

# ACCESSING WATER FOR DOMESTIC USE: THE CHALLENGES FACED IN THE GA WEST MUNICIPALITY, GHANA

## **Abstract:**

*This paper investigates the various challenges people face in their quest to access water for domestic use. Three communities were randomly selected in the Ga West Municipality in the Greater Accra Region of Ghana. Questionnaires were administered to 246 households and 29 respondents were interviewed from water supply companies and other opinion leaders. Issues investigated included the main sources of domestic water, distance from the source of water to the home, mode of transporting water to the home and the cost involved in the purchasing of water. The results show that the major challenges in accessing water in the district were distance from the home to the water source, monetary cost of water which was considered expensive, and the mode of transportation which was mainly head-porterage. It is recommended that households harvest rainwater in larger quantities and invest in large storage tanks into which water could be stored for use.*

*Keywords: domestic water, access, Ghana*

## **Introduction**

Water supply systems are important facilities to every society. Provision of potable drinking water to homes and industries is necessary for development. According to Simmons (1991), water is the commonest compound on earth and it is not only essential for life but has become interwoven with human livelihoods in various inextricable ways. Though water resources are in abundance, it is unevenly distributed on earth resulting in water scarcity in some parts of the earth. Efforts by government and non-governmental organisations to make water accessible to homes irrespective of its availability have not yielded the expected outcome. When the supply of water from a source is insufficient (in terms of its quantity and quality) to cater for the needs of its population, its users most often than not devise individual and collective responses to water scarcity (Drinking Water Review Panel, 2000). More than 1.1 billion people in low and middle-income countries (representing about one in every five people) lack access to clean, safe drinking water (MercyCorps, 2006).

The issue of water scarcity in parts of the world has affected its accessibility. Available fresh water is also reducing by quantity and quality due to human development processes such as construction projects in water ways and pollution by industrial waste. The most affected are people in the developing countries with a greater majority being children. In Ghana, over nine million people have inadequate access to treated water (WaterAid, 2006). The policy of the then Ghana Water and Sewage Corporation (GWSC) included the supply of potable water to rural communities based mainly on groundwater sources because groundwater is considered not only feasible but also as the most economic source of rural potable water supply (WaterAid, 2006). The use of groundwater sources is actually not feasible for all communities. This is because,

though groundwater might be one of the inexpensive ways of supplying water in some areas such as the Northern part of Ghana, the situation is different in some areas in the South. Water from some wells and boreholes in the South and especially in the Ga West Municipality has some level of salinity, which either limit their functions or render them unproductive (DWST-GWDA, 2007).

Most of the localities in the Greater Accra Region depend on rivers, streams and canals for their water supplies (Sarpong, 2004). Though this region hosts the capital city of the country, it is no exception when it comes to issues surrounding access to domestic. It is expected to have better condition than the other regions in the country since it is the seat of government. However, due to the unequal distribution of facilities, increasing population resulting in competition between industrial and domestic water demands, many communities within this region still have inadequate supply water to their homes.

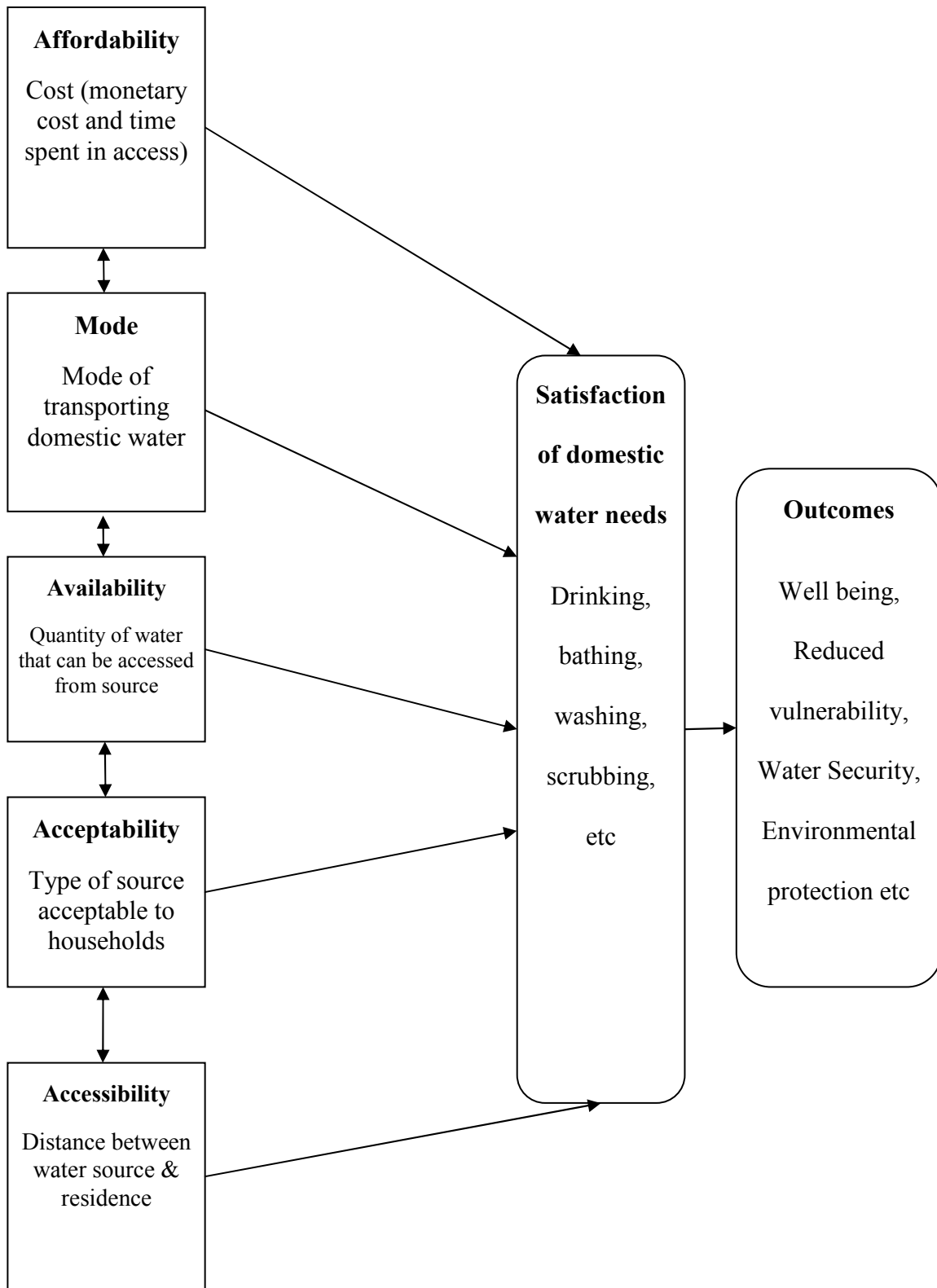
Communities with water supply systems that constantly supply homes with potable water are not secured because they sometimes face acute water shortages. Some communities have not had any form of town supply systems to provide their homes with potable water. Therefore, people spend quite some time in accessing potable water; and this is mostly carried out by females and children in the home. The former district capital (Amasaman), which has been maintained as the capital for the Ga West Municipality in the Greater Accra Region of Ghana has always been the centre for planning and the seat of administration since the creation of the Ga District in 1988 (Ga West District Assembly, 2006). However, there is no major water supply system that supplies water to communities within the district. Currently, only 17.5 percent of the population in the municipality has access to treated water, while nationally, this is above 70 percent (DWSTGWDA, 2007). This research therefore sought to find out the main sources domestic water, the distance from the source of water to the home, time spent while accessing water, mode of transporting water to the home and the cost involved in the purchasing of water for domestic use.

### **Conceptual framework**

The Penchansky's framework (1981) was adapted for the research. The framework measures access in five specific areas. These are availability, accessibility, accommodation, affordability and acceptability which overlap with each other to some degree. These measures were meant to satisfy the consumer or user's demand (Penchansky & Thomas, 1981).

The adapted framework included accessibility which measured the distance between domestic water source and residence while acceptability looked at the type of domestic water source accessed. Availability looked at the quantity of water that can be accessed from a chosen source while the mode considered the methods used in transporting domestic water from the source to the home. On the other hand however, affordability measured the monetary cost of water as well as the time spent in accessing domestic water.

Satisfaction of domestic water needs brings about outcomes which included water security, reduced vulnerability and well being



**Figure 1: Penchansky's framework for access**

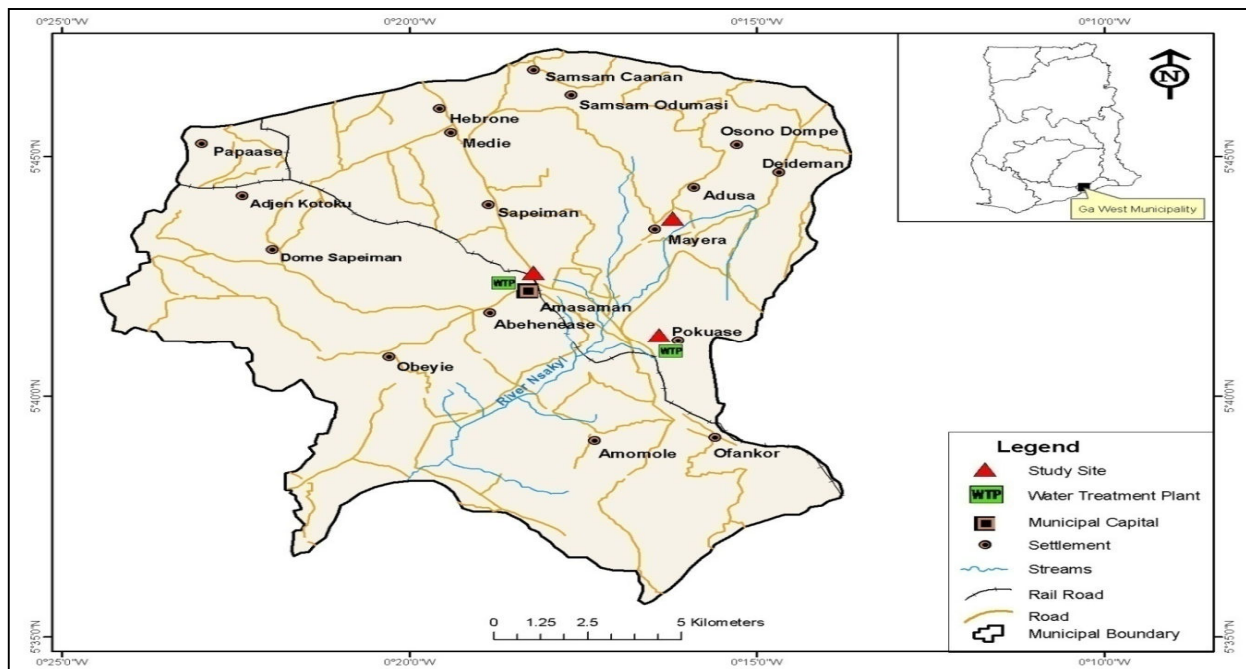
Source: Adapted from Penchansky (1981)

## Data and results

### Study area

The Ga West Municipality is currently one of the seven districts in the Greater Accra Region with its capital being Amasaman. Ofankor, Medie, Adjen Kotoku and Pokuase are some of the major towns found in the municipality. The Municipality lies within latitude  $5^{\circ} 48'$  North,  $5^{\circ} 29'$  North and longitude  $0^{\circ} 8'$  west and  $0^{\circ} 30'$  West respectively and occupies a land area of 284.01sq km which is zoned into six zonl councils (Pokuase, Mayera, Ofankor, Ayikai Doble, Kotoku and Amasaman) for effective administration. The population of the Municipality was projected to be 243,724 in 2007 (Ghana Statistical Service, 2002) but as at the year 2008, the population of the area was 183,000 (Ga West Municipal Health Management Team, 2008). The Municipality remains predominantly peri-urban and urban with a population growth rate of 3.4percent in the year 2000. The reason given was the proximity of the area to the capital city. The population is mainly concentrated along the peri-urban areas of the municipality particularly on the border with the Accra Metropolitan Assembly and Ga East District Assembly. The 2000 population figure also showed a density which was much higher than the national density though lower than that of Greater Accra Region (with 895.5 persons per sq. km). This implies great pressure on resources including water (Ga West District Assembly, 2006).

The major rivers that flow through this municipality are the Densu, and Nsakyi rivers. Densu, which is the largest of them drains down from the Eastern Region through the western portions of the district to Ga South Municipality where it enters the sea. It is also the major supply of water to most of the people in the municipality and its neighbouring communities and serves as a natural boundary between Ga West and Ga South municipalities. The bi-modal rainfall pattern enables some households in the municipality to depend on rainwater as their main source of water for the home (Fig 1 shows the map of the Ga West Municipality).



**Fig 2: Map of Ga West Municipality with selected communities involved in the research**

Source: GaWest District Assembly, 2009

The research involved respondents from various categories which basically included households (both male and female headed), traditional authorities and water supplier agencies. The water supplier agencies included the individual or private and non-governmental organisations such as the Water Health International in collaboration with Safe Water Network. The water supplier agencies under the government organisation included the Ghana Water Company Limited (Aqua Vitens Rand Water Limited), Community Water Supply and Sanitation Agency and the Water and Sanitation Committee in each community. Two communities were randomly selected (Pokuase and Mayera) while the Amasaman community was purposively selected because it was the municipal capital and was the centre for administration and planning. The total population for the three selected communities was 15,630 (Ghana Statistical Service, 2002).

Fisher, Laing, Stoeckel, and Townsend, (1998) formula for sample size estimation was used which gave a total sample size of 246. The total sample size was then proportionally allocated the three communities involved in the research (refer to Table 1). Two hundred and forty-six respondents were randomly selected from 246 households to be involved in the research while the purposive sampling technique was used to select the person in charge of the access and management of water in the home. The purposive sampling technique was also employed in selecting 29 stakeholders which included main water supply companies and opinion leaders in the municipality.

**Table 1: Selected communities and the sample size**

Selected Communities	Total Popn	No. of Houses	No. of H/d	Avg Size	Proportion (percent)	Sample size
Pokuase	10,858	1,366	2,338	4.6	60.0	148
Amasaman	3,959	626	984	4.2	34.6	83
Mayera	813	177	238	3.4	6.0	15
Total	15,630	2,169	3,560	12.2	100	246

Source: Ghana Statistical Service, 2002

Primary data were obtained from the field using field observation (non participant observation) questionnaire and interview guide. The questionnaire design employed both the close ended and the open ended questions. Field observation as a data collection technique was used to inform the researcher on the various sources of water from which the communities accessed potable water and the level of accessibility of the various water sources during the dry and wet seasons. The month of July was selected to observe the level of accessibility to water in the rainy season while January was selected to observe accessibility in the dry season. It was assumed that the seasonal changes may have influence on the level of accessibility. This also helped to observe how community members helped in the protection of water resources and its environment. An interview guide was designed to collect data from opinion leaders (traditional authorities) which included the chiefs of the selected towns, the assembly men and officials from the water supply agencies and companies. The first section sought data on the water situation in each community while the second section sought to gain knowledge on methods of improving the situation using his/her office and position. The third section focused on the management strategies adopted by these leaders to help solve or minimize the situation in their communities. The fourth part gathered information on possible solutions to the water situation in the

community in particular and the municipality as a whole. The final part gathered information on the demographic characteristics of the participants.

Questionnaires administered were analyzed using the Statistical Product and Service Solutions (SPSS) version 16. Data collected using interviews were transcribed, categorised and discussed. The non participant observation also helped to further explain the challenges faced in accessing water in the study area.

## Results and discussions

### Sources of water

The main sources of water in the municipality were found to be rivers and streams, imported tape/sachet water, harvested rainwater and ground water which was harnessed through boreholes and wells. The choice of domestic water sources was dependent on the cost of water and the distance from source to the home. Groundwater was the most accessed water source in the municipality constituting 37.4 percent of respondents. This was because most of the boreholes and wells were located close to the residence of community members making it geographically accessible. It was also affordable in terms of monetary cost and available in the quantities needed.

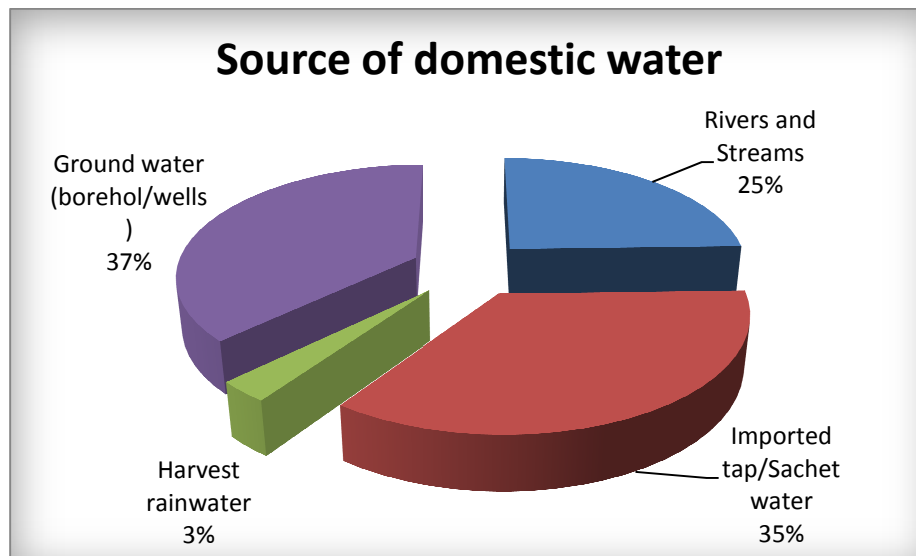


Fig 3: Sources of domestic water

Source: Fieldwork, 2009

The data also showed that though men were also involved in the access of domestic water, their preferences for the source of domestic water was a little different from that of the women. Males had the highest percentage in access of imported tap/sachet water (constituting 38.5). On the other hand however, none of them considered rainwater harvesting as an option. More females (constituting 38.2 percent) accessed domestic water from ground water sources while a few (about 4.9 percent) considered rainwater harvesting. Women considered water from

imported tap/ sachet water sources to be expensive. Women were concerned about managing resources available to them especially when it has to do with monetary cost. Women also accessed water from groundwater sources because they felt they were affordable and available in quantities which could reduce vulnerability and increase water security (Penchansky, 1981).

Women were known for a long time to be the collectors and managers of water for the home (Tenkorang, 2002). From several researches, it has been confirmed that women were practically responsible for the collection and transportation of water from the source to the home. They were also responsible for the use and management of water. They have actually been branded as the ‘domestic managers’ of water (WaterAid, 2006). Women were to decide on where to collect water, for which purpose in the home and how much water should be collected for use in the home at a point in time. This is done considering the time spent on accessing water, the energy used, the reliability of the water source and more importantly the quality and quantity of water to be accessed (Society and Natural Resources, 2002). Though the sampling technique employed the probability sampling technique, the data collected showed that females were the main people involved in the collection, allocation and use of water in the home.

**Table 2: Source of water by sex**

<b>Source of water</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
Rivers and Streams	25.3	24.3	24.7
Imported tap/Sachet water	38.5	32.6	34.9
Harvest rainwater	0.0	4.9	3.0
Ground water (borehole/wells)	36.3	38.2	37.4
Total	100.0	100.0	100.0
N	91	144	235

Source: Fieldwork, 2009

More than half of all respondents in the selected communities accessed domestic water from different sources for domestic use. Confirmed by Engel et al (2005, cited in Eguavoen, 2008), many households in the various regions in Ghana are faced with having to decide on which source of water is more potable for household consumption because they have to access water from different sources. This makes water user groups dynamic giving household options to choose from, bearing in mind the minimization of risks especially during the dry season. Therefore, the choice of water source involves the need for reasoned decision based on one’s own criteria of access, time, effort, water quality, quantity and reliability (Tenkorang, 2002).

The issue of income affects the choice of domestic water source. The number of respondents who were unemployed constituted 15.2 percent of all respondents. Sixty four percent of respondents were self employed residents who were into trading and farming activities. Ten percent worked in the formal sector as extension officers and teachers in their communities. The rest (2.5 percent) were not employed but worked on short term contracts. More than 60 percent of the males respondents were employed in the formal sectors as veterinary, extension officers and technical officers as compared to 48 percent females employed in the formal sector as teachers and nurses. More women (61.4 percent) were employed in the informal sector than males (38.6 percent). As a result, most respondents were unable to really

give accurate information on how much they earned at the end of the month. Most of them clarified this by stating that the money was spent before it was even accounted for at the end of the month or sale of a product. One of the respondents explained further that:

*The money I earn from this business is small. I mostly spend it before even accounting for it. It is more of “from hand to mouth” thing. Therefore, I can't really tell how much I earn at the end of the month (Ama).*

Though many of the households' accessed domestic water from four main sources in the municipality, the data showed that regardless of the level of income, the sources of domestic water were virtually the same though there were few differences. Majority of those who earned about GH¢ 50.00 a month accessed domestic water from groundwater sources because there were cheaper (usually costs about GH 10.00p per 20 litre bucket). Those who had the highest monthly income were however more informed and used management strategies which could help them reduce the cost of accessing domestic water. About 35.5 percent of people within the highest income earning group (i.e. > GH¢ 160.00) accessed imported tap/sachet water for domestic purposes while the same percentage accessed domestic water from groundwater sources. Almost six percent of respondents from this group made efforts in storing harvested rainwater in large quantities. This was because they had resources to buy or build underground tanks to store harvested rainwater. As defined by Abane (2005), access also included ones convenience in reaching a facility that will enhance ones living condition. Convenience involved the facility being within ones physical reach in order to make access easier. This explains the reason why people were forced to depend on the sources available to them in their communities.

The data showed that men had higher incomes than the women and hence they could afford water from this source because they were more into the formal sector. Most women on the other hand access water from groundwater sources for three main reasons-monetary cost, quantity and proximity of the source in question. Water from this source was cheaper compared to imported tap/sachet water and most of the wells and boreholes were closer to their residence. The general overview, 37.4 percent which was the highest accessed domestic water was from groundwater sources followed by imported tap/sachet water because of proximity and the perception about the quality of water source. According to Nyarko et al (2006), though there are several alternatives of water sources throughout the year which is available to people in a community, households seemed to have preferences for water from particular sources using their perception of potability. Groundwater and imported water sources were considered to have high quality than the rest and this explains why only 3 percent of all respondents invested in harvesting rainwater in large quantities.

Vehicles were mostly used in importing tap/sachet water from communities outside the municipality. Accessing imported tap/sachet water took an average time of an hour. Majority of households (constituting about 52.6 percent) who took less than fifteen minutes in making round trip accessed domestic water from groundwater. Groundwater sources were closer compared to the other sources. Imported tap/sachet water was however known to be closer than the rivers and streams because they were sold at strategic points which made access easier.

Nyong and Kanaroglou (1999) stated that most households preferred using water irrespective of its quality as long as they were found in areas closer to their homes to cut off the extra time spent at sources with good quality but located far away. Eguavoen (2008) also found



out that people were actually not bothered about the quality of the water they accessed as a major factor in their choice though they may have their own perceptions about the quality of water. This was because they were likely to access domestic water from sources which were of poor quality because they were closer; hence the issue of proximity does have a great impact on the choice of domestic water source. The selected communities made use of the water available to them. Gleick (1996) also stated that sometimes, people tend to reduce their per capita water use from about five to ten litres per day in order to reduce cost and to sustain the continuous supply of water for household use.

The average time spent by an individual in making round trips in accessing water for the home was about twenty five minutes. The time spent in accessing domestic water had a direct effect on the quantity accessed, convenience and mode of transportation. Transporting domestic water from the source to the home was mostly by head portorage. This affected the quantity of water accessed at a time and this demands several round trips to arrive at the quantity needed for domestic use at a time.

**Table 3: Source of water by monthly income and time spent in making a round trip**

<b>Source of water</b>	<b>&lt;GHC 50.00</b>	<b>GHC 60.00- 100</b>	<b>GHC 110.00- 150.00</b>	<b>&gt;GHC 160.00</b>	<b>Total</b>
Rivers and Streams	26.7	18.9	30.0	23.5	25.3
Imported tap/Sachet water	29.1	40.5	33.3	35.3	32.9
Harvest rainwater	1.2	2.7	0.0	5.9	1.8
Ground water (borehole/wells)	43.0	37.8	36.7	35.3	40.0
Total	100.0	100.0	100.0	100.0	100.0
N	86	37	30	17	170

	<b>&lt;15 mins</b>	<b>16 to 30 mins</b>	<b>31 mins to 1hr</b>	<b>&gt;Hour</b>	<b>Total</b>
Rivers and Streams	14.7	21.8	37.5	36.7	24.6
Imported tap/Sachet water	31.6	34.5	39.3	40.0	35.2
Harvest rainwater	1.1	7.3	1.8	3.3	3.0
Ground water (borehole/wells)	52.6	36.4	21.4	20.0	37.3
Total	100.0	100.0	100.0	100.0	100.0
N	95	55	56	30	236

**Source of water by monthly income and time spent in making a round trip**

Source: Field Work, 2009

According to the UNICEF/WHO Joint Monitoring Programme (2006), round trips to facilities which took more than thirty minutes were not accessible facilities. They also included the fact that any improved water supply system should be accessed from a household connection or public standpipe which was protected. Boreholes and protected dug wells were considered accessible when they were located within a kilometer of the user's home. Domestic water was more accessed from groundwater sources because this source was closer and cheaper compared to the other sources, making it more accessible to the other sources.

The most educated in the municipality accessed domestic from imported water sources. This was because they considered other sources not potable. The main river that flows through the municipality was contaminated due to development and poor sanitation conditions rendering it unsuitable for drinking without any prior treatment (Johannesson & Olsson, 2009). It seems that the highly educated were looking out for their health other than the cost of the water accessed. Those who had education up to the tertiary level accessed domestic water imported tap/sachet water sources (constituting 43.9 percent) and groundwater sources (constituting 34.1).

**Table 4: Source of water by level of education**

<b>Source of water</b>	<b>None</b>	<b>Primary education</b>	<b>JHS</b>	<b>SHS/O/A Level</b>	<b>Tertiary education</b>	<b>Total</b>
Rivers and Streams	47.4	31.5	28.0	8.3	7.3	25.0
Imported tap/Sachet water	47.4	41.1	18.7	37.5	43.9	34.5
Harvest rainwater	0.0	0.0	1.3	0.0	14.6	3.0
Ground water (borehole/wells)	5.3	27.4	52.0	54.2	34.1	37.5
Count	19	73	75	24	41	232
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Fieldwork, 2009

People who had no formal education on the other hand, accessed domestic water accessed water from rivers and streams and imported tap/sachet water because these were sources that were closer and also because they had developed taste for water from these sources. The assertion made by Gleick (2003) is that users of water may be more likely to value the taste of water available to them and the convenience associated with it, than opt for other alternatives. Also, according to Nyarko et al (2006), though there are several alternatives of water sources throughout the year which is available to people in a community, households seemed to have preferences for water from particular sources using their perception of potability. Those who had, had tertiary education made efforts to harvest and store rainwater in large quantities and this they said saved them some money and time in having to access domestic water.

#### **Distance from domestic water sources to the home**

Some of the community members covered a distance of about a kilometre to access domestic water. A few of the households (12.8 percent) covered more than two kilometres in accessing domestic water. There were little differences with the distance covered by both males and females. This was as a result of the fact that both covered the same distance in accessing the same water source. The difference was the preferred mode of transport from the source to the home.

**Table 5: Distance by sex**

<b>Distance</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
<1km	40.7	40.3	40.4
1.5Km	24.2	22.9	23.4
<2Km	20.9	25.0	23.4
>2.5Km	14.3	11.8	12.8
Total	100.0	100.0	100.0
N	91	144	235

There were various modes of transporting water from the sources to the home. These modes were by head portorage (73.5 percent), by a private vehicle or commercial water tankers (7.3 percent), by using a wheelbarrow (8.5 percent) and by a locally made trolley (10.7 percent). The locally made trolleys and the use of wheel barrow in transporting water helped to reduce the stress involved where the head portorage method was used. However, through observation from the field, it was noticed that these modes of transportation were only possible if more men were involved in accessing and transporting domestic water from source to the home. This was because these machines needed a lot of manual energy to push since a large amount of water is transported at a time.

Over 47 percent of households covered a distance of about a kilometre in accessing domestic water. This is done by head portorage which allows people to take shorter routes to their destination. On the other hand however, the use of a vehicle to access domestic water means the use of definite routes that will allow easy access by a vehicle. Therefore, the longest distance (2 kilometre and above) were mainly covered by the use of a vehicle, locally made trolleys or by the use of a wheel barrel.

**Table 6: Distance by mode of transportation**

<b>Distance</b>	<b>Head portorage</b>	<b>Wheel barrel</b>	<b>Vehicle</b>	<b>Local truck</b>	<b>Total</b>
<1km	47.7	45.0	.0	16.0	40.6
1.5Km	23.3	35.0	29.4	4.0	22.6
<2Km	16.9	20.0	35.3	68.0	23.9
>2.5Km	12.2	.0	35.3	12.0	12.8
Total	100.0	100.0	100.0	100.0	100.0
N	172	20	17	25	234

Source: Fieldwork, 2009

## Mode of transporting domestic water

Through field observation, it was noticed that due to the cost involved in maintenance and purchase the locally made trolleys and the wheel barrow, very few people could afford to own them. Vehicles such as water tankers and pickup trucks were mainly owned and used by the water supplier agencies. These modes were therefore, very expensive for the individual households to employ to supply the home with water on a sustainable basis. Nonetheless, a hand full of some rich community members employed this mode to supply their homes with water throughout the year.

Besides this, head portorage was the commonest mode of transporting water from the source to the home. It has been the traditional way of transporting water and data collected showed that this tradition was still practiced. In most cases however, it was the containers used in accessing water from the source that determined the mode of transportation. Containers carried were usually big pans and gallons to enable people carry as much water as possible at a time. This needed a lot of energy and therefore added to the stress involved in accessing domestic water. According to a research conducted by WaterAid International in 2006, women usually carried very big pans and containers in order to carry a large amount of water at a time. For each of the modes used in accessing domestic water, there have been particular characteristics or social dimension which includes cost, labour, time and decision making. Each of these conditions is to help ensure an outcome of water security which involves the reliability of adequate quantity and quality of domestic water source (Society and Natural Resources, 2002).

**Table 7: Mode of transportation by sex**

<b>Mode of transportation</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
Head portorage	67.4	77.8	73.8
Wheel barrel	10.1	6.9	8.2
Vehicle	10.1	5.6	7.3
Locally made trolleys	12.4	9.7	10.7
Total	100.0	100.0	100.0
N	89	144	233

Source: Fieldwork, 2009

About 77.8 percent of women used the head portorage method in transporting domestic water to the home while about 67.4 of the males used this method. Women in many societies are face with the primary responsibility of organising and undertaking domestic work which includes accessing domestic water (Elson, 1995) Though females also used vehicles, locally made trolleys and even the wheel barrow to transport domestic water to the home, these modes of transportation were patronised more by males than females (refer to table 7).



**Plate 1: Using locally made trolleys to transport water from source**

Source: Fieldwork, 2009

### **Cost of water**

In order to achieve sustainable access to a particular source of water to satisfy domestic water needs, issues such as affordability are considered. Affordability includes the monetary cost of water and the time spent in accessing water to satisfy domestic water need. The general overview of the data shows that most people prefer to access domestic water that was cheaper compared to the rest irrespective of its quality or quantity. The majority of respondents (constituting over 53 percent) accessed domestic water from sources which were affordable so as to maintain constant supply of domestic water from that source. The main objective is to help reduce vulnerability and increase water security.

Water was bought for as low as GH0.05p per every twenty litre bucket. The data also showed that proximity was taken into consideration as long as the monetary cost of water was affordable. People did not opt for domestic water which was near but expensive. They considered the one which was cost effective both in terms of the monetary cost and the distance. Majority of respondents (53.1 percent) accessed domestic water from sources which were cheaper and the cheapest source considered is the groundwater source.

Water was sold at prices ranging from five Ghana Pesewas to fifty Ghana pesewas (refer to table 8) within the studied communities in the municipality. The price was however, dependent on the source of water. Ground water harnessed through hand dug wells and boreholes had little or high level of salinity limiting its functions. Therefore, water from ground water sources was sold mostly at five Ghana Pesewas and where the salinity level was low, it was sold for ten Ghana Pesewas per a twenty litre bucket. For most women, accessing a higher quality

water might have to be forgone in order to make time for other household chores (Society and Natural Resources, 2002).

Interviews with individual and private water vendors of imported tap/sachet water showed that a bucket of water was sold for twenty pesewas or more. This made it quite expensive for the average household to provide water from this source on a sustainable basis. According to Maxwell, Levin, Armar-Klemesu, Morris, & Ahiadeke, (2000) water vendors tend to make more profit by selling water five to ten times its actual price. Though the Water Health International sold a twenty litre bucket of water for ten pesewas in Pokuase and Amasaman it was considered to be expensive by the people in these communities. This reduced the demand of water from this source by community members.

**Table 8: Cost of water and time spent in accessing water**

<b>Cost of a bucket of water</b>	<b>&lt;15 mins</b>	<b>16 to 30 mins</b>	<b>31 mins to 1hr</b>	<b>&gt; 1hr</b>	<b>Total</b>
<GH 10p	50.0	53.3	66.7	37.0	53.1
GH 20-30p	38.9	35.6	18.8	48.1	34.4
GH 40-50p	6.9	2.2	14.6	7.4	7.8
>GH 50p	4.2	8.9	.0	7.4	4.7
Total	100.0	100.0	100.0	100.0	100.0
N	72	45	48	27	192

Source: Fieldwork, 2009

Quite a number of respondents made use of sachet water especially for drinking. This was mainly supplied in bags by vehicles on demand. A bag containing about thirty-three sachet of water with each sachet weighing about five hundred milligrams was sold on the average at seventy Ghana Pesewas from the distribution trucks. Though this was expensive, it was assumed that sachet water was safer to consume as drinking water as compared to the available sources of water in the municipality.

Pokuase and Amasaman, the district capital had a small plant put up by an NGO (Water Health International) to help resolve the water issue in the municipality. Though it was expected to ease the stress that goes into accessing water in these communities, data collected showed that few people actually patronized water from this plant. Despite the fact that business is booming for this NGO, it was found out that people who actually patronized water from this plant were people from the periphery and outside the communities

The data also showed that the Mayera community spent the highest amount of time in accessing water for household use. Pokuase community on the other hand had the least amount of time spent in accessing water. This was due to the available opportunities to the people in the Pokuase community. The main river in the municipality (Nsakyi River) flowed through the Pokuase Township while the Sunkwah stream also took its source from one of the highlands in the community. Apart from this, the water treatment plant constructed by the Water Health International in collaboration with Safe Water Network gave more than enough alternatives to community members to choose from. Though the district capital (Amasaman) has almost the same alternatives, it not have streams and rivers when compared to Pokuase. However, much

time was not spent in accessing water compared to the people in the Mayera community because the district capital was more accessible. Due to this, many respondents from this community (i.e. Amasaman) said they depended on imported water and sachet/bottled water for household consumption. Many of the water supplier agencies could easily supply people in the community with water because they were more accessible.

## **Conclusions and recommendations**

The main sources of domestic water in the municipality are rivers and streams, imported tap water, harvested rainwater and groundwater sources. However, the most accessed water source was groundwater which was harnessed through boreholes and wells. The challenge found was that water from this source had high levels of salinity making them hard water. Hard water made household chores more difficult. It is therefore recommended that the District Water and Sanitation Team in collaboration with NGOs in the district give more attention to the quality of water from the boreholes and wells they construct for the community rather than considering the quantity and its proximity to residence of community members.

Only about forty percent of respondents accessed domestic water within one kilometre leaving the majority covering more than a kilometre in accessing domestic. According to the UNICEF/WHO Joint Monitoring Programme, round trips to water facilities which were more than one kilometre were not accessible facilities. This means that domestic water was not accessible to most households. It is recommended that Ghana Water Company comes in to supply treated water through laid down pipes to homes.

Head portorage is the main mode of transporting domestic water from the source to the home. This mode of transporting domestic water takes a lot of productive time and energy. It is therefore recommended that the District Assembly, Community Water and Sanitation Team and Non-Governmental Organisations (NGOs) helped communities within the municipality to raise funds to improve upon the water treatment plants built in Pokuase and Amasaman by the Water Health International. This will help increase the quantity and quality of water supplied to cover more communities within the municipality.

The cost of domestic water is expensive. Those sources which were considered more potable were expensive and this made it difficult for the average household to access on a sustainable basis. It is also recommended that the District Water and Sanitation Team, teams up with the informal water supply sector to help reduce the cost of water and also to improve access to domestic water source. Households should be encouraged to invest into large tanks that could store harvested rainwater in large quantities. It is the most inexpensive way of accessing domestic water.

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