ACCESS TO POTABLE WATER IN RURAL SWAZILAND: A CASE OF MASHOBENI SOUTH

M. I. Shongwe[1] and M. T. Dlamini

ABSTRACT

Accessibility to safe drinking water is one of the most effective ways for improving the health status of a community. However, water scarcity around the world still remains a problem despite the Millennium Development Goals efforts. A study was undertaken at Mashobeni South, in Swaziland to investigate accessibility to portable water. Major communal water points and homesteads were identified through a reconnaissance survey. Face-to-face interviews were then conducted using an interview schedule. Water sources at Mashobeni South were 'unimproved'; rivers/streams, and unprotected wells. The return time and distance to water source were also outside the basic recommended values. The average consumption per capita per day was 13.1 litres, which is slightly above two thirds of the UN minimum requirement. About 72% of the water was used for personal hygiene, with about 22% used for cooking and another 6% used for drinking. The area has a lot of natural water sources but the water has to be brought next to the users. Treatment before use, especially for drinking has to be considered.

Keywords: Access, Consumption, Potable water, Water scarcity
[1] Agricultural and Biosystems Engineering Department, University of Swaziland, Private Bag Luyengo, Luyengo M205, Swaziland
Author's email address: shongwemi@uniswa.sz

INTRODUCTION

Significance of water resources

Sound water resource development and management underpins attainment of all the Millenium Development Goals (MDG), not only the one dealing specifically with water supply and sanitation (Lenton *et al.*, 2007). However, poor water quality and lack of access to improved sanitation continue to pose a major threat to human health (Sanitation connection, undated). According to the Government of Swaziland (GoS) (2005) safe drinking water help to reduce the incidence of waterborne diseases, reduces public and private expenditure on healthcare and further increases the productivity of the population as time spent travelling to collect water is reduced. On the other hand, non-availability of safe water has an effect on nutrition status with high negative consequences on young children and to people with compromised immunity (GoS, 2008, and Lenton *et al.*, 2007). According to Seckler *et al.* (1998) access to water is threatened by increasing consumption patterns.

Kumar *et al.* (1996) stated that accessibility to safe drinking water is one of the most effective ways for improving the health status of a community. Nevertheless, water scarcity around the world remains a problem despite the effort of the MDG on water and sanitation (UNESCO, 2004). Water scarcity is not only affecting economic development and health status, but also education as reported by the IRIN Humanitarian News and Analysis (2007) that in some areas, most notably in Africa and Asia, school hours are spent collecting water.

The WHO (2002) states that lack of access to safe water supply, sanitation and hygiene is the third most significant risk factor for poor health in developing countries with high mortality rates. This is directly linked to poverty as supported by a national study conducted by the GoS (2005) which showed that poverty prevalence was high among households using rivers, canals, and wells compared to those who used indoor-piped water.

Access to water supply

According to Gulaid (2007) globally, two in three people lacking access to clean water survive on less than US $2 a day, and one on less than US $1. The WHO and UNICEF (2010) reported that 884 million people in the world do not have easy access to improved water sources, a majority of them from developing regions with over a third in sub-Saharan Africa. The rural population continue to lag behind in this regard, as stated by Novicki (1997) that two thirds of the rural population in sub-Saharan Africa lack access compared to a quarter in urban areas. Despite an increase of 11% since 1990 to 2009, only 60% of the population in sub-Saharan Africa is using improved water sources for drinking (WHO and UNICEF, 2010). Mmegi (2004) states that more than half of the rural population in the SADC region does not have access to clean water.

Water scarcity, as defined by Manyanhaire and Kamuzungu (2009), is insufficient quantity and/or quality. It is the imbalance between availability and demand, and the degradation in quality to the extent that the demand by all sectors, including the environment, cannot be fully satisfied (FAO, undated; Anonymous, undated). The causes

of water scarcity are diverse as stated by the FAO (2010), and affect mostly those living in rural areas. Abrams (2000) stated that water scarcity stems from both natural and human-induced activities such as population growth. The main challenges facing rural communities in terms of water supply, as identified by Nkhuwa (2007) are; long distances to water points, carrying heavy water containers on heads, and long queues at water points. Unreliable and less accessible water supplies have a huge impact on household food security as it is also one of the major problems affecting small-scale irrigated agriculture (Shongwe, 2008).

The UN indicator for access to water has shifted from 'access to safe water' (UNDP 2000; World Bank, 1993) to 'access to improved water sources' (UNDP, 2001; World Bank, 2001). The difference between the two is outlined in Table 1 by Aiga (2006) based on World Bank (1993), (2003). An 'improved' drinking water source as defined by the WHO and UNICEF (undated: 1) is one that, "by nature of its construction or through active intervention, is protected from outside contamination, in particular contamination from faecal matter".

Before 2005 more than 50% of the rural population in Swaziland relied on unsafe water drawn from rivers, streams, springs, and dams (GoS, 2005). In some cases, these sources dried out during dry seasons bringing hardships to communities. The situation has improved as the UNICEF (2010) report that the overall access to 'improved water sources' in Swaziland has risen to about 69%. However, the rural areas are still behind urban areas in this regard, 61% compared to 92%, respectively.

Table 1. Comparison between 'access to safe water' and 'access to improved water source' (Aiga, 2006)

		Access to safe water	**Access to improved water source**
Type of water source	Rural Urban	Sanitary well, spring Public fountain, standpipe	Household connection, public standpipe, borehole, protected well, protected spring, rainwater collection
Time	Rural	Do not have to spend disproportionate part of the day fetching water	n.a
	Urban	n.a	
Distance	Rural	n.a	Within 1000 m of dwelling
	Urban	Within 200 m of dwelling	n.a
Quantity		20 litres *per capita* per day (lpcd)	20 lpcd
Quality		Treated surface water and untreated but uncontaminated water.	

The country's National Development Strategy (GoS, 1997) emphasises the need to facilitate the provision of clean and safe water to all. According to GoS (2005), Swaziland's goal is for everyone to access safe water, proper sanitation and proper waste disposal by the year 2022. The government's commitment is also enshrined on its water policy statement where it states that all people should be entitled to a minimum of 30 litres of safe and clean water *per capita* per day, at a distance of not more than 200 metres (GoS, 2009). This study was aimed at understanding the dynamics of access to

water in rural areas. The main objective of the study was to evaluate access to domestic water sources at Mashobeni South.

METHODOLOGY

Description of study area

Mashobeni South is found in the Shiselweni region, on the Highveld, south west of Swaziland (Figure 1). It is located at 27.05^{o} South and 31.23^{o} East. The area has a few streams and the nearest main river is the Mkhondvo River, which runs through forestry plantation. It has an annual precipitation between 1000 and 1250 mm (GoS, 2007).

Population and sampling

The study targeted four sub-areas of Mashobeni South; Hlane, Ndzingeni, Khapheni and Mbhandzeni. A random sample size of 81 homesteads was selected from a sample frame of 383 homesteads following a sample size selection chart by Isaac and Michael (1995).

Data collection and analysis

Major communal water points and homesteads were identified through a reconnaissance survey with the help of residents. Coordinates of homesteads and water sources were then located using a GPS. Face-to-face interviews were conducted on residents using an interview guide. Distances between homesteads and water points were measured using a GPS. Data was analysed using frequencies and percentages from SPSS Version 17.0.

Qualitative data was summarised and presented in a narrative form. Results were benchmarked against the UN values for access to water (World Bank, 1993, and World Bank, 2003).

RESULTS AND DISCUSSION

Household size

The average household size for the area was eight and this was more than the country average of five heads per household (GoS, 2007). Table 2 highlights the fact that 65.5% of the households had a household size of more than five.

Table 2. Number of people per household (N = 81)

Household size	Frequency	Percentage (%)
6 – 10	33.0	40.7
1 – 5	28.0	34.6
11 – 15	14.0	17.3
16 – 20	6.0	7.4
Total	*81.0*	*100.0*

As the population grows, pressure is placed on water and other resources to provide adequate supply of food for the people while maintaining the integrity of the ecosystem. According to WHO (2009), high population increases water usage and thus lead to water shortage. However, scarce water supplies and/or poor water quality may lead to poor health. If, due to water scarcity, people exploit poor quality alternatives and/or carry heavy water containers over long distances, this may lead to negative health implications.

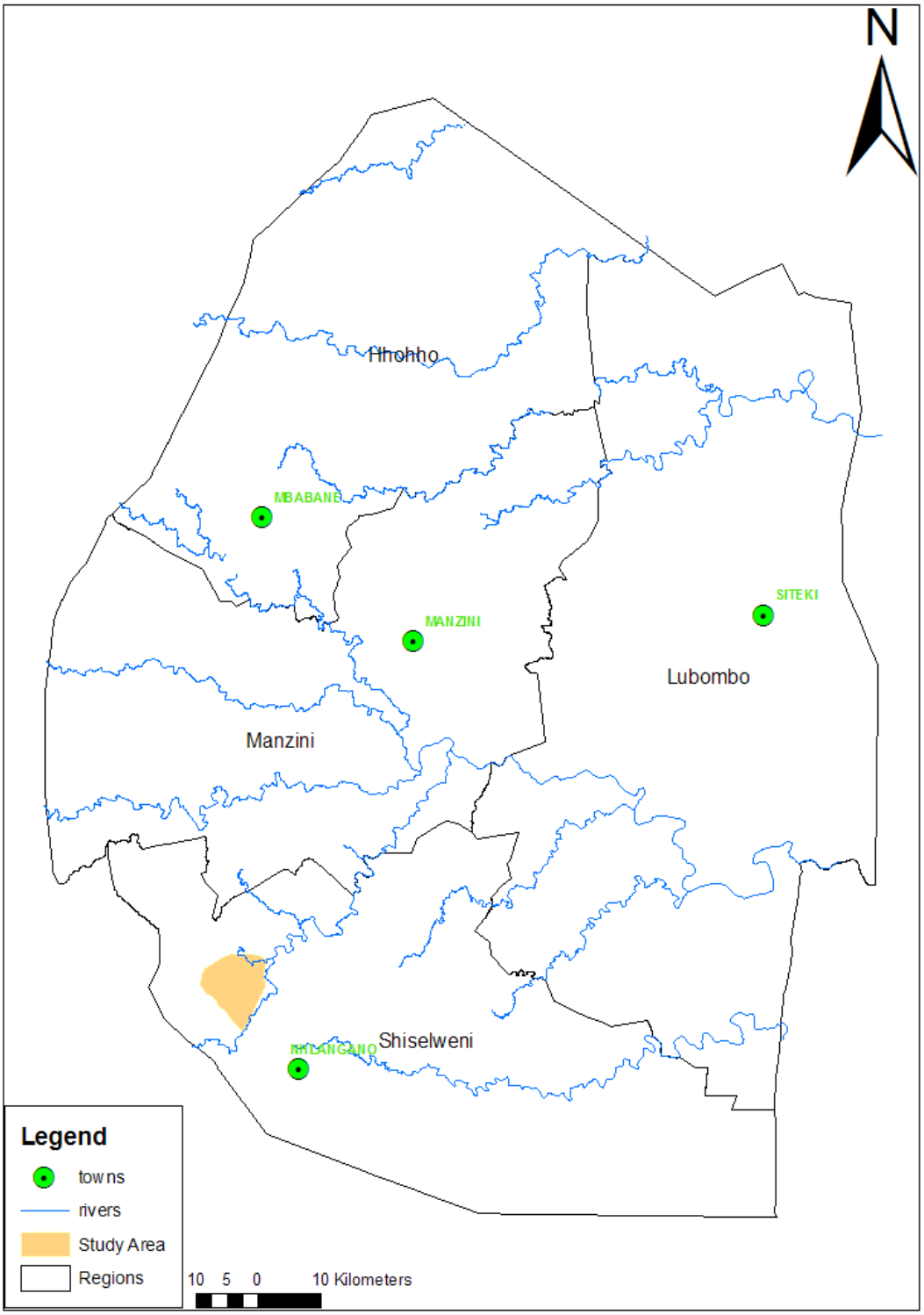

Figure 1: Map of Swaziland showing the study area

Sources of water

The main sources of water at Mashobeni South were "unimproved'; rivers/streams, unprotected wells, and piped water (water drawn from streams using some pipes to a nearby point). About 69.2% of the homesteads depended on rivers/streams while 25.9% got their water from unprotected wells. There was only a single private pipe water supply and it supplied 4.9% of the homesteads. Some (4.9%) of the homesteads mentioned that they sometimes use rooftop rainwater harvesting (RWH) as a source of water during the rainy season. The low use of RWH might be attributed to the fact that most of the resident houses were grass-thatched, and mostly had a low catchment area.

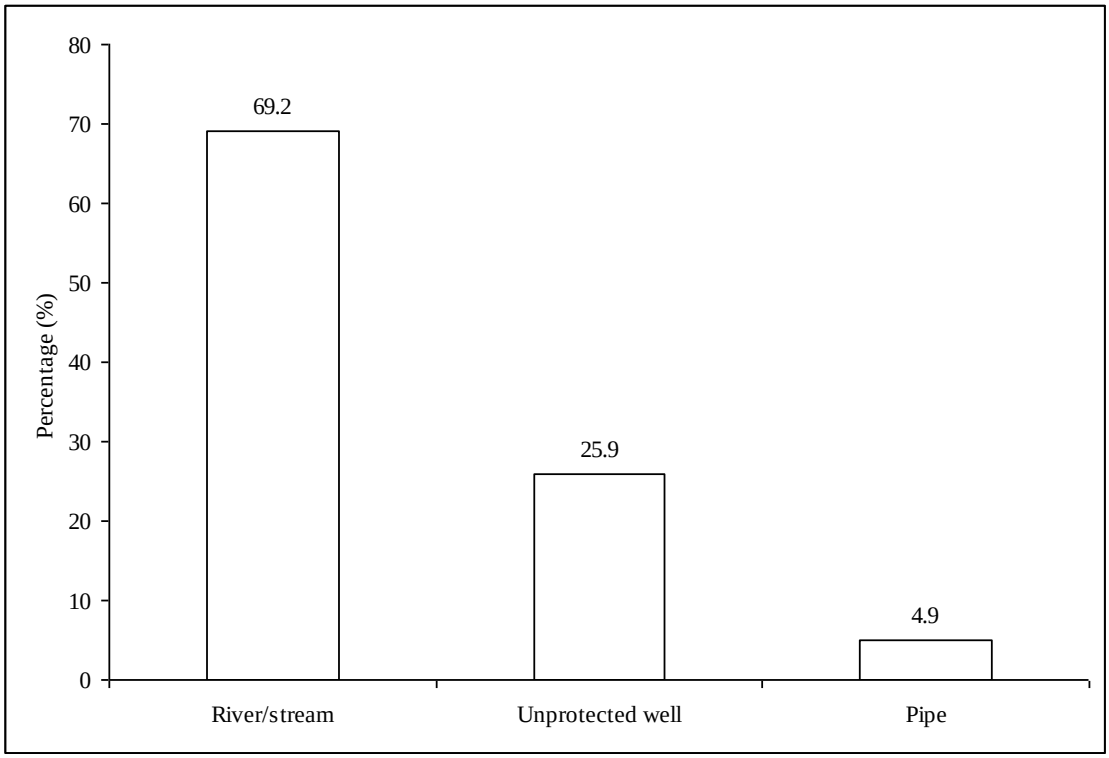

Figure 2. Major sources of water at Mashobeni South (N = 81)

As a large number of the population depended on river/streams and unprotected wells, the residents might had been exposed to water-borne diseases since the water was

not treated before use. According to Krantz and Kifferstein (2003), water pollution is usually a main problem in open sources beside water scarcity. During the rainy season water is more likely to be polluted from sediments such as silt and other solids besides the microbial pollution.

The distance to water source

The distances between places of residence and nearest water sources are presented in Figure 3. The majority (67.9%) of the residents travelled between one and four kilometres to get to a water source.

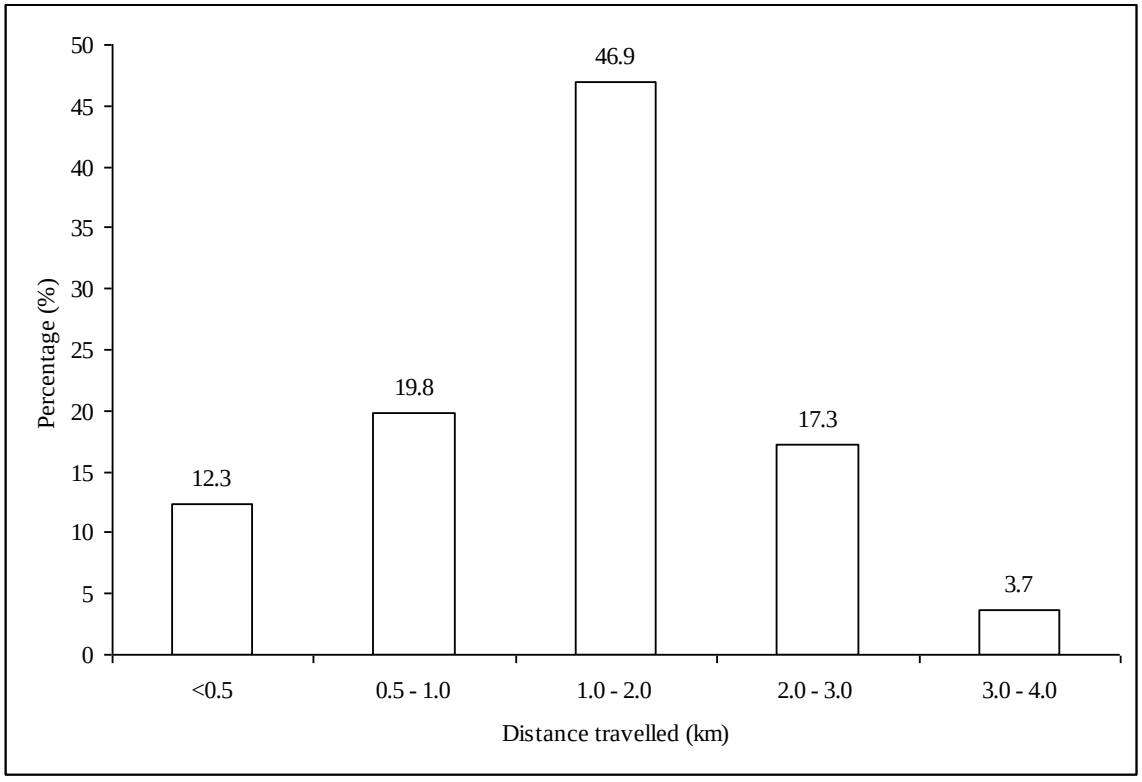

Figure 3. Distance between homesteads and sources of water (N = 81)

According to the World Bank (2003), the recommended distance between sources of water and the place of residence for rural settings should be less than 1 km. Since only 32.1% of the homesteads were within the recommended distance, this implies that 67.9% of the residents did not have easy access to water. Despite that water was available; the main problem is the distance travelled to the water sources other than availability.

Time to collect water

The time for a return trip is given in Figure 4. Almost 15% of the residents were within the WHO and UNICEF (2010) recommended 30 minute bracket. Moreover, the rest still have to spend between 30 and 120 minutes to collect water. As more time is spent on collecting water from distant sources, there are productivity losses and labour diversions incurred (Shuh, 2007). The longer return time is uncommon in Africa as observed by the WHO and UNICEF (2010: 28) that 'water collection trips of over 30 minutes are most prevalent in Africa'.

Besides the distance travelled, the time spent on water collection might have been increased by low water discharge at water sources. Sometimes the residents spent more time while waiting for water to clear after it had been polluted by livestock. According to WHO and UNICEF (2010) people spending more than half an hour per round trip 'progressively collect less water, and eventually fail to meet their families' minimum daily water needs'

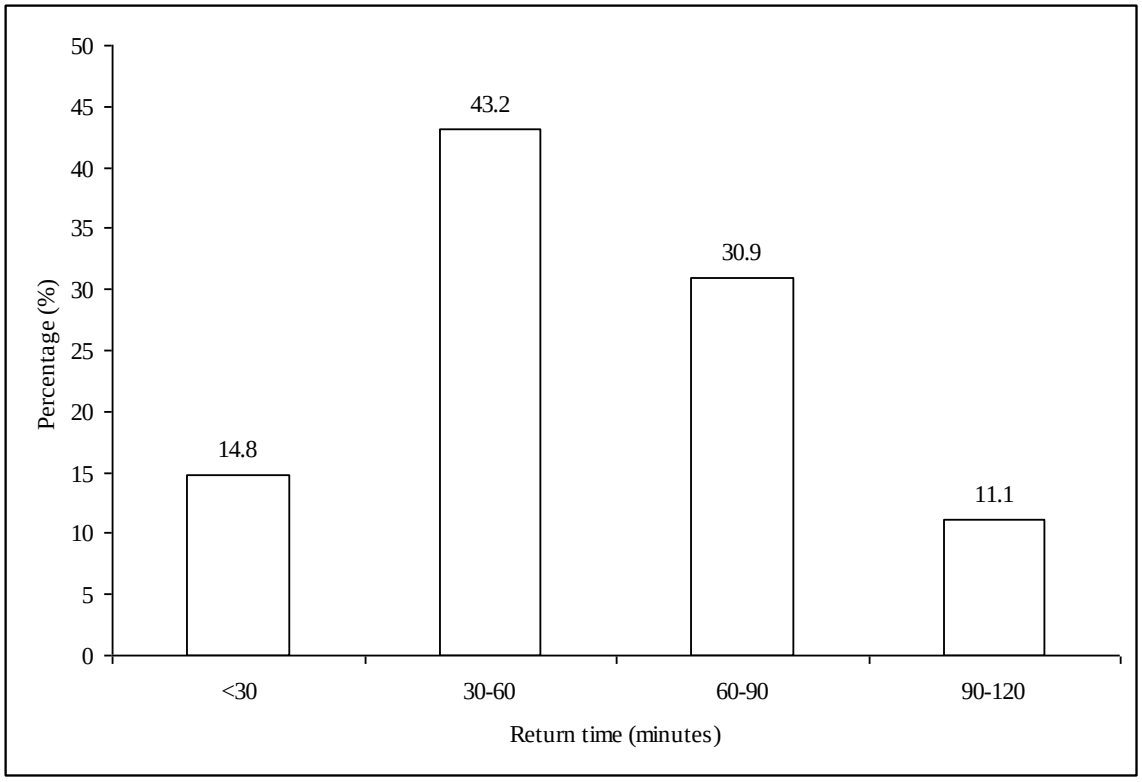

Figure 4. Time spent on water collection per day (N = 81)

Water for domestic uses

Table 3 indicates the average water use *per capita* per day at Mashobeni South. According to Mwendera (1999), human water consumption varies according to availability and the standard of living of the people. Reasonable access is at least 20 lpcd from a source of about one kilometre of the users dwelling (WHO and UNICEF, 2000). Table 3 shows a consumption of 13.1 lpcd which is below the WHO and UNICEF recommended value, however, this 13.1 lpcd sometimes exclude water used for laundry, which in most cases at the area, was carried out at water sources. The water used by the residents was about two thirds of the WHO and UNICEF recommended value of 20 lpcd.

Table 3. Water for domestic uses (lpcd)

Uses of water	Water quantity (lpcd)	Percentage (%)
Personal hygiene	9.4	71.8
Cooking	2.9	22.1
Drinking	0.8	6.1
Total	13.1	100.0

Most of the water was used for personal hygiene (71.8%), followed by cooking (22.1%), and then drinking (6.1%). This order of use is the same as that identified by Thompson *et al.* (2001) for typical urban areas in East Africa and also follows the pattern recommended by Gleick (1996: 87) which is based on 'fundamental health considerations and on assumptions about technological choices usually made at modest levels of economic development'.

CONCLUSION AND RECOMMENDATIONS

The residents of Mashobeni South were using 'unimproved' water sources from rivers/streams and unprotected wells. These sources were not easily accessible in terms of distance and return time. Water consumption *per capita* per day was also below the basic minimum outlined by WHO and UNICEF. However, the area has a lot of natural water sources, rivers/streams and wells, but the water has to be brought close to the users. Treatment of water especially for drinking has to be considered if such sources are to be explored. The area has enough annual precipitation to consider some rainwater harvesting options.

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