

## Assessment of Water Shortage and its Implications to Gender Role in Semi-arid Areas in Mvumi Ward, Dodoma in Tanzania

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### Abstract

This study was carried in Mvumi wards in Dodoma region, Tanzania. The study area was selected to represent semi-arid biome as it experiences annual excessive drought. The majority rural dwellers in Tanzania live in extreme shortage of water. The general objective of this study was to assess the impacts of water shortage to social life especially to women. Questionnaire, PRA's and documentary review were used for data collection. A sample size of 120 respondents was used for the study to cover two villages namely; Ilolo and Iringa. The finding shows that the majority (about 70%) of rural communities are severely suffering from water shortage crisis. They spend more time to fetch water instead of engaging in other economic activities. And, women are more vulnerable and stressed to this problem. There is a need to supply water services to the rural communities in order to solve this problem.

**Keywords:** Water shortage; Women; Semi-arid areas; Mvumi ward; Tanzania

### Introduction

According to recent report by WHO 884 million people in the world do not have access to safe water. As a result, 1.4 million children die every year from water-borne illnesses--that's 1 child every 20 seconds. The majority of these people who suffer from this problem are from Sub Saharan African countries.

Most sub-Saharan African countries including Tanzania are poor and their people are lacking some of the basic services including water [1]. Political instability, civil wars, excessive drought and diseases especially HIV in some of these countries has forced their government to concentrate on short-term plans instead of long term plan. On other hand, political instability, power monger and impacts of climate change have been pulling behind the struggles toward socio-economic development. Therefore, despite of being endowed by various resources like minerals, natural and artificial forest, national parks, lakes and great rivers, fertile soil and favorable climate but these government have failed to supply their people with adequate social services especially water.

In Tanzania, there is numerous water bodies which if well managed could help to supply water to every citizen [2]. Despite of being among the countries which have best implemented the Millenium Development Goals, Tanzania is still experiencing dramatic water shortage especially in rural areas. Politics have been rulling and deciding about on everything with no political will of alleviating poverty especially in rural areas. Political leaders contest for various positions then after winning they continue with their own business. Corruption exuberate this problem [3].

The central regions of Tanzania such as Dodomd, Singida, Tabora and Shinyanga are in semi-arid area, hence they are good examples of the areas which experiences water shortage in great magnitude [4]. One of the great challenges in solving this problem is weak or an

adequate investment in the sector. There is no big water project invested which can serve large population like three regions. Therefore, Mvumi Ward in Dodoma is sampled by this study to represent the area with excessive shortage of water in the country [5].

### Location of the Study Area

Dodoma rural district is located as among of six districts found in Dodoma the central part of Tanzania. According to 2012 Tanzanian National Census, the population of Dodoma rural district 495,176 made up of 96,686 households. The district lies between the latitudes of 6°30' to 8°0' of south of the Equator and between the longitudes of 35°30' to 37°0'E of East of the Greenwich Meridian. The altitude of the district lies between 1200 m and 1400 m above the sea level. The average rainfall is 500-800 mm and the maximum temperature is 31°C, with the minimum 18°C [6]. The district made up 8 divisions, 48 wards and 128 villages covering an area of 14,004 sq km.

Mvumi ward as a study area; is among of wards found in Dodoma rural district, it has a total population of 10218 (4,671 males and 5543 females) with 2117 households. Areas of 98 squares km of which 77 squares km are suitable for agriculture and livestock keeping 10 squares km are forest reserve and 12 Squares km are mountainous with slight bushes and scrubs. The ward is located 30 km south of Dodoma municipality [7].

### Climate and vegetation of the study area

Mvumi ward has a semi-arid climate with bimodal rainfall pattern of 400 mm to 1000 mm with an average of 550 mm-600 mm. The average rainfall decreases from north to south and from west to east. The short rains start in mid-November to mid-January and long rains start early March up to May. The average temperature is 26°C. Large parts of the ward have few vegetation cover and soil fertility in large tracks of the district and ward is medium to poor.

## Economic activities of the study area

The income of the Ward depends on agriculture output and livestock keeping. However, if there are fluctuations to a large extent affect crops and livestock production. The basis of the Ward economy is agriculture and livestock keeping. According to 2012 census about 78% of the population is employed in agriculture sector [7]. The most important cash crops are maize, sorghum, simsim “ufuta” and millets.

## Methodology

### Sampling design, sample size and data collection methods

The sampling unit for this research was a household. Both random and purposive sampling were employed in selecting both the study area and/or sampling units. Purposive sampling was used to select two villages in the ward [8]. The guiding principles for the adoption of purposive sampling were the effects of drought, severity of the problem and accessibility to the area. Likewise, purposive sampling was used to select sub-villages from each village.

A sample of 120 respondents was randomly picked out for the study. Thus, 60 households were randomly sampled from each village to ensure that every household had equal chance to be selected for the study. Therefore, every household in the area had equal chance to be picked for this study.

In this study, household was taken as a group of people who eat from a common pot, sharing the same house and may cultivate the same land. In addition, according to Tanzania National Census of 2012 a household is the arrangement made by persons individually or in groups for providing themselves with food and other essentials for living or a group of persons who live together and share expenses.

Participatory Rural Appraisal (PRAs) tools were also effectively used to grasp the socio-economic aspects of the peoples’ livelihoods. These were very useful than questionnaire because they are more participatory and involve the respondents more closely. Key informants in this study involved Village Executive Officer (VEO), Ward Executive Officer (WEO), elders and women. Quantitative data were analyzed using Statistical Package for Social Science (SPSS) while qualitative data from PRAs tools were analyzed through content analysis.

## Presentation of Findings and Discussion

### An overview of water shortage in the study area

Mvumi is one of the wards found in semi-arid lands of Tanzania. It is characterized by shortage of rainfall, high temperature and excessive drought throughout the year. It experiences low rainfall below 700 mm yr<sup>-1</sup> with very high ground evapotranspiration. Therefore, the land is very dry denying the possibility of supplying water from shallow wells dug in the area.

The findings from field survey through questionnaire and participant observation done in the study area shows that there are no reliable water sources as people still relies on shallow wells, traditional wells and hand dug wells in the river bed [9]. Therefore, the households depends more on these sources [10]. Water accessibility is inadequate in most households as people spend more time for water fetching than in other economic activities. The problem of water shortage becomes more pronounced during the dry season.

In the century of advanced technology and sciences, it is not expected to see people living in very hard environment (Figure 1). People especially women travels long distance and spent many hours a day fetching for water (Tables 1-3).



**Figure 1:** Women and children fetching water in the study area. Source: Field Survey Data 2015.

### Time spent for water fetching in the study area

The findings from questionnaire survey shows that about 63% of the respondents spent a time of over six hours in a day for fetching water, while 33% of respondents spend over three hours and about 4% of the respondents were not aware of the time management (Table 1). As well results from FGD and key informant interview support the results as the majority explain the problem as the most hectic compared to other crisis like transport network and health services.

This finding is supported by Panda [11] who argued that women living in rural areas suffer severely when searching for water. The problem has also been exuberated by drought caused by the impacts of climate change (ibid).

Sources	Frequency	Percent
>6 hrs	75	62.5
>3 km	40	33.35
Others	5	4.15
Total	120	100

Source: Field Survey Data, 2015

**Table 1:** Time Spent for Water Fetching in the Study Area.

The findings imply that despite of some respondents being unaware, water shortage takes much of their working hours. In connection to that, some marriages have broken up as women spend more time for water fetching instead of being close to their husbands. These findings are supported by Rosen and Vincent who discovered that majority of people in sub-Saharan Africa spent more time for domestic water searching instead for other economic activities. This author concluded that time, if there could be reliable water sources; people could save time for water fetching and instead use that time for housework, rest, social, personal, agricultural and other income generally activities which in turn would improve the household income.

Therefore, there is a need to establish reliable water sources near the community where people live. This notion was further supported by Bauman [12] who argued that the water supplies should locate near to community in order reduce time spent in fetching water.

### Distance covered to and from water sources

The findings from both primary data and documentary view show that people travel long distances to collect water though it varied from one household to another. Results from questionnaire survey shows that 50% of the respondents access water sources at a distance of more than 3000 meters (>3 km) from their home (Table 2). As well, GIZ [13] added that women walk a very long distance in most sub-Saharan African countries fetching for water.

Sources	Frequency	Percent
>3 km	60	50
3 km	40	33.35
Others	20	16.65
Total	120	100
Source: Field Survey Data, 2015		

**Table 2:** Distance covered Fetching for Water.

The majority respondents spent over three hours. This is because many sources are located away from peoples homestead this forces them to travel a long distance for water searching and for those sources located nearby were not functioning well and those to some extent functioning were too few to meet the need of scattered rural households. A good example is Bungani dam which is located three kilometers from Ilolo village and four kilometers from Iringa village. Generally, the average distance required for a person to travel fetching for water is very long. This must have negative affect to other socio-economic activities that need to be implemented by the same people.

### Responsibility of water fetching in the household

Findings from questionnaire survey in the study area show that 62.5% of the respondents said that water fetching is mainly done by women (Table 3). Thus, women and girls travel to the water sources spending about six hours on average day-1 to collect water. This clearly shows that women play a significant role in domestic water collection. Malley et al. [14] added that women are more involved in water fetching than men especially in developing countries.

In connection to that, ADF added that women in rural areas often travel long distances up to five hours per day to collect water. Women and young girls play a major role in accessing and carrying water. Women are also at risk from violence such as rapping because of travelling for long distance day.

Women affects	Frequency	Percent
TRUE	75	62.5
FALSE	15	12.5
Not sure	30	25
Total	120	100
Source: Field Survey Data, 2015		

**Table 3:** Shortage of Water Affects Women in Most Case.

This gender role is streamlined by most African culture which gives women the primary responsibility for collecting and managing water for their households. It is common for women and girls in Africa to walk more than 5 km to gather water for their families during the dry season [15]. On the other hands, girls are often tasked to help with water fetching rather than schooling.

Basing on the findings above, there is a need to improve the provision of water services so as to reduce gender oppression as women and girls. Currently, they are at risk from raping and killing by both human being and animals (lions and hyenas). This notion is supported by Panda [11] who argued that the reduction of water shortage problem in semi-arid areas and improve more availability and accessibility of water, leads to minimize the effect of time and energy women spent and used in fetching water. As well, it will reduce the risk of women to be raped and killed.

### Water sources for domestic use as optional livelihoods

Findings from questionnaire survey shows that about 54 respondents use shallow wells as their means for security water access at their households. On other hand, 42 respondents use traditional wells and 24 respondents use other sources (Table 4). Moreover, shallow wells do not help much because they are often polluted and dry up. Furthermore, results from PRAs show that most of respondents were frequently suffering from diarrhea as they have been using unsafe water obtained from tradition wells [16].

Sources	Frequency	Percent
Shallow wells	54	45
Traditional Wells	42	35
Others	24	20
Total	120	100
Source: Field Survey Data, 2015		

**Table 4:** Water Sources in the Study Area.

Furthermore, results from the PRAs tools show that water has been managed through community labor contribution to water users groups, and this observed from villages where shallow wells exist. In this study respondents were asked to show how water sources have been maintained. Some villages' water use groups were found inactive because their shallow wells were no longer discharging water at a required amount especially during dry seasons. During dry season water sources dries up, hence the area experiences poor water discharge as supported by Malley et al. [14].

As a way forward, there is a need to improve some local water sources in order to sustain human health, food production and industrial activities in a certain area. This will help to reduce poverty in rural areas [4]. Beside, 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 problem associated with water shortage to the societies for domestic water supply in rural households [3].

## Conclusion

Sources of water such as shallow wells, traditional wells and dams represent the most important water sources for rural households as their means of livelihoods. These sources are being used throughout the year despite of drying out during dry season. Generally, the situation of water services in most rural dwellers in Tanzania is worse.

There is a need to join hands with all development stakeholders to improve the situation by supplying water to these areas. Improved access to convenient, reliable source of safe water has an impact on health through reducing the time and energy burden on the household. We have to think widely on how to overcome the problem. To start with, rain water can be harvested by tapping and storing it. Kahinda et al. [17] added that water from rain harvest may help to improve rural life. At least this can reduce the magnitude of the problem. If this is done, it will be more significant to women and children/daughters who bear the responsibility for seeking, drawing and carrying water for domestic uses such as drinking, cooking, gardening and bathing. Academic performance of these school children will increase to effective attendance in schools. Marriage break-up, rapping and killings among the women will also be rescued [18-24].

## Declaration of Conflict of Interest

The author is not aware of any affiliations, membership, funding of finance holdings that might be perceived as affecting the objectivity of this review.

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