

*Full Length Research Paper*

# Impact assessment of water scarcity at Somntongo in the lowveld region of Swaziland

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A survey was conducted to assess the impact of water scarcity in Somntongo, in the lowveld region of Swaziland. The study adopted the use of questionnaire, interview schedules and focused group discussions. Information sought included sources of water, distances between water sources and places of residence, and the effect of water scarcity on the various aspects of human activities. The study revealed that only two rivers and five boreholes were the major sources of water while distances of as much as 5 – 20 km were covered in search of water. In about 82% of the homesteads, the water use was about 3.3 litres/head/day and 2.3 litres/livestock/day. These are quite low compared to the minimum standards of 25 litres/head/day, and between 25 and 35 litres/livestock/day. Water scarcity has resulted in the death of livestock; some cultivated crops have withered while others are not cultivated for lack of irrigation water. In some instances, schools have temporarily been closed due to water shortages. Construction of more boreholes and dams can reduce the water scarcity and promote the standard of living in the community.

**Key words:** Swaziland, water, scarcity, harvesting, irrigation, agriculture.

## INTRODUCTION

Water is one of the most basic needs for the sustenance of life, and its utilization can be categorized into industrial, agricultural and domestic. Globally about 69% of water resources is used for agriculture, 23% for industrial while domestic use accounts for 8%. However, because of the differences in levels of technology, while developing countries devote as much as 88% of their water to agriculture, the developed nations use less than half for agriculture (Postel, 1990; Postel, 1991).

Water as a natural resource should be readily available and affordable but in many instances, it is scarce and beyond the reach of many people (World Bank, 1993). Engelman (1995) reported that of about 2.5% of the water resources that can actually be consumed, only one-third of it is accessible as the balance two-thirds are confined in glaciers and permanent snow cover. Gleick (1995) and Larsen (2004) reported that about 17% of the world population, majority of who are living in developing countries have no access to fresh water to meet their do-

mestic and other requirements. Gleick (1995) reported that Africa is already one of the driest continents in the world, and with an increase in population and a decrease in amount of rainfall, its countries are facing water stress and scarcity.

Water scarcity leads to the destruction of the environment and conflicts are common as industries, agriculture and domestic needs compete for the limited available water (Frederikson, 1996). Tensions over the distribution of water can escalate into discord between groups dependent on a shared resource. According to Frederiksen (1996) and Horfkes (1984), the poor are the ones who suffer most when there is water shortage. To them, water shortages can mean long walk to fetch it, high prices to buy it, food insecurity and diseases due to drinking dirty water. Water should not only be adequate in quantity but must also meet certain standard qualities. Polluted streams create problems for fish, wildlife and humans (Winpenny, 1991). Sedimentation, fertilizers, pesticides and manure are the main reported pollutants of drinking water (Horfkes, 1984).

Swaziland is located between latitudes 30° 30'E and 32° 30'E of the Greenwich and between longitudes 25°

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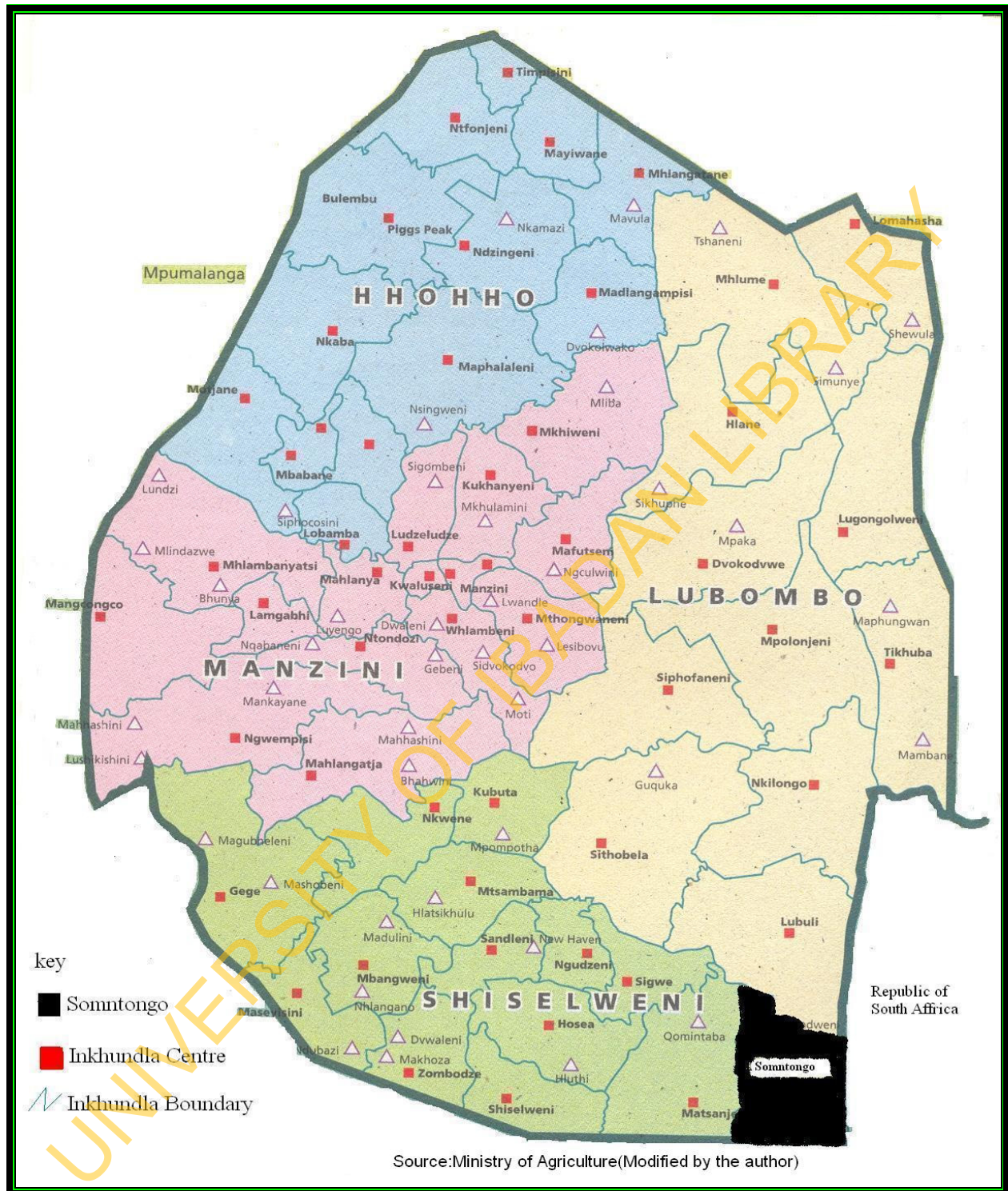
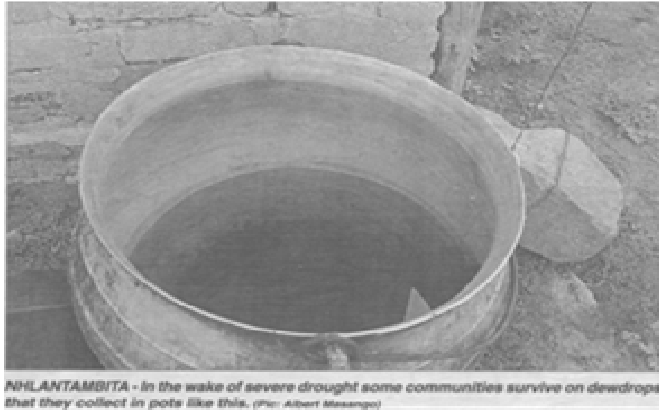


Figure 1. Map of Swaziland showing study area as shaded in black.

30°S and 27° 30' S of the Equator. The country covers a total area of 17,363 km<sup>2</sup>, out of which 17,203 km<sup>2</sup> is land and the remaining 160 km<sup>2</sup> is water. The country is divided into four ecological zones: the Highveld, Middleveld, Low-

veld and Lubombo (Figure 1). Due to droughts in recent years, many areas of Swaziland are facing aggravated water scarcity. One of such areas is Somntongo where the water scarcity has inflicted injuries on the social and



**Figure 2.** A pot used to collect dew to be used as drinking water (Source: Times of Swaziland, Friday November 4, 2005 Page 11).

and economic lives of the populace. It is imperative that such impacts are quantified and appropriate remedial measures taken. The work reported in this paper was undertaken to assess the impact of water scarcity in Somntongo, in the Lowveld region of Swaziland.

## METHODOLOGY

The study was carried out through the use of questionnaire, interview schedules, personal observation and focused group discussion. Questionnaire and interview schedules were developed which among others sought for information on the sources of water available to the respondents, various water uses, distances between places of residence and water sources, reliability and adequacy of water sources, problems experienced with water collection and the effect of limited water availability on various human activities.

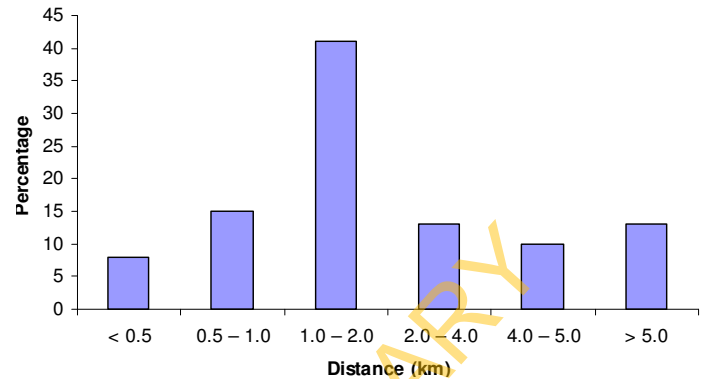
The targeted population was the Somntongo community members and 150 homesteads were selected. The instruments were administered in February, 2006. In addition to these instruments, secondary information was obtained from the libraries of the University of Swaziland, the ministry of agriculture, Mbabane and the Swaziland National library, Mbabane. Information was also sourced from the Internet.

The Statistical Package for the Social Sciences (SPSS) was used to analyze the data. All data collected were interpreted using frequencies and percentages, and the results were presented in bar and pie charts.

## RESULTS AND DISCUSSION

### Water availability

Two rivers and five boreholes were the sources of water available in Somntogo. While 30% of the populace depended on the rivers, the boreholes were the water sources for the remaining 70%. In most cases, the discharges from these sources were very low and got dried during the dry season. During the dry season, the inhabitants who have the means go to the Ingwavuma River which is about 20 km from the community. The Iguaquuma River was not only far from the community but it was



**Figure 3.** Distances between residence and water sources.

also used for sugarcane irrigation upstream such that the volume downstream and where some members of the community relied on, was very low.

Rain water harvesting as a source of water had very little impact in Somntogo. Besides the low annual rainfall received over a short period of the year, many of the homesteads were of thatched roofs with low harvest potentials compared to corrugated iron sheet roofs. Because of the seriousness of water scarcity, dews have become a source of water in Somntongo as in other drought affected communities (Figure 2).

### Burden of water collection

The distances between places of residence and nearest water sources are presented in (Figure 3). Ideally, water source should be between 250 – 500 m away from the place of residence (Emmett and Rakgoadis, 1993). Since only 8% of the population at Somntongo falls within this range, it implies that 92% of the residents do not have an easy access to water.

The number of households sharing a water source varies from as low as 20 to as much as over 60, as presented in (Figure 4). The large number of households sharing a source results in high rate of depletion. People often queue and wait for as long as three hours to collect water. Sometimes people wait and when it gets to their turn, the source becomes completely depleted and they have to go back without water. Some people spend part of the night at the source and this poses danger to their lives. Children and women, who are the major water collectors in the homesteads, spend much of their time scouting for water.

Water collection can be done by motor vehicle, livestock or head carriage. About 78% of the respondents earn an annual income of below US\$160.00, and could neither afford to own a vehicle nor pay the cost of water transportation. A few made use of their livestock while a majority transported their water by head carriage over a wide range of distances.

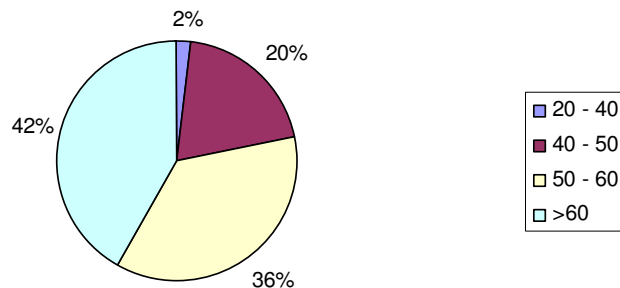


Figure 4. No. of households sharing a water source.

Most water collection was done on foot by women who had other engagements and school children. Because of the time spent on water collection, other jobs especially domestic chores were affected while lateness to school by children whose first job is the collection of water was very common.

### Water consumption

The various uses and quantities of water in Sonmtogo are presented in (Figure 5). Water was used mainly for domestic and livestock and no irrigation activities were carried out. About 84 and 16% of the homesteads with an average population of 11, used less than 30 L and between 30 and 50 L of water per day respectively for their domestic purposes. This gave an average of between 2.7 and 4.5 litres/head/day. Compared with the minimum standard of 25 litres/head/day, reported by Emmett and Rakgoadis (1993), this was grossly inadequate and the community was subjected to water stress

About 88 and 12% used less than a total of 25 L and between 25 and 50 L of water per day for their livestock, the average population of which was 11 and comprised various animals. This average of between 2.3 and 4.5 litres/animal/day was below the recommended minimum values of 15 – 45 L for cattle, 5– 15 L for sheep and goat, and 10–27 L for pig (Agric. and Agri-food Canada, 2003; Bengtsson and Whitaker, 1986). Livestock were subjected to water stress and there were reported cases of livestock lost due to water scarcity as shown in (Figure 6).

About 18% of the respondents reported to have lost one animal whilst 6 and 2% have lost two and three animals, respectively. Cattle were the most affected species, yet they are the most important livestock especially as they are used for the settlement of bride price or *lobola*.

As a result of water scarcity, domestic practices such as regular bathing and washing were compromised resulting in poor hygienic situations in the homesteads, dirty water such as from washing was given to livestock since the little available one was insufficient to meet the human needs. Livestock were driven for more than 15 km to the river since the earth dams were dried. Sonmtogo is

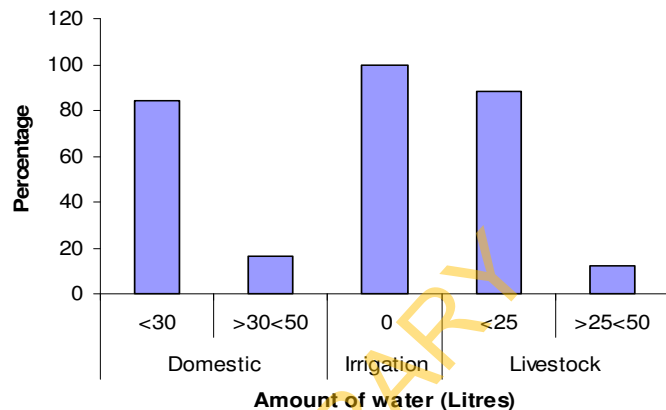


Figure 5. Amount of water used.

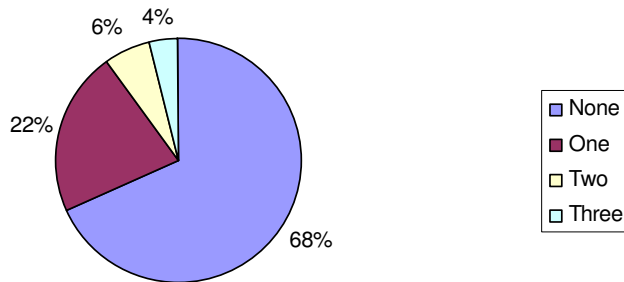
suitable for the commercial production of maize, potatoes, cassava, beans and sorghum but these were only cultivated on small scale due to lack of water for irrigation. Irrigation was not practiced in the area for lack of water. Cotton was the only commercial crop cultivated because of its water tolerance. Sugarcane which is a major cash crop in Swaziland was not cultivated because of its high water demand. During the study, the researchers were informed that financial institutions were unwilling to give loans for sugarcane production in the area because they had no confidence in the success of such investments. These situations constituted threats to the attainment of food security and economic empowerment programmes of the kingdom.

### Impacts of water scarcity

**The impacts of water scarcity in Sonmtogo include the following:**

a) A lot of time and energy are expended in water collection and in some instances; the water may not be obtained after a long search. As a result of this, there is a reduction in the time available for productive work while domestic chores suffer. Children, who are mainly involved in water collection, go late to school and their future is being mortgaged. Information obtained from schools confirmed that the performances of most of such affected children have declined. In some instances, when the water sources in schools are depleted, classes are suspended until water is available. The HIV/AIDS pandemic prevalent in the country is made worse by poor quality water. Clean water prolongs lives thus it is as necessary as medicine and proper diet.

b) As a result of its scarcity, water is expensive. The cost of 100 L of water was US\$0.70 while a 5,000 L tanker load sold for US\$42.00. The annual income of over 80% of the populace was less than US\$160.00. Expenditure on water reduces the income available to meet other domestic responsibilities and this is a burden on the rural



**Figure 6.** Number of livestock lost due to water scarcity.

poor and further complicates their poor economic situation. The severity of water scarcity and inability to pay for its supply has compelled some people to depend on dews for their water need (Figure 2). Schools are compelled to use funds for other projects for water supply

c) With a population of about one million people, the predominant occupation in Swaziland is agriculture. About 70% of the populace is engaged in subsistence agriculture producing both crops and animals while agriculture accounts for about 17% of the country gross domestic products (Wikipedia, 2005). Water is a basic requirement for effective agricultural production and its scarcity in Somtogo has resulted in the loss of livestock and limited the type and extent of crops that can be cultivated. This has not only reduced the income potentials of the inhabitants but has increased food deficits within the community. This is a threat to the attainment of the food security goal of the Kingdom.

## Conclusions

Somtogo depends on two rivers and five boreholes for water supply. These sources are inadequate as a result of which domestic practices such as bathing and regular laundry were compromised while unclean water was fed to livestock. Livestock have been lost due to water scarcity while the variety and scale of crop production have been reduced due to lack of water for irrigation. The burden and cost of obtaining water has reduced the time available for productive work, educational programmes have been affected while income available for domestic responsibilities has been reduced. Water scarcity constitutes a threat to the attainment of the food security programme of the Kingdom.

## Recommendations

- The laudable efforts of the Swaziland Water Crisis Assessment Team (SWCAT) at providing water at short notice to distress areas has been hampered by lack of transport. The unit should be adequately funded in order to be able to discharge this function.
- Members of the community should take steps towards

solving the problem of water scarcity. Some of the existing thatched roofs should be replaced with other materials with higher rain water harvesting potentials and acquiring high volume storage containers, so that rain water can be collected and stored to serve the family especially during the dry season.

c). Agriculture is the main source of income for most Swazi families and the backbone of the food security programme of the kingdom. The government should ensure adequate provision of water to meet domestic, irrigation and livestock needs through drilling of boreholes and construction of reservoirs.

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