundwater is almost always the preferred source, and its use is probably still very much below the potential in many countries. Knowledge of the manner in which water exists in the water-bearing ground formations can give successful prospecting for

groundwater. Available hydrological information about the study area should be collected and collated. To provide data to form a basis for drawing up a hydro geological map, a survey of the study area should be made, preferably towards the end of the dry season. This hydro geological map should show distribution of aquifers, springs, depth of water tables and piezometric levels. Geophysical investigations (i.e. resistivity measurements) are very useful in understanding the distribution and quality of groundwater. Sometimes it is necessary to drill small boreholes for post-prospecting purposes to supplement the data obtained from surface geophysical methods. To obtain the maximum amount of information from a borehole, geophysical logging may be necessary in order discover a sustainable source of water for the community (Ministry of Water and Environment, 2006).

Whatever 'community' may mean to different people, they understand that changing the level of community participation from one to another is indeed difficult. At the level of implementation, the relatively small projects which were started in response to the community's needs, show higher levels of participation and more consensual modes of decision making. However, the large projects with extensive service delivery systems which lack client-centered planning, have little to do with community participation. In the latter, there is little expectation of participation by anyone. The non-vocal stake-holders, who often constitute the majority, get 'marginalized', rather than assimilated, in these projects. They perceive themselves as the passive objects of the development projects, rather than as active participants involved in shaping their own future (Konzil & McGrath, 1996).

The recommended first step towards establishing a community’s water needs is development of a community profile detailing, among other considerations, the natural environment, economic pressures, and demographic conditions, all of which play an important role in identifying and delineating areas within a community for which water treatment may be a concern. The

community profile will help facilitate the identification of "problem areas" or "areas of concern", and provide the information necessary to establish treatment and disposal needs for these areas. Once treatment needs are established, decentralized (i.e. on-site systems, shared systems, package treatment plants) and centralized (i.e. sewers and large conventional treatment plants) alternatives can be developed and evaluated to find the most cost/effective, environmentally sensitive solution(s) (Smit & Cronje, 2001).

The objective of the community profile is to provide a summary of the information that will be useful in identifying the types of existing and/or anticipated water related problems and the constraints that will limit the range of feasible technical solutions. The community profile should provide a summary and/or description of: existing water-related water quality and public health problems; current and future land use patterns; existing and future water supplies; sensitive natural resources; existing water facilities, including collection and conveyance systems, and on-site systems; current and projected wastewater flows and loadings; and future growth and economic development plans. In addition, the community profile should contain a summary of existing regulations, permit requirements, and institutions that are concerned with water management in the study area. Using this information, areas showing signs of existing water-related problems and currently undeveloped areas that may be threatened with future water impacts can be identified, and treatment and disposal needs determined (Smit & Cronje, 2001).

All people covered by a project, irrespective of gender, caste or classes have access to clean water. However, they may not all have equal access to all the benefits which are part of the work. Many important decisions made during project implementation are made by well-off and influential men in the village. Women and poor men are not equally involved, both at times are poorly represented in project management committee. Those who probably have the most to gain

from these water supply and sanitation systems, mainly poor women and men should be involved in the management of the water system (Schouten and Moriarty, 2003).

2.4 Community Participation in Monitoring and performance of gravity flow schemes

According to Harvey & Reed (2007), Community participation in monitoring is the extent to which community members are involved in watching over activities aimed at checking the progress towards desired goals related to community based water systems including regular inspection of the water sites and water facility, slashing of around the source, cleaning of tanks and taps, ensuring security of the water facility and reporting to the concerned authorities the functionality status of the water facility. District implementation manual (2014) for water and sanitation sector ,communities are supposed to monitor and follow up the construction works, record and take note of the materials delivered to site and make sure the works conform to the required specifications and standards. However, most community people lack the skills to monitor and detect defects in the implementation process, which in most cases leads to substandard work, hence project failure.

According to Jacobson (2008), the community project remains on course and maintained once the community members have been involved. It is for this reason that the study will determine whether community participation in monitoring affect performance of gravity flow schemes. Community projects in which beneficiaries are highly involved in their monitoring have higher chances of survival than those with low community participation in monitoring (Heath field, 2008).

According to UNICEF (1999), the necessary pre-condition for the success of community-based monitoring systems is the availability of user-friendly, simple and cheap water quality test kits because water quality is one of the parameters that may make the community become reluctant

on their water source. Such testing kits have the potential to strengthen the existing national water quality monitoring systems by providing the means for better and more timely sampling and analysis by community themselves and also give direct knowledge of the quality of water from their source. However, the negative attitude towards public projects by the community people makes monitoring not to succeed. This emanates from expectation of payment, forgetting that the project is for their own benefit, coupled with political interference. They all combine to make monitoring process, unsuccessful.

The staff in charge of management and maintenance of the water supply varies depending on the size of the project. For small water supply systems, selected technicians and the management committee are trained during and after the construction. For larger and multi-village systems with a community base management staff are generally professionally trained and hired by the community water board (National Water and Sewerage Corporation: 2007).

2.5 Summary of literature review

The literature reviewed shows how community participation has been important in the provision of safe water facilities with the main purpose of promoting continuous performance of these water facilities. However, there were a number of gaps which warrant further scrutiny, such as; inappropriate technology which is susceptible to failure, water user committees seem not to be well trained in some aspects to understand their role and also detect defects during the course of functionality.

Furthermore, much as disenfranchised communities are brought on board, but their participation without training and direct involvement make them lack the necessary skills and understanding of the technicalities. This could be the reason why water projects stagnate when the developers partners close their projects. The technicalities involved do not favour community participation

unless; they are taken through the nitty-gritties of the initiative before they are given the mantle of managing the water sources communally.

Finally, the literature envisages that, community have no hand at implementation stage; they also lack the skills to monitor and detect defects in the implementation process. The situation is worsened by negative attitude by the community members towards public projects, largely because they have not lived up to the cost of maintenance during the implementation course.

These gaps envisaged in the review, show that lot needs to be done as pertains to community participation in the sustainable management of gravity flow water schemes. Never the less, community participation seems to be one of the most widely used methods of involving communities in the water projects. The study findings are in agreement with the review.

CHAPTER THREE:

METHODOLOGY

3.0 Introduction

The chapter presents the procedure that was followed in order to obtain the results by the researcher. It gave a description of methods and how data collection and analysis was done. This included research design, the study population, sample size and selection, sampling techniques and procedures, data collection methods and instruments, procedure of data collection, validity and reliability of the data collection instruments, data analysis and measurement of variables.

3.1 Research Design

The study used descriptive cross sectional research design. The descriptive research design was used to obtain information concern the status of gravity flow schemes and also described what existed with respect to the situations on the ground concerning the gravity flow schemes. The descriptive research design was used to investigate more on the questions; 'who'(categories of study participants), 'when'(the time of the study vis-as vis respondent's convenience), 'what'(the phenomena being undertaken), 'where'(the geographical area of the study) and' how'(methodologies used to make the study a success). The cross sectional survey design was used to measure the differences among people related to variables over short period of time (Amin, 2005). The timeline involved in this cross sectional design could not allow the researcher to probe more through digging deep, which curtailed coming up with an in-depth outcome. However, the design gave the researcher an insight of having a better understanding of the relevant methodologies of data collection in line with it, hence a success.

3.2 Study Population

The total study population was 660 comprising of 636 households directly taking water from the gravity flow schemes, 2 private operators managing the distribution of water from three gravity flow schemes, 3 water boards overseeing the operation of the private operator but also taking water from these gravity flow schemes , 11 political leaders and 8 district and sub-county staff who are responsible for provision of service delivery in the supply areas.

3.3 Sample Size and Sampling Technique

The total sample size was determined using the population size and sample size table developed by Krejcie and Morgan, 1970 as adopted by Amin, 2003. From the research table shown below total study population size being 660, the total sample size was 216 individuals.

Table 3.1: showing the population size and sample size

Category	**Population size**	**Sample size**	**Sampling technique**
Private operators	2	2	Purposive sampling
Water boards	3	3	
Political leaders	11	6	
District and sub-county staff	8	5	
Households	636	200	Simple random sampling
Total	**660**	**216**	

Source: Manafwa district water office (2013)

Both Probability and non-probability sampling techniques were used in determining the sample size from the population. Purposive sampling was used on water boards, Private operators, political leaders and district staff. These were selected because they are knowledgeable and have key information regarding performance of gravity flow schemes.

Simple random sampling was used on the 200 households' heads because each member selected of the targeted population had an equal and independent chance of being included in the sample. Where, out of the study population of 636 households,200 respondents were selected after coming up with groups containing three households per group. After creating groups of three households, each third member of the group was selected for participation in the study. This subsequently enabled the researcher to get the required number. This method allowed for the most generalizability of the findings (Amin, 2005).

3.4 Data collection methods

Data for this research project was collected using both primary and secondary data collection methods. Primary data collection methods involved use of questionnaires, interviews and observations while secondary data collection method involved reviewing relevant documents to the study.

3.4.1 Questionnaires

Neuman (2002) defined a questionnaire as a survey in which the research conceptualizes and operationalizes variables and questions. The questionnaire method has been fast and quick as questionnaires were distributed to respondents, then picked them in agreed intervals of time, this saved a lot of time, cost and energy. The questionnaire was used to collect data from the household heads through self-administered questionnaire for those who can read and write. Out of the 200 households selected, 160 (80%) households returned their questionnaires, which was substantial enough for analysis of the study findings to continue. The questionnaire was used to collect first-hand information and filled out whenever the respondent had time.

3.4.2 Interviews

This involved in depth interactions and conversations meetings face to face with the key informants like the private operator, district and sub county staff, water boards and political leaders through further probing. In this method attitude, beliefs, social clues, values, voice intonations were used to get information regarding community participation and performance of the gravity flow schemes (Mugenda & Mugenda, 2003).. This involved the researcher asking open ended questions prepared for the interview one after the other and the researcher himself took records of the responses from the respondents to each question. The method was essential in reducing non response rate. All the 16 key informants were interviewed which enabled the researcher to get dependable responses.

3.4.3 Observations

Observation was used to collect primary data on the conditions of the gravity flow schemes and the general behavior and attitude of the community towards functionality of the gravity flow schemes. The primary data was collected by visiting the sampled areas of the study to see activities which were being done around the water taps such as cleaning, records of collection of money for operation and maintenance, fencing of taps and repairing of broken parts and also check and see whether there is continuous flow of water or not on the taps. All the key components of the gravity flow schemes were observed by the researcher which enabled the collection of first-hand information without depending on the views of the respondents.

3.5 Data collection instruments

Observation checklist, questionnaires, interview guides were the main instruments of data collection. Observation checklist, questionnaires, interview guides were designed to answer all the research questions.

3.5.1 Questionnaires

The questionnaires had close ended questions which restricted the respondent to a fixed set of answers on the likert scale, which was easier, more flexible and faster to be answered. The attitude of the respondents was determined using the likert scale because it is easier and can be easily constructed (Amin, 2005).The questionnaire had five sections; demographic characteristics, community participation in planning, community participation in implementation, community participation in monitoring and performance. All respondents were briefed about the research before administering in order to build confidence and rapport.

3.5.2 Interview Guide

Interview guide was used to collect qualitative data through in depth interactions and face to face narratives with the key informants like the private operator, district and sub county staff, water boards and political leaders because they are directly involved in the issues of community participation and performance of these gravity flow schemes. Open ended questions were used and this allows the respondents to give information in detail (Amin, 2005).

3.5.3 Observation Checklist

The Observation Checklist was one of the instruments used to collect data related to the performance of the gravity flow schemes. The items included; flow of water on taps, leakages and burst along the pipeline, fence around the tap stands, cleanliness of the containers and around the facility. Where possible some of the items like flow of water on taps, leakages, and cleanliness was captured and documented using photographs and recordings of some of the vital information needed for the study while visiting the study areas.

3.6 Quality Control

3.6.1 Validity

The research questions, interview guide, observation checklist were subjected to gravity flow scheme experts at Ministry of Water and Environment regional office in Mbale, who rated them in terms of relevance, simplicity, clarity, ambiguity. In addition each question item was subjected to content validity index and only those item with content validity index above 0.7 were valid because they could measure to the attributes.

3.6.2 Reliability

Reliability refers to how dependable the research instrument is to the research study. The questionnaire is consistent if the score obtained from one item is correlated with scores obtained from other items in the instrument. The reliability of the questionnaire was checked by calculating the cronbach's Alpha coefficient and if the coefficient is 0.7or greater than then the question item is consistent and reliable. If the cronbach's Alpha coefficient is high means that there is high reliability of the research instrument (cronbach, 1951) as cited by Lance CE, Butts MM, Michels LC.

3.7 Measurement of variables

The research study considered variables under community participation in planning, community participation in implementation, community participation in monitoring and performance of gravity flow schemes. This involved assigning of numerical data from the questionnaires in order to change them in to values for easy interpretation. A five point Likert scale (1=strongly disagree, 2=disagree,3=neutral,4=agree to 5=strongly agree) was used to get quantifiable primary data from respondents.

3.8 Data collection procedure

The researcher and two research assistants were involved in the collection of data through administering the questionnaires, face to face interactions and observations in the field. The assistants were trained in areas of data collection and the ethical conduct before being dispatched to the field. Research assistants were given photocopies of introductory letter from Uganda Management Institute so that they could have easy access and gain audience with the community members. The self-administered questionnaires were distributed and picked at an agreed appropriate time after the respondents had internalized and made responses to the questions.

3.9 Data Analysis

Data analysis involved organization and interpretation of information generated into useful data. The research used both the quantitative and qualitative data analysis techniques.

3.9.1 Quantitative data analysis

Quantitative data collected was scrutinized, edited, coded and entered into a Microsoft office excel computer program and analyzed using the statistical package for social scientists between the variables. Frequencies and percentages were used in describing responses to question items on community participation and performance of gravity flow schemes. Pearson's correlation coefficient (r) was used to examine the relationship between independent variable and dependent variable.

In addition regression analysis was used to determine the coefficient of determination (r^2) which showed how a change in independent variable affects the change in dependent variable.

3.9.2 Qualitative data analysis

Qualitative data collected was analyzed basing on Creswell (2005) recommended steps: (i) data was categorized in themes,(ii) Information not having direct or indirect bearing on the theme was removed, (iii) Themes were classified into major categories,(iv) Major categories were

clustered into subcategories with their concrete meaning transformed into language of science, (v) Categories and subcategories formed an opinion on the description of community participation and performance of gravity flow schemes in Manafwa.

3.10 Ethical considerations

The researcher ensured that there was confidentiality about the respondents and their views, respect for the views given, consent was sought from the respondents during the research, focus on the study, permission to obtain the information from the district was also sought, and explanations about the purpose, expected outcomes and benefits of the study was made clear to the respondents and also acknowledging the sources of the information used.

CHAPTER FOUR:

PRESENTATION OF FINDINGS, ANALYSIS AND INTERPRETATIONS

4.0 Introduction

This chapter contains the answers obtained from 176 respondents who participated in the investigation. The findings have been analyzed with statistical breakdowns accompanied with detailed qualitative narratives for clear and better understanding.

4.1 Response rate

Out of 200 planned questionnaires, a total of 160 respondents returned their questionnaires; while interviews were conducted with 16 respondents. The total number of respondents was 176 out of the targeted 216 respondents giving 81% response rate. This shows that all respondents did not participate, but the number that responded was substantial enough.

Table 4.1: Response rate

Participants	**Interviews**	**Questionnaires**
Private operators	2	
Water boards	3	
Political leaders	6	
District and sub-county staff	5	
Households		160
Sub total	**16**	**160**
Total	**176**	

Source: Field data 2015

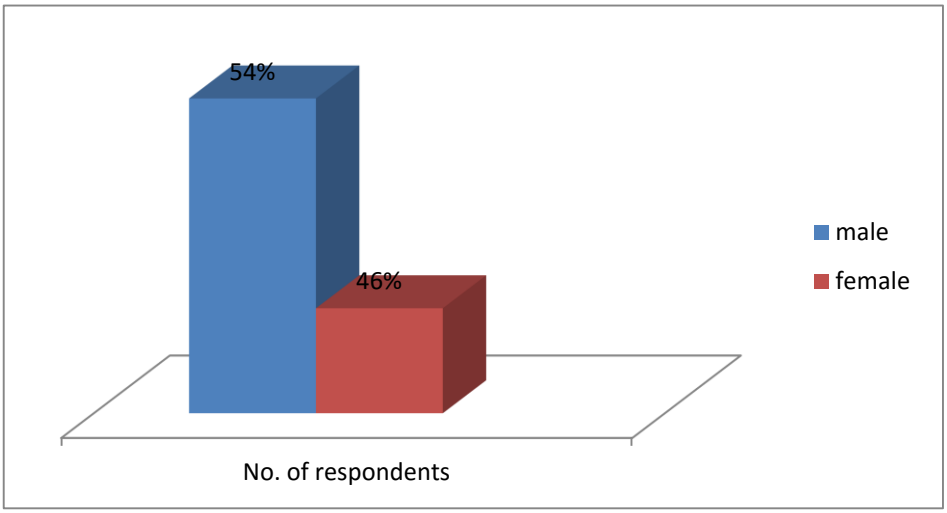
Table 4.1 shows the category of respondents who participated in the study. The total number of respondents were 176, 16 respondents were interviewed and these included 2 private operators, 3 water board members, 6 political leaders and 5 District/Sub-County staff. While 160 filled self-

administered questionnaires who included; household members benefiting from the gravity flow schemes. The category of respondents chosen was representative and the total number of 176 respondents was good enough for the study.

4.2 Socio- Demographic data of respondents

The socio-demographic data comprises of sex/gender, age range, level of education, and occupation of the respondents.

Figure 4:1: Sex/gender of the respondents



Source: Field data 2015

The statistics in figure 4.1 above, show that majority of 176 respondents, 96(54%) were male. While 80(46%) were female. This could be attributed to men being more involved in water management committees and payment of bills in the locality than women and also, are more versed with gravity flow schemes activities than women.

Table 4.2: Age frequency of respondents

Age range	Frequency	Percentage %
Below 18	13	7.3
18-30	38	21.5
31-45	74	42
46-60	35	20.2
Above 60	16	9
Total	**176**	**100**

Source: Field data 2015

The statistics in table 4.2 above show that all age groups participated in the study. They constituted; 74(42%) were in the age range 31-45, followed with 38(21.5%) were in the age range 18-30. Since water is an important resource in the community, all age groups had to be represented.

Table 4.3: Educational levels of respondents

Educational level	Frequency	Percentage
Primary	43	24.4
Ordinary level	65	36.9
Advanced level	16	9
Certificate/Diploma	37	21.2
Degree & above	15	8.5
Total	176	100

Source: Field data 2015

According to the table 4.3 above, the majority of the respondents 65(36.9%) were of ordinary education level, followed with 43(24.4%) were primary leaver. This is attributed to the literacy level in the locality, though educated, but most of them had dropped in Ordinary level. Such as situation is tricky, especially when it comes to understanding the gravity flow scheme technology involved, which may prove to be a problem to them.

Table 4.4 Occupation of respondents

Occupation category	**Frequency**	**0% age**
Farmer	77	43.7
Business operators	45	25.5
Casual labourers	4	2.2
Employed	50	31.6
Total	**176**	**100**

Source: Field data 2015

According to the table 4.4 above, majority of the respondents were farmers 77(43.7%), followed with 50(31.6%) who were employed. This is attributed to farming being the main source of employment and also, the area being near a border point (Lwakhakha border post), where cross border trade is very active between Uganda and Kenya.

4.3 Community participation in planning

This objective dwelt on community participation in planning for water sources. The respondents were presented with options provided in the questionnaire which were: 1) strongly disagree,2) disagree 3) not sure 4) agree 5) strongly agree. In order to analyze the data easily, the findings were summarized in percentages and respondents had to agree or disagree or being not sure.

Table 4.5: Community participation in planning

Statements	SA	%	A	%	NS	%	D	%	SD	%
Community members attend meetings to discuss matters concerning gravity flow water supply system	55	37.2	36	24.3	11	7.5	20	13.5	26	17.5
Community members make decisions on matters concerning gravity flow water supply	62	41.7	29	19.5	20	13.4	18	12	20	13.4
Community members are involved in assessing their needs	72	48.4	26	17.4	24	16.2	18	12	9	6
Community members are involved in identifying the location and site of their water system	71	44.4	38	23.8	23	14.4	21	13.1	7	4.3
Community members are involved in identifying the water source technology in their areas	41	27.9	10	6.8	43	29.3	42	28.6	11	7.4

Source: Field data 2015

According to the statistics in table 4.5 above, Community members always attend meetings to discuss matters concerning gravity flow water supply system, where 55(37.2%) strongly agreed and 36(24.3%) agreed. This is attributed to the fact that clean and safe water is of great importance to them, because the community cannot do without it. During interviews, the local leaders "*affirmed that clean and safe water is of great importance to them and it is life for the community".* This means that people value water, as one of their needs; therefore have to attend meetings related to water activities.

Findings in table 4.5 above, indicate that, Community members always make decisions on matters concerning gravity flow water supply, where 62(41.7%) strongly agreed and 29(19.5%) agreed. This is because the planning system is participatory in nature, where the community people must have a hand as primary stakeholders. The reason behind is to create a sense of ownership and attachment to the water source.

Findings also indicate that, Community members are always involved in assessing their needs, where 72(48.4%) strongly agreed and 26(17.4%) agreed. Similarly during interviews, *"local leaders confessed to the statement of being always involved in needs assessment"*. This emanates from the fact that the communities know what they want, therefore, their involvement is a sign of them having a direct hand in the running of the gravity flow water supply schemes.

Findings also indicate that, community members are involved in identifying the location and site of their water system, where 71(44.4%) strongly agreed and 38(23.8%) agreed. This is attributed to it being a communal project, therefore the location must be accessible to all and also consensus on the land being used reached. The same was said by the local leaders during the interview "*that the water is for their own benefit, the identification of site and location is really important by the community."* This is a sign that the water project has been accepted by the community, as envisaged by their donation of land.

Finally, findings indicate that, Community members are not always involved in identifying the water source technology in their areas, where 42(28.6%) disagreed and 11(7.4%) strongly disagreed respectively. While 41(27.9%) agreed and 10(6.8%) strongly agreed also, however, a substantial number were not sure 43(29.3%). This is based on the fact that choice of technology is a complicated matter which needs to be chosen by the engineers charged with constructing the gravity flow schemes, and then just furnish the community people on how it is going to run, however, it must be appropriate and sustainable.

4.3.1 Correlation results for Community participation in planning

The study established whether a relationship existed between community participation in planning and performance of gravity flow schemes with the findings obtained presented in Table 4.6.

Table 4.6: Correlation results for community participation in planning

		Community participation in planning	Performance of gravity flow schemes
Community participation in planning	Pearson Correlation	1	.131
	Sig. (2-tailed)		.099
	N	160	160
Performance of gravity Flow schemes	Pearson Correlation	.131	1
	Sig. (2-tailed)	.099	
	N	160	160

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

Source: Primary data

Table 4.6 above presents co-efficient correlation results obtained for community participation in planning and performance of gravity flow schemes where results reveal a positive .131 relationship existed between community participation in planning and performance of gravity flow schemes. The result obtained meant that, a unit change in community participation in planning increased performance of gravity flow schemes by 13.1% and its implication is that identification of needs, improved or better decision making and attending of development meetings would result into an improvement of performance of gravity flow schemes.

4.3.2 Regression results for Community participation in planning

This section presents inferential results specifically regression results between community participation in planning and performance of gravity flow schemes in Manafwa with the results obtained reflected in Table 4.7

Table 4.7: Regression results between community participation in planning and performance of gravity flow schemes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.131[a]	.017	.011	.53926

a. Predictors: (Constant), community participation in planning

Source: Field data

Table 4.7 presents linear regression results for between community participation in planning and performance of gravity flow schemes. The results obtain reveal R as .131, R^2 as .017, Adjusted R^2 as .011 and standard error of the estimate as .53926 using the predictor community participation in planning. The R^2 score of .017 explains a 1.7% variance that community participation in planning and performance of gravity flow schemes in this study with 98.3% explained by other factors. The implication here is that community members must have a hand in planning given that they have a better understanding of the realities on the ground and creates a sense of ownership among them, hence increasing the chances of performance of gravity flow schemes.

4.4 Community participation in Implementation

This objective dwelt on community participation in implementation of gravity flow water schemes. The respondents were presented with options provided in the questionnaire which were: 1) strongly disagree,2) disagree 3) not sure 4) agree 5) strongly agree. In order to analyze the data easily, the findings were summarized in percentages and respondents had to agree or disagree or being not sure.

Table 4.8: Community participation in implementation

Statements	SA	**%**	A	%	NS	**%**	D	%	SD	%
I always contribute money for use in the gravity flow scheme construction	49	33.1	43	29	10	6.8	22	14.9	24	16.2
I am always willing to contribute local materials needed in the construction of gravity flow scheme	64	43.3	31	20.9	16	10.8	24	16.2	13	8.8
I am always willing to provide labour needed in constructing gravity flow scheme	65	43.9	31	20.9	13	8.8	26	17.6	13	8.8
I am always willing to provide land needed for construction of gravity flow scheme	34	22.9	62	41.9	9	6	22	14.9	21	14.3

Source: Field data 2015

According to the statistics in table 4.8 above, community members always contribute money for use in the gravity flow scheme construction, where 49(33.1%) strongly agreed and 43(29%) agreed respectively. This is attributed to the fact the said water is for their own benefit, therefore, have to contribute money to sustain the water sources. During the interview, *"the local leaders said that the communities have to contribute money to sustain the water sources."* This means that the water user committees are able to carry out minor repairs and replace simple broken parts that are not costly, which is the reason behind the smooth running of the gravity flow water schemes.

Findings in table 4.8 above, community members are always willing to contribute local materials needed in the construction of gravity flow scheme, where 64(43.3%) strongly agreed and 31(20.9%) agreed. This based on the fact that the water sources being developed are for their own use, which was in consonance with local leaders views in interviews. This means that people are in full support of the water works, as the beneficiaries of the gravity flow schemes;

therefore they see no loss in contributing towards acquisition of local materials needed in the construction.

Findings also indicate that community members are always willing to provide labour needed in constructing gravity flow schemes, where 65(43.9%) strongly agreed and 31(20.9%) agreed. This is because they are the primary stakeholders and are also paid, which is a source of income. *"The same was echoed by local leaders since it comes with benefits of getting temporarily employed for an income".* This is a way of creating a sense of ownership among community members and also on job learning such that when they are left to maintain they can easily run the water sources without any difficulty.

Finally, findings indicate that, community members are always willing to provide land needed for construction of gravity flow scheme, where 34(22.9%) agreed and 62(41.9%) strongly agreed. This is because the water is for their own benefit and the local leaders said "*the allocation of land has no implication of losing ownership, apart from the portion donated."* The meaning here is that, for the water works to a reality, land needs to be available, which the community people have complied to.

4.4.1 Correlation results for Community participation in Implementation

Correlation is used to measure the strength of relationships between two variables. In this correlation analysis, Pearson's correlation co-efficient has been used to measure the relationship between implementation and performance of gravity flow schemes with the findings obtained presented in Table 4.9.

Table 4.9: Correlation results for community participation in implementation

		Community participation in implementation	Performance of gravity flow schemes
Community participation in implementation	Pearson Correlation	1	.066
	Sig. (2-tailed)		.407
	N	160	160
Performance of gravity Flow schemes	Pearson Correlation	.066	1
	Sig. (2-tailed)	.407	
	N	160	160

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

Source: Primary data

Table 4.9 above presents co-efficient correlation results obtained for community participation in implementation and performance of gravity flow schemes where results reveal a positive .066 relationship existed between community participation in implementation and performance of gravity flow schemes. The result obtained meant that, a unit change in community participation in planning increase performance of gravity flow schemes by 6.6% and its implication is that, by locals contributing land, local materials and timely labour would result into performance of gravity flow schemes.

4.4.2 Regression results for Community participation in Implementation

This section presents inferential results specifically regression results between community participation in implementation and performance of gravity flow schemes in Manafwa with the results obtained reflected in Table 4.10.

Table 4.10: Linear regression results for between community participation in implementation

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.066[a]	.044	.002	.54278

a. Predictors: (Constant), community participation in implementation

Source: primary data

Table 4.10 presents linear regression results for between community participation in implementation and performance of gravity flow schemes. The results obtain reveal R as .066, R^2 as .044, Adjusted R^2 as .002 and standard error of the estimate as .054278 using the predictor community participation in implementation. The R^2 score of .044 explained a 4.4% variance that community participation in implementation had on performance of gravity flow schemes in this study with 95.6% explained by other factors. The implication here is that community members must have a hand in implementation of gravity flow scheme related activities, because they are the beneficiaries, who will have it in mind that the water user committee and district water office takes them as key stakeholders.

4.5 Community participation in monitoring

This objective dwelt on community participation in monitoring of gravity flow schemes. The respondents were presented with options provided in the questionnaire which were: 1) strongly disagree,2) disagree 3) not sure 4) agree 5) strongly agree. In order to analyze the data easily, the findings were summarized in percentages and respondents had to agree or disagree or being not sure.

Table 4.11: Community participation in monitoring

Statements	SA	%	A	%	NS	%	D	%	SD	%
I always report to the authorities whenever there is a mal-function of the gravity flow scheme	80	53.4	62	41.4	5	3.3	2	1.3	1	0.6
I always participate in cleaning of the tanks and tap stands	24	16.2	31	20.9	11	7.4	63	42.7	19	12.8
I always participate in slashing of the sources of the gravity flow scheme	25	17.1	24	16.4	8	5.5	69	47.3	20	13.7
I am always willing to support any activity involving inspection of sites gravity flow scheme	88	57.9	36	23.6	14	9.2	13	8.6	1	0.7
I always report any leakages or bursts to the on the authorities on the gravity flow scheme	75	50.5	65	43.6	4	2.6	3	2	2	1.3

Source: Field data 2015

According to the statistics in table 4.11 above, community members always report to the authorities whenever there is a mal-function of the gravity flow scheme, where 80(53.4%) strongly agreed and 62(41.4%) agreed. This is attributed to their vigilance and also their past experience of water shortage, especially during dry season; therefore they don't want the old situation to re-occur. This means that, whenever there is a malfunction on the gravity flow schemes, the anomaly is quickly fixed to avert the problem.

Findings indicate that community members rarely participate in cleaning of the tanks and tap stands, where 63(42.7%) disagreed and 19(12.8%) strongly disagreed respectively. This is because of their limited understanding of the cleaning procedure and also being caught off-guard on the cleaning timeline, the same was said by the local leaders. During observation, "*the taps and tanks appeared clean and in good condition"*. This implies that tanks and taps are always cleaned by the scheme attendants assigned to the scheme by the water user committee, however,

community members need to be involved in the cleaning process for purposes of doing it themselves and subsequently getting clean water.

Findings also indicate that community members rarely participate in slashing of the sources of the gravity flow schemes, where 69(47.3%) disagreed and 20(13.7%) strongly disagreed respectively. This is because the water user committees have not made use of the community members on grounds that there are scheme attendants who do the slashing and cleaning of water sources. This non-involvement of community members in cleaning of the water sources leaves a lot to be desired given that the water from gravity flow schemes is for their own good, therefore need for involvement in cleaning and other activities.

Findings also indicate that community members are always willing to support any activity involving inspection of sites gravity flow scheme, where 88(57.9%) strongly agreed and 36(23.6%) agreed. This attributed to voluntary nature of site inspection, which comes with no pay, which was cemented by local leaders during interviews, "*who said that community members are in support of all water related activities"*. This is a positive guesture; however, the authorities have not taken the initiative of involving the community members in water management activities, including site inspection for purposes of learning.

Finally, findings also indicate that community members always report any leakages or bursts to the authorities on the gravity flow scheme, where 75(50.5%) strongly agreed and 65(43.6%) agreed. This is also due to their vigilance, where, they don't want to go back to the old situation of water shortages during the peak hours, whose response was not different from the local leaders. This means that they want every household to get enough water.

4.5.1 Correlation results for Community participation in Monitoring

Correlation is used to measure the strength of relationships between two variables. In this correlation analysis, Pearson's correlation co-efficient has been used to measure the relationship between monitoring and performance of gravity flow schemes with the findings obtained presented in Table 4.12.

Table 4.12: Correlation results for community participation in monitoring

		Community participation in monitoring	Performance of gravity flow schemes
Community participation in Monitoring	Pearson Correlation	1	.048
	Sig. (2-tailed)		.546
	N	160	160
Performance of gravity Flow schemes	Pearson Correlation	.048	1
	Sig. (2-tailed)	.546	
	N	160	160

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

Source: Primary data

Table 4.12 above presents co-efficient correlation results obtained for community participation in monitoring and performance of gravity flow schemes where results reveal a positive .048 relationship existed between community participation in monitoring and performance of gravity flow schemes. The result obtained meant that, a unit change in community participation in monitoring increased performance of gravity flow schemes by 4.8% and its implication is that, regular slashing of source, coupled with cleaning of tanks/taps as well as reporting of functionality status would lead to better performance of gravity flow schemes.

4.5.2 Regression results for Community participation in monitoring

This section presents inferential results specifically regression results between community participation in monitoring and performance of gravity flow schemes in Manafwa with the results obtained reflected in Table 4.13.

Table 4.13: Regression results for between community participation in monitoring

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.048[a]	.002	-.004	.54334

a. Predictors: (Constant), community participation in monitoring

Source: primary data

Table 4.13 presents linear regression results for between community participation in monitoring and performance of gravity flow schemes. The results obtain reveal R as .048, R^2 as .002, Adjusted R^2 as -.004 and standard error of the estimate as .54334 using the predictor community participation in monitoring. The R^2 score of .002 explains a 0.2% variance that community participation in monitoring had on performance of gravity flow schemes in this study with 99.8% explained by other factors. The implication here is that involvement of community members in monitoring the progress of gravity flow scheme project, gives them knowledge and also it is a sign of recognition of their input.

4.6 Performance of Gravity Flow Scheme

This objective dwelt on the performance of gravity flow schemes. The respondents were presented with options provided in the questionnaire which were: 1) strongly disagree,2) disagree 3) not sure 4) agree 5) strongly agree. In order to analyze the data easily, the findings were summarized in percentages and respondents had to agree or disagree or being not sure.

Table 4.14: Performance of Gravity Flow Scheme

Statements	SA	%	A	%	NS	%	D	%	SD	%
Water is always available when required	44	30.3	51	35.1	11	7.6	31	21.5	8	5.5
The gravity flow scheme has sufficient water for users	44	29.5	63	42.5	15	10	21	14	6	4
Water quality is always good	60	40.6	46	31	25	16.9	13	8.8	4	2.7
Money collected for gravity flow scheme activities is always used on the activities of the scheme	49	33.1	9	6	60	40.6	16	10.8	14	9.5
Money collected for gravity flow scheme activities is always accounted for in time (one month)	16	10.8	6	4	60	40.6	17	9.5	49	33.1
Minor breakdowns in the gravity flow scheme are immediately repaired(In a day)	67	45	31	20.8	12	8	25	16.9	14	9.3
Major breakdown in the gravity flow schemes are promptly addressed within one week	71	45	42	26.5	15	9.5	20	12.7	10	6.3

Source: Field data 2015

According to the statistics in table 4.8 above, water is always available when required, where 44(30.3%) agreed and 51(35.1%) strongly agreed respectively. While 31(21.5%) disagreed and 8(5.5%) strongly disagreed, however, 11(7.6%) were not sure. This is attributed to the source having enough water throughout the year, thanks to the efforts of water management team. The meaning here is that community people have got unlimited access to clean and safe water.

Findings also indicate that the gravity flow schemes has sufficient water for users, where 44(29.5%) agreed and 63(42.5%) strongly agreed respectively. This is also attributed to the source and storage facilities being in place, which was confirmed by the local leaders in interviews and the researcher during observations. This means that the water is sufficient enough for all the beneficiaries, because the sources of the gravity flow schemes having sufficient yields and storage tanks, in addition to the area's terrain being favourable.

Findings also indicate that the water quality is always good, where 60(40.6%) agreed and 46(31%) strongly agreed respectively. While 13(8.8%) disagreed and 4(2.7%) strongly disagreed also, however, 25(16.9%) were not sure. This is attributed to treatment procedure adopted before water is distributed for use by the community, which was also confessed by the local leaders and confirmed by the researcher in observation. This means that the community people have got access to clean water, however, it is safety was not ascertained.

Findings indicate that community members were not sure whether the money collected for gravity flow schemes activities is always used on the activities of the schemes, 60(40.6%). This was followed with 49(33.1%) who agreed and 9(6%) strongly agreed respectively. This is attributed to lack of transparency in accounting for the money collected and was similarly echoed by the local leaders during interviews. This means that the water management team is not responsible to the community by concealing the usage of the money realized. Such a scenario leaves a lot to be desired, because the water flow schemes are for them.

Findings also indicate that community members were not sure whether money collected for gravity flow scheme activities is always accounted for in time (one month) 60(40.6%). This was followed with 49(33.1%) who disagreed and 17(9.5%) who strongly disagreed respectively. This is also attributed to water management not being responsible to the community and a similar response was echoed by the local leaders who confessed to have never seen any accountability. This means that there is no openness about money realized, by the water user committee which leaves a lot to be desired. Therefore, community members need to be enlightened on their rights as pertains to the management of funds collected for water sources maintenance.

Findings also indicate that minor breakdowns in the gravity flow schemes are immediately repaired (within one day), where 67(45%) strongly agreed and 31(20.8%) agreed respectively.

This is attributed to the hard-work of water user committees and the operators, which was also confirmed during observation, as minor leakages were not seen anywhere. This is a sign of quick repairs, thanks to the efforts of water user committees which shows a semblance of sustainability in the management of the gravity flow schemes.

Finally, findings indicate that major breakdown in the gravity flow schemes are promptly addressed within one week, where 71(45%) strongly agreed and 42(26.5%) agreed. This has been due to collections from the community people, which they use to promptly fix the breakdowns, which was confirmed by the local leaders in interviews. This implies that there are measures in place to ensure that minor repairs are carried out before they become big, which allows only the use of few resources instead of when cracks enlarge.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary and discussion of results as per the objectives that guided the study, conclusions and recommendations directed to stakeholders. The summaries and discussions are a replica of the findings above.

5.1 Summary of Findings

In light of the findings above on the relationship between community participation and performance of gravity flow schemes among households in Manafwa district**.** Below is the summary of findings;

5.1.1 Community participation in Planning

The objective was to examine the relationship between community participation in planning and performance of gravity flow schemes among households in Manafwa. It was envisaged that there is a significant relationship between planning and performance of gravity flow scheme at r^2=0.131. The performance of gravity flow schemes is heavily influenced by planning, therefore has to be given utmost attention. Therefore, the relationship is valid, where planning is a prerequisite for better performance.

5.1.2 Community participation in Implementation

The objective was to establish the relationship between community participation in implementation and performance of gravity flow schemes among households in Manafwa.

It was envisaged that implementation heavily influences performance of gravity flow schemes, r^2 = 0.66. The implication here is that community members are integral part of planning for the

gravity flow schemes, which greatly enhances its performance hence giving it a niche in terms of succeeding.

5.1.3 Community participation in Monitoring

The objective was to determine the relationship between community participation in monitoring and performance of gravity flow schemes among households in Manafwa.

It was envisaged that monitoring is prerequisite for better performance of gravity flow schemes $r^2 = 0.48$. Monitoring helps ascertaining the progress of gravity flow schemes and also identify loopholes which may impede its success then address them, hence better performance. However, the results show that monitoring concept is not being given utmost attention as evidenced by the slight contribution it has had towards performance.

5.2 Discussion of results

In light of the above findings presented on the relationship between community participation and performance of gravity flow schemes among households in Manafwa district**.** Below is the discussion of results;

5.2.1 Community participation in planning

The study found out that Community members always attend meetings to discuss matters concerning gravity flow schemes, where they make decisions on matters to that effect. This is more so with needs assessment which they are involved in thereby giving the project a true meaning as pertains to planning for activities that concern it. This was in consonance with Brett A. Gleitsmann, (2007), who stated that studies have shown that change in water use behaviours and sustainable management of water supply is more likely when diverse community members authentically participate in decision making, negotiation and concerted action related to water supply innovations. He was also not different from Singh.(2005), who suggested that, for water

supply management to be sustainable, local people must be encouraged to negotiate, communicate, learn and arrive at joint decisions that reflect community choices and preferences. The statements show that community members have to be integral part of the planning process, for there to be binding decisions in respect of the success of the water supply project.

The study also revealed that community members are involved in identifying the location and site of their water system; however, they are not always involved in identifying the water source technology in their areas. Similarly, a report by the Ministry of Water and Environment, (2011), stated that, there is need of inclusive approach avoiding marginalization of the poor. This can be gained through programmes that are series of integrated activities directed to the establishment and continue functioning and use of water supply services. In addition, Vincent, (2003), added that, in planning for water supply in poor communities, technological design specifications have been dominated by the donor and implementing agencies, while communities have been typically left out of this critical design and planning phase. Emerging perspectives in the last decades have compellingly indicated that technology adoption and sustainable management of water supply innovations are determined by complex social forces and social relations that shape people's choice of technology, and water use behaviours. This implies that though community people have a say on the location, but the choice of technology is not theirs, as also envisaged in the review, where technological choice had no hand of the community members.

5.2.2 Community participation in implementation

The study established that community members always contribute money for use in the gravity flow scheme constructions. Also, not to mention, they are always willing to contribute local materials needed to enable the commencement, completion and repair of defects, instead of waiting for the authorities to do for them. This was in consonance with the report by African Development Fund, (2005), which stated that, the needs and concerns of all community members

involved in water projects should be taken care off during planning and implementation phases. In that, realistic proposals and budgets should be developed and decision made by all community members, local leaders and government extension staff during the meetings. This agrees with the findings by Schouten & moriarty (2003) who defines community participation in implementation as the extent to which community members are involved in executing activities aimed at achieving desired goals related to community based water system including contributing money for managing the water facility, contributing the necessary materials for constructing the water facility, contributing labour for constructing and general management of the water facility, sparing time to attend to any necessary issues related to the water project. This similarity is a confirmation that community members can participate in implementation by contributing resources and labour.

The study also revealed that community members are always willing to provide labour needed in constructing gravity flow scheme. In addition, they have no problem with providing land needed for the construction of the gravity flow scheme. This was consistent with the findings by Schermerhorn (2004) who defines community participation in implementation as the extent to which community members are involved in carrying out, executing, or practicing of a plan, a method, or any design for doing a community project activity. Similarly, excerpts from the community resource handbook (2007), states that the community should provide land for the construction of the water source and pipeline routes and also sell the locally available materials necessary for the construction to the contractor. The contractor is expected to provide employment to the community members in order to empower them economically and equip them with skills. In view of the above, in most cases community members lack the necessary professional and basic skills which are a requirement for working with the contractors. This

confirmation shows that the provision of labour and land by the community does exist in other areas, which is important.

5.2.3 Community participation in monitoring

The study established that community members always report to the authorities whenever there is any mal-function of the gravity flow schemes. This is in line with Harvey & Reed (2007) where community members report to the concerned authorities the functionality status of the water facility and ensure security of the water facility in their location. However, it was discovered that they rarely participate in cleaning of the tanks and tap stands, also slashing of the water sources. A related circumstance is expressed by Konzil & McGrath,(1996), who stated that, whatever 'community' may mean to different people, they understand that changing the level of community participation from one to another is indeed difficult. At the level of implementation, the large projects with extensive service delivery systems which lack client-centered planning, have little to do with community participation. In the latter, there is little expectation of participation by anyone. This non-involvement of community members in cleaning of the water sources leaves a lot to be desired given that the water from gravity flow schemes is for their own good, therefore need to be involved in cleaning and other activities.

The study also revealed that community members are always willing to support any activity involving inspection of sites. It is not surprising that they always report any leakages or bursts to the authorities on the gravity flow schemes. This was also confirmed by Jacobson (2008), who stated that, community projects remain on course and maintained once the community members have been involved. Similarly, Heathfield, (2008), who stated that, Community projects in which beneficiaries are highly involved in their monitoring have higher chances of survival than those with low community participation in monitoring. This development therefore is a replica of what is happening in other areas of the world; therefore need to be given utmost attention.

5.2.4 Performance of gravity flow scheme

The study established that water is always available when required, which is sufficient and of good quality. This emanates from the quality of works carried out, coupled with the sources of the gravity flow schemes having sufficient yields and storage tanks, in addition to the area's terrain being favourable. This was confirmed by UNICEF (1999), whose report stated that, the necessary pre-condition for the success of community-based monitoring systems is the availability of user-friendly, simple and cheap water quality test kits because water quality is one of the parameters that may make the community become reluctant on their water source. Such testing kits have the potential to strengthen the existing national water quality monitoring systems by providing the means for better and more timely sampling and analysis by community themselves and also give direct knowledge of the quality of water from their source. Therefore, the testing of water quality lends credence to the study, which activity does exist before water is disbursed for consumption.

The study established that community members were not sure where the money collected for gravity flow schemes activities is always used on the activities of the schemes. In addition, they were also not sure whether money collected for gravity flow scheme activities is always accounted for in time (one month). This implies that there is no openness on accountability of money realized by the water user committee which leaves a lot to be desired. Therefore, community members need to be enlightened about their rights as pertains to the management of funds collected for water sources maintenance.

The study also revealed that minor breakdowns in the gravity flow schemes are immediately repaired (within one day). However, because of their incapacity to manage major breakdown in the gravity flow schemes, they promptly report to the authorities who address them within one week. This implies that there are measures in place to ensure that minor repairs are carried out

before they become big, which allows only the use of less resources. Thanks to the efforts of water user committees which shows a semblance of sustainability in the management of the gravity flow schemes.

5.3 Conclusion

In light of the above findings, below is the conclusion of the findings

5.3.1 Community participation in planning

The first objective of the study was to examine the relationship between community participation in planning and performance of gravity flow schemes among households in Manafwa. The study involved collection of data using questionnaires from the household beneficiaries, interviewing key informants in the study areas and observation of the key features and behavior of community towards the gravity flow schemes in the areas.

The study found out that Community members always attend meetings to discuss matters concerning gravity flow schemes, where they make decisions on matters to that effect, involved in identifying the location and site of their water system; however, they are not always involved in identifying the water source technology in their areas. Therefore, if community members participate in planning for the gravity flow schemes, identification of where to construct the water sources, regular attendance of meetings and needs assessment, then there will be a strong positive corresponding effect on performance of the gravity flow schemes.

5.3.2 Community participation in implementation

The second objective of the study was to establish the relationship between community participation in implementation and performance of gravity flow schemes among households in Manafwa. The study involved collection of data using questionnaires from the household

beneficiaries, interviewing key informants in the study areas and observation of key features on the status of the gravity flow schemes in the areas.

The study revealed that community members always contribute money, local materials, labour and land during and for use in the gravity flow scheme constructions. The study shows that, if community members participate in implementation of gravity flow scheme activities, in terms of contributing money, labour provision, land for the construction of water sources among others, then there is a positive corresponding effect on the performance of the gravity flow schemes.

5.3.3 Community participation in monitoring

The third and final objective of the study was to determine the relationship between community participation in monitoring and performance of gravity flow schemes among households in Manafwa. The study involved collection of data using questionnaires from the household beneficiaries, interviewing key informants in the study areas and observation of key features on the status of the gravity flow schemes in the areas.

The study established that community members always report to the authorities whenever there is any mal-function of the gravity flow schemes and are always willing to support any activity involving inspection of sites. The study shows that, if community members participate in monitoring of the gravity flow schemes, such as; community members reporting to the authorities whenever there is a mal-function of the gravity flow scheme, supporting of site inspection activities, report identified leakages or bursts to the authorities, then there is significant effect on the performance of gravity flow scheme. However, it was envisaged that community members are not involved in cleaning of the tanks and tap stands, also slashing of the water sources, which needs to be addressed for purposes of having no loopholes which may

affect water projects. In this respect, there is a considerable positive effect of monitoring on the performance of the gravity flow scheme.

5.3.4 Performance of gravity flow scheme

The study shows that the performance of the gravity flow scheme can only be possible if community members are involved in planning, implementation and monitoring. These are tenets of community participation helping in determination of the performance of gravity flow scheme. In this respect performance is measurable, as evidenced by the water being always available when required, sufficient and of good quality. They also repair minor breakdown, but report major breakdowns to the authorities because of the magnitude. This developments is due to quality of works carried out, coupled with the sources of the gravity flow schemes having sufficient yields and storage tanks, in addition to the area's terrain being favourable.

5.4 Recommendations

The recommendations are directed to stakeholders to address the identified gaps for purposes enhancing the performance of gravity flow schemes, particularly the monitoring aspect.

5.4.1 Community participation in planning

Community participation in planning for the gravity flow water supply needs to be strengthened by involving community members in all stages by making the community to identify their needs and make decisions on the locations of water sources. This is based on the benefits that come with it, as envisaged in the study just concluded. The fact here is that planning is a key component of performance which can only be possible if well implemented.

5.4.2 Community participation in implementation

Community members need to be wholly involved in the implementation of projects that are for their own benefits. This is because of their better understanding of the realities on the ground and

also the resource factor, where, if there are shortfalls they can contribute materials as well. The provision of labour is good for learning purposes as it gives them a basic niche to maintain the water points long after the construction works were concluded.

5.4.3 Community participation in monitoring

Community members have an important role in monitoring water related projects. Therefore, they need to be involved in all cleaning of the sources and taps, reporting functionality status of the water sources, repair of the minor leakages and burst, payment of funds for operation and maintenance. This is because they are acquainted with the project and can identify gaps for purposes of enhancing performance and sustainability. This as a result makes monitoring aspect easy, because all loopholes are detected and addressed which becomes a basis for gauging results.

5.4.4 Performance of gravity flow scheme

It has now been envisaged that community participation in planning, implementation and monitoring are prerequisites for better performance of the gravity flow schemes. Therefore people have to be involved in these three aspects for there to be a measurable performance. Though, it may be hard to involve people in all stages, but their involvement in key stages of the water project increases the chances of the project succeeding.

5.5 Areas of further research

Basing the study, further research is needed on the involvement of community people in the monitoring of water projects, which is normally taken as being more technical, subsequently not involving the community members directly and regularly.

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APPENDICES

APPENDIX I: INTRODUCTION

Dear Respondent,

My name is **Alunyu Denis**, student at Uganda Management Institute (UMI), Kampala pursuing masters of management studies (project planning and Management). In partial fulfillment for the requirement for the award, I am conducting a study on the effect of community participation and performance of gravity flow schemes among households in Manafwa district. The findings from this study will be used in the development of future gravity flow schemes and help on improvement of the performance of the existing gravity flow schemes as well as contribute to the existing body of knowledge. You have been selected by chance to participate in the survey and I would like to request you to answer some questions related to water supply system.

All the information you are giving will be confidential and will not include any specific names of the respondents.

Thank you for your time and cooperation.

Alunyu Denis

Researcher

UGANDA MANAGEMENT INSTITUTE

APPPENDIX II: QUESTIONNAIRES

SECTION A: BACKGROUND INFORMATION

Please tick the information applicable to you.

1. What is your gender?

Male ☐ Female ☐

2. What is your age in years?

Below 18 ☐ 18-30 ☐ 31-45 ☐ 46-60 ☐ Above 60 ☐

3. What is your highest level of education?

Primary ☐ O-level ☐ A-level ☐ Certificate or Diploma ☐ Degree and above ☐

4. What is your occupation?

Farmer ☐ business ☐ Casual labourer ☐ Salary employment ☐

Please answer the following questions by ticking what best describes your response from the scale of 1-5 (1-stronly disagree, 2-disagree, 3-not sure, 4-agree, 5-strongly agree)

	1-stronly disagree, 2-disagree, 3-not sure, 4-agree, 5-strongly agree	1	2	3	4	5
SECTION B: COMMUNITY PARTICIPATION IN PLANNING						
5	Community members attend meetings to discuss matters concerning gravity water supply system					

6	Community members make decisions on matters concerning gravity water supply system					
7	Community members are involved in assessing their need					
8	Community members are involved in identifying the location and site of their water system					
9	Community members are involved in identifying the water source technology in their areas					
	1-stronly disagree, 2-disagree, 3-not sure, 4-agree, 5-strongly agree	1	2	3	4	5
SECTION C: COMMUNITY PARTICIPATION IN IMPLEMENTATION						
10	I always contribute money for use in the gravity flow scheme construction					
11	I am always willing to contribute local materials needed in the construction of gravity flow scheme					
12	I am always willing to provide labour needed in constructing gravity flow scheme.					
13	I am always willing to provide land needed for construction of gravity flow scheme					
SECTION D: COMMUNITY PARTICIPATION IN MONITORING						
14	I always report to the authorities whenever there is any non-functionality of the gravity flow scheme					
15	I always participate in cleaning of the tanks and tap stands					
16	I always participate in slashing of the sources of the gravity flow scheme					
17	I am always willing to support any activity involving inspection of					

	the sites gravity flow scheme.					
18	I always report any leakages or bursts to the authorities on the gravity flow scheme.					
SECTION E: PERFORMANCE OF GRAVITY FLOW SCHEME						
19	Water is always available when required					
20	The gravity flow scheme has sufficient water for the users					
21	Water quality is always good					
22	Money collected for gravity flow scheme activities are always used on the activities of the scheme.					
23	Money collected for gravity flow scheme activities always accounted for in time (one month)					
24	Minor breakdowns in the gravity flow scheme are immediately repaired (within one day)					
25	Major breakdowns in the gravity flow schemes are promptly addressed within one week.					

Thank you for your time and cooperation.

APPENDIX III: INTERVIEW GUIDE

SECTION A: COMMUNITY PARTICIPATION IN PLANNING

1. How was the community involved in planning and identification of needs before implementation of the gravity flow scheme?
2. Were the community involved in making decisions on the location of the sites?
3. .If yes explain more. If no, explain why?
4. Do you think community participation in planning has an influence on the operation and maintenance of gravity flow scheme?
5. If yes explain more. If no explain why?

SECTION B: COMMUNITY PARTICIPATION IN IMPLEMENTATION

6. Did community actively participate in the construction of the gravity flow scheme?
7. If yes explain how. If no explain why?
8. Did the community contribute resources (land, labour, local materials) towards the implementation of the gravity flow scheme?
9. Are you satisfied with the performance of the water user committees during and after implementation of the gravity flow scheme?

SECTION C: COMMUNITY PARTICIPATION IN MONITORING

10. Do you think community participation in monitoring has an influence on the operation and maintenance of the gravity flow scheme?
11. If yes explain how. If no explain why?
12. In your opinion, has the community been monitoring their functionality of their gravity flow scheme?

SECTION D: PERFORMANCE OF GRAVITY FLOW SCHEME

13. Do you think the scheme has met its goal by supplying enough potable water to the community?
14. If yes explain how. If no explain why?
15. Does the community have the capacity to handle major breakdowns during operation and maintenance?
16. If yes explain how. If no explain why?
17. Has the management committee been collecting and using the money for the purpose they are intended for?
18. If yes explain how. If no explain why?

APPENDIX IV: OBSERVATION CHECKLIST

Please tick the observed state of operation and maintenance of the gravity flow scheme components.

Components	**Indicators**	**State of the components**				
		Very good	Good	Fair	Bad	Very Bad
Water source	Presence of a fence					
	Protection of catchment area					
	General cleanliness					
	Condition of pipes and fittings					
Reservoir Tanks	Condition of pipes and fittings					
	General cleanliness					
	Condition of the tanks					
Break pressure tanks	Condition of pipes and fittings					
	General cleanliness					
	Condition of the tanks					
Tap stands	Condition of pipes and fittings					
	General cleanliness					
	Condition of the taps					
Pipeline	Condition of pipes and fittings					