COMMUNITY PARTICIPATION AND SUSTAINABILITY OF WATER FOR PRODUCTION FACILITIES IN RAKAI DISTRICT, UGANDA

BY

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DECLARATION

I, Lydia Kaboyo, declare that this is my original work, and where other people's work was used, it was duly acknowledged. I further declare that this work has not been presented to any other Institution or University for any award.

Signed: ……

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APPROVAL

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DEDICATION

This dissertation is dedicated to my dear *late husband Christopher Kaboyo Adyeri*, who supported, encouraged, tolerated and gave me an opportunity to make my dream come true. To all those who were always on my side during the odds and rough times, I dedicate this piece of work to you. Thank you!

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Above all, I wish to thank Lord God almighty who has continued to keep me safe and gave me knowledge to accomplish this work.

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LIST OF ACCRONYMS AND ABBREVIATIONS

DWD	Directorate of Water Development
FY	Financial Year
GoU	Government of Uganda
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
MDGs	Millennium Development Goals
MWE	Ministry of Water and Environment
MWLE	Ministry of Water, Lands and Environment
NWSC	National Water and Sewerage Corporation
O&M	Operation and maintenance
RGC	Rural Growth Centre
UBOS	Uganda Bureau of Statistics
UMI	Uganda Management Institute
UN	United Nations
UNDP	United Nations Development Program me
WHO	World Health Organization
WSDF-C	Water and Sanitation Development Facility Central Branch
WSSB	Water Supply and Sanitation Board
WUC	Water User Committee

ABSTRACT

The purpose of the study was to examine the influence of community participation on sustainability of water for production facilities. Literature reviewed suggests that community participation indeed has an impact on the sustainability of water for production facilities. The study attracted a total of 158 respondents (83% response rate), providing qualitative and quantitative information to the study. The results revealed that community planning only has a mild positive but insignificant effect on sustainability of water for production facilities, while community implementation was revealed to have a moderate positive significant effect on sustainability of water for production facilities. Community participation in facility management was shown to have a strong positive significant effect on sustainability of water for production. Overall Community Participation was found to have a significant positive effect on sustainability of WfP facilities. The study recommended that the Government of Uganda through MWE should reconsider providing more funds, at the start of the facility, in order to curb problems to do with funding, but gradually introduce economic activities like fishing and farming to generate O&M revenue in order to ensure sustainability of water for production facilities. It was further recommended that MWE should take lead in sensitizing and encouraging the community members on their obligations to sustainably manage the water for production facilities, but should also ensure that community responsive technologies are identified at project planning phase.

CHAPTER ONE

1. INTRODUCTION

1.0 Introduction

This study examined the influence of community participation on the sustainability of water for production facilities in Rakai District. The study specifically examined the influence of community planning on sustainability of water for production facilities, effect of community implementation on sustainability of water for production facilities and the effect of community management (operation and maintenance) on the sustainability of water for production facilities in Rakai District. This chapter presents the background of the study, statement of the problem, objectives of the study, research questions, hypothesis, scope and the significance of the study and operation definition of terms and concepts.

1.1 Background to the study

1.1.1 Historical background

Water is a key strategic resource, vital for sustaining life, promoting development and maintaining the environment (Ministry of Water and Environment, 2008). Accesses to safe water, improved sanitation facilities and practices are pre-requisites to a healthy population and therefore have a direct impact on the quality of life and productivity of the population (United Nations Development Program, 2007). Besides domestic water supply, water is also vital for: Livestock Water Supply, Industrial Water Supply,

Hydropower generation, Agriculture, Marine Transport, Fisheries, Waste Discharge, Tourism, and Environmental Conservation (MWE, 2008). Water, therefore, significantly contributes to the national socio-economic development and thus poverty eradication.

Despite many years of development efforts, access to water supply in the world continues to be extremely marginal. Over 1.2 billion people worldwide; the majority of which live in developing nations, particularly in sub-Saharan Africa, still do not have access to water for production facilities (Prokopy, 2005). Scarcity of water has always been the dominant factor in most parts of the world. For instance, throughout most of the arid Middle East, with its population, have been relying on scanty and erratic seasonal rains or on rivers for their water supply (Schouten & Moriarty, 2003). Until the beginning of the 20th century, agriculture in the region was almost entirely rain-fed, and therefore was limited to the northern part of the region and the coastal area (African Development Fund [ADF], 2005).

In Africa, many countries are well endowed with water resources (WAE, 2008). However, despite this abundance, many African countries have suffered from a lack of access to water for production, for centuries. The majority of water sources in African rural areas are still rivers, streams, hand-dug wells, and intermittent springs, which are all not developed for productive purposes like irrigation and livestock watering (ADF, 2005). These sources, in their natural state, are not protected from flooding or water level reduction in the drought periods hence making them unsuitable to harness for productive purposes.

Despite Uganda's being well endowed with significant water resources, the challenges of rapid population growth, increased urbanization and industrialization, uncontrolled environmental degradation and pollution are leading to accelerated depletion and degradation of the available water resources (ADF, 2005). In order to meet the above challenges, government initiated reforms in the water sector, in 1997, to ensure that water services are provided and managed with increased efficiency and cost effectiveness (UNWD Report, 2005). Comprehensive sector reform studies went on since 1998 and were completed by August 2004. During these studies, detailed situation analysis of the sector was carried out resulting in the preparation of a comprehensive water sector strategy, investment plans and time bound national targets for the sector up to 2015 (UWASNET, 2009). Among the key sector reforms was the water for production sub-sector reform which highlighted the importance of shifting from rain-fed agriculture to development of water for production facilities in the country to improve agricultural production (MWE, 2009c). In demonstrating its commitment to the reform process, government has already embarked on the process of constructing valley tanks, dams and implementing other strategic recommendations from these studies.

In 1998, the government of Uganda, together with its development partners, initiated the water for production program aimed at promoting and developing water for production infrastructure across the country. The program has constructed over 300 water for production facilities including valley tanks, dams and micro irrigation systems in the south, western, mid-western and Karamoja regions of the country (MWE, 2009b). However, continuous sector monitoring has revealed that the functionality rate of the existing water for production facilities is as low as 27% (MWE, 2009a). The MWE

therefore instituted a situation analysis study to establish the state and reasons for failure of the water for production facilities (MWE, 2009b). The study highlighted that one of the main reasons for low sustainability of the water for production facilities was low community participation and ownership of the facilities, among others such as poor technology choice and low quality of construction materials used (MWE, 2009b).

1.1.2 Theoretical background

The Resource Mobilization and Social Movements theories developed by McCarthy & Zald (1987), which examines a variety of resources that must be mobilized in the community, for sustainability of water for production facilities in rural areas will be used. The theory suggests that in order to achieve sustainability, all stakeholders must actively participate (McCarthy & Zald, 1987). However, understanding participation involves understanding power; the ability of the different interests to achieve what they want (Sewakiryanga, 1996). Power will depend on who has information and money. It will also depend on people's confidence and skills. Many organizations are unwilling to allow people to participate because they fear loss of control; they believe there is only so much power to go around, and giving some to others means losing their own. However, there are many situations when working together allows everyone to achieve more than they could on their own (Wardrop *et al*., 2000).

Community members' contributions might take the form of money, labor, material, equipment, or participation in project-related decision-making and meetings (Bhandari *et al*., 2007; Mengesha *et al*., 2002). Moreover, Harvey and Reed (2007) described forms of contribution such as the expression of demand for water, selection of the technology and

area, financial contributions, provision of labor and materials, and selection of management systems. Lyer *et al*. (2006) explained that about 98% of World Bank-supported Rural Water projects have included some cash contributions from user communities during the period from 1977 to 2003.

The theory strongly argues that community involvement, even at the lower intensities of participation, is a "perquisite for sustainability" (McCarthy & Zald, 1987). The participation of communities based on their willingness to contribute increases effectiveness, efficiency, empowerment, equity, coverage and the overall sustainability of water supply projects (Narayan, 1995). A focal issue in the water supply and community participation in developing countries is gauging the willingness of individuals to manage their water sources through the contribution of time and resources (Schouten & Moriarty, 2003). The rationale is that contributing more time and other resources to the protection and maintenance of water supply sources is a positive action that may potentially improve the sustainability of water supply infrastructures (Gleitsmann, 2005; Whittington, 1998).

1.1.3 Conceptual background

The Resource Mobilization perspective adopts as one of its underlying principles that social movements deliver collective goods, and bear the costs of working to obtain them (McCarthy & Zald, 1973).

To ensure sustainability of communal facilities there is need for community involvement in planning for the project, contribution in terms of resources and operation and

maintenance of the constructed facilities. Resource Mobilization theory offers that an organization may depend upon internal resources or mobilize from the external environment to achieve its goals (McCarthy & Zald, 1987). Internal resources in water for production system would be from contributions in the system. This can be explained in terms of community members' willingness-to-pay (WTP) in cash, materials, labor and time. The participation of communities based on their willingness to contribute increases effectiveness, efficiency, empowerment, equity, coverage and the overall sustainability of water supply projects (Narayan, 1995). Another significant source of resources to the system may be external sources which may include conditional grants from the government, donations from bilateral and multilateral agencies and obtaining loans to run particular activities of the project (Bhandari *et al.,* 2007).

Further still, The Resource Mobilization Theory provides for participation of individuals in the activities of the organization. In water for production system, community's participation in operation and maintenance of water facilities can lead to greater sustainability. Harvey & Reed (2006) strongly argue that community involvement in the operation and maintenance can lead to sustainability of the system.

Water user committees have been argued to increase functionality and behavioral change among community members (Narayan, 1995). Contributing more time and resources to the protection and maintenance of rural water supply sources is a positive action that may potentially improve the sustainability of water supply infrastructures (Gleitsmann, 2005; Whittington, 1998). Resource mobilization, election of water user committees and construction of water facilities will therefore be assessed as indicators of community

implementation and management of water for production facilities. Institutional sustainability, behavioral change, full functionality, reliability of sources and effective use of facilities will be assessed as indicators of sustainability of water for production facilities in Rakai District.

The dependent variable, sustainability of the water for production facilities will be studied basing on the World Commission on Environment and Development (WCED) (1987) report, which evaluates sustainability on the basis of environmental, social and economic services to the community. Water Aid (2011), however, modifies the sustainability criteria, specifically for water supply programs and revises the sustainability construct to be defined by institutional, behavioral (social), economic and environmental sustainability.

1.1.4 Contextual background

Over the last ten years the Ugandan government has established systems and structures that are being used to rapidly transform the country's productive sectors (UNDP, 2007). Government initiated a Poverty Eradication Action Plan in 1997 with the aim of enhancing participatory approach to development and engenders further increase in resources going into the social sectors of Education, Health and Water (MWE, 2008).

Recognizing the central role of community participation in the project cycle, it is important for project donors/sponsors (Government, Private or Non-Governmental) to involve all stakeholders in the design and implementation of water projects so as to ensure beneficiary ownership and also to instill virtues of accountability, transparency

and sustainability (Maraga *et al*. 2010). Active participation of beneficiaries in project design and implementation will also enable donors/sponsors to identify and address the factors leading to poor community participation in water projects (Maraga *et al*., 2010). Poor community participation in water projects, for instance, could be attributed to a number of socio-cultural, economic, and environmental factors (UNDP, 2006).

According to Victor and Bakare (2004), many people participate in water activities if they are able or expect to get important livelihood sustaining products from them. A number of studies indicate that factors such as socioeconomic benefits, age and education influence people's participation in projects. But more important, households participate in water activities if they are able to get important livelihood sustaining products from the water, for example, power and food (Victor & Bakare, 2004; Maskey *et al.*, 2003).

1.2 Statement of the problem

Effective community participation in planning, implementation and management of community projects has been promoted as an approach to increase community ownership, leading to improved sustainability of the project outputs (Harvey & Reed, 2006; Smet & van Wijk, 2002). In Uganda, this approach has been widely employed as a strategy to enhance community ownership of rural water supply and sanitation interventions for improved sustainability of facilities (UWASNET, 2009).

Despite the wide adoption of community participation in water supply and sanitation projects and programmes, functionality of water facilities has stagnated at 47% for rural water supply and 27% in the case for water for production (MWE, 2009a). Most of the

facilities constructed to improve agricultural production have failed abstraction systems, many have silted due to poor care and others are even abandoned due to total failure. It was therefore not clear to what extent community participation influenced facilities sustainability in Uganda especially in water for production sub-sector.

A number of scientific researches on community participation and sustainability of water for production facilities have been carried out in Uganda. However none has linked community participation to sustainability especially on WfP facilities. If nothing is done, functionality of water for production facilities will remain at a low percentage and this can lead to donors withdrawing their support to implementation of the projects, silting and eventually drying up of the facilities, and thus resulting into food insecurity due to poor and limited agricultural production caused by limited access to water for production. Therefore, this study will provide knowledge and understanding on how community participation can influence sustainability of water for production facilities in Rakai district.

1.3 General objective

The general objective of the study was to examine the influence of community participation on sustainability of water for production facilities in Rakai District.

1.4 Specific objectives

The specific objectives of the study were:

i. To examine the influence of community planning on sustainability of water for

production facilities in Rakai District.

ii. To examine the influence of community implementation on sustainability of water for production facilities in Rakai District.

iii. To assess the effect of community participation in facility management on sustainability of water for production facilities in Rakai district.

1.5 Research questions

The following research questions guided the study:

i. To what extent does community planning influence sustainability of water for production facilities in Rakai District?

ii. How does community implementation affect sustainability of water for production facilities in Rakai District?

iii. How does community participation in facility management affect sustainability of water for production facilities in Rakai district?

1.6 Hypotheses of the study

The study was guided by the following hypotheses:

i. Community planning significantly influences sustainability of water for production facilities.

ii. Community implementation significantly affects sustainability of water for production facilities.

iii. Community participation in facility management significantly affects

sustainability of water for production facilities.

1.7 Scope of the study

The research exercise was carried out in Rakai District, concentrating in the 3 counties of Kooki, Kakuuto and Kyotera where most of the facilities constructed by the Ministry of Water and Environment (MWE) are located. Rakai district was selected because it was the first district in Uganda where water for production facilities were constructed under the Water for Production project of the MWE in 1999. The study therefore had a time scope of 2000 to 2010. The facilities have been operational the longest; hence would provide adequate information to evaluate the community participation and sustainability. Rakai District is located in the South Western region of Uganda, west of Lake Victoria, lying between longitude 31^0E, 32^oE and latitude 0^oS.

1.8 Significance of the study

The study will be beneficial to all stakeholders including among others the central government, districts, NGOs, Community Based Organizations (CBOs), private companies and the community to come up with appropriate measures to address problems resulting from poor community participation in the sustainability of water for production facilities. Central and local government agencies will use the results of the study to design strategies for involving communities in planning and implementation of water for production facilities. Community Based Organizations and private sector will benefit from the findings of the study by understanding the importance of involving communities in the implementation of water for production facilities. The findings from the study will

also help other researchers in future to carry out further investigations in the related areas while it will also add a block to the existing body of knowledge on sustainability of water supply projects.

1.9 Justification of the study

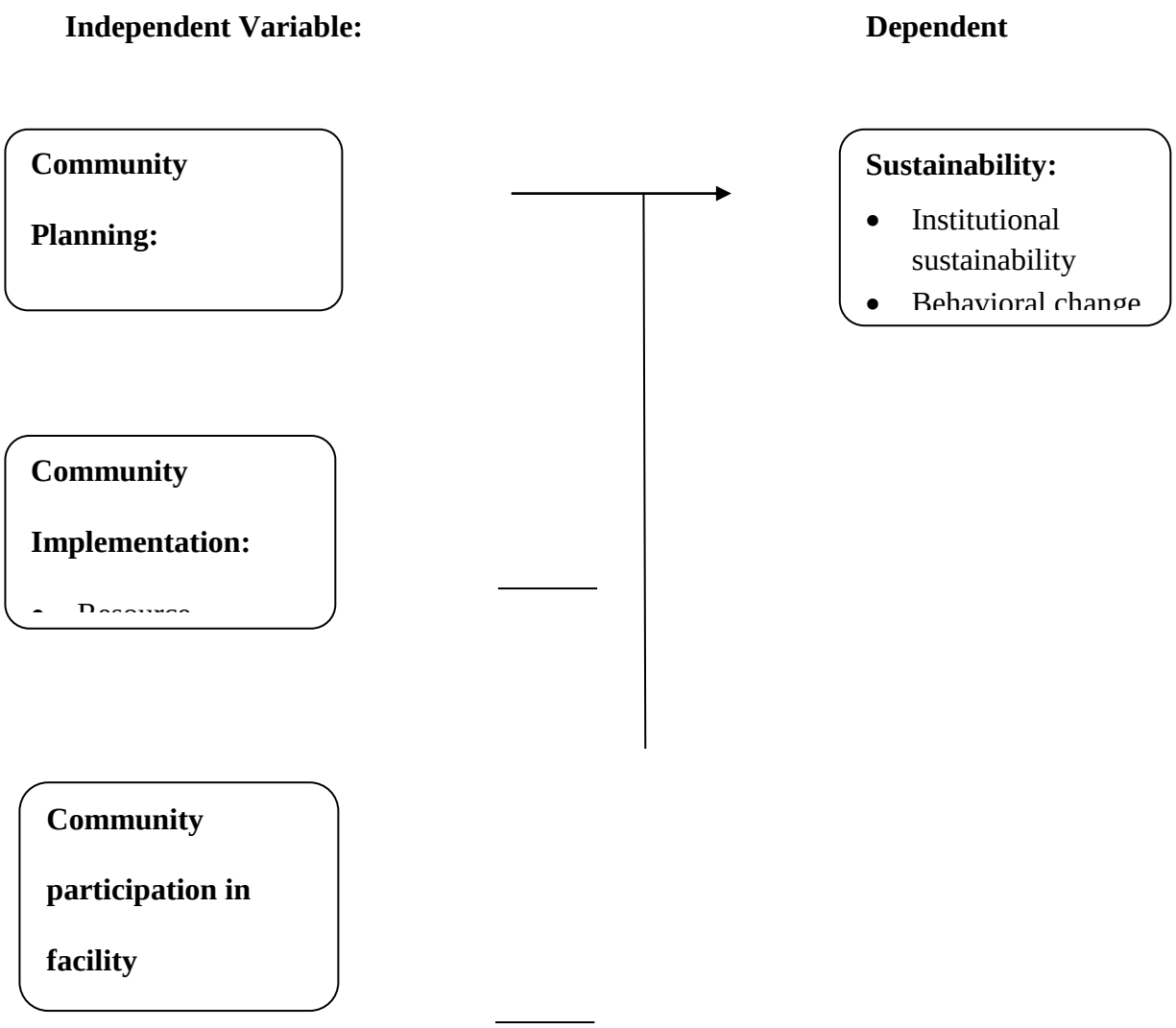
Studies carried out relate to operation, management and maintenance of rural and urban water supply projects. The urban water supply systems are managed by a conventional water utility and rural water supply management is based on community management concepts. The operation and maintenance of water for production facilities adopted a community based management system. However, despite the wide adoption of community participation in management of water for production facilities, there are peculiar sustainability challenges such as silting, pump break downs and general vandalism of the facilities, which need critical analysis to be addressed.

1.10 Conceptual Framework

The conceptual framework presents independent and dependent variables, analyzing the factors that influence sustainability of the water for production facilities. Figure 1-1 shows conceptualization of the study on community participation and sustainability of water for production facilities in Rakai district. Community planning, implementation and facility management constituted the independent variable affecting the dependent variable of sustainability of WfP facilities. Indicators for the independent variable were derived basing on provisions of Resource mobilisation theory (McCarthy & Zald, 1987). The theory asserts that to achieve project sustainability there is need to involve

beneficiaries in all stages of implementation such as planning, project implementation and project management. The dependent variable was derived from Narayan (1995), where project sustainability was attributed to institutional, behavioral, economic and environmental sustainability.

The study analyzed sustainability on the attributes of involvement of community members in needs assessment exercise, identification of the most appropriate technology to be used, involving communities to mobilize the required resources to construct the facilities, formation of management structures, construction of the facilities, utilization of water facilities, maintenance of water facilities and community contributions towards operation and maintenance of the WFP facilities.



Source: Adapted from McCarthy & Zald, 1987; Water Aid, 2011; Narayan (1995)

Figure 1-1: The conceptual framework for the study

1.11 Operational Definitions

Sustainability:

Sustainability, within the context of this study, is defined as the length of the useful life of water supply infrastructures. More specifically, it is the capacity of the improved water supply sources in providing continued beneficial services over time.

Community Participation:

Community participation is the creation of opportunities to enable all members of a community to actively contribute to and influence the development process and to share equitably in the fruits of development.

Water for Production (WFP):

Water for Production (WFP) refers to the development of water resources for productive and multi-purpose uses, including water for human consumption, water for crops, livestock and wildlife, commercial aquaculture (fish farming) rural industries, hydro power generation and any other consumptive uses.

Water for Production facility:

Water for Production facility refers to any water source developed for productive purposes like irrigation, fisheries, animal watering, and energy production e.t.c. For this study, water for production facilities shall constitute only valley tanks and dams, which have been constructed by the Ministry of Water and Environment in the study area.

Community Participation in Facility Management:

Community participation in facility management refers to operational management and maintenance of the facilities after construction by the communities through communal management structures such as water user management committees and associations.

CHAPTER TWO

2. LITERATURE REVIEW

2.0 Introduction

This section involves looking at the existing literature that gives details of the major variables of the study. Some studies have been carried out relating to the determinants of community participation in sustainability of water for production facilities. The research study therefore reviews some of them to determine their relevance to the topic under study in relation to the set objectives.

2.1 Theoretical Review

Community involvement in management of water for production facilities to ensure sustainability has been presumed to come ahead of project implementation under the common theme of Demand Driven Approach, this has received harsh criticisms from NGOs such as Water Aid and many other development partners (Brett *et al.*, 2007). The main area of contention is the failed mobilization of communities earmarked for a water project. The contention is that setting it as a prerequisite to project implementation is another way of further prejudicing the poor and disadvantaged communities (Water Aid & Tear Fund, 2003). The result of this has been inadequate involvement of local communities in the planning, financing, implementation, monitoring and management of communal services (Anand, 2007). Insisting on mobilization ahead of implementation in order to embrace demand-driven approaches has left many communities that fail to attain

readiness. In many instances communities with vigilant politicians have had to be considered even where readiness has lacked. In cases where this has happened, questions have been raised (Water Aid, 2003) on whether it is still necessary to follow these orthodox demand-driven approaches and if so how they should be enforced.

2.2 Community planning for sustainability of water facilities

According to Feroze and Rahman (2003), the general considerations for planning and design of a low cost water supply scheme in developing countries include among others, the system should be planned together with the community to enable adaptation to local conditions; an appropriate in-built system should be made to monitor the performance of the entire system; and sustainability of the system should be given preference in the planning, design and pricing of water supply.

The practice of planning requires attention to the potential barriers to success. Three key areas of concern are; access to analytical tools and adequate information, the level of commitment of community utilities and regulators to considering and pursuing new options, and the consistency of approaches and methods within the real-world context of existing community utility and regulatory practices. If these issues are relevant to least-cost planning for energy utilities, they are as much or more applicable to the case of water. Most public utilities engage in some form of planning, although the extent and scope of planning vary greatly. Utility planning can be characterized by four general approaches: traditional supply planning, least-cost utility planning, integrated resource planning, and total water management. For water systems, information resources vary substantially, and the need to develop data processing and analytical capabilities is clear

(Viessman, Warren & Mark, 1998).

According to Viessman *et.al* (1998), planning for water utilities is not that different from planning by electricity utilities, which can be characterized by its focus on utility ownership and control of all production resources (including central station power plants), its reliance on system and financial planning processes internal to the utility, and its emphasis on the goals of minimizing electricity prices and maintaining a high level of system reliability. In the case of water, ownership and control of resources is more constrained (for example, by limits to groundwater withdrawals). However, the emphasis on utility ownership of the water delivery prevails much like the case of electricity distribution (Andrew, 1990).

2.2.1 Needs assessment

Although sufficient efforts have been applied to ensure that water for production facilities are sustained, the issue of needs assessment has not been addressed, yet it is key towards sustainability (Water Aid Uganda, 2003). In order to design a comprehensive water project, needs and concerns of all stakeholders have to be considered, in the planning process and implementation phases, and it starts with the community developing a vision and then coming up with needs/problems (ADF, 2005). Community members, community development committee representatives, local leaders, and government extension staff should be involved in the decision making process and assist the community to develop realistic proposals and budgets.

2.2.2 Identification and selection of technology used

The type of technology suitable for a particular area depends on the groundwater level, water quantity and hydro-geological conditions (Ahmed & Rahman, 2003). There are diverse sources to supply of water for production in many areas in Uganda. These include; conventional communal sources and self supply sources (Carter, 2006). The conventional communal sources are justified for improved and adequate water supply and use of high level technology like drilled boreholes equipped with hand pumps, collection tanks and protected springs (Carter *et al*., 2005). Other macro scheme techniques include; powered systems like submersible pumps and gravity flow schemes (Carter, 2006). However, the conventional communal facilities in most of the rural areas in the developing countries have been unsustainable because of their high rate of breakdown as a result of poor operation and maintenance, congestion, difficulty in operating the pumps and long distances because sources are too few and yet rural households are many and scattered (Brett *et al*., 2007; Singh *et al.*, 2004). Therefore, choice has to be made on which mode of technology to be used to provide water for production, especially that, which will help the community achieve sustainability of water facilities.

2.2.3 Gender approach

The general issues of differentiating between men and women and rich and poor are often of similar nature throughout the world (Feroze & Rahman, 2003). The actions and solutions, however, tend to be local specific. Thus, the way in which a gender approach is applied varies from case to case and circumstance to circumstance. Water points are not effectively used when they do not meet women's requirements when they are not

consulted on their design and location (Kurup, 1997). The participants become aware that the activities of their projects affect men and women differently and thus learn to undertake analysis that incorporate gender concerns (Bogaarts, 1991).

In Sri Lanka, Nepal, Pakistan and India, ideas that only men are farmers and interested in irrigation, along with the traditional male domination in public decision making are factors that underlie the absence of women in water users' organizations (Kome, 1997; Zwarteveen & Neupane, 1996). In addition, women are thought incapable of participating in meaningful ways (partly because they are illiterate) and they are assumed to be busy with other, more appropriately female activities. Social norms prescribing women to confine their activities to a small geographical area (homestead, village or nearby fields) may also effectively exclude women from becoming members of water users' organizations (IRDAS, 1993).

2.3 Community implementation

A large gap exists in most projects between the approach the project is designed to employ and that which its staff or intermediaries actually employ in the field (Kleemeier, 1995). To improve sustainability, project staff must ensure that their rules are well communicated and understood by those who are expected to implement them, especially to undertake social mobilization activities (Kleemeier, 1995). In addition, staffs need to be adequately trained and have adequate resources available to them. Finally, supervision mechanisms should be established to ensure that project rules are implemented correctly.

2.3.1 Resource mobilization

In a decentralized system, resources for mobilization (logistical and human resources) need to be provided so that local governments can deal with community mobilization activities ahead of implementation (Carter *et al*., 2005). Often this has been lacking in many projects for water for production and funds are only provided for making new installations and sometimes for maintenance (Cranifield, 2003). Most of the people especially in rural areas are poor and often try to mobilize their friends and neighbors to improve traditional water sources using local labor and materials (Carter, 2006).

The aim of community mobilization in this context was to ensure that there is a demand for service among all potential users, to identify the preferences and priorities of the community, and to ensure that users are committed to operating and maintaining the system before a decision is reached to build a water system (Water Africa, 2009). When community mobilization is weak or absent, projects risk having their benefits appropriated by community leaders or dominant ethnic groups, excluding women and other user groups from decision making processes and project benefits, and jeopardizing a community's commitment to sustain the water system (Prokopy, 2005).

2.3.2 Formation of Water User Committees (WUCs)

The sustainability approach includes development of project existing strategies and facilitates handing over to the beneficiary communities, applying user-friendly technologies, electing and training Water User Committees (WUCs), strengthening community management efforts, and establishing community by-laws (Alford, 2007). As

a result, self supply initiatives managed by WUCs have evolved as an alternative approach to water supply construction and management. This has been based on locally available and easily affordable technologies to the users in the rural communities. Self supply initiatives are spear headed by people in the respective communities who have the income and are willing to invest in water supply sources (Carter *et al*., 2005). Self Supply builds on the initiatives of private households or communities to improve water supply through user investment in water treatment, supply construction, upgrading and management (Sutton, 2008).

According to Demeke (2009), the WUCs in the village enforce regulations that require households using water for irrigation to safeguard the water source by turns. Thus, the additional benefits involve additional responsibility, which address the equity of water access, as a number of other households do not have water access for irrigation. In Amhara region, Ethiopia, the WUCs had set strict regulations of water collection timing and water use turns for irrigation. For instance, the water source is closed from 8:00 AM in the morning to 5:00 PM in the afternoon so that no one is allowed to collect water during this period every day (Demeke, 2009).

2.3.3 Construction of water facilities

Approximately 97 percent of the fresh water available in the world is underground. Wells provide groundwater for individual domestic needs, communities, cities, industry, crop irrigation, and agriculture. Some wells tap hot water, or geothermal resources. In other cases, groundwater is used solely for its cooling capabilities. Some wells are dug solely to

study water quality or quantity: these are called monitoring wells or observation wells (World Bank, 1993).

According to MWE (2006), post-construction activities pointing mainly to sustainable management of schemes requires that management units through Water User Committees and Associations be established and properly trained during the project life. Most of the time, mobilization activities (formation of user committees and training them) have been conducted by consultants whose limited and definite time on the project is based on contracts which often expire before the user committees are fully aware of their roles (Brett *et al.*, 2007). This has often led to failure in operation and maintenance of facilities. Development and supply of water to supplement rain-fed agriculture is envisaged to increase the crop, livestock, wildlife and fish production through increased cropping intensity and reliable water supply, especially in the semi-arid and drought prone zones (UWASNET, 2009).

2.4 Community participation in management of water facilities

Many organizations working in the water supply sector have come to recognize that the sustainability of the water service is equally important as ensuring the initial access itself. These approaches which include targeting operation and maintenance of water facilities, incorporating gender sensitivity, ensuring genuine participation of community members and concerned stakeholders in all the project cycles and addressing advocacy issues are designed based on the demand responsive approach (ADF, 2005). DRA has been described as an approach that "allows communities to make informed choices about the types and levels of services to be provided, taking into consideration their affordability

including operation and maintenance" (ADF, 2005).

In the 1990s, total water management emerged as a potentially salient concept for water and wastewater utilities. Total water management reflects the philosophy that water resources should be managed for the greatest good of people and the environment with opportunities for participation in water policy by all segments of society (Reisner, 1993).

Total water management recognizes the paradigm shift from considering water available in unlimited quantities to understanding water supply as a limited resource. Total water management seeks to inspire the water industry to embrace such ideas as sustainability, stewardship, unified water resource policies, watershed and ecosystem management, water conservation, and the importance of public and political support for water management decisions. Total water management also recognizes that water resources are a part of numerous complex systems, both natural and social. Advocates of integrated resources planning (encompassing, for example, water, energy, and land-use planning) make a similar point. These perspectives present numerous intellectual, analytical, and evaluative challenges (Andrew, 1990; Reisner, 1993).

2.4.1 Utilization of water facilities

If communities are to be considered as the managers of their water supply sources, then we should know what attitudes and potentials they have, and how they should be organized and supported. Since adequate protection and routine maintenance enhance the sustainability of water supply systems (Ainsworth & Jehn, 2005), an important question to be addressed in the community is, what factors prevent households from achieving

this? Whereas criticism over the policy of requiring capital cost contributions for water from poor communities is emerging (Schouten & Moriarty, 2003), it is crucial to know whether this initial participation has any positive or negative implications on future outcomes (i.e., sustainability of the water supply infrastructure).

2.4.2 Maintenance of water facilities

Many cities have aging water infrastructures, some as old as 100 years (American Society of Engineers, 2001). The structures and materials used in piping systems are reaching the end of, or are exceeding, their life expectancy. With these older systems, additional monitoring requirements may be imposed; for example, water systems that still have Asbestos Cement pipes are required to periodically test for asbestos content in the water (Cech, 2003).

Because maintaining and operating aging infrastructure is getting more costly, communities have been deferring maintenance while spending money on more pressing needs and some replace pipes only when they break. Direct infrastructure costs continue to escalate for building, replacing, or improving treatment plants; laying or replacing pipe; maintaining aging dams; and accessing new water sources. Indirect costs also are increasing for expenses such as electricity used to pump the water, and by new equipment made necessary by governmental mandates to treat for additional contaminants (American Society of Engineers, 2001; Cech, 2003).

2.4.3 Community contribution to operation and maintenance of WFP facilities

On the other hand, community contribution is the amount people give in cash, in kind,

and labor in exchange for services, and should, in a demand responsive project be linked to the relative costs of providing different levels of water services (World Bank, 1993).

Although a complete analysis of the relationship between contributions and sustainability is clearly shown, the project rules for cost sharing arrangements are poorly defined in most of the projects (Water Aid, 2003). In a demand-responsive approach, contributions should serve as mechanisms for signaling demand. The level of contribution should reflect both initial investment costs and recurrent costs, so that a community's contribution provides a strong indication that it is willing and able to bear the expected costs of the system (Narayan, 1995). Although all projects in most rural areas have a financial policy in place, none has a clear rationale for the contribution level (World Bank, 1993). In addition, many water projects do not consistently enforce their own rules, especially when expected contributions are relatively small or in-kind.

According to Narayan (1995), the information about cost and contributions is difficult to obtain and unreliable. In many projects data about total costs for individual systems is unavailable. Few projects keep any data about the indirect costs of building systems such as staff time, training, and overhead. Official records on how much money people contributed in each community is very hard to get. In many communities people make some kind of contribution toward the system, either in cash or kind. However, households often disagree with each other and with the water committee about how much they have contributed. Less than a third the households know the total value of their cash and in kind contributions of (World Bank, 1993). In several communities, households pay as much as three times the per capita costs of the system. In others, people even pay

significant amounts of cash for projects that do not require a contribution. In Indonesia, for example, some people are forced to pay for services whether or not they want them by powerful community groups (Narayan, 1995). People perceive the contribution as a tax, not as an expression of demand for a water system.

2.5 Summary of literature reviewed

Extensive literature was reviewed in the course of the study as presented in the sections above. There is evidence that community participation in implementation of projects has an influence on the overall sustainability of the projects. Several water for production projects implemented in the country have been successful owing to effective community participation. Much of the literature reviewed however, relates to rural and urban water supply projects, especially related to water for consumption. There is limited literature on WfP facilities in Uganda, in particular not in Rakai District. This study therefore conducted a field study to examine the influence of community participation on sustainability of water for production facilities in Rakai district.

CHAPTER THREE

3. METHODOLOGY

3.0 Introduction

This is a detailed description of selected methodology. It is a plan, structure and strategy of the investigation conceived so as to obtain answers to the research questions. It provides a procedure or plan of the study. The chapter presents the research design, study population, sample size, sampling technique and procedure, data collection methods and instruments, data quality control, measurement of variables, procedure for data collection, data analysis and concludes with ethical considerations to the study.

3.1 Research Design

The study employed a case study research design. The case study research design was applied because it provides much more detailed information and provides detailed description of specific and rare cases. The design was also relevant in this study because Amin (2005) contends that case study design probes deeply and in an intense manner, analysing interaction between the factors that produce change or growth. A cross sectional survey was used since the study was conducted at a particular time. Amin (2005) further contends that a questionnaire survey is the best research design to analyze the situation at particular time and over a wide area of geographical coverage.

3.2 Study population

The research was conducted in Rakai District. It is located in the South Western region of Uganda, west of Lake Victoria, lying between longitude 310E, 32^{o}E and latitude 0^{o}S. Its southern boundaries are part of the international boundary between Uganda and Tanzania. Since the start of the Water for Production Project in 1998, a total of 09 Water for Production facilities were constructed in Rakai district by the Ministry of Water and Environment. These systems constitute of the study population. According to the MWE (1998), the nine facilities are estimated to serve a total population of about 12,000 people, who constitute the parent population of the study.

3.3 Sample size

A sample can be selected for the study, whose results can be generalized to the entire study population (Amin, 2005). The sample size has characteristics of the entire population. The study area has sixteen total number of water for production facilities nine constructed by the Government of Uganda and seven facilities constructed and managed by private farmers. The study focused on the government facilities that were communally managed to access the contribution of community participation and involvement towards sustainability of WFP facilities. The study population included key respondents because they were considered knowledgeable and experienced about the study and these included Community Development Officers, LC I chairpersons, community representatives, and water user committee members. Due to the limited time and resources available to conduct the study, the accessible population to the study constituted the 9 L.C.I chairpersons (one per village), the Water User Committee

members (Nine per facility), the 3 Community Development Officers (one per sub-county) and 135 opinion leaders/community representatives (15 per facility). This gave a total accessible population of 228 respondents. The Morgan and Krejcie sample size table (1970) cited in Barifaijo *et al.* (2010) was used to then select the sample as shown in Table 3-1.

Table 3-1: Sample size determination

Category	**Accessible Population**	**Sample**	**Sampling technique**
Community development officers	3	3	Census
Chairpersons of Water User Committees	9	9	Census
L.C I Chairpersons	9	9	Purposive
Water User Committee members	72	68	Simple Random
Opinion leaders/community representatives	135	102	Simple Random
Total	**228**	**191**	

Source: primary data

3.4 Sampling technique and procedure

Probability and non-probability sampling techniques were employed to select respondents to the study. Census sampling technique was used to select CDOs (three CDOs cover the whole study area), Water User Committee Chairpersons (one per

facility) and LCI chairpersons (one per village/facility). These were selected because they are experienced and always intervened in water management issues for the facilities, hence provided qualitative information for the study.

Simple random sampling was used to determine the specific User committee members and opinion leaders/community representatives to participate in the study. Lists of the key stakeholders were provided; assigned numbers and the researcher randomly picked names to participate in the study. This ensured objectivity and equal chance of participation of each member.

3.5 Data collection methods

The study used; unstructured interviews, structured questionnaires, observations, discussions and documentary review utilizing survey method of both quantitative and qualitative techniques.

3.5.1 Documentary review

The researcher reviewed relevant documentation on sustainability of water for production by systematic documentary review methodology. This involved reviewing documents at the MWE, Rakai district and community level.

A documentary review check list was used for this purpose. Documents were obtained from the Ministry of Water and Environment, District Water Office and the Water User Committees. This method provided more information which helped the researcher to understand the study more. Annex A presents the documentary review checklist.

3.5.2 Questionnaires

Sekaran (2003) contends that administering a questionnaire is one of the most effective methods of conducting a survey. This collected quantitative data. Data collection methods were based on the use of questionnaires.

Detailed questionnaires were used to collect data and information from respondents. A set of pre-determined closed ended questions constituted the questionnaire, which were self-administered to the respondents of the study. This method provided standardized responses which were easy to analyze, it however consumed a lot of time since some respondents took up more time to fill up the questionnaire. Appendix B presents the proposed questionnaire which was used in the study.

3.5.3 Observation

Observation methodology was used to collect primary data from the field. This involved a list of items to be observed during the study process, such as the state of available water supply structures, mechanisms for drawing water among others. This methodology enabled the researcher to follow up on the information from the respondents, especially on the status of the facilities.

An observation checklist was as well used to collect observation information. Annex D presents the observation checklist.

3.5.4 Interview

Face-to-face interviews were used with the intention of gathering information about

community participation and sustainability of water for production facilities. It is a helpful method for obtaining in-depth qualitative data, which may not be obtained by any other method (Mugenda and Mugenda, 2003).

Unstructured interview schedule instrument was used by the researcher to conduct face-to-face interviews. Key informants were interviewed in order to obtain in-depth qualitative information about community participation and sustainability of water for production facilities. This method enabled the researcher to get more information which was not thought about and yet relevant to the study. It faced a challenge however, that some respondents were reluctant to provide sensitive information especially about the performance of the water user committee members. Such information was derived from the questionnaires. Appendix C provides the interview schedule to be used in the study.

3.6 Data collection instruments

The self administered questionnaire and interview guide were administered to community development officers, chairpersons of WUCs, LC1 Chairpersons, WUC members and Community representatives to synthesize their views on community participation and sustainability of water for production facilities.

3.6.1 Questionnaire

The questionnaire was considered appropriate to save time and increase on objectivity of the respondents. The questionnaire included a Likert scale of 1-3, agree-disagree, a set of pre-determined closed ended questions constituted the questionnaire, which were self-administered to the respondents of the study. Appendix B presents the proposed

questionnaire to be used in the study.

3.6.2 Interview guide

Besides the administered questionnaire, face to face interviews and telephone calls were held with community development officers, chairpersons of WUCs, and LC1 Chairpersons. This acted as complementary sources of data on knowing more about sustainability of water for production facilities. The researcher was aware of shortfalls with the interview methods. To prevail over such a problem, the interview guide focused on the research topic to control the interviewee as well to avoid theorizing and bias and to keep course of the interview. As Nisbert & Walt,(1980:13) pointed out interview s only reveal how people perceive what happens not what actually happens hence calling for the use of observation alongside interviews to bridge the gap.

3.6.3 Observation checklist

A log book was used to document observations and interviews from the field. Each contact was registered using a pre defined format to facilitate the identification of actors and events. Periodic reflections and synthesis of the gathered data from the observations were registered. The focus was to emerge research questions and observations with elements in the initial research frame work. New discoveries were identified and properly recorded. Each observation checklist was checked frequently for accuracy and completeness. These were pre-tested, pre-coded and all necessary changes were made and analyzed, and the purpose of involving all these techniques was to explore and understand more deeply about community participation and sustainability of water for

production facilities.

3.7 Data quality control (Reliability and Validity)

In a research such as this, as (Denzin and Lincoln,1998) assert findings are not arrived at by statistical means only but rather methodological strategy involving several data sources such as questionnaires, interviews and documentary analysis. To control bias or errors validity was ensured by use of experts in the various fields to look at the questionnaire. The researcher ensured reliability by using the test-retest method; that is, administering the test survey to the sample population and re-administering the same tool to the same sample after a an appropriate period (two weeks). All instruments were pre-tested before actual use on water for production facilities in Lyantonde district, which has similar characteristics as the study area. From the test – retest results correlation (coefficient of stability) was obtained as 0.814, which is high and significant showing a good test-retest reliability.

Table 3-2: Test-retest correlation results

		Test Results 1	Test Results 2
Test Results 1	Pearson Correlation	1	.814**
	Sig. (2-tailed)		.000
	N	10	10
Test Results 2	Pearson Correlation	.814**	1
	Sig. (2-tailed)	.000	
	N	10	10

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

3.8 Procedure for data collection

After the necessary introduction letter from UMI, specifying the objectives of the study, the researcher was granted permission from MWE and Rakai District management to carry out the research. A plan was drawn and timetable made to meet the relevant respondents. The researcher then administered the edited instruments to the sample. Data was then collected with help of research assistants who distributed and collected questionnaires from respondents. Telephone calls and face to face interviews were held with senior community members in Rakai District. Group discussions and direct observations were as well employed to facilitate the research. Filled questionnaires were edited and analyzed using SPSS. The rationale for editing was to authenticate for any errors in filling questionnaires, this was to guarantee correctness and consistency in answering questions and follow up unreturned questionnaires.

3.9 Measurements of variable

This involved the assigning of numerical data from the questionnaire to change them into values for easy interpretation. A standard Likert scale of 1-3 responses from Agree to disagree were used to get quantifiable primary data from individual respondents under the guidance of the supervisors.

3.10 Data Analysis

This involves organization and interpretation of data generated. The data was organized; edited to ensure completeness, accuracy and uniformity; coded using a coding frame-by classifying answers to the different questions into mutually exclusive, exhaustive and

representative categories. Data was then analyzed quantitatively and qualitatively according to the objectives of the study as further described.

3.11 Quantitative data analysis

Statistical data analysis was conducted on quantitative data, aided by the Statistical Package for Social Scientists (SPSS) to establish relationships between the variables. This included descriptive statics to measure central tendencies and dispersion of mainly background data, correlation analyses to establish relationships between the independent and dependent variables. The direction and strength of the relationships between the variables was analyzed by inferential statistics by using regression analysis.

3.12 Qualitative data analysis

Qualitative data was collected through interviews. The researcher first read through all the responses to get familiar with the trends and themes. Emerging themes were identified and then basis for analyzing the data was formed, using content analysis and finally came up with a report of findings. The researcher then collected them and analyzed their responses to the questions posed and came up with a bias free report from the independent answers.

CHAPTER FOUR

4. PRESENTATION, DATA ANALYSIS, AND INTERPRETATION OF FINDINGS

4.0 Introduction

This chapter presents analyses and interprets the study findings arising from the raw data collected from the field using questionnaires, interview guide, observation and documentary analysis on Community Participation and Sustainability of Water for Production facilities in Rakai District. The first section presents the response rate. This is followed by the background information about the respondents and a presentation and analysis of the study findings in relation to the specific objectives.

4.1 Response rate

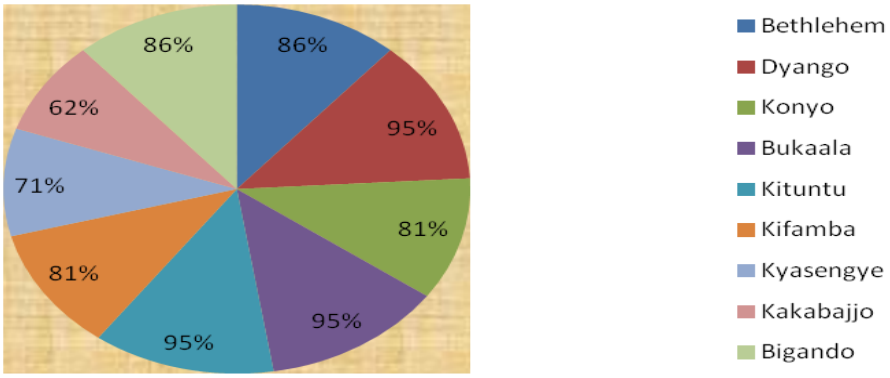
A total of 191 questionnaires were distributed and 158 returned making a response rate of 83%. The respondents to the study included the community development officers, chairpersons of water user committees, Local leaders, water user committee members and opinion leaders as community representatives for the facilities. The results in table 4-1 illustrate the response rate of the study.

Table 4-1: Response rate

Category	Sample	Response	
		Number	%age
Community development officers	3	3	100%
Chairpersons of Water User Committees	9	5	56%
L.C I Chairpersons	9	6	67%
Water User Committee members	68	60	88%
Opinion leaders/community representatives	102	84	82%
Total	**191**	**158**	**83%**

Source: Primary data

Analysis by the respondents shows that each facility was proportionately represented in the sample study as shown in Figure 4-1.



Source: Primary data

Figure 4-1: Pie chart showing respondent rate per facility

Figure 4-1 shows that the response rate was high for all the facilities apart from Kakabajjo and Kyesengye valley tanks and this was attributed to the fact that the facilities

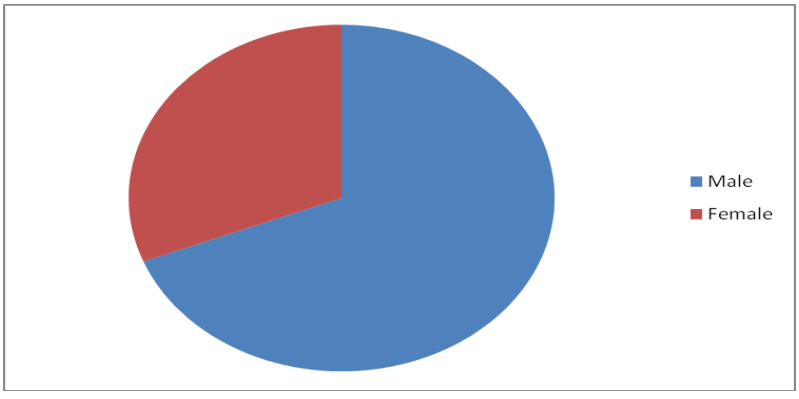
are dry with no water and therefore community members were not interested in answering questions regarding the facilities . The good response rate enabled the reseach assistants to get sufficient information from all the facilities.

4.2 Demographic characteristics about the respondents

This section gives the characteristics of the respondents in form of graphic presentation. For this study gender, age and level of education were considered important to the study.

4.2.1 Gender of study respondents

Water for production has a variety of activities involved such as livestock rearing, fishing, crop irrigation, poultry keeping and domestic use. It is very important to consider the aspect of gender. In the survey, 69.03% of the respondents were male while 30.9% of the respondents were female. Figure 4-2 shows the distribution of respondents by gender.



Source: primary data

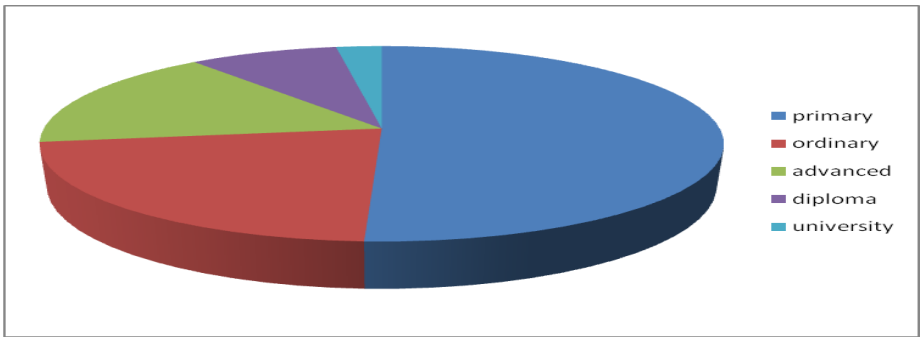
Figure 4-2: Gender segregation among respondents

The results of the study therefore show that more males participated compared to the females in the study. This can be interpreted that, the water for production activities are mainly dominated by men and this was supported by Mzee Alphonsi, the community representative for Kyasengye valley tank that;

"Men are more active on issues related to valley tanks and dams, unlike on boreholes because they own land, cattle, are involved in fishing and besides they are the ones who slash and clean around the facilities. Therefore they are more interested in maintenance of the facilities compared to women and children".

4.2.2 Level of Education of study respondents

The respondents were categorized in different levels of education; this was considered important because some aspects such as technology used would be best understood with some level of education.



Source: Primary data

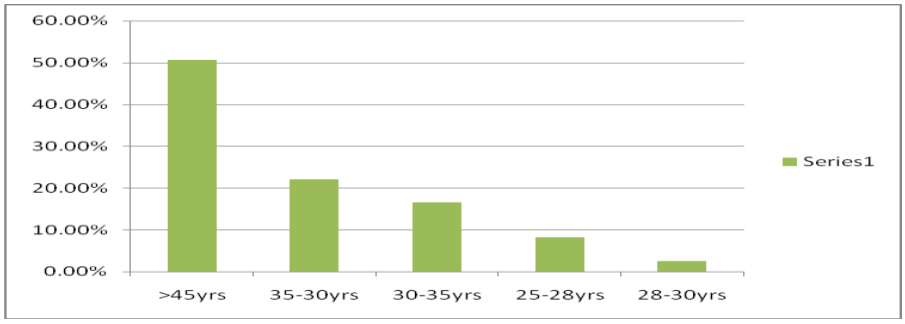
Figure 4-3: Respondents' education level

Figure 4-3 illustrates that majority of 50.7% of the respondents had attained primary level education followed by 22.1% who were of ordinary level, 16.5% were advanced level, 8.2% had attained a diploma and 2.5% had attained a university degree and above. This

can be interpreted that majority people of lower education are actively involved in water for production activities and therefore more interested in issues concerning maintenance of their facilities.

4.2.3 Age of study respondents

The respondents were categorized in different age brackets and 50.7% were aged above 45years, 22.1% of the respondents were between 35-45 years, 16.5% were aged 30-35years, 2.5% of the respondents were between 28-30years and the rest of the 8.2%% fell in the age bracket 25-28years. Figure 4-4 shows the age distribution of the respondents to the study.



Source: primary data

Figure 4-4: Graph showing age category of respondents

The age grouping of the respondents in the study shows that all the respondents were of mature age hence capable of providing reliable responses to the study.

4.3 Analysis and interpretation of study findings

Three dimensions of community planning, community implementation and

community participation in facility management constituted the independent variable against dependent variable sustainability. The findings on each of the dimensions in the area visited are presented in line with the objectives of the study in the following sections.

4.3.1 Community planning

Respondents to the study were required to state their views with regard to community involvement in planning. Literature reviewed acknowledges that, sustainability of water for production facilities depend on community involvement in planning. This was assessed using needs assessment, identification and selection of technology and gender approach indicators.

Table 4-2: Respondents' views on community planning

FACTOR: COMMUNITY PLANNING	RESPONSES		
	AGREE	**NEUTRAL**	**DISAGREE**
Needs Assessment			
In my opinion, the community identified their need for the facility before implementation	65 (46.4%)	25 (17.9%)	50 (35.8%)
In my opinion, the facility addresses needs of all stakeholders in the community	95 (68.9%)	17 (12.3%)	26 (15.8%)
In my opinion, the community representatives were involved in decision making before implementation	83 (59.3%)	13 (9.3%)	44 (31.4%)
Identification and selection of technology			
In my opinion, the community participated in the identification of the technology (e.g. abstraction, type of facility) to implement	63 (45.0%)	27 (19.3%)	50 (35.7%)
In my opinion, appropriate technology was used on the facility	63 (49.6%)	41 (32.3%)	23 (18.1%)
The community understands use of the technology implemented	43 (32.8%)	35 (26.7%)	53 (40.5%)
Gender approach			
In my opinion different gender groups (women, men and disabled) were consulted on their special needs before the project	82 (57.0%)	32 (21.9%)	26 (19.1%)
In my opinion different gender groups (women, men and disabled) were encouraged to participate in the project	80 (56.4%)	33 (24.0%)	28 (19.6%)
In my opinion different women groups actively participated in the planning meetings	77 (57.0%)	49 (36.3%)	9 (6.7%)

Source: Researcher

As realized in Table 4-2, 65 of 140 respondents (46.4%) agreed to the fact that the

community identified the need of the facility before it was implemented. 50 of them disagreed while the remaining 25 were neutral. For the case of the facility addressing the needs of the stake holders, 95 of 138 respondents agreed while 26 disagreed. The Chairperson Dyango valley tank explained that;

"The decision to construct the facility is taken at the district first, then they consult us on whether we need the facility and the different agricultural activities we would want the facility to address".

The district community development officer narrated further that;

"MWE contacts the district on selecting suitable sites for construction of the facilities, that's when we move to different villages consulting farmers on their needs for the facility before coming up with the most suitable site for construction".

A minority of 83 respondents (59.3%) also believed that the community representatives were involved in decision making before implementation and further majority of 45% believed that the community participated in the identification of the technology to use. Despite the fact that majority of 63 respondents (49.6%) believed that appropriate technology was used on the facilities, majority of 53 respondents (40.5%) disagreed to understanding the use of the installed technology. During one of the focus group discussions at Bukaala valley tank, members agreed that the technology is good since it is done by professional engineers, but it is so hard to use because it has a lot involved for effective use.

The majority of 82 respondents (56.4%) agreed that different gender groups were

consulted on their special needs before the project while a similar majority of 56.4% also contends that these special groups were encouraged to participate in the project at planning stage. A further majority of 77 respondents (57.0%) agreed that different women groups actively participated in the planning meetings. However, according the document reviewed especially the meeting attendance lists and minutes at all valley tanks, a rather low involvement of women in planning was revealed. The treasurer at Kituntu valley tank Mrs. Muhumuza when contacted explained that;

"Women are willing to participate in such meetings but sometimes are not allowed by their husbands since the facilities are located very far, besides men have more access to public meetings, have ability to communicate in English, are easily hired to provide cheap labour during construction, therefore gain more experience and confidence to attend such meetings compared to women"

From the findings on community planning, the results show that there was a high level of community participation in the planning stage of implementation of the projects. This is testified to by the high level of needs assessment, high level of identification and selection of technology and high level of gender approach to the planning process.

4.3.2. Community implementation

Respondents were required to state their views in regards to community involvement towards implementation of the facilities, through resource mobilisation, formation of water user committees and construction of the water facilities. Table 4-3 presents the respondents views.

Table 4-3: Respondent views on community implementation

FACTOR: COMMUNITY IMPLEMENTATION	RESPONSES		
	AGREE	**NEUTRAL**	**DISAGREE**
Resource mobilization			
In my opinion, the community contributed labor and materials (e.g. land, water, sand, bricks) to the implementation of the project	73 (53.3%)	8 (5.8%)	56 (40.9%)
In my opinion, the community contributed money to the implementation of the facility	08 (5.6%)	14 (9.9%)	120 (84.5%)
In my opinion, the community participated in soliciting for project financing	10 (7.8%)	10 (7.8%)	128 (84.4%)
Formation of Water User Committees			
In my opinion, the water user committee was active in implementation of the facility	98 (68.0%)	15 (10.5%)	31 (21.5%)
In my opinion, the water user committee formulated relevant bye-laws in implementation of the facility	115 (84.0%)	7 (5.1%)	15 (10.9%)
In my opinion, the water user committee monitored implementation of the facility	110 (78.6%)	8 (5.7%)	22 (15.8%)
Construction of water facilities			
In my opinion, the community was actively involved in implementation of the facility	72 (51.5%)	35 (25.0%)	33 (23.6%)
In my opinion, community members were involved in construction site meetings and reviews	35 (26.5%)	48 (23.4%)	49 (37.2%)
In my opinion, community members monitored construction of the facility	62 (44.3%)	18 (8.8%)	60 (42.9%)

Source: Researcher

Notably in the category or resource mobilization, 53.3% of the respondents agreed that community members contributed resources such as land and labour during construction

of the facilities. This was affirmed by the Chairperson LC1 Kakiri valley tank that;

"Land and labour contribution by members increased sense of ownership by the members for the facility, because it was no longer referred to as a Government facility. However he noted that this spirit was dying out because the family that donated land is always asking for compensation".

Despite high community resource contribution 84.5% of the respondents disagreed that community members contributed money for the construction of the facilities. The district community development officer during an interview stated that;

"According to government policy beneficiaries or community members are supposed to contribute a small percentage of the construction cost through community contributions but this is impossible because most community members are low income earners, they used to contribute land and labor but this too is becoming difficult".

68.0% of the respondents agreed that the water user committees were active in implementation of the facilities through site meetings, 84.0% also agreed that WUC established the bye-laws at the facilities, 78.6% agreed that the WUC participated in monitoring construction works. 51.5% of the respondents agreed that community was actively involved in construction of the facilities and this was boosted by the small payment the contractor pays to the involved members. Members' attending site meetings and reviews was received with mixed reaction from respondents, whereby, .37.2% disagreed, 26.5% agreed and 23.4% were neutral

4.3.3 Community participation in facility management

Respondents were required to state their views on community participation in facility management using the indicators of utilization of the facilities, maintenance of the facilities and community contribution towards O&M of the facilities. The results on the community`s participation in facility management is summarized in the table below;

Table 4-4: Respondent views on community participation in facility management

FACTOR: COMMUNITY PARTICIPATION IN FACILITY MANAGEMENT	**RESPONSES**		
	AGREE	**NEUTRAL**	**DISAGREE**
Utilization of water facilities			
In my opinion, the community uses the water from the facility for domestic, watering animals and plants and industrial purposes	106 (74.7%)	26 (18.3%)	10 (7.0%)
In my opinion, the water from the facility satisfies the demand of the community	119 (88.8%)	5 (2.4%)	10 (4.9%)
In my opinion, the community appreciate the facility as an important source of water	117(82.7%)	17 (12.0%)	8 (5.6%)
Maintenance of water facilities			
In my opinion, community members participate in the maintenance of the facility	91 (65.0%)	28 (20.0%)	21 (15.0%)
In my opinion, the facility is well maintained	11 (9.7%)	44 (35.5%)	68 (54.8%)
In my opinion, community members appreciate the need to maintain the facility	110 (78.6%)	11 (7.9%)	19 (13.6%)
Community contributions to O&M			
In my opinion, the community contributes money for O&M of the facility	13 (9.3%)	12 (8.6%)	115 (82.1%)
In my opinion, community members contribute labor for O&M of the facility	43 (30.7%)	16 (11.4%)	81 (57.9%)
In my opinion, community members make time to discuss O&M of the facility through meetings and reviews	78 (56.9%)	32 (23.4%)	27 (19.7%)

Source: Researcher

Majority of the respondents agreed that there was high usage of water from the facility in terms of consumption by both the members and their animals which proves that the members do appreciate the facility as an important source of water.

Study findings show that although there was a little poor utilization due to pumps often breaking down causing a drop in community utilization, the facility at most times was able to provide water for domestic and livestock use manually (by use of plastic containers to scoop water out of the reservoir), hence satisfying water demand in community especially during dry seasons. 74.7% of the respondents showed that the community appreciates the facility as an important water source, and this was supported during a focus group discussion at Konyo valley tank that, animals no longer walked long distances looking for water. 88.8% of the respondents agreed that water from the valley tanks satisfies the community demand. The majority of the respondents agreed that there was high utilization of the facilities, which led to improvement of their livelihoods in terms of available milk to sell, cattle to sell and clean water for domestic use.

Majority of the respondents agreed to the need for maintenance of the facilities, as this was confirmed by 65% of the respondents who agreed to community being involved in maintenance of the facility and 78.6% of the respondents agreed that community members appreciate the need to maintain the facilities. However despite the fact that the community members had the will to maintain the facility, the facilities are not well maintained this was confirmed by the majority of 54.8% who disagreed to the facilities being well maintained. The Chairperson Water User Committee Kifamba valley tank attributed this to the dying out voluntarism among the community members. He narrated

that;

"Almost all members on the water user committees were demanding for payment in order to carry on their duties, most water user committees are presently non-functional."

Majority of 82.1% disagreed that community members contribute money for O&M, 57.9% of the respondents also disagreed that community members contribute labor for O&M. However, it was discovered that the majority of 56.9% of respondents agreed that community make time to discuss O&M of the facility through meetings and reviews. This can be concluded that despite the fact that the community members have the will to participate in facility management, they require payment.

4.3.4 Sustainability as a dependent variable

Respondent's views were also enlisted on the sustainability of water for production facilities with respect to institutional sustainability, behavioral change, economic sustainability and environmental sustainability. Table 4-5 summarizes the results from the questionnaire;

Table 4-5: Respondent views on sustainability of water for production facilities

DEPENDEDNT VARIABLE: SUSTAINABILITY	RESPONSES		
	A	**N**	**D**
Institutional sustainability			
The water user committee ensures effective management of the facility	73(57.0%)	39 (30.5%)	16 (12.5%)
There are periodic reports on the management of the facility	51 (37.2%)	31 (22.6%)	55 (40.1%)
There are well defined mechanisms for seeking assistance to the management of the facility (e.g. through district water office, MWE)	81 (59.8%)	13 (9.5%)	42 (30.6%)
Behavioral change			
The community members are responsible in the use of the facility	91(71.1%)	34 (26.6%)	3 (2.3%)
The community members appreciate the advantages of the facility to the community	114(83.2%)	17 (12.4%)	6 (4.4%)
The health of community members has improved due to the facility	97(70.8%)	28 (20.4%)	12 (8.8%)
Economic sustainability			
Enough money is collected for operation and maintenance of the facility	3 (2.2%)	3 (2.2%)	131 (95.7%)
Some money from the collection is saved for repair of major equipment of the facility	3 (2.1%)	3 (2.1%)	134 (95.8%)
There is adequate capacity to manage the financial resources	3 (2.1%)	24 (17.1%)	113 (80.7%)
Environmental sustainability			
The community care for the environment around the facility (tree planting, limited over grazing, bush clearing)	66 (47.2%)	41 (29.3%)	33 (23.6%)
Excess water is properly disposed off around the facility	22(15.7%)	56 (40.0%)	62 (44.3%)
There is an environmental management plan for the facility	64(45.7%)	29 (20.7%)	47 (33.6%)

Source: Researcher **Key:** A – Agree, N- Neutral, D- Disagree

Table 4-5 above indicates that the respondents were positive about institutional sustainability with the majority of 57.0% of the respondents in agreement with the water user committees ensuring effective management of the facilities, 59.8% in agreement with the presence of well defined mechanisms for seeking assistance to the management of the facilities with the help of the district. There were, however, mixed views about the presence of periodic reports on the management of the facility, whereby 40.1% of the respondents disagreed, 37.2% agreed and 22.6% were not sure. In the words of the LC1 Chairperson of Kituntu valley tank;

"At our facility we have a water user committee with a secretary who is responsible for keeping all the meeting minutes and report, but they are not available due to poor failing system caused by lack of money to buy files."

The respondents were extremely positive about behavioral change of the community members towards the presence of the facilities. 71.1% were in agreement that the members were responsibly using the facility, 83.2% of the respondents were also in agreement that the members appreciated the advantages of the facility to the community and 70.8% of the respondents were also in agreement that the community members' health had improved due to the presence of the facility. Mr. Kajubi one of the interviewee narrated that;

"Before we got this facility we used to fetch and water our animals from the nearby wetland which has extremely dirty water, this facility has helped us a lot especially during dry seasons when our small ponds at home have dried up".

The study findings also revealed that community members were negative towards cash contributions to assist in O&M of the facilities. This was evident from the 95.7% of the respondents who disagreed to enough money being collected for O&M of the facilities. The chairperson Kituntu valley tank said that;

"We do not collect any money from the community members; they always claim that, they are not sure what the money is going to be used for and besides there are no clear collection mechanisms".

95.8% of the respondents also disagreed that some money from the collections is saved for repairs. 80.7% of the respondents also disagreed that there was adequate capacity to manage the funds collected. During a focus group discussion at Kakabajjo, a member narrated that;

"There is no money that has ever been collected here. The pump broke down and we started fetching directly from the reservoir, it got silted and dried up."

Overall results of the study show a rather low level of sustainability owing to limited O&M funds.

4.4 Relationships of variables

Correlation analyses were conducted to establish the relationship between the variables to the study. This was performed objective by objective and also included testing of the strength and magnitude of the relationships using linear regression analysis.

4.4.1 Community planning and sustainability of water for production facilities

The Pearson correlation coefficient was used to establish existence of a relationship between the independent variable of community planning and the dependent variable of sustainability of Water for Production facilities. Table 4-6 shows the correlation results.

Table 4-6: Correlation coefficient between community planning and sustainability

		Community Planning	DV: Sustainability
Community Planning	Pearson Correlation	1	.057
	Sig. (2-tailed)		.553
	N	113	110
DV: Sustainability	Pearson Correlation	.057	1
	Sig. (2-tailed)	.553	
	N	110	113

Source: Primary data

The results suggest that there was a mild positive insignificant correlation between community planning and sustainability of water for production facilities. ($r = 0.057$, $p>0.05$). The results therefore indicate that the relationship between community planning and sustainability of water for production facilities is only mildly positive, which implies that increase in community planning would have a minimal positive impact on sustainability of water for production facilities.

A linear regression model estimate using least square estimation method was used to assess the strength of the relationship between community planning and sustainability of

water for production facilities as shown in Table 4-7.

Table 4-7: Regression analysis for community planning and sustainability

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	33.464	3.670		9.117	.000
	Community Planning	.081	.136	.057	.595	.553

Dependent Variable: Sustainability

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.057[a]	.003	.006	7.11044

Predictors: (Constant), Community Planning

Source: Primary data

A linear regression model established that the results indicated that the independent factor of Community Planning accounts for only 0.3% of the total variation (R^2 = 0.003). The results further indicate that a unit increase in community planning would lead to an increase in sustainability of water for production facilities by 0.006. The findings are, however, statistically insignificant, with the significance level well above 0.05 (β = 0,057, p = 0.553).

The hypothesis that Community planning significantly affects the sustainability of water for production facilities is therefore rejected.

4.4.2 Community implementation and sustainability of water for production facilities

The Pearson correlation coefficient was also invoked to establish existence of a relationship between community implementation and sustainability of water for production facilities as in Table 4-8.

The results showed that there was a statistically moderate positive and significant correlation between community implementation and sustainability of water for production facilities ($r = 0.433$; $p < 0.01$). The results therefore imply that an increase in community involvement in facility implementation would have a significant improvement in the sustainability of water for production facilities.

Table 4-8: Correlation coefficient between community implementation and Sustainability

		DV: Sustainability	IV: Community Implementation
DV: Sustainability	Pearson Correlation	1	.433**
	Sig. (2-tailed)		.000
	N	120	117
Community Implementation	Pearson Correlation	.433**	1
	Sig. (2-tailed)	.000	
	N	117	120

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

Source: primary data

A linear regression model was also used to assess the strength of the relationship between

community implementation and sustainability of water for production facilities as shown in Table 4-9.

Table 4-9: Regression analysis between community implementation and sustainability

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.303	2.410		9.669	.000
	Community Implementation	.468	.091	.433	5.154	.000

a. Dependent Variable: Sustainability

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.433[a]	.188	.181	6.41764

a. Predictors: (Constant), Community Implementation

Source: Primary data

The findings indicate that community implementation explains as much as 18% of the variation in sustainability of water for production facilities as indicated by the coefficient of determination of $R^2 = 0.188$ and an adjusted $R^2 = 0.181$. The results suggest that a unit increase in community implementation will lead to an increase of 0.433 in the sustainability of water for production facilities. The findings are statistically significant, with the significance level well below 0.05 ($\beta = 0.433$, $p < 0.01$).

The hypothesis that community implementation significantly affects the sustainability of water for production facilities is therefore upheld.

4.4.3 Community participation in management of the water for production facility and sustainability of water for production facilities

Existence of a relationship between community participation in management of water for production facilities and sustainability of water for production facilities was also ascertained using the Pearson correlation coefficient as presented in Table 4-10.

Table 4-10: Correlation coefficient between community management and sustainability of water for production facilities

		DV: Sustainability	IV: Community participation
DV: sustainability	Pearson Correlation	1	.581**
	Sig. (2-tailed)		.000
	N	115	106
Community Management	Pearson Correlation	.581**	1
	Sig. (2-tailed)	.000	
	N	106	115

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

Source: Primary data

The results suggest that there was a significant strong positive correlation between community participation in management of the water for production facilities and sustainability of water for production facilities ($r = 0.581$, $p<0.01$). The results therefore imply that the relationship between community participation in management of water for

production facilities and the sustainability of water for production facilities is positive and strong. Therefore, an increase in the involvement of the community members in the management of the water for production facilities would have a positive, strong improvement in the sustainability of water for production facilities.

A linear regression model estimate using least square estimation method was used to assess the strength of the relationship between community management and sustainability of water for production facilities as shown in Table 4-11.

Table 4-11: Regression analysis results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.166	4.951		-.033	.973
	Community Management	1.153	.159	.581	7.273	.000

Dependent Variable: Sustainability

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.581[a]	.337	.331	5.76192

[a] Predictors: (Constant), Community Management

Source: Primary data

The findings indicate that community participation in the management of water for production facilities explains as much as 33.1% of the variation in sustainability of water for production facilities as indicated by the adjusted coefficient of determination of R^2 = 0.331. The results suggest that a unit increase in community participation in the management of water for production facilities will lead to an increase of 0.581 in the

sustainability of water for production facilities. The findings are, statistically significant, with the significance level below 0.05 ($\beta = 0.581$, $p<0.01$).

The hypothesis that community management significantly affects the sustainability of water for production facilities is therefore upheld.

CHAPTER FIVE

5. SUMMARY OF DISCUSSION, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter presents the summary of study findings, discussion of findings, conclusion and recommendations in relation to the objectives of study and review of related literature. It also highlights areas for improvement and further research.

5.1 Summaries of study findings

Community participation and sustainability of water for production facilities in Rakai District was the topic of the study with a general objective of examining the influence of community participation on sustainability of water for production facilities in Rakai District. In order to get more detailed information and description, a case study research design employing a cross sectional survey was adopted for the study for the nine valley tanks constructed by the Government of Uganda in Rakai District. Unstructured interviews, structured questionnaires, documentary review discussions and observations were used to collect data.

According to the literature reviewed, it was revealed that community planning, implementation and involvement in management is critical for sustainability of the facilities. Needs assessment was highlighted as key towards sustainability of the water facilities (Water Aid Uganda, 2003) and therefore in order to design comprehensive water project needs and concerns of all stakeholders have to be considered during the

planning process and implementation phases. Resource mobilization ahead of implementation (Carter *et al*., 2005) was emphasized since most people especially in rural areas are poor and often need to mobilize their friends and neighbors to improve traditional water sources using local materials and labor.

The accessible population to the study was 228 and only 191 were sampled using the Morgan and Krejcie sample size table (1970) cited in Barifaijo *et al*. (2010). A total of 158 respondents (indicating a response rate of 83%) participated in the study providing both qualitative and quantitative data, which was used to enrich the findings of the study. Descriptive statistics were generated and correlation and regression analyses conducted to investigate the relationships between the study variables. Thematic interpretations from the qualitative data collected supplemented the study of variables.

The study findings on community planning showed a mild positive insignificant correlation with sustainability of water for production facilities ($r = 0.057$, $p>0.05$), Indicating that an increase in community planning would barely lead to an improvement in sustainability of the water production facilities.

The study findings also revealed that there is a moderate significant positive correlation relationship between community implementation and sustainability of water for production facilities ($r = 0.433$; $p < 0.01$). This shows that increase in community implementation would have a positive improvement on sustainability of water for production facilities. This improvement was attributed to community contributions (land) and participation in mobilization activities during project implementation.

The study findings further revealed a significant strong positive correlation between community participation in facility management and sustainability of water for production facilities ($r = 0.581$, $p<0.01$). This positive correlation was attributed to community participation in cleaning around the facilities and attending meetings related to management of the facility. Limited funds for O&M was, however, highlighted as a major threat to sustained operation of the existing facilities.

5.2 Discussions of findings

The key findings of the study are discussed objective by objective as follows.

5.2.1 The influence of community planning on sustainability of water for production facilities in Rakia district

The research showed a mild positive linear relationship between community planning and sustainability of water for production facilities. The results further revealed that involvement of community members in planning and decision making led to selection of best technology to be used which could lead to effective sustainability of water for production facilities.

According to MWE 2010, one of the key challenges facing water developments is high costs for operation and maintenance of the constructed facilities and lack of knowledge to operate the technology installed on water facilities. This is in line with research findings where respondents indicated that the community did not understand the use of technology implemented thus resulting into facility breakdown.

5.2.2 The influence of community implementation on sustainability of water for production facilities

The research showed a positive linear correlation between community implementation and sustainability of water for production facilities. The respondents agreed that the water user committees were formed, trained and formulated relevant bye-laws during the implementation of the project, which were later helpful in maintaining the facilities.

Findings also revealed that community members had no money to contribute towards implementation of the facilities; they sometimes provided land and labor for implementation of the facilities. The Government encourages community members to make some contributions in form of land, cash and labour towards construction of the facilities as a means of creating sense of ownership, but this is not possible in Rakai District because most community members are low income earners.

5.2.3 The effect of community participation in facility management on sustainability of water for production facilities

The research revealed a positive linear correlation between community participation in facility management and sustainability of water for production facilities. This was attributed to high utilization of the facilities and therefore willingness to participate in the management of the facilities. However, primary data indicated that economic maintenance factors like little or no money collected and lack of capacity to manage the little funds collected for O&M of the facility in times of break downs drastically affected the community's participation in sustaining the facility.

5.3 Conclusion

The study intended to examine the influence of community participation on sustainability of water for production facilities in Rakia, Uganda. From the study findings, the following conclusions can be drawn.

5.3.1 The influence of community planning on sustainability of water for production facilities

According to the findings, majority of the respondents consented to being involved in needs assessment and that there was positive gender approach during planning of the facilities. However, the study findings reveal that community planning barely leads to improved sustainability of water for production facilities.

It was also discovered that the biggest challenge in planning was failure by the community to understand the technology installed on the facilities especially the abstraction system. This can be interpreted that regular pump break downs are due to community's failure to understand and properly use the abstraction system which leads to direct animal watering and fetching for domestic use. Such activities have led to silting of the facility and eventually causing the facility to dry up. The study therefore concludes that involvement of community members in planning does not significantly affect sustainability of WfP facilities.

5.3.2 The influence of community implementation on sustainability of water for production facilities

According to the findings, it was revealed that community implementation significantly affects sustainability of water for production facilities. It was also discovered in the study that whereas community members contributed land and labor, there were no cash contributions registered and besides the spirit of land contribution and voluntarism to work was dying out. The study reaffirmed that for sustainability of the facilities there is need for the community members to develop a sense of ownership through resource mobilization and contribution, involvement of communities in formation of water user committees and construction of the facilities. The study therefore concludes that community implementation significantly affects sustainability of WfP facilities.

5.3.3 The effect of community participation in facility management on sustainability of water for production facilities

The study identified that lack of community will to operate and maintain the facilities voluntarily was the root cause of vandalism and poor facility management in Rakai District. This is evident in the study as it was highlighted that, even though community members played a big role in the utilization of the water facilities, most of them did nothing to maintain the facility. The study therefore concludes that community participation in facility management has a significant effect on sustainability of WfP facilities.

5.4 Recommendations

In order to achieve sustainability of water for production facilities, the research came up with a number of recommendations as presented further on.

5.4.1 Community planning and sustainability of water for production facilities in Rakia district

- To achieve sustainability through community planning, MWE and Rakai District administration should ensure that the community members are regularly trained and sensitized on the various technologies to be installed on the facilities during the planning stage. Through such workshops, community members should be helped to define their needs.

- There is also need for the government to come up with the most appropriate technology which is user friendly to men, women, disabled, children and pregnant women. This would improve on the responsiveness of technology to the community hence increased sustainability.

5.4.2 The influence of community implementation and sustainability of water for production facilities

- There is need for Government, MWE in particular to plan and budget for land acquisition since water for production facilities occupy big land. While this has been helpful in engendering community ownership, with time it will be very impossible to have a community member donating sufficient land to construct the facilities.
- During implementation a member from the water user committee most preferably the caretaker should be trained by the Contractor during construction so that by the time construction is complete the caretaker is well conversant with the

technology on the facilities.

- MWE together with Rakai District should ensure that community members especially the community representatives are always part of the site meetings; with this can increase community awareness on the technologies being used on the facilities by the community representatives. It can be made contractual whereby the chairperson of the water user committee is also required to sign on the site meeting minutes.

5.4.3 Community participation in facility management and sustainability of water for production facilities

- MWE and Rakai District should plan and budget for O&M fund to assist the community members and water user committees to maintain the facilities as soon as the facility is finished and gradually teach self sustaining mechanism to discontinue the subsidy. This is because most community members are low income earners who cannot afford to make cash contributions for O&M of the facilities. This fund can be used to pay caretakers in water user committees and pay for minor repairs.

- MWE together with Rakai District should come up with income generating activities such as introduce fishing at facilities, so that the water user committees can sell the fish with the help of the production office at the district to generate income for O&M of the facilities. These internally generated savings would help address operation and maintenance challenges, otherwise it is difficult to operate and maintain all existing water for production facilities, without support from the

ground. This can also check on the under utilization of the facilities which in the end lead to mismanagement of the facilities. Community members and water user committees should be sensitized on financial management skills to ensure proper handling and saving of the funds collected.

- Rakai District and the respective Sub counties should ensure that the established bye-laws are enforced to ensure proper operation and maintenance of the facilities, cleanliness and environment / water catchment protection at the facilities.

5.5 Limitations

- The study considered a limited sample of participants for the study of community participation and sustainability of WfP facilities. This was necessary to ensure that only participants with adequate knowledge and experience in management of WfP facilities were considered. This may have affected the significance of the results.
- This study was conducted in only one district of Rakai, its findings may not necessary apply in other districts with WfP facilities and therefore recommendations have to be applied with caution. Rakai district was chosen because it has WfP facilities that have been operational the longest.

5.6 Areas of Further Research

As observed from the findings, the biggest challenge on water for production facilities is the technology used to abstract the water from the reservoir to the users. The pumps

require a lot of energy to pump the water to the taps and cattle troughs which is not user friendly to some pregnant women, people with disabilities and children. Besides the pumps are too weak, they break down easily and yet are very costly to replace. This study therefore recommends a research on the most appropriate technology for abstraction of water from the reservoir to the community use be carried out as soon as possible.

The study only covered Rakai District; there is need to study community participation and its influence to sustainability of water for production facilities country wide so as to come up with strong recommendations that will lead to improved functionality and sustainability of water for production facilities.

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APPENDICES

Appendix A: Documentary review checklist

Appendix B: Survey questionnaire

Appendix C: Interview guide

Appendix D: Observation checklist

Appendix E: Work plan and timeframe

APPENDIX A: DOCUMENTARY REVIEW CHECKLIST

1. Review water sector performance reports and other documentation in the Ministry of Water and Environment
2. Water for production project profiles and documentation
3. Review meeting minutes for water user committee meetings
4. Review technical site meeting minutes

APPENDIX B: SURVEY QUESTIONNAIRE

Dear respondent,

This questionnaire is prepared to gather information about community participation and sustainability of water for production facilities. The data is intended to develop a mechanism to help improve the sustainability of water for production facilities based on your suggested solutions. In answering my questions, please remember that there are no correct or wrong answers. I am just after your honest opinion. This information will be delivered to those who are extremely confidential and who really want to see your socioeconomic development.

Thank you for your time and cooperation!

Household ID NO _____

Name of Village _____

Name of Water facility _____

SECTION B: BACKGROUND DATA

Please tick the answer that descries you.

1. What is your age (in years)?

1	2	3	4	5
Below 18	18-28	29-38	49-58	Above 58

2. What is your gender?

1	2
Male	Female

3. What is your highest level of education?

1	2	3	4	5
Below O-Level	O-Level	A-Level	Diploma	Degree and above

4. How long have you been using the water for production facility?

1	2	3	4	5
Below 2years	2-5years	6-10years	11-15years	Above 15years

SECTION B: COMMUNITY PARTICIPATION

Please answer the following questions by ticking the number that describes your opinion.

1) Agree
2) Neutral
3) Disagree

COMMUNITY PLANNING	**1**	**2**	**3**
Needs Assessment			
In my opinion, the community identified their need for the facility before implementation	1	2	3
In my opinion, the facility addresses needs of all stakeholders in the community	1	2	3
In my opinion, the community representatives were involved in decision making before implementation	1	2	3
Identification and selection of technology			
In my opinion, the community participated in the identification of the technology (e.g. abstraction, type of facility) to implement	1	2	3
In my opinion, appropriate technology was used on the facility	1	2	3
The community understands use of the technology implemented	1	2	3
Gender approach			
In my opinion different gender groups (women, men and disabled) were consulted on their special needs before the project	1	2	3
In my opinion different gender groups (women, men and disabled) were encouraged to participate in the project	1	2	3
In my opinion different women actively participated in the planning meetings	1	2	3

COMMUNITY IMPLEMENTATION	**1**	**2**	**3**
Resource mobilization			
In my opinion, the community contributed labour and materials (e.g. land, water, sand, bricks) to the implementation of the project	1	2	3
In my opinion, the community contributed money to the implementation of the facility	1	2	3
In my opinion, the community participated in soliciting for project financing	1	2	3
Formation of Water User Committees			
In my opinion, the water user committee was active in implementation of the facility	1	2	3
In my opinion, the water user committee formulated relevant bye-laws in implementation of the facility	1	2	3
In my opinion, the water user committee monitored the implementation of the facility	1	2	3
Construction of water facilities			
In my opinion, the community was actively involved in implementation of the facility	1	2	3
In my opinion, community members were involved in construction site meetings and reviews	1	2	3
In my opinion, community members monitored the construction of the facility	1	2	3

COMMUNITY MANAGEMENT	**1**	**2**	**3**
Utilization of water facilities			
In my opinion, the community uses the water from the facility for domestic, watering animals and plants and industrial purposes	1	2	3
In my opinion, the water from the facility satisfies the demand of the community	1	2	3
In my opinion, the community appreciate the facility as an important source of water	1	2	3
Maintenance of water facilities			
In my opinion, community members participate in the maintenance of the facility	1	2	3
In my opinion, the facility is well maintained	1	2	3
In my opinion, community members appreciate the need to maintain the facility	1	2	3
Community contributions to O&M			
In my opinion, the community contributes money for O&M of the facility	1	2	3
In my opinion, community members contribute labour for O&M of the facility	1	2	3
In my opinion, community members make time to discuss O&M of the facility through meetings and reviews	1	2	3

SECTION C: SUSTAINABILITY OF WATER FOR PRODUCTION FACILITIES

Please answer the following questions by ticking the number that describes your opinion.

1) Agree
2) Neutral
3) Disagree

SUSTAINABILITY OF WATER FOR PRODUCTION FACILITIES	**1**	**2**	**3**
Institutional sustainability			
The water user committee ensures effective management of the facility	1	2	3
There are periodic reports on the management of the facility	1	2	3
There are well defined mechanisms for seeking assistance to the management of the facility (e.g. through district water office, MWE)	1	2	3
Behavioral change			
The community members are responsible in the use of the facility	1	2	3
The community members appreciate the advantages of the facility to the community	1	2	3
The health of community members has improved due to the facility	1	2	3
Economic sustainability			
Enough money is collected for operation and maintenance of the facility	1	2	3
Some money from the collection is saved for repair of major equipment of the facility	1	2	3
There is adequate capacity to manage the financial resources	1	2	3
Environmental sustainability			
The community care for the environment around the facility (tree planting, limited over grazing, bush clearing)	1	2	3
Excess water is properly disposed off around the facility	1	2	3
There is an environmental management plan for the facility	1	2	3

APPENDIX C: INTERVIEW GUIDE

Dear respondent,

This interview is intended to gather information about community participation and sustainability of water for production facilities. The data is intended to develop a mechanism to help improve the sustainability of water for production facilities based on your suggested solutions. In answering my questions, please remember that there are no correct or wrong answers. I am just after your honest opinion. This information will be delivered to those who are extremely confidential and who really want to see your socioeconomic development.

Thank you for your time and cooperation!

Respondent ID NO_____

Name of Village _____

Name of Water facility _____

Please answer the following questions to the best of your knowledge.

1. How was the community involved in the planning and identification of needs before implementation of the facility?
2. Were gender considerations identified before implementation of the facility?
3. Did the community contribute resources to the implementation of the facility (land, labor or money)?
4. What is your assessment of the performance of the water user committee before, during and after implementation of the facility?
5. Did the community actively participate in the construction of the facility (through site meetings and reviews)?
6. What is the level of utilization of the facility?
7. Does the community participate in the operation and maintenance of the facility?
8. Does the community contribute resources to the O&M of the facility?
9. Are institutional procedures clear for the management of the facility?
10. Has the community behavior (use of the water, improved health) improved due to the facility?
11. Do you think there are enough resources to manage and repair the facility at all times?
12. What is the level of environmental management around the facility?

APPENDIX D: OBSERVATION CHECKLIST

Please answer the following questions about the state of the water for production facility according to the following categorization:

1) Good

2) Neutral

3) Poor

STATE OF WATER FOR PRODUCTION FACILITIES	**1**	**2**	**3**
Structural state of the facility (embankment/dam/reservoir)	1	2	3
Abstraction facilities	1	2	3
Animal watering facilities	1	2	3
Fencing	1	2	3
Environmental condition around the facility	1	2	3
Sanitation facility	1	2	3

APPENDIX E: WORK PLAN AND TIMEFRAME

Activity	**Duration (Weeks)**	**2011**																							
		MAR				**APR**				**MAY**				**JUNE**				**JULY**				**AUG**			
Finalize proposal and research instruments	16																								
Data collection	6																								
Analyse the data	2																								
Write the dissertation	10																								
Submit the dissertation	1																								
Make corrections	1																								
Attend Viva	1																								
Final corrections and submission	1																								