

**DETERMINANT FACTORS FOR COMMUNITY'S ACCESS
TO SAFE AND CLEAN WATER IN WATER SHORTAGE
AREAS OF TANZANIA**

Berling Magolyo Sospeter*

Renatus Mukasa*

Maseke Richard Mgabo**

Abstract

For years since independence, several rural communities in Tanzania have continued to experience unabated pressure on access to safe and clean water. Consequently households in areas prone to water shortages have evolved devising different measures in revamping accessibility to water resource. However, the pattern of water accessibility in such areas is shaped by different factors. This paper narrates finding from a study conducted at Mwanza region in one of the area (Buswelu ward) proclaimed for persistent water shortages. The study investigated the socio-economic characteristics of community members, study area characteristics, water provision infrastructures and stakeholders initiatives in relation to water provision. A total of 84 head of households were involved comprising 33 males and 51 females. Both interview and observation methods were employed whereby questionnaires and focus group discussions were administered. Findings indicate that, both socioeconomic and demographic characteristics of household members emerged to shape differences in consumption pattern and accessibility to safe and clean water within households and wider in a community. While the burden of water scarcity is felt differently among households at different time intervals

* Department of Development Finance and Management Studies, Institute of Rural Development Planning, Dodoma, Tanzania

** Department of Population and Development, Institute of Rural Development, Dodoma, Tanzania

of the year, women and their daughters bare more burdens as compared to their men/boys counterparts because of the embedded socio-cultural set-up. However, persistence of water shortage in the area is exacerbated by prolonged drought concurrently with mismanagement of water sources and infrastructures. Finally recommendation is given to Local Authorities, Government and other Stakeholders to consider differences in households' socio-economic and demographic characteristics as pre-factor for water development intervention in an area.

Keywords: Water accessibility, clean and safe water, Determinant factors, Rural women burden.

1.0 Introduction

While water is the fundamental resource which makes life possible all over the world, only 1% of the world's water is usable to human being while about 97% is salty sea water and 2% is frozen in glaciers and polar ice caps (Bielik *et al.*, 2010). The United Nations Environmental Programme (UNEP) indicates that, worldwide the demand for water is growing rapidly for human consumption and in many low-income countries the cost of developing new supply is becoming prohibitive, simultaneously with an increase in water pollution and mismanagement of water catchments areas which exacerbate the imbalance between supply and demand. Continued population growth in water stressed areas especially in large part of Africa, continues miserably to terrorize initiative for poverty reduction. UNEP (2010) indicates that the absolute number of people living in water-stressed regions increases significantly across the developing world, and estimate by Global Environmental Outlook show that more than half of the people in the world will be living in severe water stressed areas by 2032. Although water scarcity is a global phenomenon, most of rural areas in Africa are heavily struck by water scarcity. According to World Bank report in 1998, about 40 million hours were spent in yearly in searching for unsafe water and while half of the continent's population was without access to safe and clean water (World Bank, 2002). In the rural African context, the burden of water scarcity affects household members differently but a remarkable burden is observed to women who are in most cases culturally responsible for making sure a family is water secure. At times of water scarcity, women normally tend to bare more workload as compared to their men counterparts. The World Bank indicates that, women in developing countries walk many kilometers a day to fetch often

unsafe supplies of water for their families, carrying back loads of 20 kilograms which is equal to the weight of a piece of an aircraft luggage (Jefreys, 2008; World Bank, 2002).

However, the context of access to safe and clean water is one of the Millennium Development Goals which calls for Governments to halve by 2015 the proportion of people without sustainable access to safe drinking water and sanitation. For Tanzania, the government in collaboration with other development stakeholders has strived in provision of water for its citizens though still a lot need to be done enabling communities easy access to clean and safe water. Despite of government efforts, most rural areas in Tanzania still face difficulties in accessing safe and clean water making water a scarce commodity. Access to clean and safe water has significantly remained lower in rural areas at around 47.9% compared to 80% in urban areas (NBS, 2010). Only about 11% of households have water at the door. About 38% have to walk up to 15 minutes to reach a water source, about 27% walk up to 30 minutes and the rest spend more than 30 minutes getting to water. Women and girl-children are the most adversely affected by lack of water because culturally and traditionally they have the role of fetching water (Social Watch, 2011). It has become a common phenomenon if you stroll along in many semi-arid rural areas in the country to find women occasionally accompanied by their men counterparts and children in search for water everyday.

The prevalence of water shortages in such rural areas of Tanzania has portrayed differences in accessibility to safe and clean water in the same locality. Some households within a single community miserably adjust to cope while others adapt by drawing less from households assets. The prevailing disparity in water accessibility to such communities stood as basis for undertaking this study. The study looked at factors which determine accessibility to safe and clean water, referring to one of rural areas in Mwanza region at Buswelu ward, Tanzania as case study.

3.0 Research Methodology

3.1 Study area profile

This study was conducted in areas of Ilemela District, Mwanza which is one among the eight districts forming the administrative structure of Mwanza Region. Ilemela District is formed by ten wards namely Pasiansi, Butimba, Nyakato, Igoma, Bugogwa, Ilemela, Mkolani, Buhogwa and Buswelu. Most part of the district is covered by gravities with isolated rocky hills masses which makes a unique feature of the rocky city. The soil is well drained ranging from yellow, red, gritty sand to clay loams. The District comprises numerous hills made to be settlement to some of the district residents. The district receives rainfall of 700-1000mm per annum, with two rain seasons, which is the short rains occurs from August –October and long rain season from December to May each year. Average annual temperature is between 20 and 30 centigrade. This study was conducted in Buswelu ward which is one among eight wards forming Ilemela District. This ward was purposively chosen because of having a predicament of water scarcity to most of its community members compared to the rest wards.

3.2 Data Collection and Analysis

Both quantitative and qualitative data collection methods were employed including participatory rural appraisal (PRA) approaches, such as focused group discussions, key informant interviews and direct observations for qualitative data, while quantitative data were obtained through structured and semi-structured household questionnaires. Respondents were selected using probability sampling technique guided by a sampling frame which comprises a list of all households in the study area from which sampling unit (head of households) were drawn for interview. Primary data were supplemented by information from secondary sources including District reports and ward records. A total of 84 head of households were involved including 5 officials. Information gathered from household heads were processed before being subjected into analysis, for this case a Statistical Package for Social Science (SPSS) version 11.5 was employed. Descriptive analysis was carried out for computing simple measures like frequencies and percentages, and some variables were cross-tabulated to widen explanation on relationships between variables. A chi-square analysis was run to test for relationship significance between some variables in regards to factors for accessibility to safe and clean water in the area.

4.0 Research findings and Discussion

Findings from this study depict a scenario that, the magnitude and consequences of the predicament of water shortages varies within households and wider in a community. Several factors shape this variation ranging from socio-economic, demographic to cultural set-up.

4.1 Family size and water consumption pattern

In a wider context a household in an African society embraces members in co-residence, sharing the same meals cooking from one pot and undertaking joint or coordinated decision making as a social system (Mohamed *et al.*, 1994). In the study area, a household comprised a group of individuals ranging from 2 up to 10 or more family members living together in one roof. The findings indicated that most households were made up of members ranging from 2 -4 (52.4%) followed by 5-10 (44.0%), and above 10 members (3.6%) as indicated in Table 1. Households with bigger family size experienced less shortages and vice versa as compared to their counterparts with fewer individuals. But the trend was not uniform since households with fewer individuals also showed greater access to water while other households with bigger family size also in some cases indicated to experience water shortages. With such trend it was not easy to derive a conclusive assertion whether or not number of individuals in a household paves influence to accessibility of clean and safe water. Therefore family size can not be a determinant factor for water accessibility unless linked with other households' inherent socio-economic and demographic characteristics.

Table 1: Household size in relation to adequacy of water consumed per day

Household size	Adequacy of water per household		Total
	Adequate	Not adequate	
2-4 family members	29(34.5%)	15(17.9%)	44(52.4%)
5-10 family members	20(23.8%)	17(20.2%)	37(44%)
>10 family members	0 (.0%)	3(3.6%)	3(3.6%)

Total	49(58.3%)	35(41.7%)	84(100.0%)
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Among 44 households with 2-4 family members, 66% indicated adequacies to water consumption while 34% indicated inadequacy to water consumption. The trend depicted further for households with 5-10 family members whereas among 37 households 54.0% indicated a bigger adequacy to water consumption while 46.0 % showed lesser adequacy to water consumption. The extent of water consumption also showed variations among households. Amount of water used by most 44(52.4%) households with the size of 2-4 family members ranged from 2-5 buckets per day while 37(44.0%) households with family size of 5-10 family members were using 6-10 buckets per day whereas few households 3(3.6%) with household size of more than 10 people consumed 11-15 buckets per day. The findings also indicated that, 49(58.3%) of the sampled respondents agreed to be comfortable with the amount of water they use per day as enough, while 35(41.7%) of the sampled respondents answered that the amount of water they use per day is not enough for domestic consumption. Generally, the amount of water consumed by these households were even below the amount of water recommended for a healthy person, a person needs about 20 liters of safe water each day to meet his or her metabolic, hygienic, and domestic needs (World Bank, 2002).

4.2 Age of Respondents

In many parts of Africa where water scarcity has struck, normally a group of children, the sick and elders are the ones considered to be affected most because of their inability to fend for themselves. However this was a bit contrary to the study area, age of individuals at different cohort did not show a remarkable variation in water accessibility. Younger children and adults are accustomed responsible to make sure elders, children and the sick person are supplied with water even at time of scarcity. This could be due to social cohesion which still hold strong in the study area. Among a sample 84 head of households, 35(41.7%) were of the age between 18-35 years, 39(46.4%) aged between 36-55 years while 10(11.9%) were aged above 55 years.

4.3 Education level of respondents

Education level of respondents showed to have greater influence to awareness of safe and clean water. As is the case for most rural communities in Tanzania, many individuals in the study area

managed to secure for primary education (64.3%) while the rest went up to secondary education (16.7%), tertiary (7.0%) and few who had never been to school at all (2.4%) as shown in Table 2.

Table 2: Respondents awareness on safe and clean water

Education level attained	Awareness on clean and safe water		Total
	Aware	Not aware	
Primary Education	38(45.2%)	16(19.1%)	54(64.3%)
Secondary Education	14(16.7%)	3(3.6%)	17(20.2%)
Adult Education	1(1.2%)	0(0.0%)	1(1.2%)
Tertiary Education	4(4.8%)	0(0.0%)	4(4.8%)
Not gone to school	2(2.4%)	6(7.1%)	10(9.5%)
Total	59(70.2%)	25(28.9%)	84(100.0%)

However, despite of most respondents' low education level attained, most of them indicated to be knowledgeable about the meaning of safe and clean water. Most of them managed to give a nearly correct meaning of clean and safe water despite of few respondents who didn't answer it correctly. The explanations given by respondents included 36(42.9%) treated water, 23(27.4%) water which is free from pollutants and with no harm to human beings and 15(17.9%) rain water. A big number of respondents who have never been in a class at all 10 (11.9%) failed to describe correctly what it means by safe and clean water. The chi-square test (62.469, $P < 0.05$ df 4) on the level of education of respondents in relation to the level of awareness on clean and safe water indicated that, there is a great relationship between the level of education attained by respondents and awareness on clean and safe water. According to World Bank (2002), safe and clean water is explained to include treated surface water, as well as untreated but uncontaminated water from sources such as natural springs and sanitary wells".

4.4 Occupation of the respondents

It was noted that variation in type of people's occupation plays a big role in shaping differences in water accessibility in a wider community. Households with wider options for earning income indicated to be more accessible to safe and clean water. The results of analysis showed that, 51

(60.7%) of all respondents were farmers, 6(7.1%) employed, 27(32.2.0%) are businessmen. Out of 51 farmers, only 18(21.4 %) had access to clean and safe water while rest of the respondents experienced low access to safe and clean water. However, the context of water accessibility was noted to be influenced by level of income which fosters purchasing power. As purchasing power becomes strong, it broadens means of accessing this valuable resource as it was indicated by employees who have reliable flow of income. During water scarcity, this group of respondents opts for buying water from vendors which is sold for Tshs.300 to Tshs.500 per 20 liters bucket. This is the opportunity missing to most farmers who experience narrowed purchasing power due to dwindled income from agriculture activities.

4.5 Gender in accessing safe and clean water

As for most rural communities in sub-Saharan African where water scarcity has struck, the predicament of water shortages at household affect members differently, and this necessitated a keen look at gender division of labor during water shortages in the study area. Households in Buswelu ward are not different from rural communities elsewhere in rural Africa and Tanzania in particular. For long time in rural communities women have remained to be weaker partners in bargaining over resources which in times of water scarcity compromises their capacity to cope as depicted in this research's findings. Among households visited it was clear that women are responsible for fetching water being assisted by their daughters. Among 84 households, 79 household heads (94.0%) admitted that women are responsible for making sure that a household has enough water for domestic consumption including cooking and laundry and only 5 households (6.0%) admitted to share the responsibility of fetching water between men and women. The prevailing gender stereotype in this area has compelled women walk many kilometers daily spending much time in searching for often unsafe water for their families, which in actual fact deny them opportunity to participate fully in other productive activities. However, the burden of water scarcity for women shows to vary depending on held status within a household and wider in a community. Female headed households indicated to exercise higher degree of equal responsibility between genders in fetching water, and actually this was missing in male headed household where the activity of fetching water was left as women responsibility.

The occupation and marital status of women showed significant influence to water fetching workload. Women who are self employed and civil servants admitted to experience a relief on water scarcity because of their purchasing power which enable them to pay for water provision services. Although the component for marital status did not reveal any significant effect on water accessibility, female headed households admitted to enjoy a relief contrary to male headed households where most women are subordinated. The distribution for marital status was as follows; married couples (76.2%) followed by singles (6.0%), widows/widowers (9.5%), separated/divorced (8.42%). The Chi-square test (2.004, $P > 0.05$ df 3) indicated that there is no significant relationship between someone's marital status and access to clean and safe water in the study area.

4.7 Means for reaching the water source

The finding shows how the task of fetching water has continued bearing more burden to women who walk very long distances of about 2 to 3 kilometers daily in search of water carrying heavy buckets and or other containers on their heads per trip. In Africa, especially in rural Africa according to the World Bank 40 million hours are lost yearly in searching of unsafe water and half of Africa's population is without access to safe and clean water (World Bank, 1998). In this study, the means for reaching the water source showed to depend on a varied socio-economic and demographic characteristics including income level, age, physical status/disability etc. Among 84 respondents, 92.9% walk on foot searching for water and this group is dominated by women, 7.1% pedal bicycle/gutta searching for water. For Tanzania, it is estimated that 45.5% of households still get water from non-improved sources including unprotected dug well, rivers, dams and springs which are common in rural areas (NBS, 2010). The findings in Figure 5, indicate that, few households 13(15.4%) use spring as their water source while 54(63.1%) use water from wells which historically has remained to be sources of water for the majority of rural communities. Only 18(21.4%) households had access to tap water. The distance covered from community area to water points seemed to pose implications to community livelihoods whereby people cover long distances searching for water as indicated in table 3.

Table 3: Distance traveled searching for water

Distance traveled	Frequency	Response (%)
Within 400 m	32	38.1
401-1000 m	38	45.2
More than 1000 m	14	16.7
Total	84	100.0

Although Tanzania has adopted a Millennium Development Goal of increasing access to improved drinking water, a big number of individuals still lack access to this valuable resource. This implies that Tanzania still has a long way to go in achieving this goal. The results indicate that, a big number of respondents 52(61.9%) walk more than 400m searching water for their family use. Off all respondents, 37(44.0%) takes long time ranging from 30 minutes up to more than an hour to fetch water. This situation negatively affect the production capacity of households hence accelerate poverty in such rural communities. According to NBS (2010) about 46.7% of the Tanzania's population is estimated to spend up to 30 minutes or longer searching for water.

Table 4: Time spent by community members in searching water

Time taken (minutes)	Frequency	Response (%)
15-30	32	38.1
31-60	26	31.0
More than 60	11	13.0
Below 15	15	17.9
Total	84	100.0

A report by Social Watch (2011) comprehends that water for the majority of Tanzanians is still not within easy reach. About 38% Tanzanians have to walk up to 15 minutes in order to reach water sources, while about 27% of household end up to 30 minutes walking to source of water. The rest have to spend more than 30 minutes to get source of water. Lack of access to safe and

clean water is the heart of poverty trap, especially for women and children who suffer from illness and lost opportunities in many developing countries like Tanzania.

4.8 Stakeholders' initiatives

Since independence, the government of Tanzania in collaboration with several water development actors has strived to make sure that water supplies are within community reach although up to now the situation is still held in contrary. In the study area, community members have been collaborating with government in making sure that water is within easy reach despite of some discrepancies. About 35(41.7%) respondents pointed out that they are aware of the presence of water supply project supported by Mwanza Urban Water Supply Authority (MUWASA) which is the government agency. MUWASA water supply project supported by government implements the National Rural Water Supply and Sanitation Programme (NRWSSP) which aim at ensuring provision of adequate clean and safe water to the community members in the study area in the near future. On other hand 49(58.3%) respondents were not aware of the presence of any Government or private institution dealing with supply of clean and safe water in the study area. This is due to the fact that few people are served by MUWASA water supply project, simply because water users have to pay for user fee, also many 67(79.8%) respondents complained of not being involved in implementation of such projects denying them sense of ownership.

Through focus group discussion with some community members it was informed that, for some areas supplied by tap water, community members are responsible to pay for user fee. Also in areas with wells driven by hand pumps, community members take role in managing those pumps. In case of any destruction community members have to raise fund for re-construction. The researcher was also informed that, some of the community members do boil drinking water as one of the efforts to access safe water. The study also found that there is established water committee in the ward that coordinate and manage water issues in the ward. The water committee members have the responsibilities to sensitize villagers about water sources protection, to conserve the environment in the villages, to coordinate and monitor all activities about water sources and uses.

5.0 Conclusion

The issue of water quality and its guaranteed availability to all people regardless of income or social status is one of the most important factors towards development of rural community. Striving along this responsibility, since independence the government of Tanzania has revamped in developing social services to its citizens including safe and clean water provision. But in contrary the rural population has continued to subsist in water shortage whereas cases of water shortage prevalence continue to be order to the day. In rural areas people have to walk or travel long distances searching for water and this has impacted negative consequences in production activities. The burden of water scarcity within a community showed to be determined by socio-economic and socio-cultural factors of community members, and this burden becomes lessened or worsened by differences in how household assets are converted into meaningful strategies for accessing safe and clean water. Socio-economic factors such as occupation, education level attained, income earning capacity, family size etc shows a significant impact for a household's access to safe and clean water in connection with factors like water supporting infrastructures and stakeholders' initiatives. Strikingly, women have continued to bare more burdens as compared to their men counterpart when a household is struck by water scarcity. Finally this study recommends that, any initiative geared at developing water sector in rural areas should pay a thorough investigation on the socio-economic and socio-cultural characteristics of community members which shows to enhance accessibility to this vital resource "water".

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