

**DETERMINANTS OF COMMUNITY PARTICIPATION IN BOREHOLE  
MANAGEMENT, A CASE OF BUTALEJA DISTRICT**

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## **DECLARATION**

I declare that this research report is my original work and has never been submitted to any institution of learning for any award.

ISOGOLI HENRY

Signature.....

Date.....

## **APPROVAL**

This is to certify that this report was developed under my supervision. I acknowledge the worthiness of the study and therefore approve it to be forwarded for examining.

DR. KIRABIRA PETER

Signature.....

Date.....

## **DEDICATION**

I dedicate this work to my parents, late Titus G. Mudanye & Mrs. Margret Mudanye (living) for their role to raise me up, Grandmother NAMUNGWE MARRIAM and my children; Kobusingye Frida Ruth, Namungwe Mariana Celine and Miyaya Valerie Violet and Ms Akello Florence.

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## OPERATIONAL DEFINITIONS

*Alternative water source:* is a possible water source for a rural community in an area such as river which is different from a borehole constructed to serve house hold purposes.

*Borehole:* Is a long narrow well drilled to access underground water and fitted with hand pump to prevent contamination and ease of access

*Community:* Is a group of people living and interacting together with one another sharing common geographical location/environment, same culture, same religion, and some problems

*Community participation* is defined as a process by which individuals, families, or communities assume responsibility for local problems and develop a capacity to contribute to their own community development (Singh ISS, RP 2005:15)

*Empowerment:* The process of enabling people to gain strength, confidence and vision to work for positive change in their lives individually and collectively with others.

*Governance:* Democratic management of a project, proper decision making, accountability of project resources, proper records, financial accountability, by- law and other project regulation.

*Improved water source:* is a water source including protected springs and manual pumps formally developed for domestic water use of rural households.

*Management:* Refers to the activities aimed at keeping existing capital assets in serviceable condition.

*Participation:* is a process through which stakeholders' influence and share control over development initiatives, decisions and resources which affect them (World Bank learning group on participatory development 1995)

*Project:* Refers to community water projects in public areas, especially water boreholes drilled and fitted with hand pump for the purpose of easy use.

*Sustainability:* is used to imply how boreholes function over a period of time. More specifically is the capacity of the improved water supply sources e.g. boreholes, in providing continued beneficial services over time

## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>CAO</b>	-	Chief Administrative Officer
<b>CBOs</b>	-	Community Based Organizations
<b>CLTS</b>	-	Community led total sanitation
<b>CSOs</b>	-	Civil Society Organization
<b>DALY</b>	-	Disability Adjusted Life years
<b>DLG</b>	-	District local government
<b>DPU</b>	-	District Planning Unit
<b>DWD</b>	-	District Water Department
<b>MDG</b>	-	Millennium Development Goal
<b>MWE</b>	-	Ministry of Water and Environment
<b>O&amp;M</b>	-	Operation and Maintenance
<b>SNV</b>	-	Netherlands Development Organization
<b>SSA</b>	-	Sub Saharan Africa
<b>TPC</b>	-	Technical Planning Committee
<b>UGX</b>	-	Uganda Shillings
<b>UNICEF</b>	-	United Nations International Educational Fund
<b>WASH</b>	-	Water, Sanitation and Hygiene
<b>WHO</b>	-	World Health organization
<b>WUC</b>	-	Water User Committee
<b>UN</b>	-	United Nations

## ABSTRACT

*Introduction:* In Uganda, a total of UGX 16.8 billion was spent on borehole construction in FYs 2011/2012-2012/2013 constituting 38% of the total water supply investment (MWE Annual report 2013). Civil Society Organizations (CSOs) have invested over 723.7 million (29%) of total investment in community management activities including major repairs on boreholes (MWE Annual report 2013). The biggest challenge experienced in the process of implementation was the lack of sustainability of these water supply sources (Reed & Harvey, 2007; Wood lock, 2002). According to Sutton, 2005; the operational failure rates in most African countries stood between 30-60%. By 2013, the non-functionality of boreholes in Uganda stood at 16% (MWE 2013).

*Objective:* To assess the determinants of community participation in the management of boreholes in Butaleja district.

*Methodology:* It was imperative to investigate the individual relationship of each of the potential factors with the response first. A survey and a focus group discussion were conducted among the community members in selected villages in Butaleja District. Binary logistic regression was fitted to the data at the monivariate, bivariate and multivariate level of analysis to explore the inferences under the different levels of analysis.

*Results:* The bivariate results showed that education, Family size, Operational borehole, Status of the borehole and routine meetings by WUCs are significant determinants in community Participation. When adjusted for other potential factors, all the above were significant except for routine meetings by the WUC.

*Conclusion:* Education level, Family size, Status of the borehole and the borehole being operational are the factors that influence community participation in borehole management in Butaleja District.

*Recommendations:* It is recommended that re-training of WUCs and advocacy be carried out to increase community participation in borehole management. Further, rigorous strategies need to be formulated to achieve long-term participation of the community to ensure continued management and maintenance for higher water satisfaction. And mechanisms that can address poverty to maintain continued participation in terms of payments for operations should be formulated.

*Keywords:* Borehole, community participation, binary logistic regression, Butaleja District.

## **CHAPTER ONE: INTRODUCTION AND BACKGROUND**

### **1.0 Introduction**

This chapter presents the background of the study, the problem statement, and justification of the study, the study area, objectives and finally the research questions. The study assessed the determinants of community participation in the management of boreholes in Butaleja district.

### **1.1 Background**

According to the 2014 WHO update report on drinking water and sanitation, more than half the world's population, almost 4 billion people, now enjoys the highest level of water access: a piped water connection at their homes. However, more than 700 million people still lack ready access to improved sources of drinking water and nearly half are in sub-Saharan Africa. One tenth of the global disease burden could be prevented if there is improvement in water supply, sanitation, hygiene and management of water resources (WHO 2008). 4% of all deaths and 5.7% of total disability adjusted life years (DALYs) can be attributed to water, sanitation and hygiene (Pruss A. *et al* 2002).

In response to the above challenge, Government, non-governmental and local organizations worldwide have promoted safe water supply and sanitation programs (Prokopy 2005) including borehole construction and maintenance projects. In Uganda, a total of UGX 16.8 billion was spent on borehole construction in FYs 2011/2012-2012/2013 constituting 38% of the total water supply investment (MWE Annual report 2013). Civil Society Organizations (CSOs) have invested over 723.7 million (29%) of total investment in community management activities including major repairs on boreholes (MWE Annual report 2013).

The biggest challenge experienced in the process of implementation is the lack of sustainability of these water supply sources (Reed & Harvey, 2007; Wood lock, 2002). According to Sutton, 2005; the operational failure rates in most African countries stood



between 30-60%. By 2013, the non-functionality of boreholes in Uganda stood at 16% (MWE 2013). One of the strategies that have been employed by some governments and other organizations to speed up the progress in improving safe water coverage and ensuring sustainability is decentralization of responsibility and ownership to communities basing on their abilities and willingness to manage the water supply system.

As indicated by Gleitsmann, 2005; sustainability of water supply system mostly depends on how much the technology relate to the needs of the users and their ability and willingness to manage it over time. It should however be noted that in rural areas of the world, administrative structures and institutional support are so weak to address advocacy, facilitation of finance, management and to encourage resident commitment which has led to water sources become non-functional after a few years of use (Lockwood, 2002). Evaluation of water source management programs attribute low sustainability to limited participation by the community in terms of partial demand, restricted ownership, incomplete community education and limited sustainability of community management structures such as water user committees (Reed & Harvey, 2006). Studies indicate that sustainability of rural water supply structures is associated with initiatives which promote public participation calling for necessity of meaningful involvement of water users during planning implementation, operation and maintenance depending on the need and potential (Liyer & Davis, 2002).

The biggest hurdle has been operation and maintenance of water and sanitation facilities (SNV 2013). Community Participation in borehole water management is an action that is required to better borehole water use and its maintenance to ensure sustainability. As indicated by many other authors, community participation is a prerequisite for sustainability (Reed & Harvey 2006; Narayan, 1995) and the forms of contribution/participation include;

labour, money, equipment, meetings, material things and participation in decision making (Bandari et al 2007).

## **1.2 Background of the Study Area**

Butaleja district was created and passed by an Act of parliament in July 2005. It was carved out of Tororo district and it covers a total land area of 644 square kilometers of which most is flat. It is located in Eastern Uganda and borders Mbale district to the East, Budaka - Pallisa districts to the North, Namutumba district to the West and Tororo-Bugiri districts to the South (Butaleja District Environmental Policy, 2009). According to the 2010 report from the Directorate of Water Development, Ministry of Water & Environment, the main water supply technology in Butaleja is the deep borehole and the safe water coverage of the district stood at 68.9% serving a population of 146,340 out of 212,615 people of which 51.1% were female.

## **1.3 Problem Statement**

In Uganda, despite investments in water and sanitation facilities by government, civil society and other development organizations, about 11 million people still have no access to safe water and proper sanitation facilities. In Butaleja district, it is a common feature to see boreholes without adequate protection for example fencing (Butaleja DPU 2013). For Butaleja district in particular, the current non-functional boreholes stands at 16% (DWD 2014).

However, there is scanty information on the factors that influence the participation of households in borehole management in the district. This has consequently led to a number of people continuously losing access to safe water, implying that the people who would be served by these non-functional boreholes are subsequently likely to suffer from consequences of; Children not attending school as they will be looking for water, cases of defilement of

underage girls going to a far water source, households suffering from water related diseases due to use of unsafe and inadequate water, women suffering with domestic chores; diseases as a result of use of unsafe water, all leading to increased poverty levels at households.

There was several suspected possible factors that could be affecting the community participation in borehole management which include among others socio-economic factors, borehole factors and institutional factors. This research aimed at studying these factors while looking at Butaleja district as a case. It is hoped that the findings and recommendations from this study will be part of the solution in contributing to efforts by development agencies, the government and policy makers in improving access to safe water in this district and the country at large.

## **1.4 Research Objectives**

### **1.4.1 Main Objective**

The main objective was to assess the determinants of community participation in the management of boreholes in Butaleja district.

### **1.4.2 Specific Objectives**

Specifically, the study looked to;

- To determine the level of community participation in borehole management in Butaleja district.
- To identify the socio-economic factors influencing community participation in borehole management in Butaleja district.
- To assess the borehole factors influencing community participation in borehole management in Butaleja district.
- To assess the institutional factors influencing community participation in borehole management in Butaleja district.

### **1.5 Research Questions were;**

- What is the level of community participation in borehole management in Butaleja district?
- What are the socio-economic factors influencing community participation in borehole management in Butaleja district?
- What are the borehole factors influencing community participation in borehole management in Butaleja district?
- What are the institutional factors influencing community participation in borehole management in Butaleja district?

### **1.6 Justification of the study**

Water and sanitation are integral aspects of ensuring sustainable development. This is reflected in Goal 6 of the Sustainable Development Goals (SDGs) which aims to “Ensure availability and sustainable management of water and sanitation for all”. Particularly, target 6b seeks to support and strengthen the participation of local communities in improving water and sanitation management. The availability of these parameters influences health, gender, education issues and the economy making them paramount in achieving the other SDGs.

One of the challenges in achieving access to safe water and sanitation is lack of community participation in installation and management leading to early breakdown of boreholes. It is therefore important to have a clear documentation of the factors influencing participation by communities in management of water sources particularly boreholes.

The findings of the study inform different stakeholders local and national, public and private involved in the provision of water sources so that these challenges are addressed.

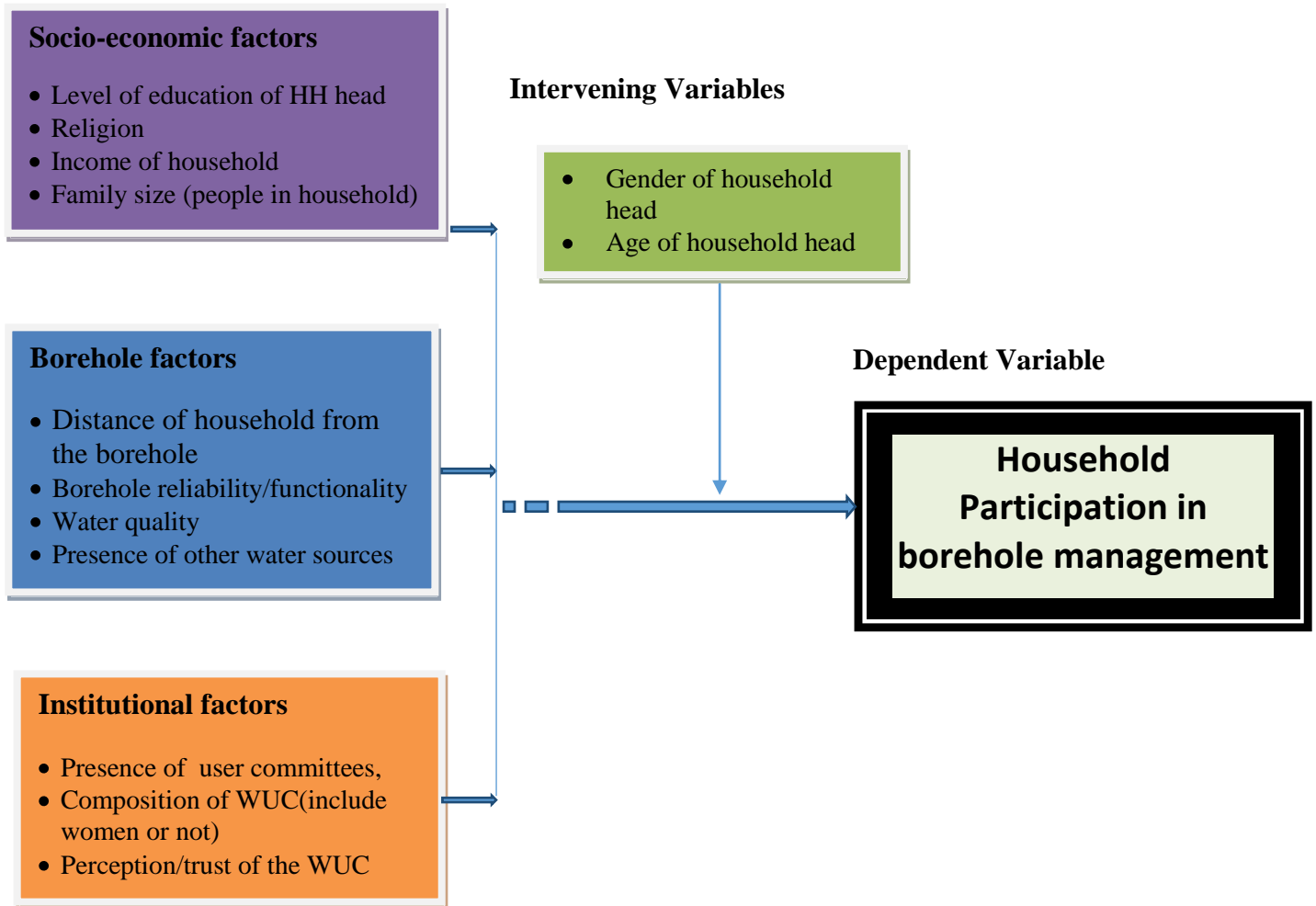
Several recommendations address the challenges of community participation in borehole management in a more holistic and sustainable manner. Other communities facing similar challenges besides Butaleja can learn from these findings. With the comprehensive analysis of the problem of lack of community participation in borehole management, its causes and economic effects to the house hold and country at large, the study will provide valuable information that will guide policy reforms both in public and private sectors and contribute to the achievement of Sustainable Development Goal 6 in Uganda.

### **1.7 Conceptual Framework**

The concept of the study involved a collection of factors which have to be integrated so as to determine what influences household participation in borehole management. A discussion of how the presence or absence of these constrain or facilitate the management of boreholes was done.

Figure 1: Conceptual Framework

**Independent variables**



### **Narrative of the Conceptual framework**

The conceptual frame work above shows how participation in borehole management, the dependent variable is influenced by many factors including; *social economic*-i.e. Level of education, Religion, Income of household and the size of the family; *demographic*- gender and marital status of the respondents; *borehole factors* i.e. Distance of household from the borehole, Water quality, borehole reliability, Presence of alternative water sources; and *institutional factors* including; Presence and composition of water user committees (WUCs) and perception/trust of the WUCs by the community members.

## **CHAPTER TWO: LITERATURE REVIEW**

This chapter presents some of the existing literature related to community participation in the management of boreholes from different writers inside and outside Uganda. The chapter is presented in sections about the different factors that were assessed in this study and how each of them has influenced community participation in borehole management as presented by different authors.

### **2.1 Demographic characteristics**

#### **2.1.1 Gender and its influence on household participation in borehole management**

Water supply should be democratic, obvious and represent the needs of the people, especially women, who are the primary users and collectors of the water (UN, Department of Social and Economic Affairs 2005, 11). Women are half of the community and they are key participants in successful projects. Involving women has also a positive impact on their position in the community (Water Aid, 2010a). According to Mazumdar K (2000), Women's role as collectors and managers of water for domestic purposes and their primary responsibility as health providers and domestic managers is widely acknowledged especially in the Third World rural areas and need re-emphasis. Women decide as to which water sources to use for what purpose.

Women and men need access to information about technology, design and financing, as well as the ability to participate effectively in decision making (UN, Department of Social and Economic Affairs 2005, 11). Many African countries now have positive policies towards women's participation in the maintenance of the water well. Nevertheless, while the woman is an official member of the water committee, the husband might undertake all the duties. The solution is that the communities are allowed to build on their own judgments of roles and



responsibilities, and women are given the opportunity to reach technical and facilitation skills (Parry-Jones, 2001).

### **2.1.2 Age and its influence on household participation in borehole management**

Water is a very important resource in the community that different age groups play roles at different levels. For example, an elder in the community can easily be given a responsibility of leadership or advisor to the WUC because of the vast experience he/she has but again when too old, he/she can be excluded from this leadership role or even payment of user fees. The same applies to children who mainly participate by providing labor during general cleaning at the bore hole (Sultana, 2009).

## **2.2 Socio-economic factors and their influence on household participation in borehole management**

### **2.2.1 Level of education and HH participation in borehole management**

In a study conducted in Kenya, level of education of respondents was found to be very important when analyzing the perception of households on NGOs supported projects. Level of education influenced the opinion of the respondents on certain aspects of project management. For instance respondents with primary education were unlikely to agree that they own projects supported by NGOs. On the other hand, respondents with college and above levels of education were likely to agree that households own the projects supported by NGOs. Similarly, respondents with primary level of education were very doubtful when asked whether they can manage the projects after NGOs withdraws while majority in the other categories agreed with view that households can actually manage the NGOs initiated projects (Osike O. S et al, 2015).

It was observed that there is significant relationship between socio – economic characteristics of respondents and sustainability of borehole water schemes in Ejigbo. Particularly, close to 30% of the variability was observed in education of respondents which determine sustainability of existing borehole water schemes. The level of education, monthly income and gender status of respondents can affect the repairs and maintenance of existing borehole water scheme in Ejigbo (Toyobo A. E & Muili A .B, 2013).Meinzen-Dick et al., (2004) also found out that coupled with the external recognition; education enhances participation in collective action.

### **2.2.2 Religion and HH participation in borehole management**

In both developing and developed countries, a wide range of cultural, spiritual, and religious values are attached to water (Shiva, 2003). Gbedemah. S., F. (2010) argued that it is easier to develop the participation of people when they share certain traits like culture and religious ideas. In some African societies, water is under the management of religious community leaders. For example, just like land, water in Ghanaian Ewe land is community-owned but vested in stools under the custody of traditional priests/priestesses in every community (a priest is a male traditional religious leader and priestess is his female counterpart) Gbedemah. S., F. (2010).

In the same study mentioned in section 2.2.1 above conducted in Nigeria, it was found that there is no significant relationship between religion and sustainability of borehole water schemes (Toyobo A. E & Muili A .B, 2013). Given this contradicting information, this study will further investigate whether religion is a contribution factor in the HH participation in borehole management in Butaleja district.

### **2.2.3 Income of household and HH participation in borehole management**

According to the 2010 water aid report, it is highly necessary for a community to understand the importance of contribution for the water that is used. The community has to decide the method, or combination of methods, it will use to build up funds for future maintenance (Parry-Jones, 2001). The project should give an opportunity to the community to decide how much they can afford and how much each household should contribute. For instance, a rural water supply and environmental program in Amahara region, Ethiopia, supported by the Finland government since 1994; Communities are required to fund 15 percent of the capital costs of projects including all the operation and maintenance costs.

A similar mechanism has been used in Waterfinns' project in Mtwara, Tanzania. There the village has to have a certain sum of water fund before the water project starts in the village and Tanzania's water policy also requires the financial participation of the village in the investment costs by 2.5 percent share (Rinta, 2008). The willingness of individuals to make these financial contributions highly depends on the income of the household. In a study conducted in Oyo state, Nigeria, it was found out that low income earnings in the rural areas have implication for willingness to pay for provision of water supply in the communities. It also affects their willingness to contribute to the management of the existing water supply infrastructure especially boreholes (Gbadegesin & Olorunfemi, 2007).

### **2.2.4 Family/household size and HH participation in borehole management**

Participation in borehole management may be in form of financial contribution or in terms of labor. It may be challenging for a large family/household size with less income to make financial contribution but the large household size serves as a ready source of labor (Adeoti A. I., 2007). However, Bohm et al. (1993) indicated that willingness to pay for improved

water services increases along with increases family size. This is because the demand is higher for large family size (Collick, 2008).

## **2.3 Borehole factors and their influence on household participation in borehole management**

### **2.3.1 Distance of household from the borehole and HH participation in borehole management**

According to Johnson R (2000) whenever safe water sources break down, valuable time is lost unproductively in travelling long distance to fetch water. Women sacrifice opportunities for social and economic advancement. Young women are seriously affected missing out on formal education due to time spent fetching water, resulting in uneducated mothers; the engines of a family enhancement. Neither are they able to contribute a large part of the potential workforce. Community Participation approaches can redress a system of sustainable water supply as well as contribute significantly towards the Government's efforts on national poverty alleviation.

### **2.3.2 Borehole reliability/functionality and HH participation in borehole management**

It is important that communities feel ownership of their water and sanitation project and are given help in the necessary operation and maintenance systems so that the project succeeds instead of falling into disrepair (Water Aid 2010b). One of the major reasons that hand pumps do not get maintenance seems to be that people often continue using traditional sources in the case of a breakdown. When these boreholes fail/ are not reliable, people are forced to look for alternative water sources. This may cause to participate in the management off boreholes to ensure greater reliability or it may cause them to abandon the boreholes. This study intends to

find out how borehole reliability affects the participation of the community in Butaleja district.

### **2.3.3 Water quality and HH participation in borehole management**

Rural households in the study area have fair knowledge, judgment and water quality perceptions of improved water supply sources (Demeke A., 2009). Most believe that ‘clarity to the eyes’ is the sole indicator of safety/water quality. Teaching them to differentiate the ‘actual’ from the ‘perceived’ quality of water and helping them to realize the benefits of improved water management can ensure better participation in water source management initiatives (Demeke A., 2009).

Adequate protection and routine maintenance enhance the sustainability of water supply systems, and improve the quality of the water from the sources (Ainsworth and Jehn, 2005). However, it is not clear why communities fail to achieve this. Bhandari et al. (2007) also showed that willingness to pay for water as a way of participation in water source management is highly correlated with source reliability, trustworthiness of WUCs, convenience of location, and water quality.

### **2.3.4 Presence of other water sources and HH participation in borehole management**

Alternative water sources are possible sources of water for rural community in an area such as rivers which are different from those constructed or improved to serve for household purposes (Demeke A., 2009). A study in Nigeria found that having alternative source of water also has a negative effect on participation in the management of boreholes (Adeoti A. I., 2007). This implies that the probability of participation reduces with increase in access to alternative sources. However, one can argue that the effect of alternative source of water is indeterminate. Though, some households may have alternative source of water, they may

prefer water from the borehole since it is considered safe. The effect of this variable can therefore be either way.

Another study in Ethiopia found that the number of alternative water sources in close proximity negatively influenced the payment of cash by the households. This suggests that the existence of alternative water sources such as rivers, undeveloped springs and home-made wells decreases households' willingness to make cash payments for sustained water services (Demeke, A., 2009).

## **2.4 Institutional factors and their influence on household participation in borehole management**

### **2.4.1 Presence of user committees and HH participation in borehole management**

In Uganda, the Water Statute enacted in 1995 in line with the principles of the Water Action Plan; Ministry of Water Lands and Environment (DWD, 2002) states that, —Ownership and Management of Water Supplies must be undertaken by users through the creation of Water User Groups (WUGs) operating through water and sanitation committees (WUCs). It further states that WUCs will be responsible for planning and Management of water systems, including collection and utilization of revenue.

Bagamahunda, G (2006), contended that as a result of this Policy all point water facilities are required to have WUCs with half the membership being women, and at least two caretakers. It is crucial that adequate mobilization and relevant training are provided at an early stage, to ensure that all stakeholders are supported to play their roles and that the magnitude of O & M requirements is well defined and planned for. This activity is continuous to maintain effective morale and involvement of all (Bagamuhunda,G 2006).

#### **2.4.2 Composition of WUC and HH participation in borehole management**

According to Bailey, R.A. (1996), a water point committees a group of 10 adults, chosen from amongst the users to manage the water point. The typical ratio tends to be women to men. In practice, only a handful is very active, but this is enough.

To emphasize the feeling of ownership by the beneficiary communities, Water User Committees must be created even before the idea of getting a safe water source is perceived by the community. The committees are then involved in the decision making when regarding the choice of improved water point system, sighting of the improved water point, trained in running community meetings, collecting and managing maintenance funds, simple maintenance tasks plus signing contracts between the committees and the project implementers, sometimes with the Local Government officials as well, clearly defining the natural responsibilities (Alan, 1997).

#### **2.4.3 Perception/trust of the WUC and HH participation in borehole management**

The management of boreholes by communities is meant specifically to empower and encourage community ownership and taking full responsibility for boreholes sustenance. In that respect, community mobilization efforts are more often directed towards soliciting community involvement and inculcating a sense of responsibility and ownership. However, this does not at all times stimulate the willingness required to accept immediate responsibility and voluntarily contribute funds for boreholes repairs and maintenance over the long haul. As such, several hundreds of boreholes become non-functional when challenges emerge relating to operation of the hand pumps (Directorate of Water Development, 2004).

The prevalent view over the past two decades indicates general acceptance that rural communities in developing countries should take full responsibility for the sustainable management of the water infrastructure investments made in their communities (World Bank,

2010). However, a commonly reported problem is that there is a poor relationship between the committee and the users in general. Committee members complain that most users are reluctant to perform maintenance duties, while users are inclined to think that the committee should take sole responsibility for management (World Bank, 2010).



## **CHAPTER THREE: METHODOLOGY**

This chapter discusses the research design that was used in the study, the data collection tools, the population that was included in the study and the sample size calculation. The inclusion and exclusion criteria used, the data analysis and management plan, the ethical considerations and finally the dissemination plan are also presented.

### **3.1 Research Design**

A cross-sectional descriptive research design complemented by interviews of households and observation surveys of boreholes was conducted in selected communities. This particular design was chosen because the data was collected at one point in time from a number of respondents.

### **3.2 Study Population**

The study population was the residents of Butaleja district who are served by community managed boreholes.

### **3.3 Sources of data**

#### **3.3.1: Primary data sources**

Primary Data was got from the household heads of borehole users in the villages (residents) who were from Butaleja district during the period of study. The other primary sources of data were the discussants that participated in the focus group discussions.

#### **3.3.2 Secondary data sources**

Secondary Data was extracted from the records of district water office about the borehole water user management committees (WUC).

### 3.4 Sample size calculation

The sample size was determined by the use of Kish Leslie's formula for calculation of sample size in cross-sectional studies.

$$n = (Z^2 \times P \times Q) / \delta^2$$

Where;

n = Sample size estimate

P = the prevalence, is the percentage of boreholes that are non-functional within Butaleja which stands at 16% (DWD, 2014)

$$Q = 1 - P = 1 - 0.16 = 0.84$$

Z= Standard normal deviate at 95% confidence interval corresponding to 1.96

$$\delta = \text{Absolute error } 5\% = 0.05$$

Therefore,

$$n = (1.96 \times 1.96) \times 0.16 \times 0.84$$

$$(0.05 \times 0.05)$$

$$n = 206.52 \sim 207$$

n is approximately equal to **207** household heads. A total of 223 respondents were interviewed in our study adding an extra 16 to cater for non-response.

### 3.5 Sampling procedure

Purposive sampling technique was applied in selecting Butaleja District because that is where the researcher works and therefore easily accessible. According to Mugenda and Mugenda (2003) 10% to 30% of accessible population is an adequate representative sample. The total number of boreholes that exist in Butaleja District constituted the sampling frame. The villages in closest proximity to the boreholes were identified, and 22 villages were selected simply based on the criteria that a borehole exists in the village. 10 households were selected

from each village using simple random sampling bringing the total sample size to 220 respondents. However, an extra 3 households were added to cater for non-response. Therefore, 223 household heads were interviewed.

### **3.6 Study Variables**

#### **3.6.1 Dependent variables**

The dependent variable was the community participation in the management of boreholes in Butaleja district. This was yes or no variable measured by any kind of participation that may include physical participation in cleaning the borehole; membership on the WUC or making financial contribution to the management of the borehole.

#### **3.6.2 Independent variables**

The independent variables on the other hand were the factors influencing the community participation in the management of boreholes in Butaleja district which included the following; **Socio-economic** factors including the Level of education of HH head, Religion, Income of household and the Family size (people in household). **Borehole** factors including Distance of household from the borehole, Borehole reliability/functionality, Water quality and the Presence of other water sources. **Institutional** factors including Presence of user committees, Composition of WUC (include women or not) and Perception/trust of the WUC. **Intervening** variables including the Age of household head and the Gender of household head.

### **3.7 Inclusion and Exclusion Criteria**

#### **3.7.1 Inclusion criteria**

These were community members who are:

- Household heads
- Known resident community members
- 18 years and above
- Willingly given consent to take part in study

#### **3.7.2 Exclusion criteria**

These were community members eligible for the study but would be excluded if they are:

- Un able or un willing to give consent to the study
- Deaf or Blind
- Too weak or ill to take part in study

### **3.8 Data collection techniques/strategies**

A cross-sectional descriptive research design complemented by interviews of households and observation surveys of boreholes were conducted in selected communities. Focused group discussions were also carried out to get comprehensive information about the topic. Interviews were used to gather information from the WUC members/management committee members- chairpersons, treasures and secretaries.

### **3.9 Data collection tools**

#### **3.9.1 Quantitative data collection tools**

Questionnaires were employed to obtain data from the respondents. In the questionnaire, both open and closed ended questions were asked to capture information from the household

representatives on their level of participation in the identified parameters of the study. Observation checklists were used to characterize water supply structures to establish borehole reliability/functionality.

### **3.9.2 Qualitative data collection tools**

The qualitative data collection tools consisted of Focus Group Discussion guides for members of the water user management committee, extension workers and the community.

### **3.10 Quality Control measures, Steps to minimize errors and eliminate bias**

Quality control started with the meticulous process of questionnaire design to the extensive training of fieldworkers/research assistants. The researcher ensured that the interviewer team visits the correct household, assisted in setting up the interviewing process and checked the completed questionnaires for obvious errors. An editor went through the questionnaires, coded the open-ended questions and ensured that the geographic and other details were correct.

Informed consent from the participant was obtained for agreeing to participate in the interview and no names or personal identifier information were collected thus ensuring anonymity and confidentiality. A few questionnaires were first pretested on some respondents prior to the study to find out whether they were understood. This helped to know whether they were able to obtain data that the study intended to obtain.

### 3.11 Data analysis

#### 3.11.1 Data Presentation

The data collected from questionnaires were coded, cleaned and analyzed using descriptive statistics in order to generate mean, frequency tables and percentages. Data obtained was organized according to categories and merged together with qualitative data to facilitate the writing and composition of the key findings. The data presented using frequency tables and percentages were managed using Epi-Data and Microsoft Excel and analyzed using STATA software.

#### 3.11.2 Data Analysis Methodology: Binary Logistic Regression

Since the data outcome of interest is binary, the binary logistic regression methodology was used for analysis. This method is described below; Y= Binary response (DV) 1: success → P, observed proportion of success (in this case, participating) 0: failure → Q = 1-P, observed proportion of failure (not participating). X = Any type of covariate (e.g. continuous, dichotomous). The general Logistic regression model with multiple covariates:

$$\text{Logit}(\pi) = \text{Log} \left\{ \frac{\pi}{1-\pi} \right\} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

Where log odds are a linear function of the covariates;  $\pi$  is the probability of participating at covariate level x. The odds ratio =  $\exp(\beta)$  represents the association with OR = 1 representing no association; OR > 1 ► positive association between variables OR < 1 ► negative association. If the 95% CI for the OR contains 1, we conclude no significant association. If the interval is above 1, we conclude positive association and if the interval is below 1, we conclude negative association.

Bivariate (single predictor) categorical data analyses and reporting are important in their own right, and they are also important as exploratory tools in the development of more complex

multivariate models (Heeringa et al, 2010). The relationship between each of the independent factors and participation was first examined in a logistic regression. This was done using the logistic command in STATA and a chi-square test to find out if there is any significant relationship between household participation in borehole management and each of the independent variables. The variables with a significant relationship with outcome variable were further used in multivariate level of analysis. Chi-square test measures the significance of association between two categorical variables. If p-value <0.05, reject the hypothesis of independence; i.e. the two (categorical) variables are significantly associated.

All discussions and interviews were audio taped and later transcribed daily at the end of the day of data collection. Recurring issues were identified into themes describing what the respondents were talking about. The themes were later organized into categories in such a way that more than one theme would fall under the same category. These themes constituted the main sections of the report and were illustrated by quotes taken directly from the interviews and discussion transcripts. Analysis of the data enabled the researcher to interpret the information and draw conclusions and recommendations from the study.

### **3.12 Ethical considerations**

This research proposal was forwarded to International Health Sciences University Research and Ethics Committee (IHSU-REC) for approval. After approval, a letter was given by the University introducing the researcher to the Chief Administrative Officer of Butaleja district. Permission was sought from the Sub County chiefs prior to data collection. Respondents were fully informed of the purpose of the research i.e. purely for academic use. Consent of the respondents was sought in order for them to participate in the study and the information that was given was treated with confidentiality.

### **3.13 Limitations of the study**

The data collectors did not probe well enough during the interviews which probably could have affected the interpretation of the questions by interviewees/respondents.

The sample size may have been small for generalizing the study findings on the determinants of community participation in the management of boreholes in Butaleja district.



### **3.14 Dissemination plan**

The report generated from the study shall be submitted to Institute of Public Health and Management, International Health Sciences University.

Additionally, a copy of the report shall be submitted to Butaleja District Health Office.

The researcher shall present the study findings at different national and international conferences related to maternal and child health care.

Lastly the researcher will publish the research findings in the international peer reviewed journals.

## CHAPTER FOUR: ANALYSIS AND PRESENTATION OF THE FINDINGS

### 4.0 Introduction

This chapter presents the findings following the critical analyses on the data collected. It specifically presents the findings related to the determinants of community participation in the management of boreholes in Butaleja district. Specifically we looked at;

- The level of community participation in borehole management in Butaleja district.
- The socio-economic factors influencing community participation in borehole management
- The borehole factors influencing community participation in borehole management
- The institutional factors influencing community participation in borehole management

Response rate: The total number of participants was 223 of which 13 did not respond. The response rate is presented below;

*Figure 2 Response rate*

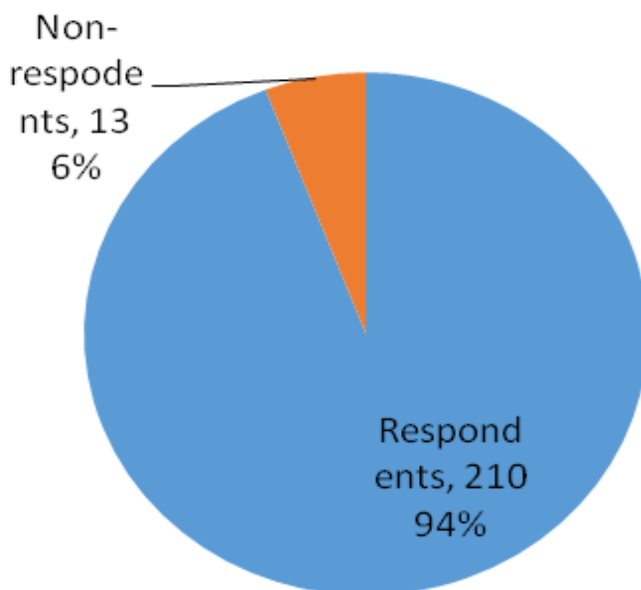


Figure 3: Level of Participation

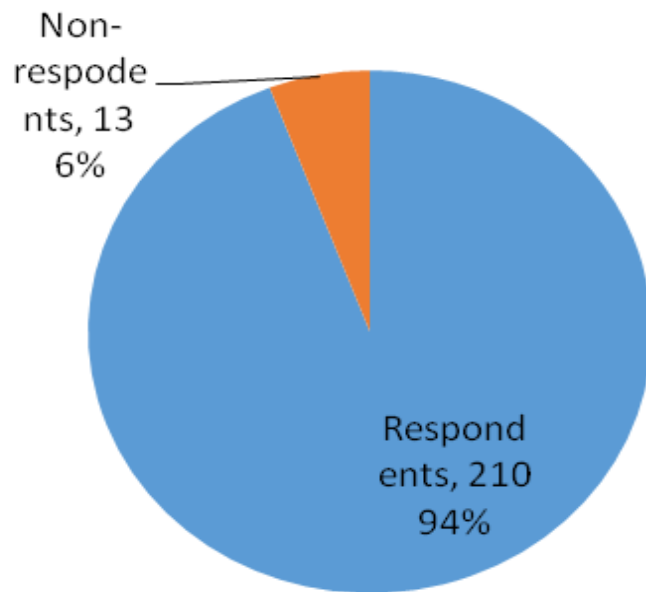


Figure 3 shows that only 13 (5.8%) participants did not respond, with a 94.2% response rate. On the right, the level of community participation in borehole management in Butaleja district is about 90% (Fig. 4.2).

## 4.2 Socio-demographic characteristics of residents of Butaleja district (respondents)

### 4.2.1 Univariate analysis of socio-demographic characteristics

*Table 1: Univariate analysis for Socio-demographic characteristic of respondents*

Characteristic	Description (coding and categories)	Frequency (N=210)	Percentage (%)
Sex	1 Male	93	44.3
	2 Female	117	55.7
Age in years	1 Below 18	2	1.0
	2 18 - 24	30	14.3
	3 25 - 34	56	26.7
	4 35 - 44	48	22.9
	5 45 and above	74	35.3
Religion	1 Protestant	66	31.4
	2 Catholic	40	19.0
	3 Moslem	97	46.2
	4 Other	7	3.3
Education level	1 None	31	14.7
	2 Primary	124	59.0
	3 Secondary	49	23.3
	4 Tertially	4	1.9
	5 Diploma	2	0.9
Family size	1 2 people	13	6.2
	2 3 – 6	82	39.0
	3 7 – 10	79	37.6
	4 Above 10	36	17.1
Income level	1 less than 100,000/-	171	81.4
	2 100,000/- – 200,000/-	22	10.5
	3 200,001/- – 400,000/-	11	5.2
	4 400,001/- and above	5	2.4

Table 1 presents the descriptive statistics for the socio-economic and demographic factors. A total of 210 respondents participated in the study. 55.7% of respondents were females and most were 45 and above years (35.3%); with primary level education (59%); an income of less than 100,000/- per month (81.4%); Moslem (46.2%) and from a family size of 3 to 6 people (39%).

## 4.2.2 Bivariate analysis of socio-demographic characteristics

Table 2: Bivariate analysis for socio-demographic factors and participation in borehole management

Variable	Participate (N=210)	Don't participate	OR	Chi-square (P-value)	95% CI	P-value
Sex				1.42(0.234)		
<b>1 Male (ref)</b>	78	6	1			
<b>2 Female</b>	92	13	0.54		0.19 – 1.49	0.239
Age in years				1.65(0.730)*		
<b>1 Below 18(ref)</b>	1	0	1			
<b>2 18 - 24</b>	25	3	1.29		0.32 – 5.18	0.717
<b>3 25 - 34</b>	46	4	1.78		0.52 – 6.16	0.360
<b>4 35 - 44</b>	40	3	2.07		0.53 – 8.12	0.297
<b>5 45 and above</b>	58	9				
Religion				4.15(0.275)*		
<b>1 Protestant (ref)</b>	60	3	1			
<b>2 Catholic</b>	29	5	0.29		0.06 – 1.29	0.105
<b>3 Moslem</b>	75	11	0.34		0.09 – 1.28	0.110
<b>4 Other</b>	6	0	-			-
Education level				15.15(0.002)**		
<b>1 None (ref)</b>	22	7	1			
<b>2 Primary</b>	100	11	2.89		1.01 – 8.30	0.048
<b>3 Secondary</b>	46	0	-			
<b>4 Tertially</b>	1	1	0.32		0.02 – 5.77	0.439
<b>5 Diploma</b>	1	0	-			
Family size				14.33(0.002)**		
<b>1 2 people (ref)</b>	7	5	1			
<b>2 3 – 6</b>	68	5	9.71		2.24 – 41.90	0.002
<b>3 7 – 10</b>	65	6	7.74		1.87 – 32.01	0.005
<b>4 Above 10</b>	30	3	7.14		1.37 – 37.22	0.020
Income level				0.39(0.910)*		
<b>1 less than 100,000/ (ref)</b>	141	16	1			
<b>2 100,000/- – 200,000</b>	18	2	1.02		0.22 – 4.81	0.979
<b>3 200,001/- – 400,000/-</b>	7	1	0.79		0.09 – 6.87	0.834
<b>4 400,001/- and above</b>	3	0	-			

\*\*Statistically significant association between the independent variable and participation,

\*Fisher's exact test

Table 2 above presents the bivariate results including the odds ratios, their 95% confidence intervals, chi-square test of independence and P-values for the demographic factors and the socio-economic factors. These odds ratios are *unadjusted* since they are estimated with no

additional controls for other factors. The education level was observed to have a significant influence on participation in borehole management (Chi square of 15.15 and P-value of 0.002). Family size was also revealed to have a significant influence on participation (Chi square of 14.13 and P-value of 0.002).

On the other hand, the following characteristics/variables were found to have an un-significant influence on participation in borehole management in Butaleja district. There is a 46% (OR=0.54; 95%CI: 0.19 – 1.49) lower chance of participating in borehole management for female respondents compared to males. However, this was not significant. The non-significant variables also included Age (Chi square of 1.65 and P-value of 0.730); Religion (Chi square of 4.15 and P-value of 0.275) and Income level (Chi square of 0.39 and P-value of 0.910).

#### 4.2.3 Multivariate analysis of socio-demographic characteristics

*Table 3: Unadjusted (crude) and Adjusted odds ratio (OR) and 95% confidence intervals (95%CI) of factors associated with Participation*

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Education level*				
<b>1 None (ref)</b>	1		1	
<b>2 Primary</b>	2.89	1.01 – 8.30	2.46	0.79 – 7.58
<b>3 Secondary</b>	1		1	
<b>4 Tertially</b>	0.32	0.02 – 5.77	0.22	0.01 – 4.23
<b>5 Diploma</b>	1		1	
Family size				
<b>1 2 people (ref)</b>	1		1	
<b>2 3 – 6</b>	9.71	2.24 – 41.90	7.8	1.60 – 37.74
<b>3 7 – 10</b>	7.74	1.87 – 32.01	8.1	1.72 – 37.95
<b>4 Above 10</b>	7.14	1.37 – 37.22	7.7	1.26 – 47.49

*\*Factor was not significant at multivariable regression*

When the significant variables were analyzed in a multivariate model, it was observed that the education level was no longer significant. The 95% CI s of the education level categories contain 1, meaning that this variable does not significantly affect participation when you adjust for family size. On the other hand, when you adjust for education level, the odds of participation are 8 times for those with a family size of 7 to 10 people compared to those with a family size of 2 people.

### 4.3 Borehole factors influencing community participation in borehole management

*Table 4: Univariate analysis of Borehole factors*

Characteristic	Description (coding and categories)	Frequency (N=210)	Percentage (%)
Borehole currently operational	1 Yes	201	95.7
	2 No	7	3.3
	3 Don't know	2	0.9
State of the borehole	1 Good (Reliable)	121	57.6
	2 Brings little water	19	9.0
	3 Breaks down regularly	34	16.2
	4 No fence	35	16.7
	5 Brings dirty water	1	0.5
Distance from home	1 Very near (less than 200m)	78	37.1
	2 200 – 500 m	79	37.6
	3 1/2km – 2km	53	25.2
	4 More than 2km	0	0
Other water sources	1 Yes	117	55.7
	2 No	92	43.8
	3 Don't know	0	0

Up to 95.7% of the respondents indicated that the boreholes in their area are functional /operational. However, only 57.6% indicated that these boreholes were in good condition and reliable. 16.2% indicated that the boreholes break down regularly and 16.7% indicated that they have no fence. The estimated distance to the borehole less than 500m for most respondents (Table 4.3.1). 55.7 % of the respondents indicated the presence and use of other water sources apart from boreholes. These are majorly unprotected springs/wells.

### 4.3.2 Bivariate analysis of Borehole factors Vs community participation in BHM

Table 5: Bivariate analysis for Borehole factors and participation in borehole management

Variable	Participate (N=210)	Don't participate	OR	Chi-square (P value)	95% CI	P- value
Borehole currently operational				20.06(0.002)*		
<b>1 Yes</b>	166	15	1			
<b>2 No</b>	3	3	0.09		0.17 – 0.49	0.005
<b>3 Don't know</b>	0	1	1		-	-
State of the borehole				14.09(0.005)*		
<b>1 Good (Reliable)</b>	105	5	1			
<b>2 Brings little water</b>	14	1	0.67		0.07 – 6.13	0.720
<b>3 Breaks down regularly</b>	22	8	0.13		0.04 – 0.44	0.001
<b>4 No fence</b>	28	5	0.27		0.07 – 0.99	0.048
<b>5 Brings dirty water</b>	1	0	1			
Distance from home				5.25(0.072)		
<b>1 Very near (less than 200m)</b>	70	4	1			
<b>2 200 – 500 m</b>	65	7	0.53		0.15 – 1.89	0.330
<b>3 1/2km – 2km</b>	35	8	0.25		0.07 – 0.89	0.032
<b>4 More than 2km</b>	0	0	-			-
Other water sources				2.25(0.134)		
<b>1 Yes</b>	85	13	1			
<b>2 No</b>	84	6	2.14		0.78 – 5.89	0.141
<b>3 Don't know</b>	0	0	-			

\*\*Statistically significant association between the independent variable and participation,

\*Fisher's exact test

From Table 5, the borehole being currently operational was observed to have a significant influence on participation in borehole management (Chi square of 20.06 and P-value of 0.002). The status of the borehole was also revealed to have a significant influence on participation (Chi square of 14.09 and P-value of 0.005).

On the other hand, distance of the borehole from home (Chi square of 5.25 and P-value of 0.005) and presence of other water sources (Chi square of 2.25 and P-value of 0.005) were found to have an un-significant influence on participation in borehole management in Butaleja district.



### 4.3.3 Multivariate analysis of Borehole factors Vs community participation in BHM

Table 6: Multivariate analysis for Borehole factors and participation in borehole management

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Borehole operational				
1 Yes	1		1	
2 No	0.09	0.17 – 0.49	0.18	0.03 – 1.17
State of the borehole				
1 Good (Reliable)	1		1	
2 Brings little water	0.67	0.07 – 6.13	0.84	0.09 – 8.31
3 Breaks down regularly	0.13	0.04 – 0.44	0.22	0.06 – 0.88
4 No fence	0.27	0.07 – 0.99	0.26	0.07 – 0.99

Adjusting for the status of the borehole, it is observed that the odds of participation are 2 times worse (OR= 0.18 Vs OR=0.09) where the borehole is currently not operational compared to where it is operational. Because of this, and also partly due to low level of system reliability and frequent pump failure, many households complain about boreholes and seem unwilling to manage them properly.

### 4.4 Institutional factors influencing community participation in borehole management

Table 7: Univariate analysis of Institutional factors Vs community participation in BHM

Variable	Description (coding and categories)	Frequency (N=210)	Percentage (%)
Presence of a WUC			
	1 Yes	192	91.4
	2 No	16	7.6
Routine meetings			
	1 Yes	141	67.1
	2 No	62	29.5
How frequent are the meetings?			
	1 Once a month	30	14.3
	2 Quarterly	46	21.9
	3 Bi-annual	45	21.4
	4 Annual	13	6.2
	5 Other	11	5.2
Does the WUC comprise of women?			
	1 Yes	191	90.9
	2 No	12	5.7
Do you trust the WUC?			
	1 Yes	185	88.1
	2 No	20	9.5

Table 7 presents the descriptive statistics from the univariate analysis of the institutional factors. It is observed that the majority (91.4%) of the respondents indicated the presence of a water user committee (WUC) in their area and 67.1% indicated that these WUCs meet routinely mostly quarterly or bi-annually. 90.9% of these WUCs comprise of women and the community indicated that they do trust the members on the committee. This is reflected in 88.1% of the respondents stating that they do trust the WUCs. The major activities carried out by these WUCs are repair of the broken down boreholes. However, most committees also play roles such as mobilizing funds and carrying out health education in the community.

#### 4.4.2 Bivariate analysis of Institutional factors Vs community participation in BHM

Table 8: Bivariate analysis of Institutional factors and participation in borehole management

Variable	Participate (N=210)	Don't participate	OR	Chi-square (p-value)	95% CI	P-value
Presence of a WUC				2.59(0.130)*		
<b>1 Yes</b>	159	16	1			
<b>2 No</b>	10	3	0.34		0.08 – 1.34	0.123
Routine meetings				7.19(0.028)**		
<b>1 Yes</b>	126	9	1			
<b>2 No</b>	40	10	0.29		0.11 – 0.75	0.011
How frequent are the meetings?				6.09(0.251)*		
<b>1 Once a month</b>	28	2	1			
<b>2 Quarterly</b>	43	2	1.54		0.20 – 11.54	0.677
<b>3 Bi-annual</b>	40	5	0.57		0.10 – 3.15	0.521
<b>4 Annual</b>	9	3	0.21		0.03 – 1.49	0.120
<b>5 Other</b>	6	0	1			
Does the WUC comprise of women?				0.96(0.413)*		
<b>1 Yes</b>	158	19	1			
<b>2 No</b>	8	0	1.02		0.09 – 6.87	0.834
Do you trust the WUC?				2.71(0.100)		
<b>1 Yes</b>	152	15	1			
<b>2 No</b>	15	4	0.37		0.11 – 1.26	0.111

\*\*Statistically significant association between the independent variable and participation,

\*Fisher's exact test

Table 8 presents the results from the bivariate analysis of institutional factors that affect community participation in borehole management. Having routine meetings was observed to have a significant influence on participation in borehole management (Chi square =7.19 and P-value = 0.028). On the other hand, presence of a WUC (Chi square = 2.59 and P-value = 0.130); Frequency of the meetings (Chi square of 6.09 and P-value of 0.251); the WUC comprising of women (Chi square = 0.96 and P-value = 0.413) and trust of the WUC (Chi square = 2.71 and P-value = 0.100) were found to have an un-significant influence on participation in borehole management.

#### 4.4.3 Overall Multivariate analysis of all factors Vs community participation in BHM

Table 9: Overall Multivariate model

Variable	Estimate (se)	OR	P-Value
Intercept	0.01 (0.915)	1.01	0.989
<b>Borehole operational (ref: Yes)*</b>			
No	-3.09 (1.133)	0.05	0.006
<b>State of the borehole (ref: Good)*</b>			
Brings little water	-1.38 (1.391)	0.25	0.320
Breaks down regularly	-1.94 (0.837)	0.14	0.020
No fence	-1.74 (0.908)	0.17	0.055
<b>Education level (ref: None)*</b>			
Primary	0.91 (0.687)	2.48	0.186
Secondary	0	1	-
Tertiary	-2.13 (1.695)	0.12	0.209
Diploma	0	1	-
<b>Family size (ref: 2 people)*</b>			
3 – 6	2.45 (0.995)	11.7	0.014
7 – 10	2.61 (1.012)	13.6	0.010
Above 10	2.91 (1.209)	18.3	0.016
<b>Routine meetings (ref: Yes)</b>			
No	0.46 (0.784)	1.58	0.558

\*Statistically significant variable,

The parameter estimate for a given category represents the log odds ratio of that category versus the reference category, adjusted for the other factors in the model. The odds of

participation are decreased by a factor of 0.05 or by 95% (odds ratio=0.05) for the respondents that were in areas where the borehole was not operational compared to where it was operational, keeping other factors constant. We also note a very big difference between respondents of different levels of education. The odds of participation for those with primary is about 2.48 times that of those with no education at all and for tertiary education level, the odds of participation are decreased by 88% compared to those with no education (OR = 0.12).

Further, relative to the 2-person families, the odds of participation increased with increase in family size after adjusting for the other covariates. The results also indicate that community members are less likely to participate in borehole management if the borehole is not in good status. Having routine meetings does not significantly affect participation when we adjust for other variables (OR = 1.58; P-value = 0.558).

#### **4.5 Qualitative Results**

The qualitative data was collected from a Focus Group Discussion with members of the water user management committee and the community. This following was emphasized by the key informers who said that the reason for non-participation was;

*“Lack of transparency in the community. The water user committees are not trustworthy especially on the funds that are collected”* [**Community member**]

Another said, *“There are some WUC members that are so rude to the community members. They are arrogant”*

This means that despite many community members trusting their WUCs, trust still plays a significant role in influencing the participation of some members in borehole management.

About the location of the borehole, it was mentioned that “*it can be near someone’s home where the other members don’t like them*” and “*or when the borehole is so far and there are other water sources*”. Some boreholes are also located at institutions like hospitals. Therefore, when they breakdown, the responsibility of repair is left to the institution [**Male FGD member, Tangi village**].

## **CHAPTER FIVE: DISCUSSION OF STUDY RESULTS**

### **5.0 Introduction**

This Thesis aimed at investigating the determinants of community participation in borehole management in Butaleja district. The data used is from a cross-sectional survey conducted in September, 2016. The main outcome of interest studied was participation in borehole management.

This chapter discusses the research findings in relation to the problem statement, literature review of studies conducted elsewhere with and in line with the specific study objectives. It also explains the obtained results from the study. The word univariate is sometimes used to mean a single response but here it was used to mean a single predictor and the same goes for multivariate.

### **5.1 Demographic Characteristics of Respondents.**

#### **5.1.1 Sex and Age**

The study findings indicated that majority (55.7%) of the respondents were female of ages 45 and above (45.3%). This could probably have been due to the fact that most respondents found at home at the time of the survey were females. However, at bi-variate analysis, sex of the respondent did not have a significant influence on participation in borehole management with a P-value of 0.234. This finding was in contrast with findings in a study in Kenya where gender differences were found in the Level of Households' Participation in NGOs Supported Projects in Homa Bay District, Kenya (Osikeet al., 2015). Female respondents complained that sometimes men sabotage the NGOs supported projects. Male respondents on the other hand argued that most NGOs projects target women and children only while neglecting their interests. The argument here is that sometimes when men get involved, they edge out women and do not allow them to participate in projects that are women specific. This notion is

pegged on the premise that women are not supposed to lead while men watch. The issue of gender inequality comes out very clear from the foregoing argument. As Cornwall and Whitehead (2007) argued, most development institutions still have to be reminded constantly on the need for gender analysis even on those projects that affect women directly. This study noted that despite the fact that most respondents were female, participation was higher among males with females being 46% less likely to participate compared to males. It is therefore, necessary that NGOs enact institutional changes on rules and practices that would promote the participation of the right beneficiaries.

Age was also found not to have a significant relationship with Participation (p-value = 0.730). This is in line with a study conducted in Ethiopia where the age of household head (HEADAGE) appeared to have a non-significant and negative relationship with both cash and labor contributions in a study of the determinants of household participation in water source management in Achefer, Amhara region, Ethiopia (Demeke, 2009).

## **5.2 Socio-Economic Characteristics of Respondents.**

### **5.2.1 Religion and Education level**

The study revealed that majority of the respondents 46.2% were Moslem and having attained primary level education (59%). Education level was found to significantly affect participation of the community in borehole management (P-value = 0.002). Osike, 2015 also found Education to be the most influential determinant on the level of household participation on the NGOs supported projects in Homa Bay District, Kenya. Majority of respondents with primary education reported that they participate immensely both as implementers or beneficiaries of the projects proceeds.

This is similar to what was observed in this study in Butaleja District where those with primary level were about twice as likely to participate compared to those with no education at

all. This could be because those with a higher education level do not live in the rural areas since they move away for work. Most community members are farmers and use borehole water often and most of these dropped out of school early. Religion did not have a significant influence on Participation and this expected since water is a community commodity regardless of someone's religious affiliation.

### **5.2.2 Family size and Income**

It was found that most respondents were coming from families of 3-6 people (39%) or of 7-10 people (37.6%) with a monthly income of less than 100,000/- (81.4%). Family size has a positive impact on participation (P-value = 0.002). This seems reasonable, as households with large family size are expected to be more concerned about borehole management given that they use more water than those with smaller households. It could also be that bigger households can easily afford payments and labor contributions towards borehole management.

Income on the other hand did not have a significant influence on participation with a P-value of 0.910. People in rural areas like Butaleja district where this study was conducted often perceive water as a free commodity. This means that households with low income will most likely not spend money for borehole operation and maintenance. However, they often contribute labor such as cleaning around the borehole as they opt to spend their meager income on other subsistence needs. This result is in contrast to what was found by Demeke, 2009 in Ethiopia and also with basic economic theory, which states that individual's demand for most commodities or services depends on income (Mbata, 2006).



### **5.3 Borehole Factors**

#### **5.3.1 Status of the borehole and Borehole being operational**

It was clear that participation was higher where the boreholes are operational compared to where they are not. This means that community members are willing to participate in borehole management when the boreholes are functional. The results also indicate that community members are less likely to participate in borehole management if the borehole is not in good status.

As noted by Kleemeier, 2000 and Biswas, 2005; the cost of investment in water projects and their operation and maintenance is getting sufficiently high that governments, donors and implementing organizations can no longer afford them all. The main challenge is getting enough resources to manage boreholes that frequently breakdown and keep them operating.

#### **5.3.2 Distance of the Borehole from home and Presence other water sources.**

This study found that the boreholes are located within a short distance (less than 200m) from the households. This variable was found not to have a borderline significant effect on Participation in borehole management (P-Value = 0.07). This means that convenience of location of bore hole does not necessarily imply participation in borehole management. However, Demeke, A., 2009 found that convenience of location positively and significantly determined Water use at the household level.

It was noted from the focus group discussions that the existence of alternative water sources such as rivers, undeveloped springs and home-made wells decreased households' willingness to participate especially by paying money for operation and maintenance.

## **5.4 Institutional Factors**

### **5.4.1 Presence of a WUC and women on the committee**

It was generally noted that there are water user committees in most of the areas that were surveyed and that these committees comprise of women. However the variables were not significant in relation to community participation in borehole management in Butaleja district. Presence of a WUC (P-Value = 0.130) and Women on committee (P-value = 0.413). This was probably because the committees mainly carry out roles such as collection of money contributions for operation and maintenance and yet most individuals make their contributions in terms of labor.

This result also implies that the community isn't likely to participate just because women have been involved in management by being members on these committees. In other words, the community has other reasons for not participating and women on the WUC do not necessarily compel them to participate.

### **5.4.2 Routine meetings and Trust of the WUC by the community**

Holding routine meetings was found to have a significant effect on participation (p-values = 0.028). Respondents indicated that they are more willing to participate where routine meetings are held by the water user committees. This means that an active WUC is likely to attract Participation by the community.

Trust of the water user committee by the community was found to have a non-significant effect (p-Value = 0.100) on participation in borehole management despite the majority (88.1%) of the respondents indicating that they trust the WUC. However, as noted from by members during the FGD, *“The water user committees are not trustworthy especially on the funds that are collected”* [Community member]. Another said, *“There are some WUC members that are so rude to the community members. They are arrogant”*; some members of

the community hold different views as regards the issue of trusting the WUCs. Similar results were found in a Kenyan study which showed that most NGOs projects that have collapsed in Homa Bay District were as result of the failure on the part of the leaders chosen to represent the community in various projects in any creative, transparent and objective way (Osike, 2015).

## CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

### 6.0 Introduction

For the community to bear the responsibility of managing and maintaining of boreholes, it is imperative that participatory methods and support mechanisms be formulated and implemented. This requires an understanding of what factors determine this participation and the role played by the community in managing and maintaining these boreholes which was the objective of this study. This study has tried to identify the leading determinants of community participation in managing boreholes and recommend possible solutions to the large-scale breakdown of boreholes in Butaleja District. This chapter deals with the conclusions, implications and recommendations from the study.

### 6.1 Conclusions

From the study findings, the following conclusions can be deduced;

**Demographic factors:** There was no demographic factor that influenced the Community Participation in borehole management. Therefore, neither gender nor age affects participation.

**Socio-economic factors:** Education level and Family size were found to influence Participation. However, Religion and income level did not have an influence on community participation.

**Borehole factors:** The status of the borehole and being operational were significant influencing factors in community participation. However, Distance from home and presence of alternative water sources did not influence Participation.

**Institutional factors:** Having routine meetings had a significant influence on community Participation in borehole management.

Borehole projects should focus on the sustainability of the systems by putting emphasis on the role of the community. Generally, the results of this study suggest that it is important to understand the socio-economic, geographical and institutional settings in a given community in order to increase their participation in water source management for sustainable development.

## **6.2 Recommendations**

From the findings of the study, we therefore recommend the following;

### **To the Borehole Administrative Committees**

- FGD members recommended that re-training of WUCs and advocacy may help to increase community participation in borehole management.
- It was reported that most boreholes are in good state or reliable. However, a significant number reported regular breakdowns and a lack of a fence around the boreholes. These are problems that can easily be corrected through adequate protection and regular cleaning.

### **To the District Health Office of Butaleja**

- Despite the good level of functionality reported, more rigorous strategies need to be formulated to achieve long-term participation of the community to ensure continued management and maintenance for higher water satisfaction.
- Mechanisms that can address poverty to maintain continued participation in terms of payments for operations be formulated. This might be achieved through working to develop strategies that specifically target the poor as a benchmark of service delivery, and that support uses of water beyond basic livelihoods, such as micro-scale irrigation, and horticultural development initiatives. Subsidies and other support

mechanisms may also be designed, which specifically target poor households (Demeke, A., 2009).

**To the government/Ministry of Health**

- Boreholes be located near the households for better satisfaction of daily water requirements. Furthermore, this will decrease the time spent on fetching water and provide more time; especially for women and children to be engaged in other (productive) activities.

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## APPENDICES

### APPENDIX 1: CONSENT FORM FOR QUESTIONNAIRE

**Study title:** Determinants of community participation in the management of boreholes in Butaleja district.

**Purpose of the study:** This study's purpose is to assess the determinants of community participation in the management of boreholes in Butaleja district. What we will learn from the research will hopefully be employed in improving community participation in the management of boreholes in Butaleja district and beyond.

**Introduction:** This research study is being conducted by Isogoli Henry, a student of Masters of Public Health from the International Health Sciences University.

**Procedure:** In case you agree to be a part of this study, we will need you as household head to respond to a series of questions in the attached questionnaire, prepared without prior knowledge of your identity.

**Confidentiality:** The information you will provide will be confidential, and any information disclosed of you will be with your permission or as required by law. Your name will not be used in any information you will avail, except for a code for your answered questionnaire. This includes not publicizing your identity in the research report or any other publications.

**Potential benefits to respondents:** There will be no direct benefits from you participating in this study; however, results from the study will help devise means of improving the management of boreholes in Butaleja district and Uganda at large.

**Potential risks to respondents:** We anticipate minimal interruptions from household work routine and discomfort from some questions if any, and as such, you are at liberty not to answer some questions or exit the study without any consequences.

**Payment for participation:** We will not pay or compensate you in any form for your participation in this study. There will also be no cost to you except your time for participating in this study.

**Investigator identification:** Should you have any concerns in regard to the research, please be at liberty to contact Mr. Isogoli Henry on mobile numbers 0753387891 and 0782 341 227 or on Email: [isogoli@gmail.com](mailto:isogoli@gmail.com)

**Statement of informed consent:** I understand the information and procedure above. All has been explained clearly to me, and my questions have been satisfactorily answered. I therefore accept to take part in this study.

Signature/Thumbprint of Subject: \_\_\_\_\_ Date \_\_\_\_\_

Signature of Witness/Interviewer: \_\_\_\_\_ Date \_\_\_\_\_

Signature of Principal Investigator: \_\_\_\_\_ Date \_\_\_\_\_

## APPENDIX II: QUESTIONNAIRE FOR HOUSEHOLD HEAD

**Study title:** To assess the determinants of community participation in the management of boreholes in Butaleja district.

**Serial No.:** \_\_\_\_\_

**Date:** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

### Section A: Socio-economic Factors

<b>Q01</b>	<b>Sex of the respondent</b>	Male	<b>1</b>
		Female	<b>2</b>
<b>Q02</b>	<b>Age of Respondent</b>	Below 18	<b>1</b>
		18 – 24	<b>2</b>
		25 – 34	<b>3</b>
		35 – 44	<b>4</b>
		45 and above	<b>5</b>
<b>Q03</b>	<b>What is your religion?</b>	Protestant	<b>1</b>
		Catholic	<b>2</b>
		Moslem	<b>3</b>
		Other	<b>4</b>
<b>Q04</b>	<b>Education level</b>	None	<b>1</b>
		Primary	<b>2</b>
		Secondary	<b>3</b>
		Technical/vocational University/college	<b>4</b>
		Diploma	<b>5</b>
<b>Q05</b>	<b>Family size</b>	2 people	<b>1</b>
		3-6	<b>2</b>
		7-10	<b>3</b>
		Above 10	<b>4</b>
<b>Q06</b>	<b>Income level</b>	Less than 100,000/- a month	<b>1</b>
		100,000/- to 200,000/-	<b>2</b>
		200,001/- to 400,000/-	<b>3</b>
		400,000/- and above	<b>4</b>

## Section B: Borehole factors

<b>Participation</b>			
<b>Q07</b>	Have you ever participated in borehole management?	1	Yes
		2	No ( <i>If No, go to 'e'</i> )
<b>Q08</b>	Do you participate in borehole management in this community?	1	Yes
		2	No ( <i>If No, go to 'Q10'</i> )
<b>Q09</b>	If yes, how long have you participated in borehole management?	1	Less than 6 months
		2	6 months to 1 year
		3	1-2 years
		4	3-5 years
		5	Over 5 years
<b>Q10</b>	If not why?	1	Inadequate funding
		2	Inadequate manpower
		3	Animals destroying what we construct
		4	I don't use borehole water
		5	Other: Specify .....
<b>Q11</b>	What's your role in borehole management?	1	Regular payment of O&M funds
		2	Conducting regular checks
		3	Mobiliser(member of WUC)
		4	None
		5	Other (Specify) .....
<b>Q12</b>	Where do you get the water for domestic use?	1	Borehole
		2	Other (Specify) .....
<b>Borehole Reliability/Functionality</b>			
<b>Q13</b>	Is the borehole currently operational and functioning?	1	Yes
		2	No
		3	I don't know
<b>Q14</b>	What is the state of the borehole in your community?	1	Good (reliable)
		2	Borehole brings little water
		3	Breaks down regularly
		4	No fence
		5	Brings dirty water
<b>Q15</b>	What is the distance between home and the borehole?	1	Very near(less than 200metres)
		2	200 – 500 metres

		3	½ km – 2km
		4	More than 2km
<b>Q16</b>	Are there other water sources besides the borehole?	1	Yes
		2	No
		3	I don't know
<b>Q17</b>	If yes, which ones specifically? (tick all that apply)	1	Spring/Well water
		2	Tap water
		3	Other, specify; .....

### Section C: Institutional factors

<b>Borehole Management Committees/WUC</b>			
<b>Q18</b>	Is there any borehole water user committee (WUC) in this community?	1	Yes
		2	No
<b>Q19</b>	Have you ever been a member of a borehole water user committee (WUC) in this community?	1	Yes
		2	No
<b>Q20</b>	How many members does the borehole water user committee (WUC) in your community comprise of?	1	Less than 3 members
		2	4-5 members
		3	6-10 members
		4	Over 10 members
<b>Q21</b>	Are you currently a member of the borehole water user committee (WUC) in your community?	1	Yes
		2	No
<b>Q22</b>	Does the borehole water user committee (WUC) have routine or regular meetings?	1	Yes
		2	No
<b>Q23</b>	If yes, how frequently do they hold these meetings?	1	Once a month
		2	Once in 3 months (quarterly)
		3	Once in 6 months (biannual)
		4	Once in a year
		5	Other (Specify) .....
<b>Q24</b>	What does the committee specifically do? (tick all that apply)	1	Repair of borehole
		2	Mobilizing for O&M funds
		3	Health Education

		4	Hold meetings
		5	Other (Specify) .....
<b>Q26</b>	Does the WUC comprise of women?	1	Yes
		2	No
<b>Q26</b>	Do you trust the WUC to handle borehole management issues?	1	Yes
		2	No



### FGD GUIDE

1. In what ways do people participate in borehole management?
2. What hinders people’s participation in borehole management?
3. What can be done to increase people’s participation in borehole management?
4. Please give your own assessment on the level of community participation in borehole management based on the 5 point scale.

	Very poor	Poor	Fair	Good	Very good
a) Decision making regarding the borehole usage					
b) Control over borehole					
c) Meeting operation and management costs					
d)Controbutinglabour during repair					
e)Participating in general cleaning exercises					
f) Involvement during selection of user commiittee					

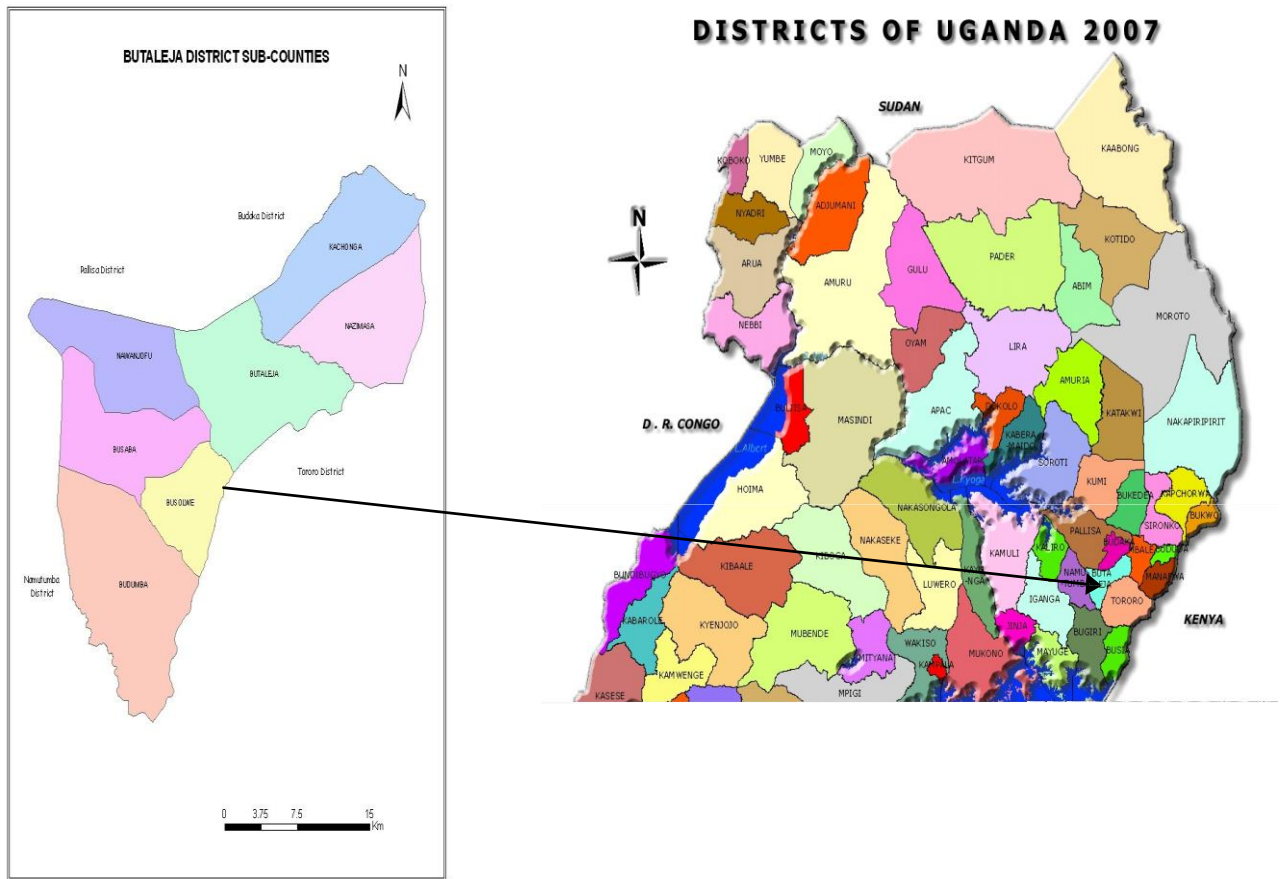
5. Is the water user committee in this village active? YES ( ) NO ( )

Please explain your

answer.....

6. According to you, which socio-economic factors hinder community participation in borehole management in this village?
7. What are the general roles and activities in management of boreholes in this community?
8. Please describe for us the quality of the water that is got from the borehole in your community.
9. What recommendations would you give to the district authorities to improve on the community’s involvement in the management of boreholes in this community and in Butaleja district as a whole?

### APPENDIX III: MAP OF THE AREA



Map of Butaleja District (Source: HIGHER LOCAL GOVERNMENT STATISTICAL ABSTRACT BUTALEJA DISTRICT)

**APPENDIX IV: MAP OF BUTALEJA BY PARISHES**

**APPENDIX V: INTRODUCTORY LETTER AND CORRESPONDENCE**

