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Domestic Water Supply: An Evaluation of the Impacts; Challenges and Prospects on Women in Rural Households in Uganda



A thesis submitted in partial fulfillment of the requirement for the award of a degree of Masters of Science

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Dedication

In loving memory of my dear mother Janet F Abeo Ikara (RIP) and to all the women in developing countries

Abstract

Adequate domestic water supply is an entry point to sustainable development. However, limited access associated with poor water supply, hygiene and sanitation is widening the poverty gap, gender inequalities and the prevalence of water borne diseases. Although the Millennium Development goal 7, aims at reducing the proportion of people without access to safe drinking water and sanitation to halve by 2015, for women in rural households in the developing countries, this seems to be far from reality. This is because though they are often the providers of household water, their needs are not given priority in decisions on domestic water supply; provision, use, technology and management. Uganda has been recognized as one of the countries in Africa that is on track towards the achievement of the MDG water target. However, in the rural areas, domestic water supply for all is still inadequate and this has got negative implications on women. This study aims at analyzing the impact, challenges and prospects of domestic water supply on women in rural households in Uganda. The purpose is to increase the understanding of how the disadvantaged groups; the women can be empowered through recognizing their wisdom and input in the decision making process and ensuring gender equality in water service provision in rural areas in Uganda. The study employs multiple research methods, which are both quantitative and qualitative. Field data from Amuria and Rakai districts in Uganda was collected through use of questionnaires, observations, site visits; semi structured interviews and focus group discussions. Secondary data was obtained through a detailed literature review. A simple analytical framework is developed based on the assessment of how the current domestic water supply system fits the needs of the women in these rural communities in Uganda. The results of

the study show that the needs not fulfilled are; improved water quality, quantity, distance, time, cost, technology, and reliability of the water sources. To adapt to the situation, women's groups and community members have taken the initiative and innovated ideas like construction of rain water harvesting stores that have a capacity of more than 200,000liters but using locally available materials and just a cost of 37\$; They also use ash as a cleanser for drinking water at household. However, women lack the capacity and the ability to influence decisions on planning, implementation and management of the current water supply projects. Therefore, knowledge about the active involvement of women is crucial for gender equality and for the achievement of sustainable development of water supply in rural areas. Further research is particularly needed on the techniques used in water supply construction and treatment to make sure that these techniques also fits the need and capacity of especially women.

Key words: *Domestic water supply, Women, Sustainability, Rural households, Uganda*

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Glossary of Abbreviations:

CAO: Chief Administrative Officer
 CBOs: Community Development Organizations
 CCF: Child Care Foundation
 DWD: Directorate of Water Development
 DWO: District Water Officer
 FGDs: Focus Group Discussions
 GWA: Gender and Water Alliance
 HPM: Hand pump mechanics
 LRA: Lord's Resistance Army
 LWF: Lutheran World Foundation
 MDGs: Millennium Development Goals
 NGOs: Non Government Organizations
 NUSAF: Northern Uganda Social Action Fund
 O&M: Operation and Maintenance
 RDLG: Rakai District Local Government
 RWH: Rain Water Harvesting
 UBOS: Uganda Bureau of Statistics
 UCC: Uganda Communications Commission
 UNDP: United Nations Development Programme
 UNEP: United Nations Environmental Programme
 UNICEF: United Nations Children's Fund
 UNOCHA: United Nations Office for the Coordination of Humanitarian Affairs
 UPPAP: Uganda Participatory Poverty Assessment Process
 WCED: World Commission on Environment and Development
 WEDA: Wera Development Association
 WHO: World Health Organization
 WUCs: Water User Committees

1. Introduction

Water is crucial for sustainable development¹. However, limited access to clean and safe water associated with poor water supply, hygiene and sanitation at household level is widening the poverty gap, gender inequalities and the prevalence of water borne diseases (Gender and Water Alliance (GWA), 2006). This is contributing to 3.7% of the total global disease burden and 2.2million death each year with women and children in the developing countries being the most affected (WHO/UNICEF 2008). Although the Millennium Development goals (MDGs) target 7(c) seeks to “*halve by 2015 the proportion of people without access to safe drinking water and sanitation*” (UNDP, 2005), it is anticipated that Sub-Saharan Africa will only reach the MDGs water target by 2040 (Sutton, 2008). But still, some 400 million of the people living in sub Saharan Africa will be left without access to safe water with a majority of them being women and children living in rural households (Sutton, 2008).

Competition for water has resulted in the collapse of water based ecological systems hence declining river flows and large-scale ground water depletion (UNDP, 2006). This is leading to an increased potential for conflict within and between countries with the rural populations being the most affected (UNDP, 2006, Anand, 2007). Even though the water crisis is observed as a general problem for the rural population, women bare the greatest burden because of their socially gendered roles, which involve looking for and collecting water for their households (Buckingham, 2000, Rodda, 1993). Because of their task of water provision at the households, the participation of women in education, income generating activities as well as in cultural and political engagements is often compromised (Panda, 2007, Karl, 1995).

Consequently, this leads to material deprivation for women, their lack of voice, vulnerability to shocks and lack of capacity to cope with any form of crisis and hence widening the poverty gap and gender inequalities in developing countries (UNDP, 2004, Rodda, 1993). Therefore ensuring easy access to adequate amounts of good quality water by extending provision of water services to rural households in a coordinated and inclusive approach for all people is central to promoting gender equality (Lenton, et al., 2008). Such a step will also contribute to the protection of natural resources which is also essential for environmental sustainability as one of the pillars of the MDGs (Lenton, et al., 2007).

Following the MDGs and the Ugandan constitutional provision on the formal right to water which states that “*the right to water helps to improve access to water for the poor*” (Anand, 2007), the Ugandan government, Non Government Organizations (NGOs) and foreign engineers have been involved in the construction of conventional² communal domestic water supply sources aimed at improving access to water in rural households (Davidson, et al., 1993, Anand, 2007). Despite of these efforts, 44% of the people in rural households in Uganda do not have

¹ Sustainable development refers to “*meeting the needs of the present without compromising the ability of future generations to meet their own needs*” (WCED, 1987). This paper is highly motivated by vision of agenda 21 towards the attainment of MDG water target, which is critical to the enhancement of gender equality among other important aspects based on local levels.

² Conventional communal sources refer to sources that are constructed by government or NGOs which are in line with the government set standards and regulations.

access to clean and safe drinking water (Anand, 2007). This is an indication that the water problem is still persistent in the rural parts of Uganda.

Therefore, there is need for more research to assess the water supply problem in the rural areas. There are a number of scientific research that have been conducted on the state of water supply in Uganda and how the country is trying to address the requirements of the MDGs water targets. However there exists a gap in the evaluation of the extent to which the needs of the disadvantaged groups especially women are met and yet they are the most affected by the water crisis in rural areas. It is imperative therefore that, research that incorporates such vulnerable groups especially women, their knowledge and needs be conducted to aid achieve sustainable solutions towards the water problem and its impacts on these vulnerable groups of people in the rural areas of Uganda.

1.1 Aims of the study

This study is an explorative attempt to analyze the impact of domestic water supply on women in rural households. This is in relation to household water use and collection, water supply systems and technology, roles and responsibilities for investment in water sources, water problems, management and maintenance of the water supply sources.

The general **aim** is to increase the understanding of how the disadvantaged members in society especially the women, can be empowered³ throughout the domestic water supply chain. This study will achieve this by incorporating the knowledge, wisdom, input and needs of the women that are expected to influence the decision making process in relation to domestic water supply in Amuria and Rakai districts of Uganda. Such a study is expected to enhance gender equality in water service provision and aid sustainable development of water supply projects in these communities and other Ugandan rural areas at large.

1.2 Specific Research Questions

To fulfill the aim of the study, the specific research questions are;

- 1) In what way does domestic water supply; provision, use, technology and problems affect women in rural households in Amuria and Rakai districts of Uganda?
- 2) What are the roles and responsibilities of actors' in domestic water supply and how can these affect women in rural households in Amuria and Rakai districts of Uganda?
- 3) What management strategies should be considered to enhance gender equality in domestic water supply in rural households in Amuria and Rakai districts of Uganda?

³ Empowerment in this paper means creating avenues that will increase women's confidence, ability and capacity to influence decisions made on water supply and management in rural communities. This is geared to improving their social, economic, cultural, political and environmental status as members of society

2. Theoretical Background

This section provides a theoretical background to put the aim of the study in a theoretical context. It deals with the water crisis in the developing countries, domestic rural water supply, approaches to water supply and women empowerment and participation in water management.

2.1 The water crisis in developing countries

The cause of the global water crisis is believed to be far from a scarcity problem but rather a result of poverty, inequality, unequal power relations and flawed water management policies evident in most of the developing countries (UNDP, 2006). However, the fact that the voices of the marginalized groups especially women, are rarely heard by the policy makers illustrates another truth behind the water crisis (Perkins, 2008). Governments do not prioritize the needs of the marginalized and without support, even the NGO activities become unsustainable (Perkins, 2008). As a result, 1.1 billion People across the globe as reported in 2004 had no access to an improved drinking water source with a majority of them living in the rural areas (UNDP, 2006, Alford, 2007).

Although water is seen as a source of life and a valuable natural resource that sustains the environment and supports livelihoods, it is increasingly being seen as a source of risk and vulnerability especially to the women (UNEP, 2004, UNDP, 2006). Women are the most vulnerable because in most societies, it is women's responsibility and not a choice to ensure that there is enough clean and safe water for their households. (Buckingham 2000).

It is often emphasized that; in developing countries where coping with the water crisis is almost impossible, millions of women and girls spend most of their time looking for water to meet their households' water needs (UNDP, 2006). Therefore, limiting their participation in productive economic activities especially for the women and low school enrolment for the girls (Coles, et al., 2005). This is worsened by policy constraints and gender inequalities that have resulted in low sustainability of the conventional communal water supplies leaving more people in the rural areas with no access to safe water for domestic use than it was in the 1990s' (Sutton, 2008).

2.2 Domestic rural water supply

One of the critical components of the Millennium Development Goals (MDGs) is increasing access to domestic water supply coupled with improved water resource management and development in rural areas (Lenton, et al., 2008). According to WHO domestic water is water used for all domestic purposes which include drinking, cooking and bathing. Therefore when measuring adequacy of water in the household all such uses should be considered (WHO, 2003).

To ensure that rural households are water secure, it necessary to evaluate the number, geographic location, yield, dependability, season and quality of the water sources (Kahinda, et al., 2007). Besides, equipping people in rural communities with appropriate technologies and skills to enable them harvest rain water and excavate underground water together with effective management of these sources can provide sustainable solutions to the problems associated with the scarcity of domestic water supply in rural households (Malley, et al., 2008).

Improved water supply services in rural areas can in turn give women more time for productive endeavors, adult education, empowerment activities and leisure (Panda, 2007). Therefore,

investment in community based organizations for water management can improve social capital for women through leadership, networking opportunities and solidarity building which can enhance their empowerment in society (Lenton, et al., 2008).

2.3 Approaches to rural water supply

There are diverse sources to supply of domestic water in rural areas. This include; conventional communal sources and self supply sources. The conventional communal sources are justified for improved water quality 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 proved to be not sustainable 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).

Conventional communal sources have also been observed as grounds for social unrest within the communities and are argued to be not funded enough to achieve the MDGs water target (Davidson, et al., 1993, Sutton, 2008). More still, though the coverage of facilities has increased in most parts of Uganda such facilities have been abandoned by the expected beneficiary communities because of the high iron content in the water (Martin, 2007). This poses a challenge to Uganda, a country with more than 80% of its population living in rural areas (UBOS, 2002). As a result, self supply initiatives have evolved as an alternative approach to water supply construction and management (Sutton, 2008).

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). This should be based on locally available and easily affordable technologies to the users in the rural communities (Alford, 2007). 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). However, most of the people in rural areas are poor and so they sometimes try to mobilize their friends and neighbors to improve traditional water sources using local labor and materials. But such sources are often associated with poor water quality and seasonal unreliability (Carter, 2006).

It is important to note that, though the self supply initiatives are private, the use and access to the water source by other households is usually shared at no cost or for a small fee, as a way of promoting social relations (Carter, et al., 2005). This is because water is seen as a natural resource and as a result payment for water in the rural setting is quite unacceptable (Shiva, 1989). However, this leaves the construction and maintenance costs in the hands of the households that initiated the construction of the self supply sources (Carter, 2006). This can compromise access to water among the disadvantaged groups in society especially the women who do not have the capacity and ability to construct and or maintain the domestic rural water supply sources (Alford, 2007).

2.3. Women empowerment and participation in water management

Women are increasingly being seen as active agents of change and the dynamic promoters of social transformations that can alter the life of all members in society (Sen, 1999). However, the manner in which decisions and choices on water resources are handled can have great implications on women who use the technologies to get water and are the end users of water resources in the households (Rydhagen, 2002, Rodda, 1993). Gender sensitivity which involves women participation in water management is important. However, instrumental gender mainstreaming⁴ in water management depends on how the main agenda can address the transformations of gender relations in water supply, use and management (Panda, 2007, Homborgh, 1993).

This is because even in instances where women maybe involved in a water supply project, they are often not given a chance to influence the focus of the projects. Yet women's involvement in the planning of the water projects could actively enhance sustainability since they are the end users of such projects (Rydhagen, 2002). Access to clean water can change gender relations in the household and offer women the opportunity for productive use where their mobility is socially constrained (Sutton, 2007, Karl, 1995). But this is only possible if those responsible for making choices for the technologies for water supply, paying water bills at household level and those who attend water management meetings at community level are identified (Rydhagen, 2002).

⁴ Gender mainstreaming means taking into account the attitudes, roles and responsibilities of both women and men and recognizing that they both have same access to and control over resources and that work, benefits and impacts may vary widely across social and gender groups (Homborgh, 1993). In other words, it involves considering the needs, roles, capacities, benefits and burdens of both men and women, rich and poor, young and old in the decision making process (UNEP, 2004).

3. Methods and Material

3.1 Research Strategy

According to Bryman (2004) a paradigm entails three important dimensions which are Ontology, epistemology and Methodology. This section provides the ideological assumptions on the above 3 dimensions which will support this case study. As mentioned in the previous section this study aims at evaluating the implications of domestic water supply on women in rural households. The focus is on exploring the ‘What’ and ‘how’ questions with the goal of understanding contemporary social discourses and developing pertinent hypothesis for further inquiry on water and women (Yin, 2003). Two case communities are chosen in order to obtain an understanding on the different perspectives of the social phenomenon. By using the same methods of data collection and analysis in both case communities, the results are triangulated and replicated to show how the gender and water issues are accredited by the case communities (Kvale, 1996; Bryman, 2004).

The study employs multiple research methods which are both quantitative and qualitative (Silverman, 2005; Bryman, 2004). Quantitative information is used to measure the degree of gender influence on women involvement in decision making and implementation of the rural water supply schemes. However, such information does not measure the quality of participation and or the level of influence women have when participating (Hochfeld, et al., 2007). Qualitative information is therefore used to measure women’s actual participation which entails their improved confidence and capacity to implement the roles and responsibilities assigned to them throughout the domestic water supply chain with no male interference (Creswell, 2007).

The ontological orientation of this study is constructivist (Bryman, 2004). However, there are many constructive approaches. This study is leaning on the constructive approach of Katherine Hayles (Hayles, 1995) who stresses the importance of ‘interactivity and positionality’. Based on this constructivist approach it is held that through the physical involvement of community members including policy makers and disadvantaged groups it is possible to enhance the empowerment of women as social actors in these communities (Sprague, 1999). This is because gender is recognized as a basic organizing principle that profoundly shapes the concrete conditions of men and women in society (Creswell, 2007). Such assumptions are subjected to empirical scrutiny of which key concepts on water and women are developed and interpreted into researchable entities (Bryman, 2004).

The epistemological orientation of this study is interpretive ideology (Bryman, 2004). The purpose is to obtain a valid and common understanding of societal discourses and action (Creswell, 2007). This is because knowledge can enable us to understand and bring about changes in the social world (Bryman, 2004). But this is only rational if the current structures that generate those events and discourses are identified through the gathering of situated facts (Llewelyn, 2007). These facts are local and grounded in specific physical, social, cultural and historical context (Sprague, 1999). However, each culture brings its own matrix of resources to bear on the construction of its knowledge system (Llewelyn, 2007; Sprague, 1999). As a result previously developed theory is analyzed and used as a template to compare the empirical results of the study in order to make generalizations (Yin, 2003).

3.2 Analytical Framework

To fulfill the aim of this thesis which is to analyze the implications of domestic water supply on women in rural households in the Amuria and Rakai districts of Uganda, and to increase the understanding of how they can be empowered through recognizing their wisdom and input in the decision making process, a simple analytical framework has been developed. As seen in figure 1, it is simply based on the assessment of how the current domestic water supply system fits the needs of the women in the rural communities. The needs are related to improved water quality and treatment, quantity of water used in the household, distance to the water source, time they take to collect water, cost of construction and maintenance, technology used in supply construction and management, seasonal reliability of the water sources, the number of households using the same water source and women involvement in management. The findings were summarized in Excel (Microsoft office 2007, windows vista version). Data was organized and the sum and averages for each variable was further analyzed using pie charts, graphs and tables. Based on these findings the room for women's empowerment in water supply is discussed.

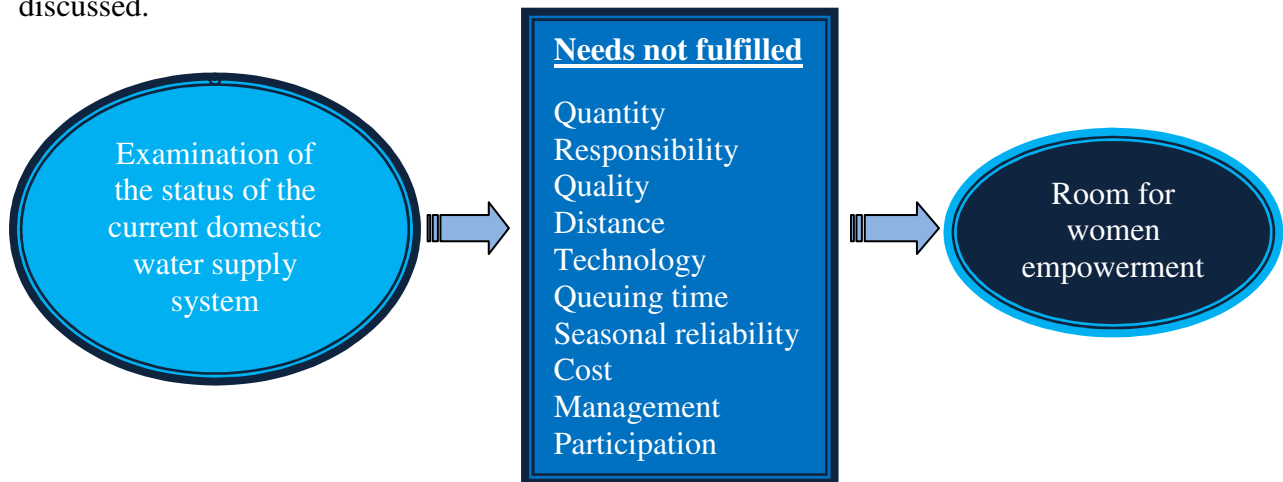


Figure 1. Description of the analytical framework

3.3 Study Area

Uganda is located in East Africa astride the equator. It covers an area of 241,039 square kilometers (UBOS, 2006). Agriculture is the main economic activity composed of basically subsistence farming and light agro based industries. It has a decentralized system of governance though the central government retains the role of policy making, setting standards and supervision (UBOS, 2006). The Ugandan ministry of water and environment holds the responsibility of water provision and the ministry of gender and social development is in charge of the overall issues on gender and women empowerment. Uganda holds the largest share of the East African total average renewable fresh water resources with Lake Victoria being its largest fresh water provider (UNEP, 2002). It has a relatively high altitude which offers it a favorable climate with two rainy seasons experienced in the central, Eastern and Western part of the country. However, towards the north, the rainy season is just once a year which makes the areas around semi arid (UBOS, 2006).

3.4.1 Selection of Case Communities

The two case communities were selected with help from the commissioner for rural water and sanitation department in the Ugandan ministry of water and environment and the district water officials. The researcher also read through the reports from the district water offices to gain a detailed overview of the on ground information of the proposed communities. The two communities were selected basing on the following criteria; a) Amuria had a high underground water potential, b) Rakai depends on rain water harvesting for domestic water use, c) the domestic water coverage is very low and therefore the communities are water stressed, d) there is private or communal initiative in construction and management of these water sources, e) women play a great role in water supply provision, construction and management, f) Communities play an active role in the operation and maintenance of the water supply schemes.

3.4.1.1 Amuria District

Amuria is located in Eastern Uganda; it is a new district formed in 2005, and has been through an emergency situation as a result of the Lord's Resistance Army rebels (LRA), cattle raiding by the Karimojong worriers and the 2007 floods that were experienced in Uganda (UNOCHA, 2006, ACT, 2007). According to the Amuria district officials, the total projected population as of 2008 was 291,300 people. The district comprises of two former counties of Katakwi which are Amuria which has five sub counties that is; Wera, Kuju, Asamuk, Orungo and Abarilela and Kapelebyong which has two sub counties that is; Acowa and Kapelebyong. Water availability and supply in the area is fair but it is highly affected by seasonal variations. As a result the water yield/level in most of the boreholes gets very low in the dry season and in most instances also the traditional wells dry up.

This particular study was carried out in households in **Acowa** and **Kapelebyong** sub counties but the official respondents were sampled from all around the district. The main language spoken in the area is Ateso but most people understand English which is the official language in Uganda. The main economic activity is agriculture and livestock farming which is practiced by over 90% of the population (UCC 2007). The production is mainly subsistence agriculture (for household consumption). The main crops include; cassava, sweet potatoes, peanuts, sorghum, finger millet, cow peas, green grams, sesame seeds, cotton and sunflower, rice, maize, beans, soya beans and citrus.

3.4.1.2 Rakai District

Rakai district is located is south central Uganda. It borders the north western Tanzanian district of Kagera in the south which exposes it to cross border commercial traffic to and from Bukoba (UPPAP 2002). It was the first district in Uganda to have been hit by the HIV/AIDs epidemic of which its consequences are still being experienced up to date (UPPAP 2002). According to the Rakai district local government officials the total projected population as of 2008 was 449593 people (RDLG).

The main economic activity is agriculture with emphasis on food crops such as cassava, maize, sweet potatoes, sorghum, bananas and finger millet. However, the area is also famous for cash crops such as coffee, fruits and vegetables like tomatoes, pineapple, onions and cabbage. There is also animal ranching which includes cattle, goats and chicken and small scale fishing carried out

water supply and gender equality in rural areas (Hermans et al., 2008). The main stakeholders⁵ expected in decision making on domestic water supply in Uganda are women, men, government, NGOs/CBOs and donors (Mills 2006).

Policy decision making should be a negotiation process in which agreements on water supply construction and management are reached on by exchange of control over issues between all the stakeholders (Timmermans 2008). However, in Uganda women tend to be left out. Even when they are involved in the WUCs their ideas are not given priority. For government engineers, exploitation of new water sources with the best available technology is what matters (Tillman et al., 1999). While for the men; women are limited to domestic issues and not to compete with men in communal meetings. It's crucial for all stakeholders to realize that they are dependent on each other now and in the future. Three dimensions that explain actor behavior are: perceptions, values and resources (Hermans et al., 2008). Figure 3 gives an overview of these dimensions basing on the Ugandan domestic rural water supply context.

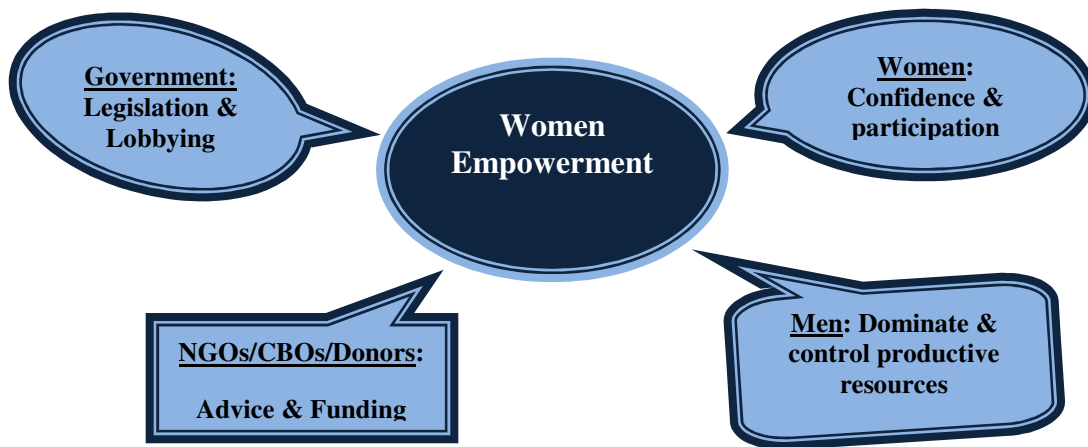


Figure 3: A stakeholder dialogue arena

3.5 Collection of Empirical Material

3.5.1 Questionnaires

Questionnaires were prepared and administered to the general public and district officials in both districts. The questionnaire for the general public consists of 39 questions divided into 4 sections and the one for the officials consists of 34 questions divided into 6 sections (see Appendix 1&2). The aim of section one was to get an overview of the respondent's background. This helped the researcher to understand the socio-economic gender relations in the households. Section two addresses the key aspects in relation to water use and demand in households like access, quantity, quality, time, distance, cost, and reliability. This was used in analyzing the extent to which the current domestic water supply affects women in rural households.

Section three aimed at analysis of the applicability of the technology used in supply construction and management and section four addresses issues on the roles of women and men in the

⁵ Stakeholders refer to individuals or organizations who are actively involved and or whose interests maybe affected as a result of the project activities (Ward et al., 2008).

management and maintenance of the water sources. This provided an understanding on the importance of local participation and women empowerment in rural water supply management. The questions in most of the sections in both questionnaires are somehow inter-related except for section 6 in the official questionnaire that addressed issues in relation to policies and strategies on women empowerment and participation in water management.

The general public questionnaires were administered to 36 respondents in Amuria and 28 respondents in Rakai. The **respondents** in Amuria included 24 men age 22-65years and 12 women age 19- 64years, while in Rakai 15 were men age 22-75years and 13 women a majority of them did not specify their age but all were adults above 18years. The official questionnaires were administered to 10 respondents in Amuria and 5 in Rakai. The men dominated the interview process because they are the majority household heads though some men delegated the task of answering the questions on water issue in the questionnaire to their wives since they are the ones responsible of collecting water in households. While for the official questionnaires most of the key positions in the district are held by the men and they are the main policy makers in the district.

The researcher with the help of an interpreter and research assistants physically administered the questionnaires. Two research assistants were selected in Rakai and three in Amuria district. The interpreter and the research assistants were selected basing on three criteria a) previous involvement in administering questionnaires, b) understanding the local language, c) University graduates. The researcher briefed them on the purpose and process of the research and guided them throughout the research process. This enabled the researcher to collect the data within two weeks. The researcher also was given a golden opportunity to attend the Amuria district meeting where all the local government officials were present. This enabled the researcher to carry out a spot on assessment of the water situation in Amuria district. Most of the official questionnaires were distributed to the respondents and they were given time to fill in the answers by themselves. But the researcher also had a dialogue with the district officials who included; Chief administrative officers (CAO), district water officers (DWO) and the town clerks.

The **positive experiences achieved** during the interviews include; a) most respondents were willing and open to provide information especially the women, b) Questionnaires were successfully administered c) The study helped the researcher to identify water stressed villages in the district, and also interact with the leaders and the water users. However, there are a number of **challenges** that were encountered through the research process. These include; a) the unwillingness of some respondents because they expected a safe water supply and were not interested in more interviews as similar studies had been carried out in the area with no output or feed back to the community, b) Households were scattered and therefore we had to walk long distances, c) The weather was unfavorable in that it was too hot in Amuria and too rainy in Rakai which made it hard to walk long distances, d) Male respondents were not so receptive as compared to the female respondents. This is because men felt water issues in the household are women's responsibility and therefore the women could be more knowledgeable; It was also observed that e) Respondents had high expectations including financial support, f) most respondents were illiterate and were not well informed on water supply and management issues and g) Most women tended to shy off from participating in the interviews as they felt that it is their husbands voice that should be heard in society but this was especially experienced when

they were interviewed by a male research assistant. h) Most officials especially from the DWD did not hand back the questionnaires which were given to them.

3.5.2 Focus Group discussions (FGDs)

FGDs were conducted with volunteers from both districts. The purpose of the FGDs was to jointly construct meaning and knowledge (Bryman 2004). The researcher was interested in understanding how people discuss the water issue as members of a group rather than simply as individuals. Two FGDs were held in Amuria with 22 volunteers who included 18 women and 6 men each group composed of 12 members. While in Rakai one FGD was held with 8 volunteers of whom 7 were women and 1 man. In each FGD there was one moderator and an interpreter, these were selected by the district officials because they are known as good interpreters. The reason for the different numbers is that the mobilization in Amuria was much easier because the researcher engaged the local leaders who helped to mobilize the community members.

In the FGDs, the researcher was much interested in interacting with the women since many of the respondents for the questionnaires were men. Interviewees were selected basing on the criteria that; a) they had been involved in domestic water provision, supply construction and management, b) they are members of the water user committees (WUCs), c) members of the informal women's groups engaged in water activities in the area, d) those who indicated in the questionnaires that they wanted to participate in the interviews with the rest of the community.

The FGDs in Amuria were held at the sub county headquarters, while in Rakai it was held at the premises of the leader of the informal women's group called "Bakyala Kwekulakulany". These venues were selected by the community members themselves. Each FGD took about 2 hours to complete. Though the participants were volunteers the researcher had to make an informal monetary contribution towards their project activities. The participants brought to the fore important issues on domestic water supply that are significant for the empowerment of women. It was particularly interesting to see and hear different arguments from the interviewees own perspectives as they frequently challenged each others' views. It was far more interesting to see how people attached meaning to the water problem and the importance of having women as empowered members in the construction and management of the water supply projects.

However, the FGDs were limited by time and resources, some of respondents did not turn up in time, some seemed to dominate the discussion and some were quiet most of the time. The discussion was "fairly free rein" (Bryman 2004) but the researcher often encouraged everyone to say something concerning the most important issues. The **opportunities** gained from the FGDs include; a) the importance of involving local leaders. The research process was successful because local leaders were involved as they helped in mobilizing the community members, b) the need to give feedback to the communities. This should be both to the respondents, Sub County and the district officials.

3.5.3 Observation, Unplanned Interviews and Site visits

The researcher also carried out field observations, unplanned interviews and site visits with the guide of the local leaders and the district officials. The purpose was to gain "situated knowledge" to fulfill the interests and the objectives of the study (Llewelyn 2007). These were basically carried out at the water sources of each locality, which include boreholes, RWH, traditional

ponds/wells and dams, and also households in the communities. The researcher observed the work carried out especially on water supply construction by the main management teams. These activities took place along with the administration of questionnaires. In the process when deemed necessary, 'special' interviews were carried out with the innovators of the techniques for water supply and treatment and leaders of the management teams.

These interviews were 'semi structured' and the questions used were interrelated with those in the general questionnaires (Silverman 2005, Kvale 1996). It was interesting to physically see and internalize the real water supply systems, especially as most people wanted to show me what is really happening on the ground. However, time and resources were limited, most of the water sources were not easily accessible and sometimes some people were not willing to participate in these types of interviews because they were not informed in forehand. The researcher also relied on the interpreter and in the process; some important information could have been lost.

3.5.4 Secondary Data

A detailed literature review of the related documents on water, women and sustainability was carried out. The main search engine was Elin, Google scholar, WHO websites and other documents were obtained from the Ugandan ministry of water and Environment and the district planning offices. The main search words were; water, women, empowerment, gender and MDGs. The criteria for selecting the documents was; a) Peer reviewed papers published in international journals with priority given to recent papers from the year 2000 and above, b) the abstract covered issues in relation to women, water and empowerment, gender equality and analysis. The purpose of the literature study was to come up with theories with which the researcher used to make analytic generalizations of the empirical data collected. However, there was limited data in relation to the topic especially in Uganda.

3.5.5 Ethical Considerations

The observation of the ethical issues in the field made this study successful. The researcher built mutual relationships with the interviewees by being sensitive and giving respect to the cultures of the people in these communities throughout the research process (Kvale 1996). I remember one comment made by the officials in Acowa Sub County; *'we like the way you are dressed because it fits our tradition and so we are volunteering to go and mobilize for you the people who can participate in the FGDs'*. When I asked them what is unique with our dressing, they said; *"most young ladies these days like to wear trousers like men, the advantage with you is that you are wearing skirts and they are long so you will not offend the local people"*. By consulting and recognizing the input of the people in these communities, the researcher is highly committed to creating knowledge that is expected to contribute to their empowerment in society (Scheyvens et al., 2003).

4. Results and Analysis

4.1 General information; household water use and water collection

This section provides a general overview of the respondents' background and how it affects water use, collection, allocation and gender relations in rural households in Amuria and Rakai districts of Uganda. The key issues identified are; education, occupation, relations in the households, income, household size, bread winners and expenditure control. These highly determine the water use and demand in the households and the extent to which women get involved in domestic water supply, planning, provision, construction, maintenance and management. An understanding of these issues can help policy makers to see which areas are critical for enhancing women empowerment. Table 1 gives a summary of respondents' background in both districts.

Table 1: Description of the respondents' background

Respondents Background		Amuria %	Rakai %
Education	Primary	45	59
	Secondary	16	22
	Tertiary/University	34	16
	Never been to school	5	3
Occupation	Formal	31	21
	Informal (Farmer & small business)	69	79
Relationship	Household head	81	57
	Spouse	14	39
	Others	5	4
Household size	Adults (>18years)	38	42
	Children (<18years)	62	58
Annual income (Ug shs)	<100,000	39	
	100,000-500,000	47	43
	>500,000	14	57
Bread winner	Husband	60	93
	Wife	24	7
	Both	16	
Expenditure control	Husband	29	61
	Wife	28	7
	Both	43	32
Household Expenditure	Water	7	10
	Food	38	37
	Energy	4	9
	Clothes	26	7
	Others (Medical & School fees etc)	25	37

Note: by the time the study was carried out; 1\$=1900Ugshs

There are variations in household income in that a majority of the people in Rakai earn above 263\$ per annum. The difference in the annual household income is because people in Rakai sell their produce to the city dwellers since they are close to the big cities including Kampala, while in Amuria food production is mainly for subsistence and little or nothing is sold in the outside markets. As a result most people in Rakai had the capability to invest in private rain water harvesting (RWH) facilities as compared to Amuria where 86% of the people earn less ~263\$ per annum.

Although bread winning was a shared responsibility in Amuria, it was also observed that a majority of the households who had women as the main bread winners were mainly households headed by widows who lost their husbands during the time of emergency as a result of the Lord's Resistance Army rebels (LRA) and the Karamojong cattle raiders that is common in the region. The region has been totally left with abject poverty with a majority of the people depending on food aid.

The average household size in Amuria is 9 people as compared to Rakai with 7 people though in both districts children were majority household members. This portrayed a direct link with the amount of water use and demand. Amuria was also evident as having more dependants as compared to Rakai though they both have got a high number of orphans whose parents died as a result of rebel activities for the case of Amuria and HIV/AIDs especially in Rakai. It was significant that people in Amuria were likely to take more trips to collect water because they depend entirely on communal sources. However, in some cases people go as a group in the family and collect water once or twice a day with children carrying ~20liter utensils of water on their heads.

4.1.1 Water use in the household

The main uses of water in the households in both districts are drinking, cooking, and washing clothes, cleaning including personal hygiene and other activities like watering animals and plants. The average household water use in Amuria district is 80liters/day, while for Rakai district the average water use per household is 40liters/day. However, this varied per household depending on the household size and priority of activities water is allocated to. The respondents said it is very difficult to collect water because facilities are few and the distance to the source is long and so the little water collected is used sparingly. In Rakai the rain water harvested is saved for drinking during the dry season but the capacity of the tanks is not good enough to meet the demand.

People in Amuria, preferred to take animals to drink water at the source and sometimes washing and bathing is done at the source when one goes to collect water. Washing clothes is done always once or twice in a week and not on daily basis. The difference in the amount of household water use in the districts is because of the fact that in Amuria the clean water sources are mainly communal and not paid for on a daily basis. But the respondents in Amuria also said that the region is very hot and therefore they drink a lot of water. Figure 4 shows the average percentage of water used for each activity in the household.

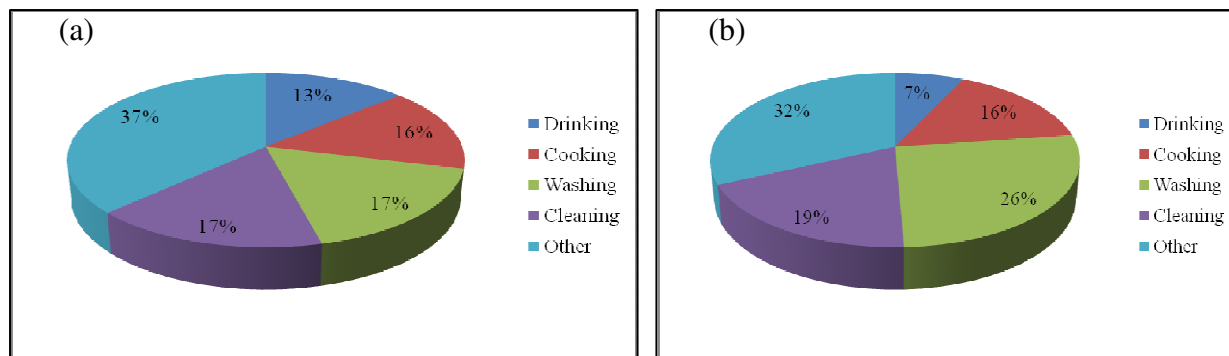


Figure 4: a) Water use in Amuria b) Water use in Rakai

4.1.2 Responsibility of collecting water for household use

Women and children are the main people responsible of looking for and collecting water in these communities, although men sometimes do help their wives when they are sick and or when the nearest water sources in the village is broken down or not functional. This is because they have to go to the other alternative sources which are in most instances far away from the villages and sometimes quite difficult for the women and children to collect the water. The men however do not carry water on their heads like the women do but they go by bike to the nearest villages to collect water for household use. However, for widowers and those who separated with their wives, children bare the greatest burden. It should be noted that the respondents did not specify if it is only the girls or boys who help, but all the children in the household participate in water collection. Figure 5 below shows the distribution of those responsible of looking for and collecting water for household consumption.

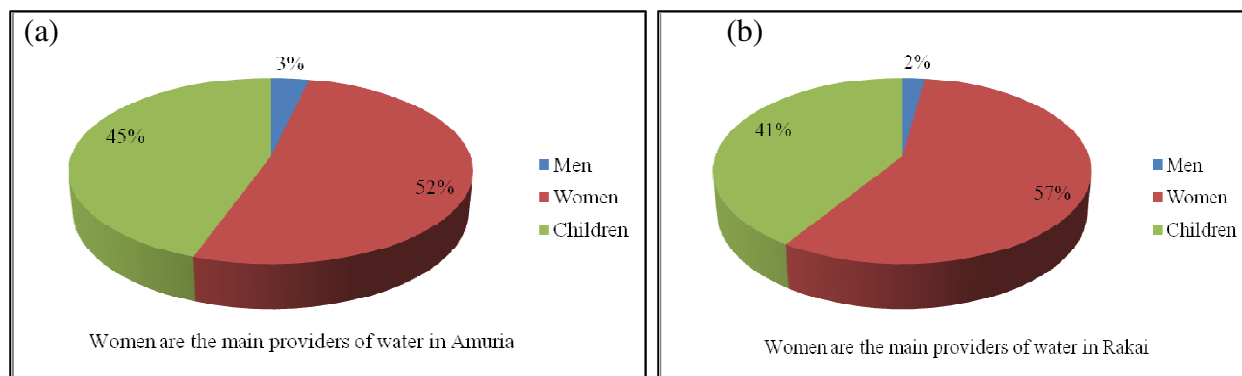


Figure 5: Distribution of those responsible of collecting water in a) Amuria and b) Rakai

4.1.3 Issues considered when collecting water

The issues considered when collecting water for domestic use in rural areas are; easy access, water quality, reliability, cost and management (Carter, et al., 2005). The respondents rated this issues on a scale of 1-3 with 1-not much, 2-quite much, 3-very much. Figure 6 shows the different responses for each characteristic.

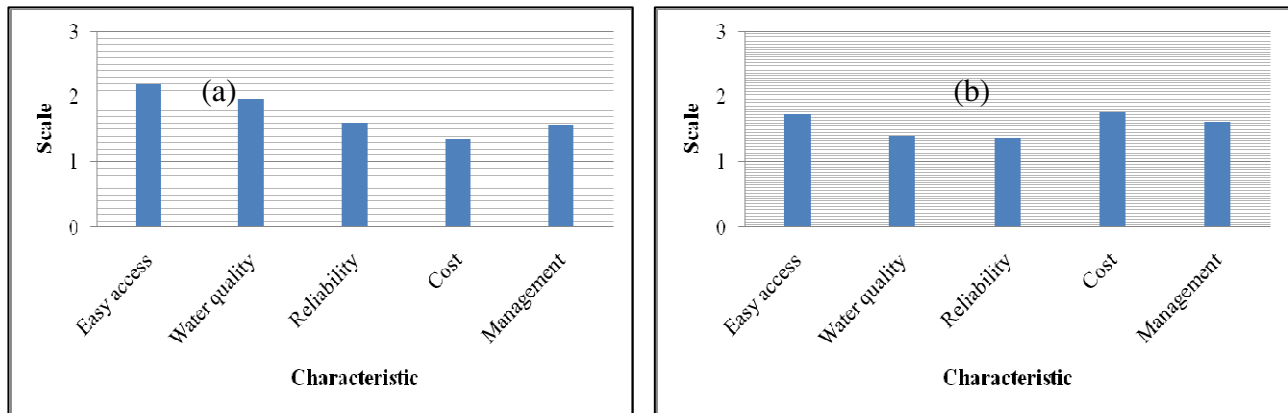


Figure 6: Issues of concern on water sources in **a) Amuria** and **b) Rakai**

As seen in figure 6 above, easy access is the main issue considered when people are looking for and collecting water for domestic use. This is because easy access helps to save time since one does not have to walk long distances to collect water, neither wait in long queues. Although water quality is observed as equally important most people do not have an option but are forced to use the open traditional wells and ponds available in the community. However, most of the existing water sources are also seasonally unreliable in that they dry up during the long dry seasons now experienced in the country. In Amuria people are not affected so much by the cost of water because currently each household pays a monthly contribution of 500-1000Ugshs/month as borehole maintenance fees though the officials said that some households are still unable to contribute. However, for Rakai cost is very significant because people have to construct RWH tanks at household level which are very expensive and those who cannot afford have to buy water from their neighbours. People also take into consideration proper management because it enhances the functionality and sustainability of the water sources.

4.2 Water supply sources and techniques

4.2.1 Communal water supply

The main source of water supply in both districts is communal sources. In Amuria 92% of the households collect water from communal sources while in Rakai district, 71% of the households depend on communal ponds especially during the dry season. However, such sources are very far away from the households and are often too congested. The main technological option used in Amuria is drilled boreholes fitted with submersible pumps and pipes, while in Rakai it is mainly RWH and ponds. According to the officials, Amuria has high underground water potential as compared to Rakai. In Amuria, more than 42% of the households depend entirely on boreholes as their main source of water, while in Rakai, 91% of the households depend on RWH.

The other techniques used in Amuria include shallow wells including hand dug wells and spring wells which supply water to 50% of the households. However, 5% of the households in Amuria also use RWH and 3% use piped water. While in Rakai, 9% of the households depend entirely on water supply from traditional ponds/wells. The officials in Rakai said that other techniques like valley tanks, gravity flow schemes, lakes/rivers and tap water are also used in the district.

However, 39% of the people in Rakai said they would prefer to also have boreholes but the district officials said such a technique is not a feasible option especially for Kooki County.

According to the Rakai district officials, in Kooki County where the study was carried out, underground water is highly mineralized and therefore the coverage in terms of facilities is very low. The only possible alternative water source is RWH of which the district is trying to construct communal RWH tanks. But even then, the capacity is too low to meet the demand especially during the dry season and as a result most people tend resort to traditional ponds. However, they often advice people to use their water sparingly and harvest rain water with the local utensils for use during the rainy season meanwhile save the water from communal tanks for dry season. Though Amuria has high underground water potential and good for boreholes, they are very expensive to be constructed by the general public and RWH is not so feasible because the area is semi arid. However, because of the water supply shortage in the area, they organise as a community to construct water sources that they share. This is further made possible with the help of Non government organizations/community based organizations (NGOs/CBOs) that are actively involved in the construction of communal water sources.

4.2.2 Self supply

People also collect water from private sources located at the individual premises which are sometimes shared with neighbours especially during the rainy season as is the case in Rakai. However, people in Amuria said that they are very poor and therefore can not afford to construct their own personal sources in the household, although they would like to have one.

The 'water store' in Rakai

When I visited Kasangala village in Kasamba sub county in Rakai district, I came across a man who because of the hardships his family was facing due to lack of clean and safe water in the village, he had innovated what he called his 'water store'. It is interesting to note that his idea had also been emulated by other people around the village. The 'water store' is used as rain water harvesting (RWH) facility and it has been in operation for 6years. The store is made up of locally available materials (clay, sand, iron sheets with gutters connecting from the main house) and it is built in the form of a small house ~15m² with no partitions. The unique thing about it is that a polythene bag which costs ~70,000 Ug shs (~37\$), is covering the inside of it. . The man said that the polythene helps to keep the room from getting moist and also to keep the water from flowing out. He also remarked that he uses the water store as a source of water for his family but at the same time he is collecting more water than the family needs and it has also become a business for himself.

He sells his water especially during the dry season at 500 Ug shs per 20liters and he earns ~ 420,000 Ug shs annually. From his earnings, he is able to pay school fees for his children and also meet other household expenditures. He said his 'water store' has a capacity of more than 200,000liters. The facility is cleaned once or twice a year most especially when the collected water is all used up. This is done in preparation for the next rainy season and also to keep the water source clean. The maintenance of the water store is entirely done by him with the help of his family members especially the wife. However, when the water is completely used his family also resorts to the traditional communal wells, of which the nearest is about 4km and the other is

7km from his home. He said that the government recently constructed some rain water harvesting tanks in the village but they are not yet in operation. However, there are too many households in the village that are expected to share the communal RWH tanks and he thinks the capacity of the tanks may not be enough to meet the demand. Figure 7 demonstrates how the ‘water store’ looks like both from the outside and inside.



Figure 7: (a) the outside view of the water store and (b) inside view of the water store

4.2.3 Traditional water supply sources

Due to supply variability from the improved water sources, people in both districts resort to unprotected traditional wells and springs. In Amuria, 65% of the households resort to traditional wells like dams, shallow wells, and hand dug wells and unprotected springs, while in Rakai district, 100% of the households resort to the traditional ponds as alternative sources of water. However, because of the poor water quality from these sources, 31% of the people in Amuria resort to the nearest boreholes often located in other villages but the distance is too long and they have to take a long time just to collect 20-40liters per trip. As a result 4% of the households in area resort to buying water from people who move around the village selling water always at a fee of >200Ugshs/20liters.

The traditional sources are not protected and as a result children are exposed to accidents as they sometimes play around the water source. Animals also share these sources together with people hence compromising the water quality. Figure 8 shows the traditional well/pond; rural households in Amuria and in Rakai respectively go to collect water especially during the dry season. Because these wells/ponds are not protected the water is dirty and needs to be treated. The ladies I found at the source said “*we have to send away the animals and have our turn. The water is often very dirty and therefore one has to clean up the source by scoping the dirty water out and wait for the clean water. This takes a lot of time and energy but we have no option because there are few boreholes and they are congested*”.



Figure 8: The traditional well in a) Acowa Amuria district, b) Kooki County Rakai district

4.3 Roles and responsibility for investment in new water supply systems

The construction of water facilities in both districts is initiated by the community members. In Amuria, 91% of the respondents said it is community members who are responsible of making the decisions on the construction of the facilities and in Rakai 44% said it is the community members. For the other sources 3% of the respondents in Amuria said its government/NGOs, 3% said it is the husbands and 3% said the women make the decisions. While in Rakai, 17% of the respondents said it is the men, 26% said the women, 4% said individual initiatives, and 9% said its NGOs/CBOs. It should be noted that in Amuria those who said it is a communal decision referred to the communal sources like boreholes and shallow wells because it is not possible for them to invest in private sources. While in Rakai the communal sources referred to are ponds and for the NGOs/CBOs there is a woman's group formed by the women in the community. The women construct RWH tanks in households and sensitize on hygiene and sanitation. However, in both districts there is a high community influence though it is more significant in Amuria district.

4.3.1 Contributions towards construction

The water users contribute towards construction either in terms of money or labor in both districts. However, in Amuria monetary contributions per household is less as compared to Rakai because for Amuria the cost is shared among the community members while in Rakai the cost is laid on respective household. In Amuria, 79% of the respondents contributed towards the construction of the water facilities and 21% did not make any contributions towards construction. While in Rakai, 77% of the respondents contributed towards constructions of the water facilities and 23% did not contribute. Among those who contributed, in Amuria 45% made monetary contributions which on average was 12000Ugshs, while 38% contributed labor, 10% provided food for the workers and 7% contributed produce which include cassava and potatoes. While in Rakai 94% made average cash contribution of 55,000Ugshs but this differed for each household depending on the type and capacity of the facility and 6% contributed in terms of labor. Figure 9 shows the distribution of cash contributions per household in each district. It should be noted that

only 14 people in Amuria and 16 in Rakai specified the amount of money they contributed towards the construction of the water sources.

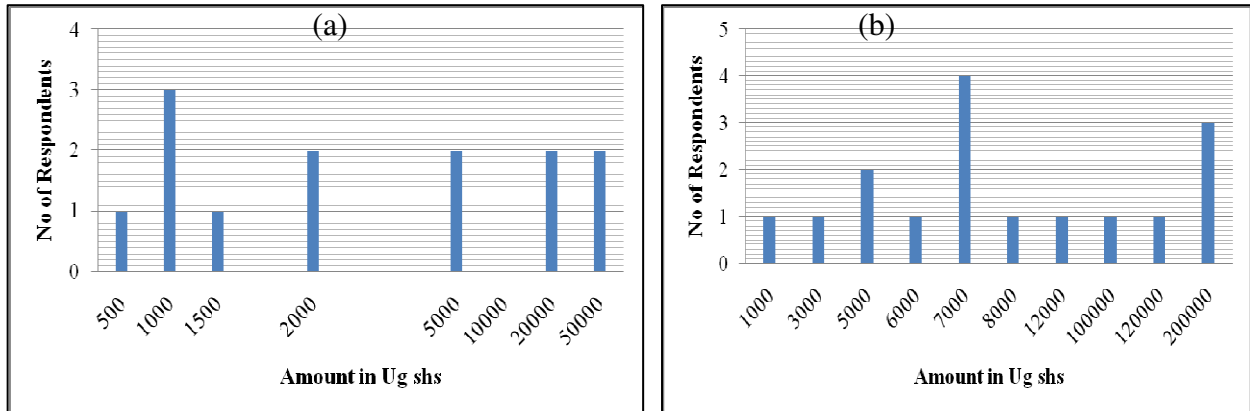


Figure 9: Contributions to construction in a) Amuria and b) Rakai

4.3.2 Subsidies towards construction of new water supply systems

The cost of construction of water supply systems is sometimes subsidized by the government and NGOs/CBOs working in the area. In Amuria the sub county official said that 50% of the cost of construction is subsidized by the government and NGOs/CBOs while in Rakai the respondents said, 39% of the cost is subsidized by an NGO called DIFA which is operating in the area. The subsidies are in form of materials and technicians. However, 50% of the people in Amuria said the cost of construction is not subsidized and also 61% in Rakai had the same view. The NGOs/CBOs working in Amuria on water and sanitation include Northern Uganda Social Action Fund (NUSAF), Wera Development Association (WEDA), Child Care Foundation (CCF) and Lutheran World Foundation (LWF).

In Amuria, WEDA is actively involved in the construction of RWH tanks. The capacity of the tanks is ~80,000liters; these are located in households with iron sheet roof. The NGO basically provides materials and labor while the owner of the household provides the technicians with food. The tanks are constructed in villages with no boreholes and the owners are encouraged to share the use of the water source with other households around the village. However, RWH is only functional during the rainy season and the capacity of the tanks is not enough to meet demand because up to 20 households share the same source.

4.4 Water supply problems; Reliability, distance, time, cost, water quality and treatment

4.4.1 Seasonal unreliability of the water sources

Domestic water supply is highly affected by seasonal variations most especially during the dry seasons. In Amuria traditional sources like shallow wells, springs and hand dug wells dry up during the dry seasons, rain water harvesting is not also possible and the water table from boreholes also gets so low. While in Rakai where people depend entirely on RWH for clean water, people said the long dry spells brought about by the climate change leaves them with a great water shortage. This is because the capacity of their RWH tanks is not good enough to save water for the dry season. More still, in Amuria too much rain during the rainy season leaves most

traditional sources flooded making it very hard to fetch water from such sources. However, for Amuria most households use communal boreholes which they said are quite reliable though they become so congested during the dry seasons. Figure 10 shows the respondents reactions on the seasonal reliability of water sources.

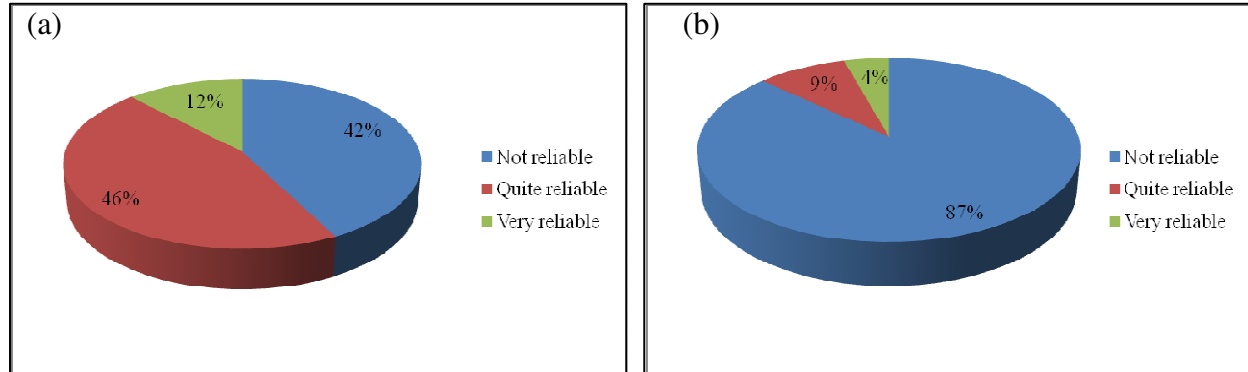


Figure 10: Seasonal reliability of the water sources in a) Amuria and b) Rakai

Seasonal unreliability highly affects the use of water in household. The most affected groups in the community are the women who were identified by 78% of the official respondents in both districts. The other groups include children identified by 11% of the respondents, 5% said all the community members, 6% said cattle keepers. However, none of the officials said that the men are affected the reason being it is mainly women’s responsibility to ensure there is water for household use. This puts a lot of burden and risk on women because they always have to look for all alternatives to meet the household water needs.

4.4.2 Distance to the water sources

People travel long distances to collect water though the distance varied in each district and also for households. In Amuria the average distance to the water source is 1.6km while in Rakai it is 2km. The number of respondents travelling a specific distance for each district is shown in figure 11. This result is based on the 36 responses from Amuria and 25 in Rakai.

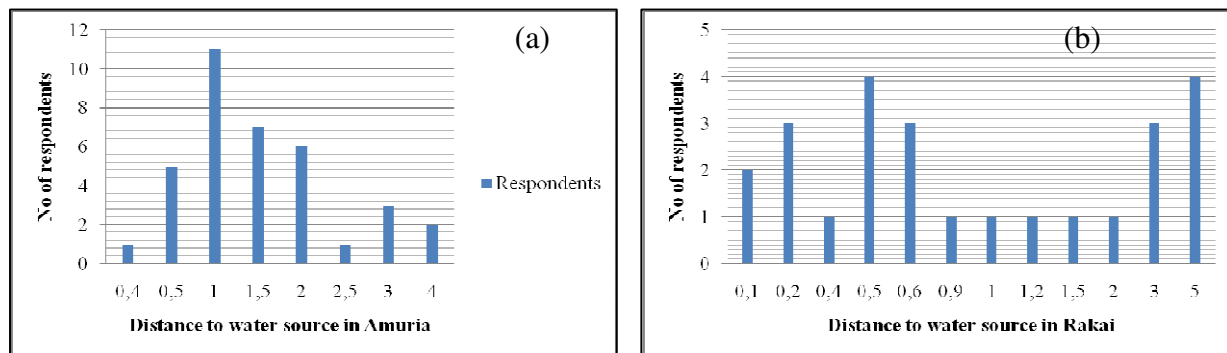


Figure 11: Distance to water source in a) Amuria and b) Rakai district

It is observed that in Amuria though 17 of the respondents travel 1km or less. However, the number of trips they take per day and the means of transportation of water is a point of concern.

It was significant that 19 of the respondents in Amuria travel more than 1km to collect water of which it is the women who transport the water home on their heads. While in Rakai those who travel short distances of less than 1km are those who collect water from personal sources and or buy from neighbors during the rainy season. However, during the dry seasons people travel to alternative sources which are mainly traditional wells and or dam to collect water.

The average distance to the alternative water supply sources in Amuria is ~2km per trip, while for Rakai it is ~3km. Such a distance is too long to travel while carrying ~20liters bucket of water on someone's head. The means of collecting water from such water sources is not easy and actually 67% of people in Amuria and 86% in Rakai said that such sources not easily accessible. However, it was evident the 33% of the people in Amuria and 14% in Rakai who said the traditional water schemes are easily accessible lived closer to such sources and one does not have to queue as it is the case with boreholes.

4.4.3 The cost of water

Payment for water differed in the districts, in Amuria every household is expected to contribute monthly maintenance fees for boreholes. However, in Rakai monthly contributions are not compulsory because most people use private RWH tanks. For the contributions in Amuria, 81% of people pay for water meanwhile 17% do not pay for water. Among those who pay for the water, 31% of them pay 500Ugshs/month, 48% pay 1000Ugshs/month, 10% pay 2000Ugshs/month. Meanwhile, 4% pay up to 25000Ugshs/month, 4% pays 30000Ugshs/month and 3% pay 36000Ugshs/month for the water.

It should be noted that those who pay 500-2000Ugshs/month in Amuria collect water from communal sources and therefore the money they pay is the general monthly communal fees that are charged and used for buying spare parts for boreholes and to pay labor for hand pump mechanics. And those who pay >2000Ugshs/month sometimes buy water from water sellers at 200-300Ugshs per 20liter. While in Rakai 24% of the people pay for the water and 76% said they do not pay. On average those who said yes, pay 20,000Ugshs because they buy water from neighbors at 500Ugshs/20liters.

4.4.4 Number of households per water source

The use of water facilities in both districts is shared among households. On average, 166 households share the same water facility in Amuria while in Rakai it is 39 households. According to the respondents in Amuria, 97% said they share the use of the water source with other households while in Rakai 55% said they share the same water source. However, 3% said they do not share the water source in Amuria while in Rakai 45% of the respondents said they do not share the use of the water source with other households. The main water source shared in Rakai is the communal pond and even though RWH is shared free of charge during the rainy season, a fee of 500Ugshs/20liters is charged during the dry season when there is scarcity of clean water. During site visits to the water sources, the researcher observed that also animals such as pigs and cattle share the same water sources with people in Amuria especially the unprotected communal ponds/wells.

4.4.5 Queuing time

People wait for too long at the source for their turn to fetch water. On average 81% of people in Amuria wait for 2hours before they can fetch water while in Rakai 30% of the people wait for 0.5hours. However, 19% of people in Amuria do not wait at the source because they use mainly traditional wells. While in Rakai 70% of the people do not wait because they rely on their private sources especially during the rainy season. For the case of Amuria people said for one to save time then you have to wake up so early in the morning or wait when most people are out in the gardens. But even then in most cases the boreholes are locked up by the caretaker. Women in Amuria said they have been abused and battered by their husbands because of staying out of home for too long waiting at the water source to collect water.

4.4.6 Water quality

The quality of water from the traditional water supply sources is very poor and exposes the users to water related health problems. According to the comments made by 75% of the respondents in Amuria and 88% in Rakai, the quality of water affects the use of water in the households. The problems associated with the poor water quality in Amuria are; It causes water borne diseases like; dysentery, diarrhoea and typhoid which puts a lot of burden on women who are caregivers at their households; It stains clothes when used for washing; the water changes the colour of food to black when used for cooking; and because the water is very dirty it needs constant boiling and treatment, yet there are no places in the community to buy the tablets for treating water. Constant boiling is also so costly as it needs lots of firewood, big utensils and takes a lot of time.

4.4.7 Water treatment

Treatment of water improves water quality which will in turn improve human health by reducing the prevalence of water borne related diseases (WHO 2003). However, it was found out that in the studied Ugandan rural communities that, not all households treat water before use. This is because the treatment methods available are limited and they are expensive. The main treatment method for drinking water is boiling. This is practiced by 71% of the households in Amuria and 100% in Rakai but it is limited to water from traditional wells/ponds and water used only for drinking purposes.

Chlorination (water guard) is another treatment method used in Amuria but to date this is limited to only 29% of the households. However, this method was used by all the households during the time of emergency when the region was hit by floods because the treatment tablets were distributed free of charge. Most households no longer use it because there are no places in the area where they can buy the drug. None of the households reported using solar disinfection and ceramic filters because they do not know how the method works.

Households in Rakai also use ash as one of the methods of cleansing water. This is an idea that was innovated by one of the community members. Ash is locally available because all of the households in the area use firewood and or charcoal for cooking. However, use of ash requires a lot of patience as it takes ~8-10hours for the water to settle, clean and safe for household consumption. Figure 12 shows a demonstration of how it works to use ash for water treatment

purposes. This technique was mentioned during the focused group discussion that the researcher held with the women's group in Kooki county Rakai district.



Figure 12: Ash as a cleanser for drinking water in Rakai

4.5 Management

4.5.1 Maintenance; costs, management teams and challenges

Communities are actively involved in the maintenance of the communal water supply sources but private sources are managed and maintained individually. In Amuria, 93% of the respondents said it is the communities that are responsible of managing and maintaining the water sources. The community elected a water user committee (WUC) which has the delegation to maintain the source on behalf of the community. While in Rakai 83% said it is managed by the community but this is limited to the management of the communal traditional well. However, 2% of the respondents in Amuria said the local government helps with major repairs meanwhile the community takes charge of minor repairs of the borehole pumps. The maintenance of the private sources owned at household is solely left to the hands of the owners. It was observed in Amuria that in 3% of the households with such facilities it is the men's responsibility and in 2% it is women's responsibility, while in Rakai 10% are managed by the men and 7% by the women.

According to 72% of the respondents in Amuria the WUCs consists of 7 members of which 5 of them are women. The community contributes in terms of money and labour. The money is used by the WUC to buy spareparts and pay hand pump mechanics. The labour is provided by the community members during the clearing, cleaning and fencing of the water sources. NGOs/CBOs and government help in major repairs and bylaws are set by the WUC members that are followed by all the community members. 7% of the respondents said the source is fenced to prevent animals and children from playing in it. While in Rakai, 13% of respondents said the management process is individual for the RHW facilities, 41% said the chairman LC1 of the area mobilizes the community members to clean the communal traditional pond and 47% said there is a water source committee.

4.5.1.1 Maintenance costs

Maintenance costs in both districts are addressed communally though it was much more significant in Amuria with 82% respondents saying so, while in Rakai they were only 56%. However, communal contributions are limited to the maintenance of communal facilities. In Amuria 3% of the respondents said it is individuals who meet the costs but basically for the facilities owned by the private individuals, 3% said it is by use of bylaws that everyone has to contribute, 3% said they lobby for help from NGOs, central government and good Samaritans and 11% said that charges/fines are imposed on defaulters to raise many for maintenance. While for Rakai, 35% said the LC1 chairperson mobilizes the community and collects fees for the maintenance of the pond while 9% said it individual for the private sources. All users are expected to contribute towards maintenance; In Amuria 97% of the respondents said they do contribute and in Rakai 85% said they also contribute.

However, in Amuria 3% said not all users are not willing to make contributions while in Rakai 15% said no because some people are not willing to contribute and participate in maintenance. According to people in Amuria 65% said contribution to maintenance is inform of money, 26% said labor, 5% said produce like cassava and potatoes and 4% said they provide food for the workers and these are basically those who are helped by WEDA to construct RWH tanks. While in Rakai 54% said it is monetary and 46% said it is inform of labor during the cleaning and clearing of the source. On average each household in Amuria contributes 1000Ugshs as maintenance fees while the average cash contribution in Rakai is 3600Ugshs but it ranges from 1000Ugshs to 15,000Ugshs for each household.

4.5.1.2 Functions of the main management team

According to 31% of the respondents in Amuria the functions of the management teams include; cleaning and controlling the queues at the water source, 4% said to mobilize the community, 31% said to collect maintenance fees and to account for user fees, 18% said to ensure proper functionality of the water source for instance make repairs incase of breakdown and 16% said to sensitize the community on proper hygiene and sanitation throughout the water chain that is clean utensils and source. While in Rakai the 59% said the function of the management team is to ensure general cleanliness of the source, 9% said to collect maintenance fees. However, 32% people in Rakai said there is no main management team but it is the local council (LC1) who collects and mobilizes other community members to clean and contribute fees for maintenance of the communal pond. This is different from Amuria where there is an elected WUC that spearheads the maintenance of the water schemes.

4.5.1.3 Challenges faced with the management and maintenance

There are many challenges faced on the management of the facilities in both districts. In Amuria, 87% of the respondents said they do face challenges and 13% said no, while in Rakai 100% of the respondents said they do face challenges. The main challenges faced in Amuria include; lack of spare parts because there are no outlets (places) in the villages and no hand pump mechanics (HPM). The WUCs are sometimes in active, the water sources are not well protected and fenced hence animals play around the water source, some community members are not willing to contribute maintenance fees, disappearance of funds and lack of accountability, poor water

quality and the sources are too congested, and also women are undermined and abused in their responsibilities because men force women to collect the funds.

While in Rakai the following were identified as the main challenges; lack of money for repairs, unwillingness of the users to contribute money and labour, limited mobilization of the people to clean the source, the water source is not user friendly as children are exposed to accidents, poor techniques used for cleaning and some people use dirty utensils to collect water from the water source and children play around the source. However, 46% of the respondents in Amuria said that the maintenance of the source is good because the WUC is active, 33% said it is fair and 21% said it is bad because it is not fenced and animals play around the source. While in Rakai 27% of the respondents said it is good, 31% said it is fair and 42% said it is bad especially for the communal pond.

4.5.2 Women involvement in water management

Women participate in the management process in both districts though in Amuria they are more actively involved as compared to Rakai. However, they do play the same roles in both districts. In Amuria, 97% of the respondents said women are fully involved in water source management while in Rakai it was only 42%. However, 3% in Amuria said women are not involved in the management while in Rakai it was 58% who said there is no women involvement. The roles played by women in the management team in Amuria include; cleaning and clearing the water source and utensils, members of the committee with positions like treasurers, vice chairpersons, and caretakers. They also promote hygiene and sanitation through out the water chain, and mobilize funds for operation and maintenance from the community. While in Rakai they mainly do cleaning and clearing of the source and collect money for maintenance.

4.5.2.1 Changes realized with women involvement in water management

In Amuria, 32% of the respondents said that the change brought about by women's involvement in the management of the water sources is; proper hygiene and sanitation has been realized throughout the water chain, 26% said women make good decisions and now the source is clean, 3% said there is quality improvement, 11% said money is kept well for the maintenance costs in case of breakdown of the facilities, 8% said there is gender balance and equality, that women have good ideas and 7% said there is feeling of ownership of the source because women take very good care in that the source is not abandoned. While in Rakai, 87% of the respondents said women involvement in water management has got a positive impact in the general cleanliness of the water source and overall community development because the women have taken the initiative to construct RWH tanks through the informal women's group which was formed by women in the community which is now operating in the area.

However, 11% of the male respondents in Amuria said there is no difference because men have power over women in decision making and sometimes women's ideas are not recognized in the decision making process. While in Rakai 13% of the respondents who were mainly men said there is no change realized because women cannot do much and are over powered by the men.

However, during the FGD in Rakai, the leader of the women’s group said that; “*Museveni*⁶ has given us (women) the power to participate in community activities and so the men can longer dominate us, but the only problem is that we do not have direct ownership of productive resources to generate income”. Figure 13 shows the summary of the changes brought by women in water source management in Amuria. This is based on the results from 25 respondents in the questionnaires of whom; 18 were men and 7 women.

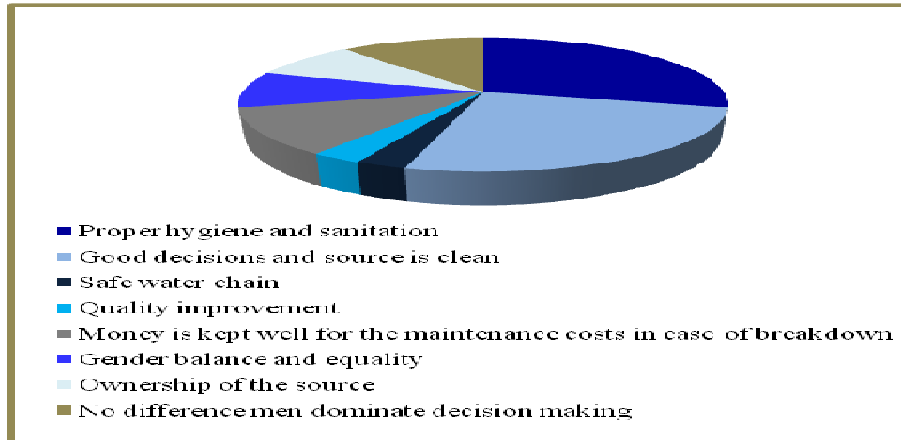


Figure 13: Changes realized with women involvement in water management

4.5.2.2 Men’s reaction on women’s involvement in water source management

There is a mixed perception on how men feel about women’s involvement in water management in the studied rural areas. In Amuria, 84% of the respondents said the men feel good of these 17 were men and 8 women, while in Rakai it was only 26% who said they feel good of these 2 were women and 4 were men. Meanwhile 16% in Amuria said they feel bad of these 4 were men and 1 woman, while in Rakai, 74% said the men feel bad and of these 11 were women and 9 men, others did not give the response. The reasons for the different opinions according to the respondents in Amuria, 43% said women ensure proper borehole maintenance and cleaning, 14% said there is sharing of ideas and responsibilities and 14% said women are more responsible in management than men since they are even the main providers of water at home. While in Rakai, 8% said women’s involvement enables sharing of responsibility since it is women who collect water and 8% said women are more developmental because through women’s informal associations, the women are actively involved in the constructing RWH tanks and support each other in the community.

However, 14% of the respondents in Amuria said women have neglected their home duties because they have taken responsibilities which are out of the household sphere instead of leaving it up for men and another 14% said women are not very reliable at work because they have to take care of household duties at the same time. While in Rakai, 62% of the respondents said

⁶ Museveni is the president of Uganda and when she (the women’s leader) talked of him, she was basically referring to the ruling government.

women are limited to housework and the men do not allow them participate in communal work, 23% said the work is so tiresome and do not want to burden women with heavy work.

4.5.2.3 Strategies for women involvement in water management

According to the district officials, policies for women involvement in water management do exist but they are not widely disseminated and understood well. In each WUC 30% of the members should be women to ensure gender balance. However, the men tend to dominate the decision making process and women's ideas are not given priority. Even when support by the district is given, the criteria used do not necessarily take into consideration the needs of women. It is mainly the districts which select the villages that lack support. The support is basically given based on the demand determined by the population and the existing number of water sources in the area. There are a number of strategies identified by the officials that are expected to enhance women's empowerment in the studied communities. These include training of women to equip them with skills and knowledge which can give them the opportunity to be actively involved in WUCs and take up leadership roles.

5. Discussion

Water use and allocation in the household has got a direct link with accessibility of the water supply sources. This is determined by the distance one travels to collect water, the cost incurred by those responsible of collecting water and the time they take to collect water (WHO, 2003). According to the WHO standards areas with access to water of more than 1000m/ more than 30minutes of the total collection time pose a great threat to human health (WHO, 2003). It was significant that in Amuria and Rakai (Kooki County) districts of Uganda, most of the people still do not have easy access to water. This has got a negative impact on the status of women and children who are responsible of collecting water. This is because they always have to travel a distance of more than 1km to collect water and to carry it on their heads. The means with which they transport water to their households raises more concern especially on water quality even though they are using an improved water sources (WHO, 2002). Bringing water closer to households can help reduce the burden laid upon women and children on looking for and collecting water and thus enable them to participate in other productive economic activities in these communities.

Improved water supply sources are few as compared to the number of users especially for the communal sources. Boreholes with pumps are the main technique used for the case of Amuria however, they have a high rate of breakdown, too congested and it is quite hard to fetch water because of long queues. The burden on women becomes even worse when the borehole pumps in the village break down because they have to travel to the next village to collect water. As a result most people resort to unsafe traditional water sources, which exposes the household members to water borne diseases. It was significant that self supply schemes which are mainly RWH facilities had a positive impact in Rakai in terms of reducing the distance travelled. But this is limited to those households who could afford either to invest in supply sources or to buy from the neighbors. This is because the cost of construction of private sources is very high.

People in Rakai have also taken the initiative and use the locally available materials in order to cut the costs of construction. Such initiatives are essential for reducing the time, health and care

giving problems on women. However, this will have a profound impact only if a cocktail of approaches to water supply are put into practice. But above all they should be inclusive and priority should be on meeting women's needs that will enhance their empowerment.

Government, NGOs and donors should take the initiative to subsidize and promote innovative ideas in Rakai to other rural areas.

The four principal dimensions on domestic water supply and availability are; Quantity, quality, spatial variability and temporal variability (Lenton, et al., 2008). Good water quality is important to women; however, most of the improved sources are seasonally unreliable. Control of water variability is important because poverty stricken and vulnerable households can have devastating effects in case of water related events like droughts and floods (UNEP, 2004). Therefore, water quality, the size, design and management of the RWH tanks should be taken into consideration in order to prevent pollution and contamination of the water. People in these communities prefer to have water sources that are reliable and can provide clean and safe water for all activities in the household. However, such sources are very expensive to construct on individual basis. The most preferred technique in Amuria is boreholes while in Rakai it is RWH. Supporting techniques that the communities' desire will significantly increase access to clean water at household, but the technology should be applicable to the existing physical conditions of the villages.

Water treatment is essential to improving water quality which reduces risks of water borne diseases (WHO, 2002). Although most people boil water, general water treatment for all household basic needs is still limited especially in Amuria because of lack of fuel and tablets for treating water. People in Rakai had started to use ash for cleansing drinking water. Ash is locally available but the quantity of water that can be treated and the quality of water before it is consumed is a point of concern. There is need therefore to build community capacity on water treatment so as to improve water quality. Special emphasis should be on equipping women with knowledge on the different methods of water treatment which should be locally available and affordable to the communities.

Equipping the local people with skills and knowledge through training will enhance capacity development which will enable them develop innovative and appropriate technologies for harvesting water, storing and managing its quality at household. However, such technologies should be equipped with water purification systems and treatment (Malley, et al., 2008). Underground water tapping through use of deep boreholes is a good technological option for increasing water supply in Amuria which has a good underground water potential. But, the technology applied should be user friendly especially for the women and also appropriate to the beneficiary communities. It is not feasible to construct an expensive water facility and have it abandoned because of the wearing down of a small component as is currently the case with most of the boreholes in these communities.

Effective water management offers social networks for women through the management committees (GWA, 2006). This gives them the freedom to express their needs concerning water supply and the problems that affect them. Moreover, women's involvement in water source management has a positive impact on the functionality and sustainability of the water supply sources. However, there is lack of real on-ground efforts that effectively address gender differences and inequalities in water management especially in Rakai district. More still, women

do not have the resources and the power to influence the decision making process. This restricts gender mainstreaming in water management to practices that just add a gender component in the water user committees which is not effective (Panda, 2007). Therefore improving access should involve improving the capabilities of women most especially their freedom and entitlements (Sen, 1999). This includes the right to safe domestic water supply and management that provides equality of opportunity for them to enjoy the right to water as members of the households. Women need to be involved in top management positions especially as main leaders; financial controllers and they also need to be motivated in resolving funds. However, this can only be possible if clear policies and guidelines are strengthened through community based management systems.

6. Conclusion

Domestic water supply has been shown to have implications on women in rural households in Amuria and Rakai districts of Uganda. This study like most others dealing with women, has shown that gender equality in water service provision that is aimed at improving access to water, can only be possible if women are empowered in the decision making process. This is particularly in aspects like household water supply; provision, use, technology, construction, problems, management and maintenance. Special emphasis should be laid upon the active involvement of women by giving priority to their needs and ideas in the planning, implementation and management of the water projects in these communities.

Although it was significant in the results of the study that women are the providers and managers of water in the households, it was also evident that in most instances though they could be involved in the provision, construction and the management of the water sources, they lacked the capacity and the ability to influence decisions on the type of technology used in supply construction and maintenance of the water sources. As a result they have been negatively affected throughout the water chain. It is critical to further investigate the technology used in water supply and treatment and the extent to which it meets the needs of women. Major emphasis should be analysis of the water quality aspects of the 'water store' and the use of ash as a cleanser for drinking water in Rakai.

The development and implementation of the domestic water supply projects should be based on community needs and participation of all groups including the women who serve as water providers. The community members should elect an active water user and sanitation committee whose role is to mobilize and coordinate the communities on the planning, management and maintenance of the water sources. Investment in self supply as is the case with Rakai RWH will bring water sources nearer to the households. This will give women the opportunity to participate in other productive activities. However, most of the people in especially Amuria are poor and therefore they need to be empowered economically among other important aspects in these communities.

Government and donors should focus aid and subsidize the cost of construction and maintenance in rural areas in general. This should be in a much more inclusive approach that benefits all members in society. It should also be in a manner that does not limit women's social networks with other women and in the WUCs. The beneficiary community should be willing to own, operate, manage and actively participate in government and or NGO/CBO initiated projects on

water supply and sanitation. Such programs should include leadership training, system operation and maintenance that should be aimed at empowering women in water service provision and management in the communities.

6.1 Concluding remarks on the community demands on domestic water supply

The community members in the two studied communities made comments and proposal for sustainable water source management and maintenance. These comments are relevant for all the stakeholders in water supply and management in Uganda. The respondents on behalf of all the community members request the government to provide spare parts and water guard outlets in the community, train HPMS and give them toolkits to take care of maintenance of boreholes. They also said that there is need to build community capacity and initiatives on maintenance. This can be achieved through training and strengthening of the water user committee. They acknowledged the roles played by the WUCs but some of them remarked that most WUCs are not very active and therefore they need to be active if not new committee members should be elected.

They advocated for local participation on the maintenance of the water source. This is mainly through women empowerment in water source management. They said that women should not just be members but also be actively involved in the decision making process. Bylaws on the maintenance of the water sources should be set. They said that this should be done by the government because if left to the community, people will undermine, therefore the sub counties and the district should take the responsibility of introducing bylaws.

They also demanded for more water sources especially boreholes and tap water as they are the main source of clean and safe water and also reliable during the dry seasons. They added that boreholes are too expensive for the community members to construct by themselves and therefore government, NGOs and donors should help in the construction and then the community members can contribute for maintenance. They also said the committee members should properly account for the funds collected from the community on operation and maintenance. They also urge for the reconstruction of traditional wells by protecting and fencing will greatly improve water quality and reduce the risk of accidents and water borne diseases. There is also need for community mobilization and sensitization to give technical advice to the management teams and the entire community.

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Appendix 1: Questionnaire for the general public

Introduction

This research is being carried out on Water, Women and Sustainability. The aim is to assess the impact of domestic water supply on women in rural households. The purpose is to increase the understanding of how women can be empowered through recognizing their wisdom and input in the decision making process in relation to domestic rural water supply; use, provision, technology, problems, management and maintenance . Your kind cooperation, response and time are highly appreciated.

Section one: Respondents background

- 1) What is your name (*optional*).....
- 2) What is your sex, please tick the box
 - i. Male
 - ii. Female
- 3) How old are you (*optional*)
- 4) What is the highest level of education you have attained, please tick the box
 - i. Primary
 - ii. Secondary
 - iii. Tertiary
 - iv. Other please specify
- 5) What is your occupation?
- 6) How are you related to the household owner? please tick the appropriate box
 - i. Household head
 - ii. Spouse

- iii. Child
- iv. Other please specify

7) How many people live in your household? Please specify number of

- i. Adults (above 18years old)
- ii. Children (below 18years old)

8) What is your annual household income? Please tick the appropriate box

- i. Less than 100,000 Ug shs
- ii. 100,000- 500,000 Ug shs
- iii. 500, 000 and above Ug shs

9) Who is the main bread winner for your household? Please specify

- i. Husband
- ii. Wife
- iii. Other, please specify

10) Who controls your household expenditure

- i. Husband
- ii. Wife
- iii. Both

11) On average how much Ugandan shillings do you spend on the following items, per month/annum

Item	Ug shs/month	Ug shs/annum
Food		
Water		
Energy (electricity, fuel etc)		
Clothing		
Others (please specify)		
Total amount		

Section two: Water use and demand

12) How much water do you use in your household on the following activities? Please specify in liters/jerry can

Activity	No. liters/day	No. liters s/month
Drinking		
Cooking		
Washing		
Cleaning including personal hygiene		
Other please specify.....		

13) Where do you go to collect water used in your household?

- i. Communal source please specify who constructed e.g. Government, NGO's, etc
- ii. Neighbors source
- iii. Personal source
- iv. Other please specify.....

14) How far is the water source from your household? Please specify in kilometers.....

15) Who is responsible of collecting and allocating use of water in your household?

- i. Husband
- ii. Wife
- iii. Other specify

16) a) Do you have to pay for the water? a) Yes b) No

b) If yes please specify how much Ug shs.....

17) a) Do you have to take a lot of time queuing to collect water? a) Yes b) No

b) If yes, please specify how much time

18) Which of the following do you take into consideration when collecting water for your household? Please rate on a scale of 1- Not much, 2- Quite much, 3- Very much

Characteristics	1	2	3
Easy access			
Good water quality			
Seasonal reliability			
Cost			
Proper management			

Section three: Technological options

19) Which of the following type of water source do you use/own in your household?

- i. Rain water harvesting
- ii. Shallow well
- iii. Borehole
- iv. Other please specify

20) Who initiated the construction of that specific source type?

- i. Husband
- ii. Wife
- iii. Community members
- iv. Other please specify.....

21) Did you make any contributions towards the construction e.g. in terms of money, labor?

- a) Yes b) No

If yes, how much did you contribute to cover the construction costs?

22) Was there any support given to you maybe inform of subsidies by the government, NGO's or the local communities? a) Yes b) No

If yes please specify.....

23) Do you share the source with other households? a) Yes b) No

If yes how many households.....

24) a) How reliable is the water supply from your private source type e.g. during dry seasons? Tick the appropriate

- i. Not reliable at all.....
 - ii. Quite reliable.....
 - iii. Very reliable.....
- b) If not reliable enough where do you go to collect water for household consumption?
- c) How far is it from your household?
- d) Is it easy to collect water from that alternative source?

- 25) a) How do you feel about the water quality from your source?
- b) Does the quality of the water from the source affect the use of water in your household? a) Yes b) No
- c) If yes please specify how

26) Do you use any particular treatment for your drinking water?

- i. Boiling
- ii. Use of ceramic filters
- iii. Chlorination
- iv. Solar disinfection
- v. Others please specify.....

27) What uses do you allocate to the water from your private source?

- i. Drinking
- ii. Cooking
- iii. Laundry (washing)
- iv. Other please specify

28) a) Would you have preferred to use a specific source type? a) Yes b) No

b) If yes please specify which type and why?

Section four: Management and Maintenance

29) Who is responsible for the management of the source e.g. cleaning and repairs incase of any breakdown?

- i. Husband

- ii. Wife
 - iii. Community
 - iv. Other please specify
- 30) How is the water source managed?
- 31) What are the main functions of the main management team if any?
- 32) Are women involved in the management team? a) Yes b) No
- 33) If yes what roles do they play in the management and maintenance of the source?
- 34) Is there any difference in terms of improvements recognized by involving women in the management and maintenance of the source? If yes please specify.....
- 35) How do the men and or husbands feel about having women in the maintenance of the water source?
- 36) a) How do you address the maintenance costs?
- b) If shared with other people, do they contribute towards the maintenance costs?
- c) If yes please specify what way and how much
- 37) How do you feel about the way the source is maintained?
- 38) Are there any challenges you have faced with the maintenance of the water source? If yes please specify.....
- 39) In your opinion what do you feel is lacking and needs to be improved in the management of the water source?

Thank you so much for your time and ideas

Appendix 2- Questionnaire for the officials

Introduction

This research is being carried out on Water, Women and Sustainability. The aim is to assess the impact of domestic water supply on women in rural households. The purpose is to increase the understanding of how women can be empowered through recognizing their wisdom and input in the decision making process in relation to domestic rural water supply. Your kind cooperation, response and time are highly appreciated.

Section 1: Respondents identification

Institution.....

Name of respondent.....

Sex.....

Date of interview.....

Section 2: People and the economy

- 1) What are the main economic activities carried out in the area?
- 2) What is the overall income level in the area?
- 3) What is the overall income distribution among women and men in the area?
- 4) Which group is the most economically active? a) men b) women c) children
- 5) Approximately how many people live in this district?
- 6) What is the population distribution in terms of sex?
 - i. Men.....
 - ii. Women.....
 - iii. Children below 18years.....

Section 3: Water resources and the area

- 7) How do you describe the area in terms water availability and supply?
- 8) Do seasonal variations affect water availability in the area? If yes please explain.....
- 9) Which groups and or gender are affected the most? a) Men b) women c) other specify.....
- 10) What do you do to help the water users cope up with the challenge?

Section 4: Water use and techniques

- 11) What is the water used for in the area?
 - i. Domestic e.g.
 - ii. Commercial e.g.
 - iii. Others please specify.....
- 12) Is the water available enough to meet the demand?
- 13) Which of the following water facilities are used by the households or communities in the area?
 - i. Shallow wells

- ii. Boreholes
- iii. Rain water harvesting
- iv. River/lake
- v. Piped water
- vi. Others please specify.....

14) How is the coverage in terms of facilities? Please rate on a scale of;

- i. Very bad
- ii. Appropriate
- iii. Very good

15) Approximately how many households share the same water supply facility? Please give number.....

16) Who is responsible for the construction of the facilities?

- i. Government
- ii. NGOs/CBOs
- iii. Private individuals
- iv. Others please specify

17) What type of facilities do you advocate for and feel should be developed and why?
.....

18) How do you feel about self supply or private investment in water supply construction and management?

Section 5: Management and maintenance

19) Who is responsible for the management of the source e.g. cleaning and repairs incase of any breakdown?

- v. Men
- vi. Women
- vii. Community
- viii. Other please specify

20) Who are the main decision makers when it comes to operation and maintenance of the water facilities? a) Men b) women

- 21) How is the water sources managed?
- 22) What are the functions of the main management teams if any?
- 23) Are women involved in the management team? a) Yes b) No
- 24) If yes what roles do they play in the management and maintenance of the source?
- 25) How do you feel about involving women in water management?
- 26) Is there any difference in terms of improvements recognized by involving women in the management and maintenance of the source? If yes please specify.....
- 27) a) How is the maintenance costs addressed?
- b) Do the communities contribute towards the maintenance costs?
- c) If yes please specify what way and how much
- 28) How are the funds controlled?
- 29) Are there any challenges you have faced with the maintenance of the water sources? If yes please specify.....
- 30) In your opinion what do you feel is lacking and needs to be improved in the management of the water source?

Section 6: Policies and strategies

- 31) What support do you provide and what criteria are used for allocating the support?
.....
- 32) Are there any existing policies and strategies adequate enough for the involvement of women in the decision making and management of the water resources?
- 33) Which management strategies do you think are necessary to improve water supply and women’s involvement in water management in the area?
- 34) In your own opinion what do you think should be taken into consideration when analyzing the impact of domestic rural water supply on women and sustainability?
.....

Thank you so much for your time and ideas

Appendix 3: Water coverage in Rakai district

Kooki	Safe water coverage (%)	Unsafe water coverage (%)
Byakabanda	72,8	27,2
Dwaniro	9,5	90,5
Kacheera	25,6	74,4
Lwamaggwa	27,2	72,8
Kagamba	8,6	91,4
Lwanda	74,8	25,2
Kyalulangira	7,1	92,9
<i>Average 1</i>	32	68
Kyotera		
Kasaali	80	20
Nabigaoa	77	23
Kirumba	64	36
Kalisizo	73	27
Lwankoni	85	15
Kabira	59	41
<i>Average 2</i>	73	27
Kakuuto		
Kakuuto	85	15
Kifamba	69,9	30,1
Kibanda	71,8	28,2
Kasasa	85	15
Kyebe	39,7	60,3
<i>Average 3</i>	70	30

Figure 1: Rakai district safe water coverage as per June 2007 Note: Average 1 is for Kooki county, average 2 for Kyotera and Average 3 for Kakuuto county.