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Assessment of Drinking Water Accessibility, Handling and Treatment Practice in Assosa Woreda, Benishangul Gumuz Region, North West Ethiopia.

Cheneke Atomsa Merga¹, Fekadu Tadesse², Desta Baye², Ali Seleman²

¹Assosa Agricultural TVET College, Generalist Animal Feed Supplier, Assosa University; ²Assosa University

ABSTRACT

Background: Safe drinking water is the basic necessities for human beings. However, billions of people in the world have not access to it today. About 28 in 100 people lack access to sufficient and quality drinking water globally. According to Ethiopian Demographic and Health Survey 2016, 97% of urban households in Ethiopia have access to an improved source of drinking water, as compared with 57% of rural households. **Objectives:** The major objective of this study was to assess the accessibility, handling and treatment practices in households of Assosa Woreda, from October 25-December 25/2020.

Methodology: Community based cross sectional study was carried out in selected households in selected kebeles of Assosa woreda using pre-designed questionnaires and observational check list as data collection tool. The source of population was all rural households in Assosa Woreda and study population was households who were living in selected kebeles. Sampling unit was households and study units were head of the household. Multistage and systemic random probability sampling technique was used in this study as sampling technique and sample size was determined by single proportion formula to be 378 households representing total of 3,265 households. Data was analyzed by SPSS IBM-21 software and descriptive frequency and cross tabulation. The results were presented by texts, tables and graphs. **Result and discussion:** The result showed that, majority, 82.8% households getting access to improved water source from hand pump which is treated while 18.2% still using unimproved drinking water source that is unprotected and untreated springs. 100% of them use Jerry-can to collect water and store water. Majority (80.2%) of the households were washing /rinsing the collection container before refilling. Most of the households (100%) reported that they cover the collection container during transport. From the total households only 13.2% practiced treating water at their home that is mainly by boiling (5.6%). The findings slightly higher than other findings done before five years, but, agree with Millennium Development Goal. **Conclusion and recommendation:** The findings of the study indicated that there were households using unimproved drinking water and unable to treat at home. To improve such problems; the community and government intervention are needed for maintaining drinking water sources those not functioning, and increasing awareness of people on water treatment..

Keywords: Water handling practice, Household, Assosa woreda.

*Correspondence to Author:

Cheneke Atomsa Merga
Assosa Agricultural TVET College,
Generalist Animal Feed Supplier,
Assosa University

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1. INTRODUCTION

1.1 Back ground

Safe drinking water is one of the basic necessities for human beings. However, billions of people in the world have not access to it today. Of this, significant number of the population is from the developing countries. Particularly women and children are the most vulnerable segments of the society. Worldwide and in Ethiopia significant number of children are dying each day because of lack of safe drinking water and appropriate sanitation and hygiene^[1]. Universal access to safe drinking water is a fundamental need and human right. Securing access for all would go a long way in reducing illness and death, especially among children. Since 2000, 1.6 billion people have gained access to basic drinking water services, such as piped water into the home or a protected dug well. In 2017, 785 million people still lack a basic water service and among them 144 million people still collected drinking water directly from rivers, lakes and other surface water sources. The data reveal pronounced disparities, with the poorest and those living in rural areas least likely to use a basic service^[2].

In 2005 the government of Ethiopia has ratified Universal Access Program (UAP) that enables to provide safe water to all citizens of the nation. However, based on the National WaSH Inventory (NWI) conducted in 2011, the water supply access coverage estimated for the year 2011 was 48.85%, 74.64%, and 52.12% for rural, urban and total . Accordingly, based on the National WaSH Inventory data for 2011, the base line water supply access coverage for 2010 would have been 43.46%, 72.56%, and 47.26%, for rural, urban and total respectively ^[3].

In 2015, 71 % of the global population (5.2 billion people) used a safely managed drinking water service; that is, one located on premises, available when needed and free from contamination. Eight out of ten people (5.8 billion) used improved sources with water available when needed. Three quarters of the global population (5.4 billion) used improved

sources located on premises. Three out of four people (5.4 billion) used improved sources free from contamination. 89 per cent of the global population (6.5 billion people) used at least a basic service; that is, an improved source within 30 minutes' round trip to collect water. 844 million people still lacked even a basic drinking water service. 263 million people spent over 30 minutes per round trip to collect water from an improved source. 159 million people still collected drinking water directly from surface water sources, 58% lived in sub-Saharan Africa ^[4].

EDHS 2016 report indicates that, about two-thirds of households in Ethiopia (65 %) obtain their drinking water from an improved source. Specifically, 97% of urban households in Ethiopia have access to an improved source of drinking water, as compared with 57% of rural households this is an improvement since the 2011 EDHS, when 54 % of households get improved water source. The most common source of drinking water in urban areas is water piped into the dwelling, yard, or plot (63%), to a neighbor (12%) or to a public tap or standpipe (13 %), resulting in about 9 in 10 urban households (88%) using piped water. In rural areas, the most common sources of drinking water are public tap or standpipe (19%), a tube well or borehole (13 %) and a protected spring (14%). Overall, 20 percent of households in Ethiopia have water on their premises, 77 percent in urban areas versus only 6 percent in rural areas. Forty-five percent of households spend 30 minutes or longer to obtain their drinking water, 53% in rural areas, as compared with only 13% in urban households ^[4].

In December 2016, in Eight Urban Regions of Ethiopia baseline values for key indicators, 84%, % of households storing drinking water with narrow-mouthed containers 96.5% of women respondents withdrawing drinking water from storage containers using safe methods (by pouring method or a cup exclusively used for this purpose); and the women with knowledge on routes of water contamination were (At source

43%, At home during storage 51.3%, While withdrawing from storage containers 26.8%, During transportation from source to home 15.5%) [6, 7].

Small scale water treatment at household level is still low. Female respondents were better practicing in small scale water treatment at household level than males. Educational status was also factor for water treatment practice in which, literate were better practicing small scale water treatment at household level than those who were illiterate. Who had an experience of drawing water by dipping were better practicing small scale water treatment at household level better than those who draw by pouring and those who were fetching the water more than two times a day were better practicing small scale water treatment at household level than those who were fetching once a day [8].

1.2 Statement of the problems

Treating water and safely storing it in the home are commonly referred to as “household water treatment and safe storage” (HWTs) or treating water at the “point of use”. Although HWTs is not new, its recognition as a key strategy for improving public health is just emerging. For centuries, households have used a variety of methods for improving the appearance and taste of drinking water. Even before germ theory was well established, successive generations were taught to boil water, expose it to the sun or store it in metal containers with biocide properties, all in an effort to make it safer to drink [9].

Treat water that has become contaminated both at the source as well as through domestic handling with the goal of reducing contamination to levels of low microbial risk is said to be household water treatment [10]. Human being have a right to water and entitles everyone to have sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses [11, 12].

Lack of clean drinking water, poor sanitation facilities and lack of community education programs are contributing to continued outbreaks of acute watery diarrhea in some parts

of Ethiopia [13]. In Ethiopia communicable diseases attributable to unsafe or inadequate water supply and improper waste management particularly excreta [14].

Ethiopian rural water coverage has increased at promising rates since 1990, from 8 to 26 % according to joint monitoring program (JMP/UNICEF-WHO) figures, and from 11 to 62 % according to government figures [15]. Even though there is great discrepancy between the two reports; both figures indicate that there is problem in water coverage in rural Ethiopia. To have access to safe drinking water does not only imply microbial and chemically safe water, but also to have a secured supply and public access to the water sources. Household treatment of water is widespread over the world, but in Ethiopia, only 5 % of the population makes use of it. Nevertheless, access to safe drinking water is very low [16].

The MDG strategy was planned to reduce the proportion of people without sustainable access to safe drinking water and proper sanitation to half of its number by 2015 [23] but WHO estimate of China, middle and low income countries 20 % and 33 % respectively [24], Zambia 35.2 % [25] and Ethiopia where, 80 % of the rural and 20 % of urban population have no access to safe water; which is the least among the continent [26].

According to suggestion given by CDC [27] boiling is easy to practice, mostly the households have the required material to do so and there is water boiling practice for other purposes like for coffee, washing heavily soiled utensils. Getting chlorine is costly and available only in the urban market where most of the residents visit market rarely but some people may complain discomfort from change in taste and odor following the utilization of chlorine [28] that might contribute for less utilization compared to boiling.. Females and literates are more likely to practice small scale water treatment at household level compared to their counterparts and illiterates respectively [29].

The major study done above is at national level and mainly focusing on urban water handling. Since major source of water at rural areas are

may not piped and treated, this study focused in identifying accessibility, handling and treatment practices of drinking water in rural households of Assosa Woreda or district.

1.3 Significance of the study

Contamination of water often occurs from handling, dirty containers or the introduction of extraneous matter during collection and transportation. Similarly, storage in the home represents a major health risk. Poor water-handling practices are the problems of Assosa Woreda. But there is no any study that has been conducted in the Woreda that indicates the extent of the problem. The result of study can be used as source of information for governmental organizations and NGOs to plan providing improved water source for households and health extension workers to provide additional health education regarding handling and treatment practices for households. Households get additional information on role of safe water source, safe handling and treatment of drinking water for their health. The study can also used as base line data for further studies and enable researchers for identifying similar problems.

1.4 Objectives

1.4.1 General objective

➤ **To assess drinking water accessibility, handling and treatment practice in Assosa Woreda, Benishangul Gumuz Region, North West Ethiopia.**

1.4.2 Specific objectives

- To identify accessibility of improved drinking water for Households from Octo. 25-Dec.25/2020
- To assess handling practices of drinking water by Households from Octo. 25-Dec.25/2020
- To identify treatment practices of drinking water implemented by Households from Octo. 25-Dec.25/2020

1. LITERATURE REVIEW

2.1 Accessibility of improved drinking water source

Water is considered to be the most important resource for sustaining ecosystems, which provide life-supporting services for people, animals, and plants. Because contaminated water is a major cause of illness and death, water quality is a determining factor in human poverty, education, and economic opportunities [17].

Access to water supply in Ethiopia is one of the lowest in the world. According to the Joint Monitoring Program (JMP), by the WHO and UNICEF, Ethiopia has the lowest rates in safe water coverage in the world with 31% of rural population and 96% of urban population using an improved drinking water sources. However, official government reports in 2010 show access to safe water supply at about 65.8% (91.5% for urban and 65.8% for rural) [18].

2.2 Handling practices of drinking water

A Study conducted in Kolladiba Woreda, in the study area most (95.2%) of the residents use jerry cans while remaining 3.9% and 0.9% use plastic buckets and traditional clay pots (Insra), respectively. About 62.6% of the collectors wash their hands before collecting water. Washing and rinsing practice of containers before collection was observed among 91.6% of respondents. The currently employed rinsing materials used by the collectors were water, soap or detergent, sand and other materials like grasses and leaves in 29.1%, 46.1%, 24.1%, and 0.7% of the cases respectively [19,20].

2.3 Treating of drinking water

The MDG strategy was planned to reduce the proportion of people without sustainable access to safe drinking water and proper sanitation to half of its number by 2015 [21] but WHO estimate of China, middle and low income countries 20 % and 33 % respectively [22], Zambia 35.2 % [23] and Ethiopia where, 80 % of the rural and 20 % of urban population have no access to safe water; which is the least among the continent [24].

According to suggestion given by CDC [25] boiling is easy to practice, mostly the households have the required material to do so and there is water boiling practice for other purposes like for coffee, washing heavily soiled utensils. Getting chlorine is costly and available only in the urban market where most of the residents visit market rarely but some people may complain discomfort from change in taste and odor following the utilization of chlorine [26] that might contribute for less utilization compared to boiling.. Females and literates are more likely to practice small scale water treatment at household level compared to their counterparts and illiterates respectively [27].

2. METHODS AND MATERIALS

2.1. Study area and period

This study was conducted in Assosa Woreda from October 25/2020 to December 25 /2020. Assosa Woreda, the study area is one of 7 woredas of Assosa zone and 20 Woredas of the Benishangul Gumuz Region, western Ethiopia located 670 kms away from Addis Ababa which is capital city of Ethiopia. The woreda has an altitude of 1,550 m.a.s.l; an average annual precipitation of 1,275 mm; and the average temperature of 20-25 0c. The woreda is inhabited mainly by Berta ethnic group and Amhara ethnic group. According to CSA, 2007 the total population of Assosa woreda is 87,366 of whom 23.25 percent was urban dwellers. About 33.3% of households engaged only on on-farm activity followed by 28.9% house hold heads were those on on-farm activity combined

with non-farm activity as livelihood strategy and sources of economy. [27].

2.2. Study design

Community based cross sectional study was carried out in selected house holds in selected kebeles of Assoa woreda using pre-designed questionnaires and observational check list to assess their drinking water accessibility, handling practices and treatment practices

3.3 Study population and Study units

The source of population were all rural households in Assosa Woreda and study population was households who were living in selected kebeles those fulfilled inclusion criteria. Sampling unit was households and study units were head of the household (Table-1).

3.4 Sample size and sampling techniques

3.4.1 Sample size determination

The sample size was calculated by using single population proportion formula [28] . Since the population under the study/household is less than 10,000. In computing sample size to achieve adequate precision, the sampling error/precision of the study was taken as 5% and 95% confidence interval. Since there was no similar study on study area the 50% proportion was used in this study. Systematic random sampling technique was employed to select **378** households from a total of **3,265** households.

So the required sample size was calculated using single population proportion formula:

$$n = \frac{(Z_{1-\alpha/2})^2 p(1-p)}{d^2} \quad \text{with considering the following assumptions where } n=\text{sample size}$$

$$d= 5\% \text{ margin of error}$$

$$p=50\%$$

$Z_{1-\alpha/2} = 1.96$ is the critical point for the standard normal distribution for the 95% confidence interval.

$$n = \frac{(1.96)^2 (0.50) (1-0.50)}{(0.05)^2} = \underline{\underline{384}}$$

$$nc = \frac{n_i}{1 + \frac{n_i}{N}}$$

where n_i = predetermined sample size

N = total no of house hold heads

$$\text{Thus, } nc = \frac{384}{1 + \frac{384}{3265}} = 344$$

Therefore, the calculated sample size will be, n=343. Adding 10% non respondent, 34 Households, the final sample size was= **378** households

3.4.2 Sampling techniques and procedures

Multistage and systemic random probability sampling technique was used in this study. At first stage, the 74 kebeles in Assosa woredas were stratified into two as: Bertha ethnic groups (36PAs) and Amhara and other ethnic groups(38 PAs). In second stage, a total of 12 (15%) of selected 6 from each strata randomly as described in table-1 was selected by simple

random sampling method to get desired study population. There are In third stage, a total of 378 house hold heads(n) was selected by systematic random sampling method as desired sample size representing 3265 total House hold heads(N) (2558 male and 707 female headed) according to their respective ratio of population size and sex per each kebele as described below in Table-1.

Table 1 Description of HH heads as study population(N) and sample(n)

Kebele	Male headed		Female headed		Total	
	N	n	N	n	N	N
Amba-14	203	23	48	6	251	29
Gambella	146	17	26	3	172	20
Aphasizim	146	17	36	4	182	21
Amba-5	212	24	28	3	240	27
Baro	286	33	86	10	372	43
Abramo	250	29	120	14	370	43
Mengelle-34	103	12	29	3	132	15
Mengelle-37	145	17	40	5	185	22
Agusha	240	28	84	10	324	38
Tsetse	292	34	84	10	376	44
Amba-8	185	21	68	8	253	29
Amba-2	350	40	58	7	408	47
Total	2558	295	707	83	3265	378

Finally systematic random probability sapling method was used to give chance for all house hold heads as sample population. The interval was obtained by dividing total sample population to determined sample sized as $3265 \div 378 = 8.6 = 9$. Then 5 number obtained by lottery

randomly from 1 to 9. Then sample was collected following 9th HH heads starting from fifth HH head (5, 14, 25.) following order of housing or sub categories in to sub-kebeles like ketena or got.

3.5 Inclusion Criteria and Exclusion Criteria

3.5.1 Inclusion criteria

Households resident for more than 6 months and respondent age above 18 years old were included since they can give complete image of the community and ethically accepted to participate in studies respectively. Head of households were interviewed with the assumption of getting correct response from them. Priority was given for women because they are more familiar with water handling than men. However where if there is household with no women for any reason men were considered for interview.

3.5.2 Exclusion Criteria;

Households having farming area and paying tax to kebele, but living outside study area excluded in the study.

3.6 Study variables

3.6.1 Dependent variables

Accessibility to improved drinking water

Drinking water handling practices

Drinking water treatment practices

3.6.2 Independent variables

Independent variable include: Socio-demographic (Age, sex, educational status, and religion, marital status, occupational status, family size, head of a household and monthly income) and Environmental issues: Source of drinking water, days when water is not fetch, distance traveled, daily requirements, etc.

3.7 Data collection tools and procedures

The data was collected by four graduating public health officer students based on topic approved by respective department. Structured questionnaire and observation checklist was used as data collection tool. This questionnaire was used to interview any member of the family >18 years of age representing household head. An observation checklist was used to assess the availability of improved water, handling and treatment practices by the interviewer. The questionnaire was originally prepared in English

language and then translated to the local language (Amharic). Translators were used for those talking only Arabic language. Finally, questionnaire was translated again translated to English for consistency.

3.8 Data analysis

The collected data was coded and entered in SPSS RBM-21 software and analyzed by descriptive frequency and cross tabulation.

3.9 Data quality control

The quality of data was assured by pre-testing in few selected household. The pre-test was conducted near the study area which had similar characteristics to the areas where the actual study was carried out. Every day after data collection, questionnaires were reviewed and checked for completeness and relevance by the supervisors and principal investigator and the necessary feedback was offered to data collectors in the next morning. Also, the principal investigators and an experienced data clerk were carefully entered and thoroughly cleaned the data before the commencement of the analysis.

3.10 Ethical considerations

After approval of proposal by advisor assigned by health officer department, formal letter was obtained from Assosa University, school of health sciences. The entire study participant informed and oral consent was obtained before starting an interview.

3.11 Operational definitions

1. Water accessibility-whether getting access to improved water source (Piped, treated stand pump) or Unimproved (Springs that is untreated) source
2. Water handling practices: are good practices related to water collection and storage like: hand washing, cleaning and rinsing of containers prior to collection, covering of filled containers during transportation, drawing water by pouring from storage containers, and keeping of drinking utensils on table after use were recorded and observed during the study period

among the participants. Poor practice opposite to the above conditions.

3. Water treatments:- Making water free from waterborne diseases by adding chemical or others like boiling, bleach/chlorine (Bishagary³¹ and Wuhager²⁹), solar disinfection, stand and settle and strain through cloth filter ([29].

3. RESULT

A total of 378 households were interviewed to get the necessary information about accessibility to improved drinking water, handling and

treatment practices of rural households. Response rate was 100% because of using representative respondent and frequently visit of households.

4.1 Socio-economic characteristics of Households

4.1.1 Variation among age, sex, marital status, religion and ethnicity

Majority, 143(37%) of HH heads were between 19-35, 295(78%) male, 293(77.5%) married, 328(84.1%) Muslim religion, and 209(55.3) Bertha ethnic group as shown in table-2.

Table 2-Variation among age, sex, Marital status, religion and ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Age of the HH head	19-35	143	37.8	37.8	37.8
	36-60	125	33.1	33.1	70.9
	61 and above	110	29.1	29.1	100.0
Sex of HH head	Male	295	78.0	78.0	78.0
	Female	83	22.0	22.0	100.0
	Total	378	100.0	100.0	
Marital status of HH heads	Married	293	77.5	77.5	77.5
	Widowed	50	13.2	13.2	90.7
	Divorced	17	4.5	4.5	95.2
	Separated	18	4.8	4.8	100.0
Religion of HH head	Muslim	318	84.1	84.1	84.1
	Orthodox	59	15.6	15.6	99.7
	Protestant	1	.3	.3	100.0
Ethnicity of HH head	Bertha	209	55.3	55.3	55.3
	Amhara	169	44.7	44.7	100.0
Total		378	100.0	100.0	

Source: Analyzed by researchers,2020

4.1.1 Variation among education, occupation, family size, and monthly income of HH heads

The data finding also indicate the majority of HH heads in educational status, occupation, family

size and monthly income to be Illiterate(144(38.1%), Agriculture and mining148(39.2%), 6-10(157/35.2%), and 1000-5000ETB(245/64.8%) respectively as shown in table-3

Table 3 Variation among education, occupation, family size, and monthly income of HH heads

			Frequency	Percent	Valid Percent	Cumulative Percent
Educational status of HH head	Illiterate		144	38.1	38.1	38.1
	Read and write		134	35.4	35.4	73.5
	Elementary		61	16.1	16.1	89.7
	Secondary		8	2.1	2.1	91.8
	College and above		31	8.2	8.2	100.0
Occupation and source of HH head	Agriculture only		142	37.6	37.6	37.6
	Agriculture and mining		148	39.2	39.2	76.7
	Agriculture and others (wage, salary, trade, etc)		88	23.3	23.3	100.0
Family size of HH head	1-5		133	35.2	35.2	35.2
	6-10		157	41.5	41.5	76.7
	11-20		78	20.6	20.6	97.4
	Above 20		10	2.6	2.6	100.0
Monthly income of HH head	Below 1000		70	18.5	18.5	18.5
	1000-5000		245	64.8	64.8	83.3
	5001-10000		63	16.7	16.7	100.0
Total			378	100.0	100.0	

Source: Analyzed by researchers, 2020

Accessibility of improved drinking water for Households

The data finding indicate that, though the majority of households, 297(78.6%), got access to improved (treated hand pump) water sources, still 81(21.4%) were using unimproved (spring, shallow well, etc) water resources that is not treated and fully protected. Difference among kebeles on accessibility of improved drinking water is presented in Fig.1

Majority of HH heads is, 306(81%), get moving round less than 30minutes to collect drinking water. Similarly majority of the House hold,

202(53, 4%), water requirement is 60-75litres (Fig.2).

4.3 Handling practices of drinking water by Households

4.3.1 Water handling during collection

Data finding indicate that, 378(100%) of the households collect drinking water with Jerrican, wash hands before collection, cover the container during transportation, and use screw cape to cover the container. Regarding responsibility to collect water from the source, in 292(77.2%) followed by children 71(18.8%). For the question who is responsible for collection of

water is mainly by Mothers 292(77.2%) followed Majority,374(93.7%) Households separate by Children,71(18.8%) and fathers 15(4%). drinking water from other domestic use.

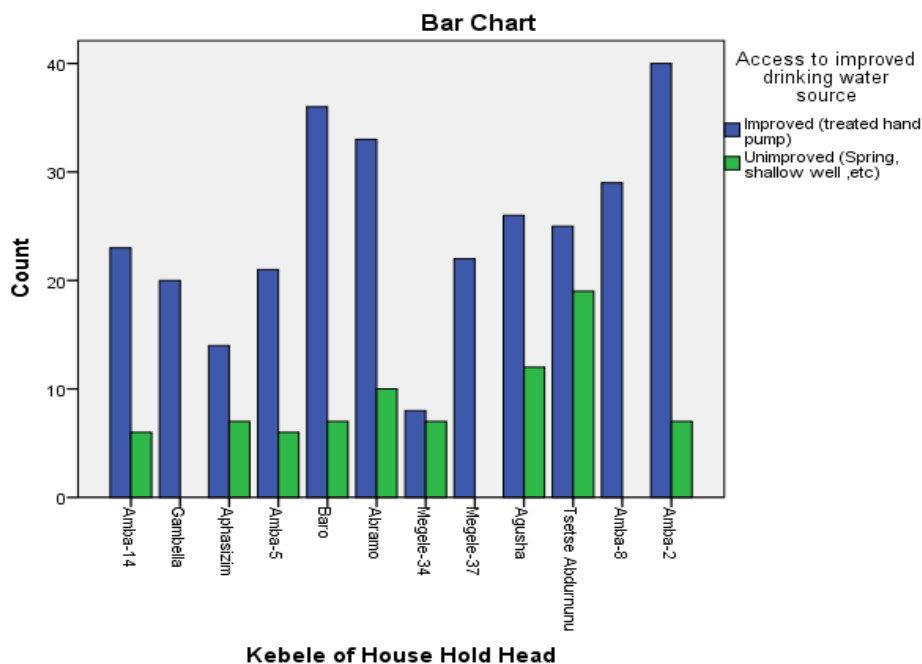


Figure 1 Kebele of Households

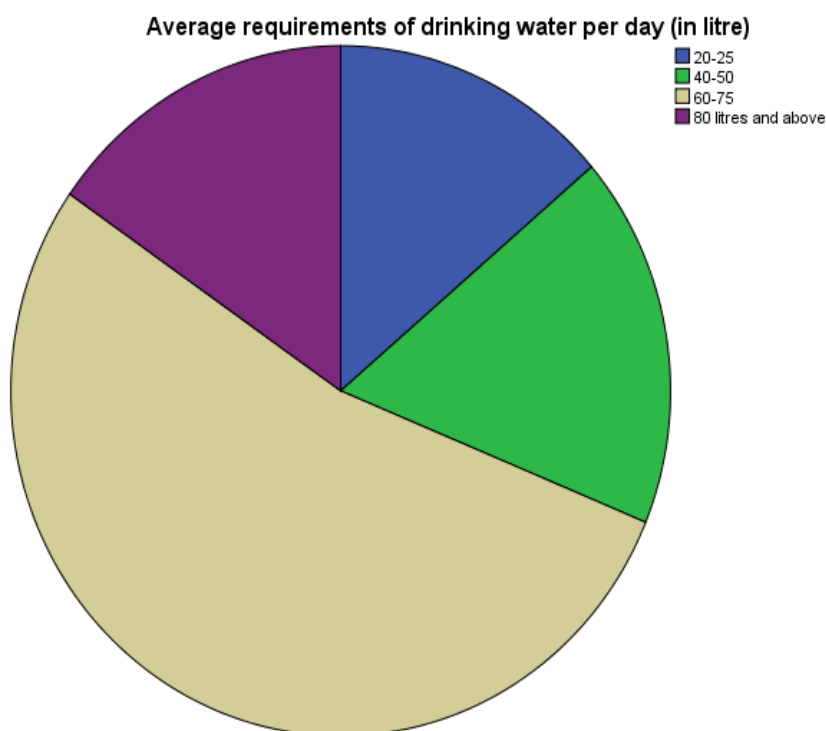


Figure 2 average requirement of drinking water per day

4.3.2 Water handling during storage

It was found that only 49(13.0%) households store water in their home for more than half day

and all of them, 49(100%), store separately from other used for domestic purpose, use Jerrican for storage which was the same with collection

material and use screw cap to cover. Similarly, 378(100%) of households draw water from container by pouring, 306 (81%) wash hand before pouring, 332(87.8) clean cup and container regularly, and all of them, 378(100%) got information on water handling mainly from health extension workers.

4.4 Treatment practices of drinking water by Households

The analyzed data finding indicate that, only 45(11.9%) practiced treating drinking water at home. The reason why majority 333(88.1%) didn't practicing can be because of they are using treated water at source and they expect untreated water or unimproved ones in this study

is free from risk of disease causing microbial or contaminations. Home water treatment practiced by households of study area is Boiling, Filtration and Chlorination/Wuhagar being 21(5.6%), 13(3.45), and 11(2.9%) respectively. Type of filtration used were cloth filtration. Majority of households, 344(91%) believe that treatment of water is important and positive attitude while remaining 34(9%) has responded no for question asked their opinion toward importance of treating water. The reason for negative attitude is that they are afraid for side effect of chemical added to water on their health and lack of detail knowledge on role of water treatment (table-4).

Table 4-Treatment practices of drinking water by households

						Did you practiced treating drinking water at home?		
						Yes	No	Total
If yes by what method?	No treat at home	Count				0	333	333
		% of Total				0.0%	88.1%	88.1%
	Wuhagar/Chlorination	Count				11	0	11
		% of Total				2.9%	0.0%	2.9%
	Boiling	Count				21	0	21
		% of Total				5.6%	0.0%	5.6%
If filtration by which method?	Filtration	Count				13	0	13
		% of Total				3.4%	0.0%	3.4%
	Not treat by filtration	Count				32	333	365
		% of Total				8.5%	88.1%	96.6%
	Cloth filtration	Count				13	0	13
		% of Total				3.4%	0.0%	3.4%
In your opinion does water treatment improve its quality	Yes	Count				35	309	344
		% of Total				9.3%	81.7%	91.0%
	No	Count				10	24	34
		% of Total				2.6%	6.3%	9.0%
Total	Count					45	333	378
	% of Total					11.9%	88.1%	100.0%

5. DISCUSSION

A total of 378 households were interviewed to get the necessary information about accessibility to improved drinking water, its handling and treatment practices of rural households. The data finding indicate that, though the majority of households, 297(78.6%), got access to improved (treated hand pump) water sources, still 81(21.4%) were using unimproved (spring, shallow well, etc) water resources that is not treated and fully protected. This finding is higher than EDHS 2016 report that only 57% of rural households getting access to improved water source as compared with 97% of urban households [5]. However this finding agree with the millennium development goal (MDG) strategy that was planned to reduce the proportion of people using unimproved or unsafe drinking water by 2015 [23]. Majority of HH heads is, 306(81%), get moving round less than 30 minutes to collect drinking water. This finding is in line with report at global level saying, 89 % of the global population (6.5 billion people) used at least a basic service; that is, an improved source within 30 minutes' round trip to collect water.

Finding in this study indicate that, 373(100%) of the households collect drinking water with Jerrican, wash hands before collection, cover the container and use screw cap to cover the container. Regarding responsibility to collect water from the source, in 292(77.2%) followed by children 71(18.8%). It was also found that only 49(13.0%) households store water in their home for more than half day and all of them, 49(100%), store separately from other used for domestic purpose, use Jerrican for storage which was the same with collection material and use screw cap to cover. Similarly, 378(100%) of households draw water from container by pouring, 306 (81%) wash hand before pouring, 332(87.8) clean cup and container regularly, and all of them, 378(100%) got information on water handling mainly from health extension workers. This finding is slightly higher than Study conducted in Kolladiba Woreda, which indicate

(95.2%) of the residents use jerry cans, about 62.6% of the collectors wash their hands before collecting water; about 62.6% of the collectors wash their hands before collecting water [20,21]. The reason why jerrican was used is its preferability to be narrow mouthed, having plastic screw coverage, easy for pouring and cleaning fulfilling criteria required by EDHS 2016[5].

The analyzed data finding indicate that, only 45(11.9%) practiced treating drinking water at home. The reason why majority 333(88.1%) didn't practicing can be because of they are using treated water at source and they expect untreated water or unimproved ones in this study is free from risk of disease causing microbial or contaminations. Home water treatment practiced by households of study area is Boiling, Filtration and Chlorination/Wuhagar being 21(5.6%), 13(3.45), and 11(2.9%) respectively. Type of filtration used was cloth filtration. Majority of households, 344(91%) believe that treatment of water is important and positive attitude while remaining 34(9%) has responded no for question asked their opinion toward importance of treating water. The reason for negative attitude is that they afraid for side effect of chemical added to water on their health and lack of detail knowledge on role of water treatment. This finding agree with suggestion given by CDC [25] boiling is easy to practice, mostly the households have the required material to do so and there is water boiling practice for other purposes like for coffee, washing heavily soiled utensils. Getting chlorine is costly and available only in the urban market where most of the residents visit market rarely but some people may complain discomfort from change in taste and odor following the utilization of chlorine [26] that might contribute for less utilization compared to boiling. Females and literates are more likely to practice small scale water treatment at household level compared to their counterparts and illiterates respectively [27].

6. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The findings of the study indicated that there majority of households are using improved drinking water source that is hand pump and treated every six month by experts from related office. Some of households use springs during day time out of schedule of fetching from pumps .Though it looks protected, not fully protected by maintaining and not treated at all. More than half of hand pumps became unfunctional and making households to use shallow well or unprotected spring. Practice of water treatment at household level is still very low though some of households are treating water at home level with boiling. The water handling during collection and storage and at all level is well practiced by households of woreda that can be due to increased government attention assigning two health extension workers for all kebeles.

6.2 Recommendation

- Water supply systems those not functioning should be reported by kebele administrative and health extension workers to woreda and related stake holders
- Health information should be strengthened.
- Concerned agencies should plan and implement hygiene education at schools and in the community as a routine work.
- Establishing practical and feasible strategy to develop and sustain intersect oral collaboration is important.
- Governmental and non-governmental organizations should advocate about use of treated water and role of using safe water by difference communication channels.
- Households who were not using treated water must practice water treatment at household level before consumption

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ABBREVIATIONS

BGRS	Benishangul Gumuz Regional State
Dec.	December
EDHS	Ethiopian Demography Health Survey
HH head	House Hold head
MDN	Millennium Development Goal
NGO	Non- Governmental Organization
Oct.	October
SPSS	Statistical Package for Social Sciences
WASH	Water Sanitation and Hygiene
WHO	World Health Organization

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ANNEXES**Annex-1:- English version of consent form and questionnaires**

A study on assessment of water-handling practices and behaviours in households of Assosa Wotreda North, Western Ethiopia September 01-October 30/2020.

Identification-----

Date of interview-----

Time at the beginning of the interview-----

Good morning/afternoon.

My name is Sr./ Ato_____ We are BSc Public Health Officers graduate student in Assosa University. We are here on behalf of the Assosa University BSc Public Health Officers graduate research team. We are going to collect information on latrine utilization and its use of this kebele and your home.

You are selected to participate in this study just by chance. I would like to interview you a few questions about sanitary conditions in this kebele and your home. It will take about 10-20 minutes. The information you provide me is completely confidential and will not be shared with anyone else without your consent. Your name or any identifying information will not be registered. Therefore, you are free to respond or not to respond the questions. Your support and willingness in responding the questions was very important for the success of this study.

Do I have your permission to continue?

1- Yes

2 - No

If the answer is yes, thanks! Conduct the interview.

If the answer is no, Thanks! Proceed to the next eligible client

Date of interview_____ Interviewer_____

Part-I. Demographic and socio-economic characteristics

1.1	Kebele of House Hold Head	_____
1.2	Ethnicity of HH head	{1, Bertha 2, Amhara, 3, Oromo. }
1.3	Religion of HH head	{1, Muslim 2, Orthodox 3, protestant 4. Catholic}
1.4	Sex of HH head	{1, Male, 2 Female}...
1.5	Educational status of HH head(Litracy)	{1, Illiterate, 2 elementary, 3-high school ,4 Diploma and above
1.6	Occupation of HH head	{1, Agriculture only}...
1.7	Total family size in each House holds	_____
1.8	Source of income(Livelihood)	{1, Agriculture only 2, Agriculture and mining, 3 Agriculture and wage, salary or trade, 4 Wage, salary or trade only}

Part-II Accessibility of drinking water during collection

1.9	Accessibility to improved drinking water source by household	{1, Improved (hand pumps) 2, Unimproved (untreated spring or Shallow well)
1.10	Time taken to collect drinking water from source(in minutes)	1. <.30m, 2. >30m,
1.11	Average requirements of drinking water per day (in litre)	_____ litres (1<10, 2-10-20, 30 21-30 4> 30

Part-II(a)) Handling practice of drinking water during collection

2.1 2.1	What type of container do you use to collect water?	{1-Jerry can , 2-plastic bucket , 3-clay pot, 4-Metal /Galvanized iron bucket/, 5- Others (Specify)_____}
2.2	Who is responsible to collect water from the source mainly?	{1-children, 2-Adults/mothers/, 3-Paid person, 4-Other /specify/}
2.3	Do you or Does the collector wash hands and container before collecting water?	{1-Yes, 2-No}
2.4	Do you or Does the collector cover collection container during transportation?	{1-Yes, 2-No}
2.5	If (2.7) is yes, what cover material do you use	{1- Screw cap, 2-Leaves ,3-Wood, 4-Tin, 5-other (specify) _____}
2.5	Do you separate drinking water from other domestic use/such as washing of utensils and cloths/	{1-Yes, 2-No}

Part-III(b) Handling practice of drinking water during storage

3.1	Do you store water in the home?	{1-Yes, 2-No}
3.2	If yes, for how long	{1,less than one day, 2,One to two days, 3 days and above}
3.3	Do you have a separate storage container from collection container?	{1-Yes, 2-No}
3.4	Type of water storage material	{1-Jerry can , 2-plastic bucket (Roto) , 3-clay pot, 4-Metal /Galvanized iron bucket/, 5- Others (Specify)_____}
3.5	Do you cover storage material?	{1-Yes, 2-No}
3.6	If yes, what type cover material is used?	{1- Screw cap, 2-Leaves ,3-Wood, 4-Tin, 5-other (specify) _____}
3.7	Method of water- drawing practice from the container	{1-By pouring, 2- By Dipping cup, 3- Other/specify/_____}

3.8	If (3.6) is dipping, do they separate cup for this purpose?	{1-Yes, 2-No, 3 not dipping}
3.9	If (3.7) is yes. Does the cup has handle?	{1-Yes, 2-No}
3.10	Where the cup is placed?	[1-Inside the container, 2-On the cover material of the storage container, 3-Hanging near by, 4-Any where in appropriate place}
3.11	Does the cup cleaned regularly?	{1-Yes, 2-No}
3.12	Do you wash your hands before drawing drinking water from container	{1-Yes, 2-No}
3.13	Do the storage of drinking water cleaned regularly before storage?	{1-Yes, 2-No}
3.14	In your opinion, is safe handling and storage practice is important?	{1-Yes, 2-No}

Part-IV. Questionnaire on Treatment of Drinking Water at Household and Community Level

4.1	Do you use treated water at their source with chlorination?	{1-Yes, 2-No, I am not sure}
4.2	Using treated water at house hold with Chlorine solution/wuhagar?	{1-Yes, 2-No}
4.3	Treating water at house hold level with boiling	{1-Yes, 2-No}
4.4	Treating water at house hold level by filtration	{1-Yes, 2-No}
4.5	If yes, type of filtration applied	{1-House hold sand filter,2-Cloth filtration,3-Other filtration method (Specify)}
4.6	In your opinion, does treating drinking water is important?	{1-Yes, 2-No}

Annex-2:- Accessed drinking water sources at study area during study period



Figure 3 Existing drinking water sources used by Households of Assosa Woreda, 2020