

# Assessment of Water, Sanitation and Hygiene Status of Households in Welenchiti Town, Boset Woreda, East Shoa Zone, Ethiopia

Worku Dugassa Girsha<sup>1,\*</sup>, Abebe Megerso Adlo<sup>1</sup>, Desalegn Ararso Garoma<sup>2</sup>, Sultan Kalu Beggi<sup>1</sup>

<sup>1</sup>Department of Public Health, Adama Hospital Medical College, Adama, Ethiopia

<sup>2</sup>Technology Transfer and Research Translation Directorate-Ethiopian Public Health Institute, Addis Ababa, Ethiopia

## Email address:

dugassaworku@gmail.com (W. D. Girsha), abemegerso@yahoo.com (A. M. Adlo), desalegnararso1@gmail.com (D. A. Garoma), sultanate2010@gmail.com (S. K. Beggi)

\*Corresponding author

## To cite this article:

Worku Dugassa Girsha, Abebe Megerso Adlo, Desalegn Ararso Garoma, Sultan Kalu Beggi. Assessment of Water, Sanitation and Hygiene Status of Households in Welenchiti Town, Boset Woreda, East Shoa Zone, Ethiopia. *Science Journal of Public Health*. Vol. 4, No. 6, 2016, pp. 435-439. doi: 10.11648/j.sjph.20160406.13

**Received:** August 30, 2016; **Accepted:** September 8, 2016; **Published:** September 29, 2016

**Abstract:** Ethiopia has made tremendous progress toward universal water, sanitation and hygiene access in the past decade, but still significant challenges remains unaddressed which varies from place to place. This study aimed to assess the status of Water supply, sanitation and hygiene of households in the town. A cross sectional study was conducted. The study subjects were randomly selected 423 households by systematic random sampling. Data were collected through interview and observation checklist. Concerning average consumption of water by households, majority 312 (74.00%) of them got less than 20 liters per capita per day. The study also revealed that, only 126 (33.60%) respondents washed their hands after defecation with soap and water. Majority of households, 294 (69.70%) disposed their solid wastes in open dump outside the yard. Those households who got water supply less than 20 liters per person per day (AOR=2.51, 95% CI=1.07-5.87, P=0.03), no hand washing practices after defecation (AOR=2.60, 95% CI=1.10-6.14, P=0.03) were more likely to have diarrhea in last two weeks. Based on the key indicators addressed in this study, access to water, sanitation and hygiene is lower than that of required standard. Health-workers and local authorities must pay special emphasis to improve these conditions.

**Keywords:** Water, Sanitation, Households, Ethiopia

## 1. Introduction

The significance of hygiene and sanitation is recognized in the United Nations' Millennium Development Goals. However, it remains one of the biggest development challenges in all developing countries [1]. It is common for many international organizations to use access to safe drinking water and hygienic sanitation facilities as a measure for progress in the fight against poverty, disease, and death. It is also considered to be a human right, not a privilege, for every man, woman, and child to have access to these services. Even though progress has been made in the last decade to provide safe drinking water and sanitation to people throughout the world, there are still billions of people that lack access to these services every day [2].

Although urban sanitation figures generally greater than rural access, it is widely known that the poor, unplanned, densely populated areas are badly underserved. This density therefore poses a greater risk of contamination than thinly populated rural areas. Limited sanitation options and high demand are compounded by poverty and limited space, creating a major challenge, particularly to vulnerable groups such as the very young, the elderly and people suffering from diseases that lower their resistance. Poorly controlled waste also means daily exposure to an unpleasant environment [3].

To achieve the targets, action must start now. Households, communities, local and national governments, civil society, and private companies all need to work together. Key areas of action that could create impact are as follows: making political commitments; creating legislation and regulations to

support improvement in access and quality of sanitation and hygiene services; bringing together more resources, having stronger institutions and better trained people; culturally sensitive and appropriate hygiene education; right choice of technology that are cost-effective and environment-friendly; giving attention to gender and equity; supporting small-scale entrepreneurs; monitoring progress; and making information flow [2, 3]. Therefore targeting hygiene and sanitation is vital for improving the health of the population at large.

The United Nations estimates that 2.5 billion people were still without improved sanitation in 2010 and around 1.1 billion practice open defecation throughout the world. The World Health Organization also estimates that, worldwide, there are 884 million people without access to a safe water supply. An even greater number, 1100 million people, do not have access to latrines or other forms of improved sanitation. Globally, Diarrhea alone kills 4,000 children every day - causing more child deaths than HIV/AIDS, malaria and measles combined [1].

Several studies in Africa documented that over half the population in Africa use an improved or shared sanitation facility; but one in four practices open defecation [2]. Similarly in sub-Saharan Africa, 45% of the populations use either shared or unimproved facilities, and an estimated 25% practice open defecation [3].

Ethiopia like many other countries in Sub-Saharan Africa has low levels of water, sanitation and hygiene facilities and practices. The national coverage figures for access to safe rural water supply within 1.5km are quoted to be 41% and access to safe urban water supply within 0.5 km to be 78%. Sanitation coverage is quoted to be 18% in rural areas and 57% in urban areas [4]. It has been reported that 60% of overall diseases is related to poor sanitation and hygiene in Ethiopia [5]. A diarrheal disease represents more than 75% of outpatient cases in Ethiopia and contributes to malnutrition. There is also a high prevalence of worm infestations (causing anemia). This, in turn, impacts on school attendance and level of education attained [6]. This is actually contributed due to poor sanitation practices such as open defecation, a low level of hygiene practices, and improper waste disposal. In general more than 80% of communicable diseases in Ethiopia are believed to be preventable using environmental health interventions, so targeting hygiene and sanitation is vital for improving the health of the population at large [7].

Among the main problems which are responsible for this situation are: lack of priority given to the sector, lack of financial resources, lack of sustainability of water supply and sanitation services, poor hygiene behaviors, and inadequate sanitation in public places including hospitals, health centers and schools. Providing access to sufficient quantities of safe water, the provision of facilities for a sanitary disposal of excreta, and introducing sound hygiene behaviors are of capital importance to reduce the burden of disease caused by these risk factors [8].

Lack of provisions to proper WASH facilities can hinder the development of a country. This may be a challenge to achieve Millennium Development Goal. Provision of

adequate WASH facilities is not only a socioeconomic and developmental issue, but also an issue of self-respect, human dignity and public health [8, 9].

The increased magnitude of water, sanitation and hygiene problems in urban settings of the country demands community-based studies that will facilitate a better understanding of the issues and influence policy and decision-making at the community, town, and regional state and national level. Therefore, this study aimed to assess Water supply, sanitation and hygiene status of households in Welenchiti Town, Bosetworeda, East Shoa Zone, Ethiopia.

## 2. Methods and Materials

### 2.1. Study Design and Setting

A cross-sectional study design was used to assess Water supply, sanitation and hygiene status of households. The study was carried out in the Welenchiti town, Oromia region state, Ethiopia. The town is located 25 km from Adama town, along the road from Addis Ababa to Dire Dawa. The study population was all households in Welenchiti town. The study units were randomly selected households from the two kebeles. The study period was from March 2015 to August 2015.

### 2.2. Sampling Methods

To select a fairly representative sample of households, the sample size was distributed proportionally to each of the two kebeles based on the number of households they have. After assigning a number to each houses, each sample was selected by systematic random sampling at an interval of 13 (5323 households divide by 423 total sample size). In case of absenteeism the next number was included in the study.

### 2.3. Sample Size Determination

The sample size was determined using the single population proportion formula.

$$n = Z^2 P (1-P) / d^2 \quad (1)$$

Where

- n = Sample size of households.
- P = Proportion of households using improved water and sanitation. No previous similar study was carried out in the area and to get maximum sample size P was taken as 50% (P=0.5).
- d = Degree of accuracy required (sampling error) is 5% that is, d = 0.05.
- Z = Standard score for 95% confidence level is 1.96.
- Additional 10 % for non-response rates were taken.

Substituting the above values (1), the calculated sample size for the study was 423 households.

### 2.4. Inclusion and Exclusion Criteria

Inclusion sampling criteria for this study was being a household living in a registered housing unit of Welenchit

town. Exclusion sampling criteria for the study were being institutions (such as offices, hotels, etc.) and households that were not registered in the kebeles of the town.

### 2.5. Ethical Considerations

The ethical approval and clearance was obtained from Adama Hospital Medical College, Institutional Ethics Review Committee. Then at all levels, officials were contacted and permission was secured. All the study participants were informed about the purpose of the study and verbal consent of all study subjects were obtained before data collection. Participants also informed that they have full right to discontinue or refuse to participate in the study. To ensure confidentiality, the name of interviewee was not written on the questionnaire. Besides, the interview was made in a place where it was conducive to the study participants, in their compound. Each respondent was assured that the information provided by them was confidential and used only for the purpose of research. Moreover, there was no risk or harm that was anticipated from participation of the study.

### 2.6. Data Collection Techniques

Data were collected using structured, pretested, interviewer-administered questionnaire through house to house and observational check list. Questionnaires were translated in to local language. In order to identify the clarity of questions, pre-testing of the instrument was done. During the pre-testing discussion was held with the interviewers and households on the problems they encountered to collect data. Correction was incorporated in the final questionnaire. Five health professionals were recruited as data collectors. Two health professionals were selected as supervisors. Training was given for both the supervisors and the data collectors for one day before the pretest and for a day after the pretest. The training includes the objectives of the study, method of data collection, checking completeness of questionnaire and the way approaching to the households.

### 2.7. Data Processing and Analysis

After the data were collected and the responses coded, the data was entered into a computer and analyzed using SPSS version 20. In the analysis process, frequency distribution of variables was worked out in order to describe them. To ascertain the association between dependent and independent variables, adjusted odds ratio with 95% confidence interval will be calculated at 5% significance level.

## 3. Results

A total of 422 representative of households, 240 (56.90) females and 182 (43.10) males, were interviewed with response rate of 99.76%. The median age of the respondents was 37 years and 199 (47.20) were illiterate. Among the respondents the majority, 255 (60.4) were Oromo by ethnicity and 275 (65.2) were Orthodox in religion.

Regarding occupation of respondents half of them, 211 (50.00) were housewife. Majority, 330 (78.19) of the households, family size were in the range of less than five persons (Table 1).

**Table 1.** Socio-demographic characteristics of the study subjects in Welenchiti Town, Bosetworeda, East Shoa Zone, Ethiopia, 2015. (N=422).

Characteristics	No (%)
Sex of respondents	
Male	182 (43.1)
Female	240 (56.9)
Age of respondents	
20-29	86 (20.38)
30-39	137 (32.46)
40-49	100 (23.69)
50-59	54 (12.79)
≥60	45 (10.66)
Ethnicity of respondents	
Oromo	255 (60.4)
Amhara	123 (29.1)
Gurage	33 (7.8)
Others	11 (2.6)
Religion of respondents	
Orthodox	275 (65.2)
Muslim	102 (24.2)
Protestant	36 (8.5)
Others	9 (2.10)
Educational status of respondents	
Literate	223 (52.84)
Illiterate	199 (47.20)
Occupation of households	
Housewife	211 (50.00)
Farmer	75 (17.80)
Daily laborer	73 (17.30)
Merchant	45 (10.70)
Governmental employ	18 (4.30)
Family size of households	
≤ 5	330 (78.19)
> 5	92 (21.81)

As indicated in table 2, Majority 277 (65.60%), of the households fetched water outside their housing compounds using public distribution points and neighborhood. Only 145 (34.40%) of households reported having piped water on their premises. The average consumption of water by households, majority 312 (74.00%) of them got less than 20 liters per capita per day. The study also revealed that, only 126 (33.60%) respondents washed their hands after defecation with soap and water. Concerning the problems related to water supply, 331 (78.40%) households were complain about scarcity of water and 25 (6.00%) complain about water borne diseases.

**Table 2.** Percent distribution of households' water supply status in Welenchiti Town, Bosetworeda, East Shoa Zone, Ethiopia, 2015. (N=422).

Characteristics of household water supply	Frequency	Percent
Source of drinking water		
public tap/standpipe	150	35.5
pipd water into dwelling	145	34.4
pipd water from neighborhood	127	30.1
Liters of water per person per day		
< 20 liters	312	73.9
≥ 20 liters	110	26.10
Problems related to water supply		
Scarcity (inadequate supply)	331	78.40
Walking distances (takes our time)	64	15.10
Water borne diseases	25	6.00
Others	02	0.50

From a total of 422 households assessed for presence of excreta disposal systems, majority 375 (88.90%) reported that they have latrine or toilet facilities; while 47 (11.10%) were without latrine. From those households who had latrine, 342 (91.20%) were traditional pit latrines. The main reasons for not having latrine are lack of space (59.60%) and costly to construct (40.40%) (Table 3).

**Table 3.** Percent distribution of households' latrine status, in Welenchiti Town, Bosetworeda, East Shoa Zone, Ethiopia, 2015.

Toilet or latrine facilities	Frequency	Percent
Availability of latrine (N=422)		
Yes	375	88.90
No	47	11.10
Reasons not having latrine (N=47)		
Lack of space	28	59.60
Too costly	19	40.40

Fortify five (10.70%) of the households had diarrhea in the last two weeks (Table 4).

**Table 4.** Proportion of households who had diarrhea in the last two weeks in Welenchiti Town, Bosetworeda, East Shoa Zone, Ethiopia, 2015.

Household family members who had diarrhea in the last two weeks (N=422)	Frequency	Percent
Yes	45	10.70
No	377	89.30

Table 5 below indicates the association between latrine availability, adequate water supply and hand washing practices after defecation with diarrhea in the last two weeks. Those households who had no latrine availability (AOR=2.92, 95% CI=1.37-6.22, P=0.01), water supply less than 20 liters per person per day (AOR=2.51, 95% CI=1.07-5.87, P=0.03), no hand washing practices after defecation (AOR=2.60, 95% CI=1.10-6.14, P=0.03) were more likely to have diarrhea in last two weeks.

**Table 5.** The impact of latrine availability, adequate water supply and hand washing practice on diarrhea in welenchiti town households, Bosetworeda, East Shoa Zone, Ethiopia, 2015.

Facilities	Diarrhea in the last two weeks	
	AOR (95% CI)	P-value
Latrine availability		
Yes	1.00	
No	2.92 (1.37-6.22)	0.01
Adequate water supply		
≥ 20 liters per person per day	1.00	
< 20 liters per person per day	2.51 (1.07-5.87)	0.03
Hand washing practices after defecation		
Yes	1.00	
No	2.60 (1.10-6.14)	0.03

AOR= adjusted odds ratio, CI= confidence interval.

From a total of 422 households, 294 (69.70%) explained that they disposed wastes in open dump outside the yard and 82 (19.40%) in refuse disposal pits. The main reason for not having refuse disposal pit is lack of spaces (77.30%). Concerning awareness on water supply, sanitation and hygiene practices, almost half percent of the households said that, they didn't have a continuous training, support and follow up from health extension professionals.

## 4. Discussions

Increasing access to improved drinking water is one of the sustainable developmental goals (SDGs). The study indicated that the proportion (34.40%) of households reported having piped water on their premises was lower when compared to EDHS 2011 report (48.40%) and other urban areas in Ethiopia [7, 9]. The average water consumption of people in this study area was (74% of households got less than 20 liters per capita per day) lower than the WHO guidelines, which state that the per capita water consumption should be at least 20 liters per day [3, 4]. The reasons may be Scarcity or inadequate water supply sources and walking distances might explain lesser amount of water consumption per capita per day. Diarrhea disease was a health problem in the study area. Households who got less than 20 liters of water per person per day had diarrhea almost two times more than households who got greater than 20 liters of water per person per day (AOR=2.51, 95% CI=1.07-5.87, P=0.03).

Washing of hand with soap after visiting toilet (or after defecation) has a paramount importance in decreasing of diarrheal and other parasitic diseases [9, 10]. The study showed only 30% of the households with latrines washed their hands after defecation. The result was much lower than the growth and transformation plan or health sector transformation plan of Ethiopia (77%) which will be achieved in next five year (2020G.C.) This poor hand washing practices after toilet is significantly associated with diarrheal diseases (AOR=3.26, 95%, CI=1.35-7.91, P=0.03).

Many researchers have underlined the relationship between public health and improper solid waste management [5, 8]. This study indicated that majority (69.70%) of the households disposed their solid wastes in open dump outside

the yard. This leads to a polluted environment and sources of communicable diseases. This finding is similar with a study done in Ambo town, Oromia region, Ethiopia 2011, where majority, (63.68 %,) of the households disposed their solid wastes in open fields [11, 12].

## 5. Limitations of the Study

The households that were included in the study were from only one town (Welenchit) and other towns in oromia were not incorporated in this study. Research results therefore are limited to this particular town and cannot be generalized to other towns in Oromia. The study was limited to the problems related to domestic environmental sanitation condition at household level and did not include data collection from the local institutions such as: the municipality, the town's health facilities, and other.

## 6. Conclusions and Recommendations

This study revealed that majority of the household's water supply was inadequate. The average water consumption of people in the town was lower than the WHO guidelines. Low proportion of the household's washed their hands after defecation. Majority of the household's proportions disposed solid wastes in open dump outside the yard. Therefore, this study recommends the following actions in order to alleviate the problems of WASH in Welenchiti town:

- Additional water supply source should be provided to supply adequate and continues water to the community.
- Increasing community based health education on hand washing practices after defecation is essential by strengthening Health Extension Workers.
- Increasing awareness and practices of safe solid waste disposal methods by the households and preparation of solid waste disposal site by the town municipal.
- Continues follow-up and supervision of all stake holders to implement community based national hygiene and sanitation strategy plan of 2015.
- Further research is needed including institutions.

## Acknowledgments

We would like to thank Adama Hospital Medical College for facilitating all processes and financial support to finalize

this paper. Our heartfelt and deepest thanks go to Boset Woreda Health Office for their valuable information and support during the paper development. Finally the authors thank those participants who voluntarily participated in this study and all concerned bodies.

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