

**WATER SUPPLY ACCESSIBILITY AND ASSOCIATED
FACTORS AMONG HOUSEHOLDS OF JIGJIGA TOWN, EASTERN
ETHIOPIA**

MSc Thesis

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Haramaya University, Harar

**Water Supply Accessibility and Associated Factors among households of
Jigjiga Town, Eastern Ethiopia**

**A Thesis Submitted to the Department of Environmental Health, School of
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**In Partial Fulfillment of the Requirements for the Degree of
Master in Water Supply and Sanitation Management track**

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Haramaya University, Harar

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HARAMAYA UNIVERSITY
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ACRONYMS AND ABBREVIATIONS

EDHS _____ Ethiopian Demographic Health Survey

HHH _____ Head of household

KII _____ Key Informant Interview

MDG _____ Millennium Development Goal

MoWE _____ Ministry of Water resource and Energy

SPSS _____ Statistical Package for Social Science

UNICEF _____ United Nations Children's Fund

WASH _____ Water, Sanitation and Hygiene

WHO _____ World Health Organization

ABSTRACT

Background: Access to improved water source for drinking and other domestic uses is a major developmental challenge in many developing countries. In Ethiopia due to its different geological formations and climatic conditions water distribution is uneven spatial and temporal across the nation, i.e. there was water scarcity in the Eastern part of the country. Even though accessible water supply is a critical issue to ensure the quality of life, there no study conduct on Water accessibility in Jigjiga town before, therefore study was aimed to assess water accessibility to fill the gap.

Objective: This study was aimed to assess the accessibility of water supply and its associated factors among residents of Jigjiga town from May 15-30/2016.

Methods: Community based cross sectional study design was conducted to study a randomly selection of 408 households and 14 key informant. Simple random sampling and purposive sampling technique was used for quantitative and qualitative approaches respectively. Data were collected by using pre-tested questionnaire and face-to-face interview with illegible household member. Data were analyzed using descriptive tests, bivariate and multivariate logistic regression analysis. All independent variables with p-value of < 0.3 at bivariate analysis were included in multivariate model to determine the predictors of the outcome variable, and to control the confounding factors.

Result: Overall 56.7% of households reported using an improved water source as the main source of drinking water supply within recommended distance and only 35.2% of households consume 20liters per person per day and less than half households (44.8%) affordable to water supply access (pay less than five percent of their income). Combining these three indicators results only a fifth of households (19%) of households accessible to water supply that meet standard. Head of household with higher level of education [(AOR=4.2, 95% CI (1.0, 18.06)] and those having private pipe water supply [(AOR=19.1, 95% CI: (5.1, 71.39)] were identified as positively significant associated factors with water accessibility compared to those who cannot read and write and those that share water from neighbor pipe respectively.

Conclusion and recommendation:

Access to water supply in the study area was very low. So that local authorities must pay special emphasis to improve accessibility and reliability of water supply and closely supervise and monitor private water vendors. Further in-depth studies should also be encouraged to look for improved interventions

1 INTRODUCTION

1.1. Background

Access to improved water for drinking and other domestic uses, such as bathing, cooking and washing of clothes, is a major developmental challenge in many developing countries. Almost 1.1 billion people worldwide do not have access to clean water and over twice this number, more than 2.5 billion, lack access to basic sanitation facilities. More than 80% of these 2.5 billion people are in Asia and Sub-Saharan Africa as documented by the World Health Organization (WHO) and the United Nations Children Fund (UNICEF) in 2009 (WHO/UNICEF 2009). In a WHO 2010 study, it was reported that only 35% of the urban population in Sub Saharan Africa have access to a piped water connection in their households (Zuin et al. 2011).

The MDG drinking water target, to halve the proportion of the population without sustainable access to safe drinking water (an increase in coverage from 76% to 88%) between 1990 and 2015, was met in 2010. Between 1990 and 2012, 2.3 billion people gained access to an improved drinking water source; raising global coverage to 89% in 2012. There has been an impressive growth in the use of piped connections to a dwelling, plot or yard. Approximately 70% of the 2.3 billion people who gained access to an improved drinking water source between 1990 and 2012 gained access to piped water on the premises. Seventh percent of the 1.6 billion people who gained access to piped water on premises live in urban areas (WHO, 2014).

Africa has the lowest water supply and sanitation coverage of any region in the world. More than 30% of Africans residing in urban areas currently lack access to adequate water services and facilities. In the year 2000, WHO estimated that Africa contains 28% of the world's population without water access to improved water supplies, and 13% of the world's population without access to improved sanitation. Only 62% of the people in African countries have access to improved water supplies, and only 60% have access to improved sanitation (WHO 2000).

Access rate to improved water supply sources hardly increased in urban Sub-Saharan Africa since the late 90's. The percent of the urban population that had access to improved water supply only increased from 67% in the late 90's to 69 percent in the late 2000's. This represented an increase of 63 million urban dwellers gaining access to improved water supply from 135 to about 199 million since late 90's.

According to EDHS (2011) report more than half of the households in Ethiopia (54 percent) have access to an improved source of drinking water, with a much higher proportion among urban households (95%) than among rural households (42%). The most common source of improved drinking water in urban households is piped water, used by 87 percent of urban households. In contrast, only 19 percent of rural households have access to piped water. Eleven percent of rural households have access to drinking water from a protected spring, and 8 percent have access to drinking water from a protected well. Nationally, the proportion of Ethiopian households with access to piped water has increased from 18 percent in 2000 to 24 percent in 2005 and 34 percent in 2011. In the last six years there has been a rapid increase in the percentage of households in Ethiopia that use some type of improved source of drinking water, from 35 percent in the 2005 EDHS to 54 percent in the 2011 EDHS (Central Statistical Agency, Ethiopia and ICF International, 2012).

1.2. Statement of the problem

The U.N. Committee on Economic, Social, and Cultural Rights defines the water in the following way: “The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses.” The Committee has identified five core components quality, accessibility, acceptability, affordability and availability as comprising the human right to water, which together are “indispensable for leading a life in human dignity.” Quality and affordability, the aspects of the right of primary importance to the communities described in this hearing request, have been defined and provide important standards for affected communities and governments alike. Quality is defined as water that is safe and does not pose a threat to human health. Affordability refers to economic accessibility and includes all direct and indirect costs for securing water for domestic use and should not compromise the realization of other human rights. In 2010, the General Assembly adopted a resolution recognizing the right to water and sanitation, and acknowledged the “importance of equitable access to safe and clean drinking water and sanitation as an integral component of the realization of all human rights” (U.N, 2010).

Water is the core constituent of the human body and most of the living species in this planet. A minimum quantity of water must be available for individuals not only for their survival but also for their various domestic needs to sustain good health. Domestic water supplies are one of the fundamental requirements for human life. Without water, life cannot be sustained beyond a few days and the lack of access to adequate water supplies leads to the spread of disease. Countries with different stages of development tend to have different water supply and demand status. The lack of safe drinking water, particularly in developing countries, is becoming an increasingly serious global topic. Developed countries are more likely access to water than developing countries. For instance in sub-Saharan Africa only 60% of the total population in the sub-continent is using improved sources of drinking water (Bradley DJ and JK., 2013).

Pertinent information on household's water accessibility is necessary to properly assess the factors that affect water accessibility. There are several factors that affect water accessibility of the households. According to the studies that have been conducted in different areas including in Ethiopia, water accessibility could be affected by different factors. Some of these factors are socio-demographic factors as gender, age, education, income, household size, housing condition; nature of employment and topographical variation; water source and its type (Dreibelbis *et al.*, 2013, David D *et al.*, 2014).

Provision of physically accessible and affordable water for personal and domestic uses is not only a socioeconomic and developmental issue, but also an issue of self respect, human dignity and public health (U.N, 2010). Therefore, this study was designed to assess accessibility of water supply in Jigjiga town to give insight about magnitude of the problem.

1.3. Significance of the Study

This study is expected to generate data about the status of water supply accessibility and its associated factors among households of Jigjiga town. The findings of the study give insight for the Somali regional state water bureau, health bureau, jigjiga town water and sewerage authority, jigjiga town health office for planning and situational analysis tasks. The study will further serve as baseline for any further investigation, as a useful material for academic purposes, and as an added literature to the existing knowledge.

1.4. Objective

1.4.1. General objective

The general objective of this study was to assess the accessibility of water supply and its associated factors among households of Jigjiga town from May, 15-30/ 2016.

1.4.2. Specific objective

- To assess accessibility of water supply among households of Jigjiga town
- To identify factors associated with accessibility of water supply among households of Jigjiga town

2 LITERATURE REVIEW

2.1 Status of water supply accessibility

A quantitative study was conducted among 240 women to Assess household Water Availability and Accessibility in Ilorin East, Kwara State, Nigeria in 2013, shows that majority (74%) of the respondents do not have access to potable water based on the World Bank/UNICEF (2010) classification in terms of distance less than 200m (Tunde, A.M, 2013).

In Nigeria a cross sectional study was conducted on determinants of domestic water consumption in a growing center urban of Osun state in 2013 as finding indicates, about 69.7% of the respondent were within 10 minutes trek from water source, 28.3% maximum to 20 minutes to water source while the remaining 1% maximum to 30 minutes to water source (Timothy.O and Pauli. L, 2014)

The results of survey conducted in Cameroon Yaoundé, 2005-2008, showed that the households in Yaoundé resorted to five different water sources to satisfy their needs. In total, 599 (19.7%) households were directly connected to the National Water Company, 1,097 (36.1%) shared a common tap located in the courtyard, less than 500 meter away, and 1,042 (35%) fetched water from public taps outside their premises, having to walk a distance of between 500 and 1,000 meter or more (Blaise H. and Nguendo Y. 2010).

A Cluster Survey was conducted in Cameroon in 2006 to analyze Awareness and the Demand for Improved Drinking Water Source choice, indicates that, among the surveyed households, 6504 (67.28%) have access to improved drinking water source while 3163 (32.72%) rely on unimproved sources. 5718 households (59.18%) collect water for their other domestic usages purpose from improved sources while 3944 households (40.82%) collect it from unimproved sources (Totouom.F.L.A, 2013).

A study done in Chongqing, China in 2008, on water pricing with households acceptability and willingness to pay shows in general the lowest water uses are found in the lowest income groups, the share of water expenditure in income is higher with the lower income groups. The share of the lowest income group, which has an average monthly income less than 200 yuan, is 6%. This exceeds the conventionally recognized "burden threshold" in water expenditure, which is 5%. For the second lowest income group, the share is 3.1%. These two lowest income groups account for 7% of the total number of households. For income groups with a monthly income higher than 1000 yuan, which accounts for about 62.9% of the total number of households, water expenditure is less than 1% of income (Wang. H et al, 2010).

As a result of study conducted in Nazareth town, Ethiopia in 2002, finding shows cost affordability high proportions of the low income group use water by buying from vendors who sell water at higher price than the existing government water tariff, the study result reveals that households from the low income areas spend, on average, 3.58% of their monthly income, whereas from that of middle and high income areas spend 1.49% and 1.02% of their monthly income on water per month (Alebel Bayrou, 2002).

Study was carried out, in 2008 in Shebedino Woreda in Southern Nations, Nationalities, and People's Region in Southern Ethiopia, among the 635 households interviewed, 286 (45 %) were using protected water sources. Hand pumps were used by 40.5 % of the respondents. Fourteen (3.3 %) of the interviewees responded that their improved water source was not working (Baye S. et al. 2012).

A household survey was carried out with about 170 households in Hawassa city, In June 2010, shows that a household, on average, consumes about 3000 L (3 m³) per month per household, which is about 100 L per day per household, which shows the average family size, per capita water consumption per day is 18 L (Tarfasa S. 2013).

There was a descriptive, cross-sectional study conducted among households of Dukem town, Oromia region in Ethiopia in 2011, the findings show that that majority (83.9%) of the households had access to water within a distance of up to 200 meter or less. regarding to time more than 82.4% of households had access to water within a time of 30 minutes or less, but interims of quantity majority of the households (83.9%) had used less than 20 litres per capita per day (Mohammed .A.I et al. 2011).

A Study conducted at Awaday town, Eastern Ethiopia in 2012 on potable water supply revealed that, only 39.4% of households had access to drinking water supply with recommended distance, 9(5.3%) of the respondents had tap water source inside their house, 37(21.8%) of the respondents used tap water source inside the private compound, 13 (7.6%) of the respondents used tap water source outside compound, 8 (4.7%) of the respondents used youth association water Vander and ,103(60.6%) majority of the respondents used alternatively water from different sources without having single water point as permanent water source (Mekonnen. A and Utama.R, 2014)

A study done in 16 town of Ethiopia shows that 91% of households receiving and using services that fall short of the required standards and also 82% of households reported using an improved water source as the main source of drinking water supply and, 35% of them use at least 20 litre per person per day (Marieke. A et al.2016)

2.2 Factors affecting accessibility of water supply

2.2.1 Socio-economic and demographic Factors

i. Income

In Nigeria as Wealth status and sex differential of household head implication for source of drinking water finding indicates, in 2013 highest proportion of households who used improved drinking water source was found in the rich wealth index group (76.7 %). Households that belong to rich wealth index and middle class were more likely to get improved drinking water source respectively than the poor (AOR=5.06;CI = 4.81–5.32, $p < 0.001$) and (AOR=2.62;C.I = 2.46–2.78, $p < 0.001$)(Morakinyo et al. 2015).

ii. House hold size

A Cluster Survey was conducted in 2006 In Cameroon to analyze Awareness and the Demand for Improved Drinking Water Source choice, the results of the finding indicates, the number of people in a household determines whether this household obtains its water from an improved source. The coefficient of the household size is statistically significant at (AOR=3.2;CI=2.12-6.39, $P < 0.0101$). Thus, the increasing of the household size decrease the likelihood of using improved sources (Totouom.F.L.A, 2013).

A cluster survey was conducted on Dimensions of water accessibility in Eastern Kogi State of Nigeria in 2010 Result obtained indicated that accessibility interims of water quantity is strongly correlated with household size and it is significant ($r = 0.001$)(Davidson S. A, et al, 2013).

iii. Sex of house hold head

In Nigeria as 2013 Wealth status and sex differential of household head: implication for source of drinking water finding indicates, households that used improved drinking water source were headed by females (66.7 %) than males (58.7 %). The likelihood of using improved drinking water source was higher in household headed by females (AOR = 1.41; C.I = 1.33–1.49, $p < 0.001$) (Morakinyo et al. 2015).

A study done in 16 town of Ethiopia shows that sex differential of household head were statistically significant on using improved drinking water source, i.e. male-headed households were more likely to have piped water on premises (60%) than female-headed households (48%). More female-headed households depend on unimproved water sources (23%) than male-headed households (12) (P -value < 0.001) (Marieke. A et al.2016).

iv. Educational level

A Cluster Survey was conducted in 2006 In Cameroon to analyze Awareness and the Demand for Improved Drinking Water Source choice, the results of the finding indicates that the proportion of households who rely on improved sources water is higher for households with more schooling. That mean proportion rises from 50.52% for households with no educational level to 63.58% for households with primary educational level and to 82.44% for households with at least the secondary educational level. This shows there is statistically significant with Educational level at (AOR =6.113, C.I = 3.08–11.34; P<0.0371) therefore, the probability for a given household to adopt an improved water source increases with the educational level (Totouom.F.L.A, 2013).

A study conducted on Effect of Socio-economic Factors on Access to Improved Water Sources and Basic Sanitation in Bomet Municipality, Kenya in 2007 show that more than 90% of the respondents with tertiary education used improved sources. Which indicates the type of water source used by households was significantly influenced by the level of education of household head ($\chi^2 = 10, df = 2, p < 0.01$) (Koskei.E.C.2013).

v. Occupation

A study conducted on Effect of Socio-economic Factors on Access to Improved Water Sources and Basic Sanitation in Bomet Municipality, Kenya in 2007 the finding indicate that, majority of households (86%) whom their heads were unemployed used unimproved sources. This show that water source used by households was significantly influenced by occupation of household head ($\chi^2 = 13, df = 3, p < 0.00$) (Koskei.E.C.2013).

vi. Tenancy

There was a descriptive, cross-sectional study conducted among households of Dukem town, Oromia region in Ethiopia in 2011, the findings shows that more than half (57%) respondent who had accessible private piped water the houses were privately owned. The results indicated that there was a statistically significant association between private house ownership and private piped water availability (AOR =2.13; CI=1.36-4.19; p<0.05) (Mohammed .A.I et al. 2011)

2.2.2 Institutional Factors

Study conducted on Examining the Influence of Economic and Political Factors Upon Access to Improved Water and Sanitation in Select African Nations, 2005-2008 show that residents in nations with good institutional Effectiveness (COR=2.26, CI: 2.20-2.33; $p < 0.001$) more likely access to improved water source than residents in low institutional effectiveness (Jenkins, 2010).

2.3. Conceptual frame work of factors affecting accessibility of water supply.

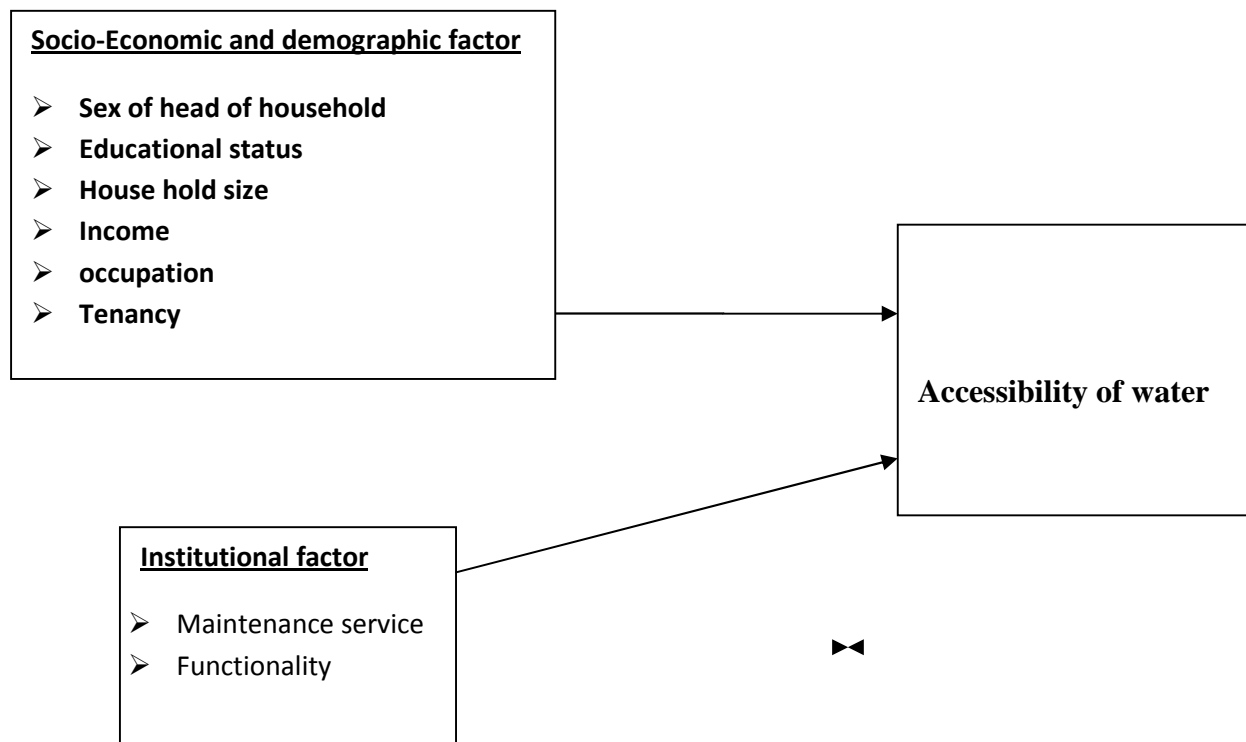


Figure 1: conceptual framework of factors affecting accessibility of water supply
Source: literature reviewed

3 METHODS AND MATERIALS

3.1 Study area and study period

The study was conducted in Jigjiga city administration from May 15- 30, 2016. This is located in the Faffan zone of, Somali region which is 631 km from Addis Ababa. Jigjiga city administration has an estimated total population of 159,300 of whom 81,789 are men and 77,511 are women Based on the Central Statistical Agency Ethiopian city and towns population estimation projection of 2015 (Central Statistical Agency, 2012).

The four largest ethnic groups reported in this town were the Somali (61.58%), the Amara (23.25%), the Oromo (7.32%), and the Gurage (4.37%); all other ethnic groups made up 3.48% of the population (Central Statistical Agency, 2012).

As official data of Jigjiga town water supply project shows there are 21 boreholes drilled to serve the town (Jigjiga town water supply office, 2015).

3.2 study design

A community based cross sectional study using quantitative techniques and complemented by qualitative methods was used.

3.3 Population

3.3.1 Source population- All households in Jigjiga town

3.3.2 Study population- All households in the four randomly selected Kebeles (kebele 05, 08, 12 and 15)

3.3.3 Study units- Selected households from Study population

3.4. Inclusion Exclusion criteria

3.4.1. Inclusion criteria

- The respondent should be resident in the household for more than six months and illegible respondent above 18 year
- A household(home) which is normally used only for residence
- For Key informants interview(KII) the respondent should have stayed more than three month in the office

3.4.2. Exclusion criteria

- Household if illegible respondent is absent (due to illness or age)

3.5. Sample size calculation

For the specific objective one

To determine the required data, representative sample size was determined using formula for a single population proportion based on the following assumptions, Margin of error 5%, Confidence level 95%, Contingency for non-response rate 10% according to Mokennen. AandR. Utama (2014) water supply accessibility of Awaday town is 39% in 2012, let as Jigjiga town accessibility is the similar since both town was found in the eastern part of the country. P=39%

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2}$$

Where, n=the total sample size required

d=marginal error

Z /2=critical value =1.96

P= urban water supply accessibility of the region. = 39%

Thus, the sample size will be as follows.

$$n = \frac{(1.96)^2 \cdot .39(1- .39)}{(0.05)^2} = 366$$

- Total number of sample size required for the study = 366
- Non-response rate of 10% (366) = 37.
- Total sample size required for the study is 37+ 366= 403.

For the specific objective two

Epi- info version 7.1.4 is used to calculate the sample size for the second specific objective: using double population proportion formula with the following assumption: power of the study to be 80%, 95% confidence level to be 1.96, and the ratio of unexposed: exposed is almost equivalent to 1. A study done in 16 town of Ethiopia shows that sex differential of household head were statistically significant on using improved drinking water source, i.e. female-headed households depend on unimproved water sources (23%) than male-headed households (12%) (P-value <0.001) (Marieke. A et al, 2016).

The required sample size is calculated using an equation:

$$n_1 = \frac{\left[Z_{\frac{r}{2}} \sqrt{\left(1 + \frac{1}{r}\right) P(1 - P)} + Z_s \sqrt{P_1(1 - P_1) + \frac{P_2(1 - P_2)}{r}} \right]^2}{(P_1 - P_2)^2}$$

n1= sample size of households that used improved drinking water sources were headed by females

n2 = sample size of households that used improved drinking water sources were headed by males

r = n1/n2 =2 that is taking one to 2 ratio.

Z /2=1.96 for the standard scale of 95% level of confidence, Z =0.84 considering 80% of power to detect a difference of (P1-P2) 8%

p1= proportion of households headed by females, 23 %

p2 =proportion of households headed by males, 12%

Let P (pooled population proportion) = $\frac{p_1 + r p_2}{1 + r}$

p = (p₁ + r p₂)/1 + r = 23+2*12/1+2 = 16

Specific objective	Proportion/Factor (p)	Calculated sample size	Non-response rate (10%)	Total sample size
1	39% Proportion of water supply accessibility.	366		403
2	Head of Household respondent	Male (12)		408
		Female (23)		

Therefore, the maximum sample size **408** was taken as a study participant.

3.6 Sampling procedures

3.6.1. Sampling procedures for Quantitative method

Stratified sampling technique was used to select the study population. First, 18 kebeles were identified and further stratified in to two strata based on the previous administration 10 kebeles(01-10) and the new settlement 8 kebeles(11-18) added from Jigjiga woreda, then from each stratum, two kebeles were randomly selected for the study. Second, a total of 403 households will be randomly selected from the study kebele based on population proportion of kebele, thirdly study unit was randomly selected from households list of each kebeles administration office then the first study unit was selected randomly from the first 19 listed households then systematic sampling method was followed for the next continuing study unit using kebeles population proportion for assigned sample size $=K^{th} = n/N(7771/403=19)$, which mean every the 19th households were selected

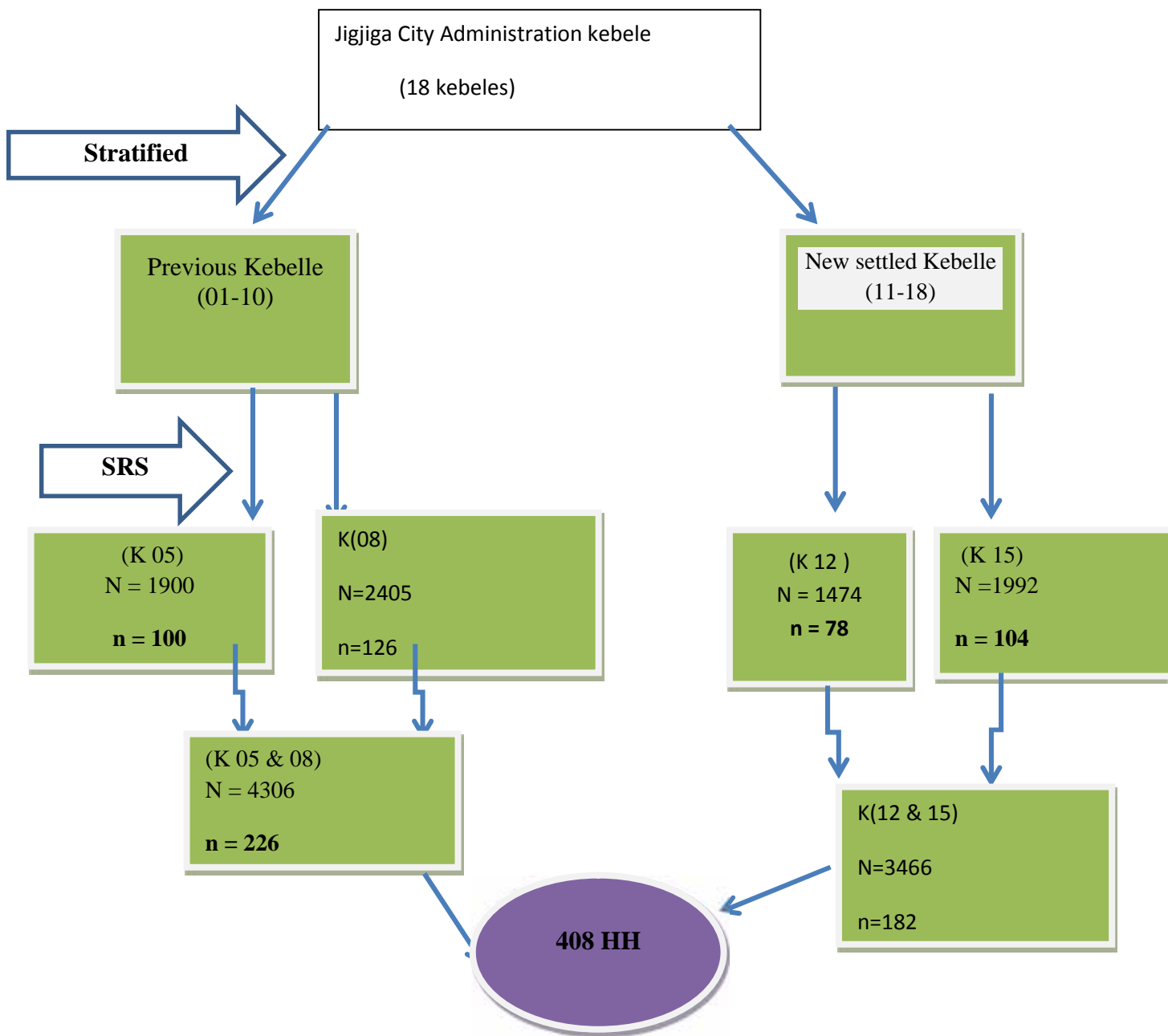


Figure2: Schematic presentation of quantitative sampling technique for assessment of Water supply accessibility and associated factors in Jigjiga town, Ethiopia 2016

3.6.2. Sampling procedures for Qualitative method.

In order to complement the data obtained by the use of structured questionnaires a total of 14 KII participants were selected from Water Supply office, Health office, Municipality office who is professional related and have experience in water supply and sanitation field of study and also kebele administrative members who working with water and sanitation committee. Two KII participants were selected from each office and kebeles. A participant for KII was selected by principal investigator (PI). Semi-structured questionnaires, which are open ended, was used to guide the interview.

3.7. Method of data collection

3.7.1. Quantitative method

The data was collected using structured questionnaires, personal observation and checklist specially developed for this purpose by interviewing the respondents.

The questionnaires were initially prepared in English and then translate into Amharic and Somali language. The Amharic and Somali version was again translated back into English to check for any inconsistencies or distortion in the meaning of words and concepts.

Ten Health Extension Workers who can speak the local language were recruited as data collectors and the data was collected through house to house survey from illegible respondent of household member who resident in the household for more than six months. Two supervisors were selected from Jigjiga city health and education office that have B.Sc. holders. The responsibilities of the supervisors were checking whether the questionnaires were correctly completed or not. Training was given for data collectors and supervisors for two days on procedures, techniques and ways of collecting the data. The questionnaires were pretested in the kebele 09 which was similar to the study population before beginning the actual data collection process and the necessary modification was made.

3.7.2. Qualitative methods

KII was moderated by the principal investigator (PI) with the assistance of trained note taker and tape recorder. Semi-structured questionnaires, which are open ended, was used to guide the interviews.

3.8. Operational Definitions

Accessible water supply: the availability of water at least 20 Litre per capital per day from improved source within 200 meter of the user's dwelling or no more than 30 minutes one way to collect water and queuing time should be less than 15 minutes and it should not take more than 3 minutes to fill a 20 Litre container (WHO, 2003).and water is deemed economic accessible (affordable) if a family's or household's monthly income spent on it does not exceed 5%(Water Aid, 2011).

Improved drinking water sources: include, piped household water connection ,public standpipe, borehole, protected dug well and spring and Unimproved drinking water sources include, surface water, vendor-provided water (cart with small tank/drum, tanker truck), tanker truck water and unprotected dug well and spring (WHO/UNICEF ,2012)

Access to water supply: was a computed result of composite WHO 2003 and Water Aid 2011 guide lines.

Household: in Ethiopian context, a person or group of persons, whether or not they are related, who normally live together in the same housing unit or group of housing units and who have common cooking arrangements.

3.9 Study Variables

Dependent Variable:

- Access to water supply (composite of WHO 2003 and Water Aid 2011)

Independent Variables:

Socio-demographic factor

- Sex of heads of house holds
- Marital status
- Household size
- Income
- Education
- Tenancy

Institutional factor

- Maintenance service
- Functionality

3.10. Data Quality Assurance

The questionnaire was translated into the local languages i.e. Somali and Amharic for data collection and then retranslated back into English. Two days training was provided to the data collectors and supervisors on the data collection tool and the data collection procedure. Then the questionnaire was pretested on 5% of the sample size out of the study area to ensure its validity. Data collectors were supervised closely by the supervisors and the principal investigator. Completeness of each questionnaire was checked by the principal investigator and the supervisors on daily basis. Data were entered by two data clerks and consistency was cross checked by comparing the two separately entered data on Epi-Data. Finally, multivariate analysis was run in the binary logistic regression model to control the confounding factors.

3.11. Data processing and Analysis

The data were first coded, entered and cleaned using Epi-Data version 3.1 and exported to SPSS statistical software version 16.0 for analysis. Descriptive statistical analysis such as simple frequencies, measures of central tendency and measures of variability were used to describe socio demographic characteristics of participants such as sex of household head, ethnicity, religion, educational level, marital status, occupation, tenancy and income. Then the information was presented using frequencies, summary measures, tables and figures.

Water accessibility was analyzed by computing WHO and Water Aid criteria, WHO Component score was computed based on source, distance, time and quantity (consumption rate) and finally Water Aid criteria cost affordability was computed to analysis overall water accessibility and associated factors among households.

On bivariate analysis, crude odds ratio with 95% CI was used to see the association between each independent variable and the outcome variable by using binary logistic regression. Independent variables with p-value of ≤ 0.3 were included in multi-variable analysis to control the confounding factors. Then outliers and influential cases were checked by standardized residuals and cook's distance respectively. Cases with standardized residuals out of the interval (-3, 3) and cook's distance above 1 were excluded from the multivariable analysis. Odds ratios with 95% CI were estimated to identify the factors associated with water

accessibilities using multivariable logistic regression analysis. Level of statistical significance was declared at $p\text{-value} < 0.05$.

3.12. Ethical Considerations

Ethical clearance was secured from Haramaya University, College of Health and Medical Science, Institutional Health Research Ethics Review Committee (IHRERC). Support letter was also written from Somali regional health bureau to Jigjiga Town water supply and sewerage authority. Informed written consent was obtained from each participant after explaining the purpose and benefits of the study. Confidentiality of the study participants' information was also ensured.

3.13. Information Dissemination

The report of the study will first be submitted and presented to Haramaya University, and then the copies of the report will be submitted to Somali regional health bureau, Jigjiga Town water supply and sewerage authority, Town Municipality, and Health Offices. Attempt will be made to present on national and international conferences and workshops. Besides, publication on peer-reviewed journal will be considered.

4. RESULT

4.1. Socio-economic and demographic Characteristics

A total of 408 households were included in the study with a response rate of 94.6%. Majority of household head 283(73.3%) were male. The median age of the respondent was 37years with inter quartile range (IQR) of 11 year. The average family size of the respondents was found to be 6.4 (+2.64 SD). The education level of the respondents ranges from minimum of not able to read and write to the maximum of college graduate. From the total respondents 54(14%) can neither read nor write, 53(13.7%) able to read and write, 74(19.2%) have completed primary education, 125(32.4%) have completed secondary school and the remaining 80(20.7%) have joined higher education. The data about the occupation of the respondent shows that 137(35.5%) was merchant, 119(30.8%) government employee, 56(14.5%) daily laborer, 68(17.6%) unemployed/pensioned and the rest 6(1.6%) was other.

Majorit240 (62.2%) of respondent were Somali and 271 (70.2%) were Muslim in religion. Concerning house related situation majority 343(88.9%) and 293(75.9%) of the respondent were married and live in Private house respectively. The average monthly income of the household is Birr 2610.52 ranging from the maximum of Birr 8600 to the minimum of Birr 500 per month (Table 1).

Table 1: Socio-demographic characteristics of respondent at Jigjiga Town Somali Regional State, of Eastern Ethiopia, May 2016

s/no	Variables		Frequency (%)
1	Sex of HHH (n=386)	Male	283(73.3)
		Female	103(26.7)
2	Ethnic group of HHH (n=386)	Somali	240(62.2)
		Amhara	77(19.9)
		Oromo	32(8.3)
		Gurage	22(5.7)
		Other	15(3.9)
3	Religion HHH (n=386)	Muslim	271(70.2)
		Orthodox	102(26.4)
		Protestant	13(3.4)
4	Educational level of HHH (n=386)	Unable to read and write	54(14)
		Read and write	53(13.7)
		Primary complete(6-8)	74(19.2)
		Junior complete(9-12)	125(32.4)
		College and above	80(20.7)
5	Respondent current marital status (n=386)	Single	9(2.3)
		Married/partner	343(88.9)
		Divorced/separated	28(7.3)
		Widowed	6(1.6)
6	Occupation of HHH (n=386)	Merchant	137(35.5)
		Government employee	119(30.8)
		Daily laborer	56(14.5)
		Unemployed/pensioned	68(17.6)
		Other	6(1.6)
7	House ownership of respondent (n=386)	Private	293(75.9)
		Kebele	24(6.2)
		Rent from private	69(17.9)

4.2 Accessibility of water supply

4.2.1 WHO2003, guide line: there are four indicators under WHO guide lines

I) source

Of the total 386 households, 219(56.7%) of them access to improved water source and the remaining 167(43.3%) get water from unimproved source for their domestic purpose; Out of 219 those get improved water source about 138(63%), 33(15%) and 48(22%) of the use private pipe, standpipe and pipe water from neighborhood, respectively. (Table 2)

Table 2: source of water supply for study participant households, Jigjiga, Eastern Ethiopia, May 2016

No	Water supply service status	Frequency	Percentage
1	private pipe	138	35.8
2	stand pipe	33	8.5
3	vendor	167	43.3
4	neighbor	48	12.4
	Total	386	100

II) Time /and Distance

Out of 386 households the majority 305(79.1%) of them got water in premises or delivered to home and the remaining 81(20.9%) of them got water outside premises. From 81 those got outside premises about 46(56.7%) and 51(63%) of them get water less than 30 minutes of one way go and within 200 meters respectively as WHO 2003 guideline. All in all out of 386 households about 351(90.9%) and 356(92.2%) of them access to water supply in terms of time and distance respectively.

III) Adequacy

Of the total 386 households only 35.2% of household members within the sampled households consumed 20 and above litres of water per person per day. The average water consumption rate was also varying with a varying type of water source i.e. average water consumption rate was 19.4 16.2 15.6 and 16 liters per capita per day for those who used Privet pipe, public standpipe, Vendor and from neighbors respectively. The average water consumption rate of study area was 17.12litres/p/d. (Table3)

Table3-Average water consumption by study participant households, Jigjiga, Eastern Ethiopia, May 2016

No	Average consumption l/p/d	Frequency	percentage
1	5-9	4	1.0
2	10-14	114	29.5
3	15-19	132	34.2
4	20-24	114	29.5
5	>25	22	5.7
total		386	100

Out of 386 households about 219(56.7%), 351(90.9%), 356(92.2%) and 136(35.2%) of them had access to water supply in terms of source, time, distance and quantity respectively. Finally when the above indicators computed only 85(22%) of them had access to water supply as WHO 2003 guide lines.

4.2.2. Water Aid 2011, guide line: economical accessibility

Expenditure of household income on water showed that low, middle and high-income households spend an average of 24.12%, 11% and 2.67% of their income on water respectively. Overall about 170(44.8%) of households were access to water supply economically i.e. pay less than 5% of their monthly income as water aid 2011 criteria.

Over all when the composite result of the above two guide lines (WHO 2003 and Water Aid 2011) was computed only a fifth of households 75(19%) of households were found to use water accessibility that meets standards.

4.3 Water supply reliability

Out of 386 households about 248 (59.6%) households who are using water from public tap and vender or private seller, why they do not have private pipe water supply, about 91(36.7%),58(23.4%), 52(21%), 43(17.3%) and 4(1.6%)of them were due to service unavailability (complicated procedures set by concerning body to get private connection), cost un affordability, distance from main line, legality issue related with house and due to lack of space respectively.

Out of 386 about 219(56.7%) of them use piped line water supply. From these 219 households, 180(82.2%) of them always use from the same/single/ piped water point and the remaining 39(17.8%) got water from different source. Out of 180 those use from single piped water point about 17(9.4%), 44(24.4%), 39(21.6%), 80(44.4%) of them have got taped water for their domestic consumption daily, less than once in a week, 1-2days in a week and 3-4days in a week respectively.

Concerning water interruption out of 180 households those use from single piped water point about 162(90%) of them were experience with water interruption. Regarding how the water interruption was let out of 162 households about 73 (45%) mentioned that water interruption lasted for 2 to 3 days, 49 (30%) said that the water interruption lasted for 4 to 5 days, 11 (7%) stated that the interruption of water lasted for 6 to 7 days and 30 (18%) claimed that the interruption of water lasted more than a week.

Regarding cause of water interruption, out of 162 households about 83 (51.2%) of the respondents stated that they didn't know the cause of water interruption, 37 (22.8%) stated

that water interruption occurred due to source/production problem, 38 (23.5%) claimed that water interruption occurred as a result of technical problem and the remaining 4(2.5%) claimed that water service interruption was due to frequent electric failure.

Head of Jigjiga town water supply said that *“due to lack of alternative water source, water scarcity was main problem we couldn’t met the recommended demand and supply because Jigjiga is one of the areas in the country with water shortage”*. Regarding to service reliability Jigjiga town water supply technical person said that *“due to water scarcity we couldn’t fit regular water supply (flow) in addition to this water interruption was another problem which is occurred due to sedimentation of salt because of water hardness that lead clogging and bursting of pipe”*.

Regarding respondent satisfaction about 344(89%) of the respondents were not happy at current water supply of the town, about 167 (49%), 29(9%) 60(18%) 76(22%) and 9(3%) constraints due to its scarcity, quality, interruption, cost and other reason respectively.

The Chairpersons of three study kebeles said that, *“the scheme capacity was very low and unevenly distributed and also there was no person assigned for public stand pipe service, i.e. the key was on the hand of irresponsible person who was voluntary care taker due to nearest to stand pipe and no payment for her service so that she open (gave services) only when the time is comfortable for her, sometime the stand pipe opened during morning time which didn’t stay more than an hour”*.

4.4 Factors Associated With water accessibility

On bi-variable logistic regression analysis household with monthly income above 4500birr were [(COR=5.82, 95%; CI: 1.86, 18.22, p <0.001)] more likely had access to water supply compare to those their monthly income range between 500-1499 birr.

House hold those had private pipe were more likely [(COR=15.44, 95%; CI: 4.58, 52.06; p <0.001)] and those buy water from water vendor were less likely [(COR=0.09, 95%; CI: 0.01, 0.89, p <0.05)] accessible to water supply compare to those use from neighbor private pipe.

Regarding educational status head of household those attend high school [(COR=3.1, 95%; CI: 1.13, 8.47, p <0.05)] and above college [(COR=3.27, 95%; CI: 1.14, 9.34, p <0.05)] were more likely access to water supply compare to those unable to read and write.

Regarding house ownership, those live in their own house more likely [(COR=2.43, 95% CI: 1.06, 5.56, p <0.05)] accessible to water supply compare to those rent from private.

Candidate those their P value less than 0.3 on bi-variable logistic regression analysis was used for multivariable logistic regression analysis, household those college and above educational status [(AOR=4.2, 95% CI 1.0, 18.06, $p < 0.05$)] were more likely accessible water supply compare to those cannot read and write.

Concerning type of water source those use private pipe water were [(AOR=19.1, 95%; CI: 5.1, 71.39; $p < 0.001$)] more likely accessible to water supply compare to those use from neighbor pipe (Table4).

Table4 Factors associated with water accessibility among households in Jigjiga Town of Eastern Ethiopia, May 2016

Independent variables	Frequency	Access to water supply		COR (95% CI)	Pval	AOR (95% CI)	Pval.
		Yes(%)	No(%)				
Education level of HHH							
unable to read and write	54(14%)	5(9%)	49(91%)	1		1	
read and write	53(14%)	10(19%)	43(81%)	2.28(0.72,7.19)	0.16	1.2(0.3,4.82)	0.52
Primary complete(6-8)	74(19%)	10(14%)	64(86%)	1.53(0.49,4.77)	0.46	0.7(0.2, 2.91)	0.73
junior complete(9-12)	125(32%)	30(24%)	95(76%)	3.10(1.13,8.48) *	0.03	2.2(0.6, 7.99)	0.09
college and above	80(21%)	20(25%)	60(75%)	3.27(1.14,9.34) *	0.03	4.2(1.0, 18.06) *	0.03
Income of household							
500-1499	60(16%)	7(12%)	53(88%)	1		1	
1500-2499	120(31%)	20(17%)	100(83%)	1.51(0.60,3.81)	0.38	1.8(0.5, 6.37)	0.61
2500-3499	123(32%)	26(21%)	97(79%)	2.03(0.83,4.99)	0.12	1.8(0.6, 5.72)	0.17
3500-4499	57(15%)	10(18%)	47(82%)	1.61(0.57,4.57)	0.37	1.1(0.3, 4.61)	0.18
>4500	23(6%)	10(43%)	13(57%)	5.82(1.86,18.22) **	0.00	3.0(0.6, 15.11)	0.30
House ownership							
private	293(76%)	63(22%)	230(78%)	2.43(1.06,5.56) *	0.03	1.5(0.5, 4.30)	0.32
kebele	24(6%)	5(21%)	19(79%)	2.33(.66,8.19)	0.18	1.8(0.3, 13.11)	0.30
rent from private	69(18%)	7(10%)	62(90%)	1		1	

Ethnicity group							
Somali	240(62%)	45(19%)	195(81%)	.46(0.150, 1.42)	0.18	0.7(0.2, 3.35)	0.84
Amhara	77(20%)	13(17%)	64(83%)	.406(0.12,1.39)	0.15	1.2(0.2, 6.90)	0.20
Oromo	32(8%)	11(34%)	21(66%)	1.048(0.29,3.84)	0.94	2.3(0.4, 14.62)	0.19
Gurage	22(6%)	1(5%)	21(95%)	.095(0.10,0.93)	0.04	0.4(0.0, 8.30)	0.38
Others	15(4%)	5(33%V	10(67%)	1		1	
Type of water source							
private	138(36%)	70(51%)	68(49%)	15.44(4.58, 52.06)	0.00	19.1(5.1,71.39)**	0.00
Public stand pipe	33(9%)	1(3%)	32(97%)	0.47(0.05, 4.71)	0.52	0.5(0.0, 6.06)	0.69
Vendor	167(43%)	1(1%)	166(99%)	0.09(0.01, 0.89)*	0.03	0.0(0.0,)	0.99
From neighborhood	48(12%)	3(6%)	45(94%)	1		1	
Sex of household head							
Male	228(73%)	55(19%)	228(81%)	1.0(0.57,1.77)	0.29	0.81(0.24,2.7)	0.44
Female	83(27%)	20(19%)	83(81%)	1		1	
Religion of HHH							
Muslim	217(70%)	54(20%)	217(80%)	.829(0.221,3.118)	0.28	0.02(0.00,38.4)	0.45
Orthodox	84(26%)	18(18%)	84(82%)	.714(.178, 2.859)	0.33	0.01(0.00,9.4)	0.29
Protestant	10(3%)	3(23%)	10(77%)	1		1	
Marital status HHH							
Single	8(2%)	1(11%)	273(89%)	.625(.031,12.41)	0.26	23.34(0.09,63.72)	0.27
Married	273(89%)	70(20%)	25(80%)	1.282(.147,11.15)	0.32	3.22(0.07,14.5)	0.41
divorce	25(7%)	3(11%)	5(89%)	.600(.051,7.012)	0.38	2.36(0.03,18.3)	0.39
Widowed	5(2%)	1(17%)	273(83%)	1		1	

*=p-value<0.05, **=p-value<0.01, CI = Confidence Interval, COR = Crude Odds Ratio, AOR = Adjusted Odds Ratio

5. DISCUSSION

This study investigated access pattern of water supply in terms of source, distance, time, quantity and affordability among households in Jigjiga town in Ethiopia. The study found that about 56.7%, 90.9%, 92.2%, 35.3% and 44.8%, of households had access to water in terms of source, distance, time, quantity and cost respectively. Over all when the above criteria are computed based on WHO 2003 guideline 22% of the households had access to water supply. The finding was in line with the study conducted in Ilorin East, Kwara State, Nigeria showed accessibility of water supply was 26% (Tunde.A.M.2013).

The accessibility of water in terms of source for this study in Jigjiga town indicated that it was, 219(56.7%) of the households used pipeline water supply and the remaining 167 (43.3%) households got water from vendors which was not improved source. This was lower than the study done on accessibility of water supply in terms of source in four regional states and 16 town of Ethiopia, which found that 82% of households were found using an improved water supply (Marieke. A et al.2016). The accessibility of water in terms of source in Jigjiga town was found to be better than the study done in Awaday town that which was 39.4% (Mekonnen. A and Utama.R, 2014)

The study revealed that 351(90.9%) and 356(92.2%) households have access to water supply in terms of time and distance respectively. This was more or less consistent with a study conducted in Dukem town, that shows (83.9%) and 82.4%) of households were accessible in terms of distance and time respectively (Mohammed .A.I et al. 2011).

The result of the study in Jigjiga town indicated that household heads with an education level of college and above were [(AOR=4.2, 95% CI (1.0, 18.06)] were more likely to be accessible to water supply compared to those household heads who cannot read and write. This result was more or less similar to a study done in Cameroon where, household heads with increasing educational level were more likely to adopt an improved water source (AOR =6.113, P<0.0371) (Totouom.F.L.A, 2013). This result of the study in Jigjiga town was also somewhat consistent with the same study conducted in Bomet municipality, Kenya which also showed

that the type of water source used by the household was significantly influenced by the higher level of education (tertiary level) (Koski.E.C 2013).

The study showed that there was varying average water consumption in liters per person per day with a varying type of water source. The average water consumption rate was 19.4 16.2 15.6 and 16 liters per capita per day for those who used Privet pipe, public standpipe, Vendor and from neighbors respectively. This result was comparatively similar with a study conducted on water accessibility among households in Ambo Town, where the average liters per person per day consumption of households from private yard connection, public tap and vendor sellers were 10.55, 8.93 and 6.51 liters per capita per day respectively (Chala Deyessa,2011).

This survey in Jigjiga town indicated that 136(35.2%) of them had access to water supply in terms of quantity in line with the study done in 16 town of Ethiopia(Marieke. A et al.2016).

5.1. Limitations of the study

The study was limited in subject/theme/ that means it limited to assess factors affecting accessibility of domestic water supply only (it doesn't include industries and consumptions by other sectors and its quality)

6. CONCLUSION AND RECOMMENDATION

6.1. Conclusion

Overall 56.7% of households reported using an improved water source as the main source of drinking water supply within recommended distance and only 35.2% of households consume 20liters per person per day and less than half households (44.8%) affordable to water /pays less than five percent of their income. Combining these three indicators results only a fifth of households (19%) of households were found to use water accessibility that meets standards.

Head of household with higher level of education and those having private pipe water supply were identified as positively significant associated factors with water accessibility.

6.2. Recommendation

❖ Jigjiga Town water supply and sewerage authority and other stake holder

- must pay special emphasis to improve accessibility and reliability of water supply
- should closely supervise and monitor private water vendors
- Further in-depth studies should also be encouraged to look for improved interventions

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8 APPENDICES

ANNEX 1. Information sheet and informed voluntary consent form for KII

My name is _____ I am working as a data collector for the study being conducted in this community by Dereje Abate who is studying for his Master's degree at Haramaya University, the College of Health and Medical Sciences. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

Title of the study: Assessment of water supply accessibility and associated factors among households of Jigjiga town, Somali, east Ethiopia.

Purpose of the study: The findings of this study can be of a paramount importance for the regional, zonal and woreda Water supply and Health office to plan intervention programs to improve water supply accessibility as well as its reliability of the study area. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of a Master's of Science in Water supply and Sanitation Management track for the principal investigator.

Procedure and duration: You will answer a questionnaire to provide me with pertinent data that is helpful for the study. There are 14 questions to discuss on the issue as focal person or stake holders for raised questions to answer. The questionnaire will take about 50 minutes, so I kindly request you to spare me this time to respond the questionnaire.

Risks and benefits: The risk of being participating in this study is very minimal, but only taking 50 minutes from your time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for water supply accessibility in Jigjiga town based on the information you provided us.

Confidentiality: The information that you will be provided will be kept confidential. There will be no information that will identify the participants in particular. The findings of the study will be general for the study community and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights: Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to stop, you have the right to withdraw from the study at any time and this will not label you for any loss or benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address: If there are any questions or enquires any time about the study or the procedures, please contact in this address.

<u>Principal investigator</u>	<u>Institution</u>
Name: Dereje Abate Address Somali Regional State, Jigjiga Tel:0939198213 : E-mail:- derejeabate7@gmail.com	Haramaya University Haramaya University. Institutional health research College of Health Science and Ethics Committee. Tel: 0254660708 P.O. Box 235, Harar E-mail:- neggabaraki@yahoo.com

Declaration of informed Voluntary Consent

The participant information sheet was read to me. I have clearly understood the purpose of the research, the procedures, the risk and benefits, issues of confidentiality, the right of participating and the contact address for any queries. I have had the opportunity to ask questions for things that may have been unclear and any questions that I have asked have been answered to my satisfaction. I understood that I have the right to withdraw from the study at any time without any pre-condition. Therefore; I declare my voluntary consent to participate in this study with my signature as indicated below.

Name and Signature of participant: _____ Date ___/___/___

Name and Signature of the data collector _____ Date ___/___/___

ANNEX 2. Participant information sheet and informed voluntary consent form.

My name is _____ I am working as a data collector for the study being conducted in this community by Dereje Abate who is studying for his Master's degree at Haramaya University, the College of Health and Medical Sciences. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

Title of the study: Assessment of water supply accessibility and associated factors among households of Jigjiga town, Somali, east Ethiopia,

Purpose of the study: The findings of this study can be of a paramount importance for the regional, zonal and woreda Water supply and Health office to plan intervention programs to improve water supply accessibility as well as its reliability of the study area. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of a Master's of Science in Water supply and Sanitation Management track for the principal investigator.

Procedure and duration: You will answer a questionnaire to provide me with pertinent data that is helpful for the study. There are 54 questions to discuss on the issue as focal person or stake holders for raised questions to answer. The questionnaire will take about one hours, so I kindly request you to spare me this time to respond the questionnaire.

Risks and benefits: The risk of being participating in this study is very minimal, but only taking one hours from your time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for water supply accessibility in Jigjiga town based on the information you provided us.

Confidentiality: The information that you will be provided will be kept confidential. There will be no information that will identify the participants in particular. The findings of the study will be general for the study community and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights: Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to stop, you have the right to withdraw from the study at any time and this will not label you for any loss or benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address: If there are any questions or enquires any time about the study or the procedures, please contact in this address.

Address

<u>Principal investigator</u>	<u>Institution</u>
Name: Dereje Abate Address Somali Regional State, Jigjiga Tel:0939198213: E-mail:- derejeabate7@gmail.com	Haramaya University Haramaya University. Institutional health research College of Health Science and Ethics Committee. Tel: 0254660708 P.O. Box 235, Harar E-mail:- neggabaraki@yahoo.com

Declaration of informed Voluntary Consent

I have read/ was read to me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risk and benefits, issues of confidentiality, the right of participating and the contact address for any queries. I have had the opportunity to ask questions for things that may have been unclear and any questions that I have asked have been answered to my satisfaction. I understood that I have the right to withdraw from the study at any time without any pre-condition. Therefore; I declare my voluntary consent to participate in this study with my signature as indicated below.

Name and Signature of participant:_____ Date ____/____/____

Name and Signature of the data collector_____ Date____/____/____

APPENDIX 3.QUESTIONNAIRES

Questionnaires on assessment of water supply accessibility and its associated factors among households in Jijiga town, Ethiopian Somali Regional State, Eastern Ethiopia

Kebele -----ketana -----house No-----

Questionnaires ID No.....

Name of the interviewer.....

Date of interview.....Time started.....Time finished.....

1. Household Demographic and Socio-Economic Information

R.No	Questions	Responses
1	Head of the household	1. Male 2. Female
2	Type of respondent:	1. Household head 2. Spouse of household head 3. Other adult member of household
3	Age of respondent:	_____
4	Ethnicity	1. Somali 2. Amhara 3. Oromo 4. Gurage 5. Other specify
5	Religion	1. Muslim 2. Orthodox 3. Protestant 4. Other specify
6	Educational level:	1. Unable to read and write 2. Able to read and write 3. Elementary complete (6-8 grade) 4. High school complete (9-12 grade) 5) College and above

7	Marital status of the household head	1. Married 2. Single 3. Divorce
8	Number of family	-----
9	Occupation of the household head	1)Merchant 2)Government employee 3)Daily laborer 4)Unemployed /not working/pensioned 5)Other specify_____
10	Types house belong	1) private 2) Rent from kebele 3) Rent from individual 4) Others_____
11	What is your Average monthly household income (in birr)?	_____ birr

2. Status of the existing Water Supply Sources

201	Do you use pipe water for all purpose in your house hold?	1) Yes 2) No
202	If yes do you have private pipe water connection?	1. Yes (if yes skip to Q217) 2. No
203	If No What is the main source of drinking water for members of your household?	1. Public tap/standpipe 2. Bottled water 3. Vendors 4. Tube well 5.borehole 6. Surface water 7.Other (please write in ...)
204	How long does it take to go there, get water and come back?	_____in minutes
205	How long is the average waiting time at the water source?	-----in minutes

206	What factors affect queening /waiting/ time at water source?	1.water yield 2.technical/convenience of water scheme/ 3.number of user 4.services hour 5.others
207	How far is the water source from your household?	_____in meters
208	Is there any other water source in neighborhood which is nearest to your home rather than your main source?	1) Yes 2) No
209	Is water available (from your main source) always?	1) Yes 2) No
210	If no what is the main reason?	1. The water source stop yield 2. service interruption 3.shift distribution 4.others
211	What is the main reason you don't have private connection so far?	1) Distance from main pipe 2) Unable to cover the cost 3) service is not available 4) the house is not legal 5) lack of space 6) long service waiting time 7) others
212	If yes why don't you use it as a source?	1. It doesn't purchased 2.It is so Expensive 3. Its quality is bad 4. others
213	In average what is the total cost needed for all process to get private connection water supply?	----- in ETB
214	On average how many liters of water your HH used from all source for all purpose per day?	-----liter
215	How much does your household usually pay per day for the water (for all purposes and sources)?	_____in ETB
216	Do you get daily taped water access for your HH	1) Yes 2) No
217	If yes How frequently was the drinking water	1. Daily, 24 hours a day

	available to your household during the last two weeks?	3. Daily, at certain hours
218	If your answer for question number 223 is no, how often do you get taped water during the last two weeks?	1) Three - five days a week 2. One - two days a week 4. Less frequent than once a week
219	Is this frequency sufficient for your needs?	1) Yes 2) No
220	How many cubic meters does your household usually use per month (for all purposes)?	-----m ³ /month
221	Does your household supply water for other person/family?	1)Yes 2) No
222	If yes on average how many liters of water your HH supply for other person/family per day	-----liter
223	How much does your household usually pay per month for the water (for all purposes and sources)?	-----in ETB
224	Did your household experience interruptions /breakdowns/ in the drinking water supply from the main source during the last six months?	1) Yes 2) No
225	If yes the water supply service interruption lasted for	1) 2 to 3 days 2) 4 to 5 days 3)6 to 7 days 4) > a week
226	What was the main reason for the interruption of the water supply?	1) No, I don't know 2)source/production problem 3) Technical problem 4) Power problem
227	Are you happy at the existing water supply of the town?	1) Yes 2) No
228	If your answer for previous question is no, your reason is	1) Scarcity 2) Unsafe 3)Interruption 4) Cost 5)other

229	Does the water service provider give you prior notice before water service interruption?	1) Yes 2) No
230	Have you made a complaint related to your drinking water (maintenance or new yard connection) service provider in the past one year	1) Yes 2) No
231	If yes What was the result of the complaint?	1- Prompt action taken 2- Delayed action taken 3- No action taken
232	If the answer for question no. is no, Are you willing to pay any amount of money for improved accessible water supply?	1) Yes 2) No
233	For which type of accessible water supply are you willing to pay?	1. Private house collection 2. Private yard collection 5. Public tap 4. other
234	If willing to pay for better services, up to how much are you willing to pay per month or per year?	-----

3. Key Informant Interview (KII)

1. How do you explain the functionality of the systems in the town developed?
2. How do you see the schemes capacity/ability to meet the water demand of its user community?
3. What is your source for supply, ground or surface water?
4. What is the trend of demand over supply of water in the town?
5. If there is shortage of water, what are the causes?
6. How do you see water supply management of the town?

ምዕራፍ ሰባት

የጥናቱ ተሳታፊዎች የመረጃ እና የስምምነት መግለጫ ቅጽ

ጤና ይስጥልኝ ስሜ _____ እባላለሁ። ደረጃ አባተ በሀረማያ ዩኒቨርሲቲ የጤና ሳይንስ ኮሌጅ በውሀ አቅርቦት እና ሳይንስ ስርዓት ማኔጅመንት የትምህርት ዘርፍ ለሁለተኛ ዲግሪ ማሞያ ለሚሰራው ጥናት ተሳታፊ ነኝ። ጥናቱን የሚሰራው በመኖሪያ ቤቶች የውሀ አቅርቦት መንስኤ የሆኑ ነገሮች በሚል ርዕስ ነው። የመጣሁበትም ምክንያት በዚህ ርዕስ ላይ መረጃ ለመስጠት ሲሆን እርሶም የተመረጡት በእጣ ነው።

የጥናቱ ርዕስ :- በመኖሪያ ቤቶች የውሀ አቅርቦት ላይ ተፅእኖ የሆኑ ነገሮችን ለመለየት የሚደረግ ጥናት

የጥናቱ አላማ:- በጥናቱ የመኖሪያ ቤቶች የውሀ አቅርቦት ላይ ተፅእኖ የሆኑ ነገሮችን ለመለየት ሲሆን በተጨማሪም የእነዚህን ነገሮች ከቤተሰብ ውሀ አቅርቦት ጋር ያላቸውን ግንኙነት ለማጥናት ጭምር ነው። ይህም ጥናት በሀረማያ ዩኒቨርሲቲ የጤና ሳይንስ ኮሌጅ በውሀ አቅርቦት እና ሳይንስ ስርዓት ማኔጅመንት የትምህርት ዘርፍ ለሚሰጠው የማስተርስ ዲግሪ ማሞያ ነው።

ድርጊት እና የሚወሰደው ጊዜ:- እኛ የምናደርገው የእርስዎን መኖሪያ ቤት በተመለከተ ለጥናቱ ጠቃሚ የሆኑ 54 የሚሆኑ ጥያቄዎችን ባካተተው ቃለ-መጠይቅ ለግማሽ ሰዓት ላልበለጠ ጊዜ ውስጥ ለሚኖረን ቆይታ መረጃዎችን በመስጠት ይሆናል።

ጉዳት እና ጥቅም:- በዚህ ጥናት የሚደርስበዎ ምንም አይነት አደጋ ወይንም ጉዳት አይኖርም የልቁንም ከጠናቱ በሚገኘው ወቅታዊ መረጃ ለህብረተሰቡ ለሚኖረው የተሣለ ኑሮ እቅድ የሚያበረክቱት አስተዋጽኦ ከፍተኛ ነው። ሆኖም እዚህ ጠናት ላይ በመሳተፊዎት ሌሎች ጥቅማ ጥቅሞች አይኖሩም።

ሚስጥራዊነት:- የሚሰበሰበው መረጃ ሚስጥራዊነቱ የተጠበቀ ነው። መረጃውም የግለሰብ ማንነትን የሚገልጽ እንዳይሆን ቁጥሮችን የምንጠቀም ሲሆን ስሞችን አንጠቀምም ማለት ነው። የጥናቱ ውጤትም ጠቅላላ የማህበረሰቡን ሁኔታ እንጂ የግለሰብን አያሳይም።

ሙብት:- በዚህ ጥናት ለመሳተፍ ሙሉ ጊዜዎን ያስፈልጋል። በዚህ ጥናት የመሳተፍ ወይም ያለመሳተፍ ሙሉ ሙብት አለመስጠት ለመሳተፍ ካልፈለጉ ደግሞ በማንኛውም ጊዜ በመሀል ራስዎን ከጥናቱ ማግለል (ማቋረጥ) ይችላሉ። ካቋረጥኩኝ ጥቅም ይላል ብኛል ብለው አያስቡ። መመለስ የማይፈልጉትን ማንኛውም ጥያቄ ለመመለስ አይገደዱም። ጥናቱን በተመለከተ ጥያቄ ወይም የሚያሳስበዎት ነገር ካለ የሚመለከተውን ሰው ከዚህ በታች በሰፈረው አድራሻ ማግኘት ይችላሉ።

አድራሻ

ተመራማሪ)	
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በፈቃደኝነት ላይ የተመሰረተ የስምምነት ማጋገጫ ፎርም

የተሳታፊውን መረጃ ፎርም አንብቤዋለሁ ወይም ተነብልኛል። የጥናቱ ዓላማ፣ ያለውንጉዳትና ጥቅም፣ ምስጢር አጠባበቅ የመሳተፍ እና ያለመሳተፍ መብት እንዲሁም ችግር ካለክ ማ ንጋርመገኛኝ ትእዛዝህን ሁለተገልጻልኝ፤ ጥያቄ ካለኝ ደግሞ እንድጠይቅ እድል ተሰጥቶኝ በመሀል ደግሞ ጥናቱን ለማቆም ከፈለኩኝ በማንኛውም ጊዜ ከጥናቱ/ ከተሳታፊነት/ መውጣት እንደምችል በመጨረሻም መመለስ የማልፈልገውን ጥያቄ አለመመለስ መብቱ እንዳለኝ ከተረዳሁኝ በኋላ በሙሉ ፈቃደኝነት በዚህጥናት ለመሳተፍ የወሰንኩኝ መሆኔን ከዚህ በታች በተቀመጠው ፊርማዬ አረጋግጣለሁ።

የተሳታፊው ስምና ፍረማ

የመረጃ ሰብሳቢ ስም ፊርማ

በ ጂጂጋ አስተዳደር በመኖሪያ ቤቶች የውሀ አቋራጫ ፍታሚዎች ነገሮችን ለማጥናት የተዘጋጀ መጠይቅ

መረጃ ሰብሳቢው ስም ----- ፊርማ -----

ኮድ----- ቀበሌ ----- ቀን -----

የጀመረበት ሰዓት ----- የተጠናቀቀበት ሰዓት -----

የተቆጣጣሪው ስም ----- ፊርማ -----

-1. ማህበራዊ እና የኢኮኖሚያዊ ሁኔታ

	መጠይቅ	መልስ
1	የቤተሰብ ሀላፊ	1. ወንድ 2. ሴት
2	ዕድሜዎ ስንት ነው?	_____
3	ብሄር	1. ሶማሊ 2. አማራ 3. ኦሮሞ 4. ጉራገ 5. ሌላ (ይገለጹ)
4	ሃይማኖት	1. ሙስሊም 2. ኦርቶዶክስ 3. ፕሮቴስታንት 4. ሌላ (ይገለጹ) _____
5	የት/ትደረጃዎ ስንት ነው?	1. ማንበብና መጻፍ የማይችሉም 2. ማንበቢያና ማጻፍ የምችላለሁ (1-5 ክፍል) 3. አንደኛ ደረጃ (6-8ኛ ክፍል) የጠናቃቀ 4. ሁለተኛ ደረጃ (9-10 ክፍል) 5. ኮሌጅና ከዛባላይ
6	የጋብቻ ሁኔታ	1. ያገቡ 2. ያላገቡ 3. ፍቺ የደራጉ
7	የቤተሰብ ባለቤት	
8	መደበኛ ስራዎ ስንት ነው?	1. ንግድ 2. መንግስት ስራ ተኛ 3. የቀን/የጉልበት ሠራተኛ 4. የሥራ አገጥሞ / እየሰራ አይደለም ጡረተኛ 5. ሌላ ካለ ይጠቅሱ -----
9	የመኖሪያ ቤት ሁኔታ	1. የቀበሌ ኪራይ ቤት 2. የግለሰብ ኪራይ ቤት 3. የግል መኖሪያ 4. ሌላ

10	በአማካኝ ወራዊ የገቢ መጠን በብርምን ያህል ይሆናል?	_____ ብር
2. ክፍል II. የመጠጥው ህአቅርቦት ሁኔታ በሚመለከት		
201	በተሰቡ ለሁሉም አገልግሎት የባንቢ ውሃ ነው የሚጠቀመው?	1. አዎን 2. ይህም
202	መልሱ አዎን ከሆነ የገልባንቢ አሎት?	1. አዎን 2. የለም
203	መልሱ አይሆንም የአርሶቤ ተሰብኖ ወይም ሌላ ጭክት ነው?	1. ባንቢ ውሃ 2. የህዝብ ባንቢ /ቦኖ/ 3. ከመደብር/ግለሰብ/ በመግዛት 4. የጉድጓድ ውሃ 5. ሌሎች
204	ከውሃው መገኛው ሃላግ ምጣት ምን ያህል ሰዓት ይፈጃል?	----- (በደቂቃ)
205	የውሃው ምን ጩታ ከደፊ ችሎታ በሁለት ሰዓት ምን ያህል ግዘይ ፊልጎል?	----- (በደቂቃ)
206	ከውሃ መገኛው ወይም ከሌሎች ለመቅዳት ረጅም ሰዓት እንደ ያለው የሚያደርገው ምን ይሆናል?	1) የውሃው ሀይል 2) የባንቢ ሚቶ አለመሆን 3) የተጠቃሚው በዛት 4) አገልግሎት የሚሰጥበት ሰዓት 5) ሌላ
207	በተሰቡ ለመጠጥን የሚጠቀምበት ውሃ መገኛ ምን ጩታ ምን ያህል ይርቃል?	----- ሜትር
208	ከዋናው ወይም ሌላ የውሃ ሚንጭ በቅርብ ይኖራል?	1) አዎን 2) አይ
209	የውሃ ምን ጩታ ለምደባ ገኛል (ይሰራል)?	1) አዎን 2) አይ
210	የማይሰራ ከሆነ ሚኒስትራ ምን ይሆናል?	1) ምን ጩታ አገልግሎት መስጠት አቋሚል 2) መስመሩ ስለተበላሸ 3) ውሃው በፈረቃ ስለሆነ 4) ሌላ
211	የገልባንቢ ማስቀጠል ያልቻሉት ምክንያት ምን ይሆናል?	1) ርቀቱ 2) ዋገው 3) አገልግሎት ስለሌለ 4) በቱህጋ ወይም ሌላ ሆኖ 5) የቦታ ጥበቃ 6) አገልግሎት ለማግኘት ረጅም ሰዓት ስለሚፈጅ 7) ሌላ
212	መልሱ አዎን ከሆነ ለሚገኘው ያልተጠቀሚኩ?	1) ስለማይሸጥ 2) ውድ ስለሆነ 3) ገደብ ስለሆነ 4)

		ሌላ
213	በአማካይ የግልቧ ንባብ ማስቀጠል ምን ያህል የፌጃል?	
214	ቤተሰቡ በአማካይ ለመጠጥው ሃምን ያህል ሊትር ይጠቀማል?	-----ሊትር
215	ቤተሰብዎ በቀን ሚን ያህል ገንዘብ ለውሃ ይከፈላል?	-----ብር
216	ቧንቧ ወይን የቀኑ ይኖራል (ወሃ ያገኛሉ)?	1) አዎን 2) አይ
217	መልሱ አዎን ከሆነ ለሚን ያህል በቀን የቧንቧ ወሃ ያገኛሉ?	1) 24 ሰአት 2) የተወሰኑ ሰአት
218	መልሱ አይ ከሆነ ላለፉት ሁለት ሳሚንት ለሚን ያህል ቀን ወሃ ያገኙት?	1) 3-5 ቀን/wks 2) 1-2 ቀን/wks 3) <1 ቀን/wks
219	ይህ ፌረቃ ለውሃ ፍላጎት (ፍጆታ) በቂ ነው?	1) አዎን 2) አይ
220	ቤተሰቡ በአማካይ ለመጠጥው ሃምን ያህል ሊትር ይጠቀማል?	-----m ³ /ሊትር
221	ለላየው ሃሚን ጭይጠቀማሉ?	1) አዎን 2) አይ
222	በቀን ምን ያህል ሊትር ይጠቀማሉ?	-----ሊትር
223	ቤተሰብዎ በወር ሚን ያህል ገንዘብ ለውሃ ይከፈላል?	-----ብር
224	ቤተሰቡ ለመጠጥነት የሚጠቀምበት ወሃ መገኛ ምን ጭባላ ፈውህን ድክመት ያህል ተበላሽቶ ይደውቃል?	1. ያውቃል 2. አያውቅም
225	መልሱ ያውቃል ከሆነ ለምን ያህል ጊዜ ተቋርጦቆየ?	1) 2-3 ቀን 2) 4-5 ቀን 3) 6-7 ቀን 4) ከሳሚንት በላይ
226	ለውሃ መቆረጥ ዋና ምክንያቱን ያውቁታል?	1) አላውቅም 2) ከምንጩ 3) መስመሩ ስለተበላሸ 4) መብራት ስለሌለ
227	በአጠቃላይ በውሃ አቅርቦቱ ዙሪያ ባለው አገልግሎት ደስተኛ ነዎት?	1) አዎን 2) አይ
228	ደስተኛ ካልሆኑ መይም በከፊል ከሆነ ምክንያቶቹ ምን ምን ናቸው?	1) የውሃ አጥረት 2) ንጹህ ስላልሆነ 3) የውሃ መቆረጫ 4) የውሃ ግጥም 5) ሌላ
229	ወሃ ወከመቋረጡ በፍትህ አገልግሎት ሰጭ ወከካል ቀድሞ ያሳወቃል?	1) አዎን 2) አይ
230	ባለፈው አንድ ድክመት ቤተሰቡ ከሚያገኘው የመጠጥው ሃም ከኒያት ባለች ግር የተነሳ ቅሬታ አቅርቦ ያውቃሉ?	1. አውቃለሁ 2. አላውቅም
231	ለቅሬታዎ ላሽ አግኝተዋል?	1. ፈጣን ማሻሻያ ሰጥቶኛል 2. የዘገየ ማሻሻያ ሰጥቶኛል

		3. ምንምየተሰጠምላሸየለም
232	በአጠቃላይየተሸለየመጠጥውሃአቅርቦትአገልግሎትእንዲያገኙለማሽጫልቢደረግጸጨማሪክፍያለመክፍልፈቃደኛነዎት?	1. ነኝ 2. አይደለሁም
233	በአቅራቢዎካሉትየወሃአቅርቦትለየትኛውለመክፈልፈቃደኛነዎት?	1)ቤትወስጥለማስቀጠል 2) ግቢወስጥለማስቀጠል3)ለህዝብቧንጧ 4)ለላ
234	ፈቃደኛነዎትእስከምንያህልብርለመክፈልፈቃደኛነዎት?	_____ብር

CUTUBKA TODOBAAD LIFAAQYO

7.1. Xaashida macluumaadka iyo foomka oggolaanshaha la wargeliyey madaxdii hay'ad

Magacaygu waa -----Waxaan shaqeynayo sidii ururiyaha xogta waxbarasho ee lagu sameeyey bulshada this by Dereje Abate oo la baranaya shahaadada Master ee Jaamacadda Haramaya, ee College of Health Sciences iyo Medical. Anigu waxaan u roonaan aad codsato in ay i amaahi aad fiiro gaar ah u aad u sharax ku saabsan waxbarashada iyo la xushay sida qaybgale daraasadda.

Horyaalka Daraasadda: Assessment of helitaanka biyaha iyo arrimo la xiriira ka mid ah qoysaska ee magaalada Jigjiga, Soomaali, bari Itoobiya

Ujeedada baadhitaanka: Natiijooyinka daraasaddan waxay noqon kartaa muhiimada a muhiim for sahayda biyaha ee gobolka, Soon iyo ujirtay iyo xafiiska caafimaadka si ay u qorsheeyaan barnaamijyo faragelinta si loo horumariyo helitaanka biyaha iyo sidoo kale isku halaynta ay aagga daraasadda. Oo weliba, ujeedadu daraasaddan waa in ay qoraan sha a sida shuruud qayb loogu talagalay fulinta ee Master of Science ee ah in sahayda Biyaha iyo Fayadhowrka track Management for baaraha maamulaha.

Habka iyo duration: Waxaad ka jawaabi doona su'aalaha ah inay i siiyaan macluumaadka muhiimka ah waa waxtar u leh baadhitaanka. Waxaa jira 54 su'aalaha si ay ugala hadlaan arrinta sida qof ama saamiga focal heysata su'aalo la kiciyey in ay ka jawaabaan. waydiimaha wuxuu ku dhici doonaa ilaa 1 saacadood, sidaa darteed waxaan si raxmad leh codsan in aad iigu tudh waqtigan in ay ka jawaabaan su'aalaha.

Halista iyo faa'idooyinka: Halista isagoo ka qayb daraasaddan waa mid aad u yar, laakiin kaliya qaadnaya ilaa 1 saacadood, ka waqtigaaga. Ma jiri doonto wax lacag toos ah ka qayb daraasaddan. Laakiin natiijooyinka ka soo baxay cilmi muujin kartaa macluumaad muhiim u ah helitaanka biyaha ee magaalada Jigjiga ku saleysan macluumaadka aad na siiyaa.

Qarsoodiga: Macluumaadka aad na siin doonaa uu noqon doono mid qarsoodi ah. Waxaa jiri doona macluumaad ku jirin in aad aqoonsado doonaa si gaar ah. Natiijooyinka daraasaddan waxay noqon doontaa guud ee bulshada waxbarashada iyo aad uma xusuusan doono wax gaar ah oo qof shaqsi. su'aalaha waxaa lagu suntan doonaa in laga saaro muujinaya magacyada. tixraaca No lagu sameyn doonaa in warbixino afka ah ama qoraal ah in ay ka qaybgalayaashu si cilmi xiri karin.

Xuquuqda: Ka qayb qaadashada daraasaddan waa si buuxda iskaa wax u qabso. Waxaad xaq

u leedahay inaad u sheegi in ay ka qayb ama aan daraasaddan. Haddii aad go'aansato in aad ka qayb, waxaad xaq u leedahay in ay ka baxaan ka daraasada waqti kasta oo aad this ma calaamadee doonaa khasaaraha ka mid ah faa'iidooyinka oo aad si kale xaq u leedahay. Ma aha in aad ka jawaabto su'aal kasta oo aadan rabin in ay ka jawaabaan.

cinwaanka Contact: Haddii ay jiraan wax su'aalo ah ama wax waqti kasta oo ku saabsan daraasadda ama nidaamka, fadlan la soo xiriir cinwaanka this.

<u>Principal investigator</u>	<u>Institution</u>
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Baaqa ogolaanshaha iskaa wax xog:

Waan akhriyey xaashida macluumaadka qaybgale. Waxaan si cad u fahamsan ujeedada cilmi baarista, nidaamka, khataraha iyo faa'iidooyinka, arrimaha sirta, xuquuqda ka qayb iyo cinwaanka xiriirka ee wax su'aalo ah. Waxaan la siiyey fursad ay su'aalo ku weydiin wax ayaa laga yaabaa in cadda. Waxaan ku wargeliyay in aan xaq u leeyahay inuu ka daraasada waqti kasta ama in aanad ka jawaabin su'aasha kasta oo aanan rabin leeyihiin. Sidaa darteed, waxaan sheegayaa oggolaanshahayga iskaa wax u qabso oo ku hadlaya magaca maamulka xarunta xafiiska in ay u ogolaadaan in daraasaddan lagu sameeyay in xafiiska la xarfaha aan (saxiix).

Maqaa iyo Saxiixa ururiyaha xogta: _____ wakitka

_____/_____/_____

Maqaa iyo Saxiixa data ururiyaha : _____ wakitka

_____/_____/_____

LIFAAQA B.QUESTIONNAIRES

Weydiimo on qiimayn ah helitaanka biyaha iyo arrimo la xiriira ka mid ah qoysaska ku sugan magaalada Jijiga, Ethiopian Somali State Regional, Eastern Itoobiya

Si loo soo buuxinayaa si ay xogta ururiya.

kilika.....Gobolka.....Degmada

Weydiimo ID No Magaca of waraysanaya

Taariikhda wareysi Time bilaabay Time dhammeeyey

Su'aalaha hubiyaa

1. arrimaha dhagaaleha iyyo mustamaca

Lumbark a	Su'aal	Jewaab
1	Maamule guri	1. nin 2. gabadh
2	Qofka wax la weydiiyey	1. Mulkilaha qoyska 2. Islaanta qoyska 3. Cunug /Dadkale(magacaaw)
3	da'adaadu waa immisa?	_____
4	Wa maxay diinta qoyska?	1. Somali 2. Amhara 3. Oromo 4. Gurage 5. Ki kale
5	Qoykaa waa mahay	1. Muslim 2. Orthodox 3. Protestant 4. Ki kale
6	Fassalka/dugsiga immisaad yaad dhigattaa?	1. Wax ma baran 2. dugsiga1-5 3. dugsiga6-8 4. dugsiga9-10 5. dugsiga hosee

7	Ma qof guursadey miya?	1. meyaa 2. qof geeriyooodey 3. qof ka la tagey
8	Da'adaadu waa immisaa	
9	Shaqadaada rasmiga waa maxay?	1.baaciy mushtari 2.shaqaaale dawladeed 3.shaqaaale maalimeed/xogsade 4. tuurateenya/qof aan shaqeeneyn 5.wax kale hadde jiraan sheeg-----
10	Arrimaha gurigaa ku saabsan	1. Guri qabale 2. Guri shaqsi ah 3. Guri shaqsi ah oo reer dagan yihin 4. Wax kale haddi u jiro sheeg_____
11	Bilohad gabi waa imisa?	_____ lahaqti

2.Biyaha Ilo jira

201	Waa Maxay isha asaasiga ah (ugu weyn) ee biyaha si aad u qabtay guriga? (Jawaabo dhowr suurto gal)	1) biibiile gaarka ah 2) biyaha magaalada PP 3 / waxaan u soo iibsadaan (qorteen 4 / Well 5 / Other
202	Haddii aadan haysan xiriir gaar ah, sababta aan baad haysaan?	1. Ma doonaya adeegga 2. Awoodid la'aan in la bixiyo eedaymaha la xidhiidha ka hor ah 3. Service waa qaali 4. Maxaa yeelay adeegga aan la heli karin 5. sababo kale (fadlan qeex waa
203	maxay isha sare, biyahana u dhaamiya guriga?	1. xiriir Private 2. qasabadaha taagan Dadweynaha 3. Stream 4. Gacanta qoday ceel 5. iibiya Water biyo 6. Roob 7. Kuwo kale (fadlan sheeg)
204	Waa maxay meyaaooca biyaha?	1. Sii 2. ka dhex 3. Qaar kale sheeg_____ aad biyaha hoose Sidee

205	maalmood ayaa la harjadaya in hal todobaad ee la soo dhaafay?	1. Marna 2. Marka 3. Labo 4. Saddex jeer ama ka badan
206	uu ahaa waxaa lagu baddalo qaybinta biyaha ee hal bil ee la soo dhaafay?	1. Haa 2. Meyaa 3. Anigu garan maayo
207	uu ahaa waxaa lagu baddalo qaybinta biyaha ee hal bil ee la soo dhaafay?	1 Haa 2 Meyaa 3 Anigu garan maayo
208	208 dhaxaysa waxa saacadood waa biyo ka il in la heli karo si qoyskaaga?	From _____ To _____ From _____ To _____
209	Imisa jeer ayaad biyo keento?	1. Daily 2. Qof kasta oo 2 maalmood 3. Qof kasta oo 3 maalmood 4. Weekly
210	Ma leedahay 20 litir weel caag horeba?	1) HAA 2 / MAYA
211	Sidee badan ee aad bixiso, waayo? birr / 20Litres / Day ama Week:	_____
212	Ma waxaad biyo cabtaan aan la daaweyn?	1) HAA 2 / MAYA
213	Haddii jawaabtu MAYA tahay, sidee baad biyo daweeyo?	1) karisaan 2 / daaweynta kale (cayim
214	In qoyskaaga, sida badan oo litir oo biyo ah ayaad cabtaa maalin kasta?	_____ litir
215	Ma waxaad u malaynaysaa biyaha aad cabto waa mid tayo wanaagsan?	1) HAA 2 / MAYA
216	216 Ma waxaad u malaynaysaa in tayada biyaha waxay muhiim u tahay caafimaadka qoyskaaga?	1) HAA 2 / MAYA
217	Sidee fog (ee mitir) waa dhaleen si fiican / gacanta bamka in aad isticmaasho?	
218	Sidee dheer (in daqiiqo) ayay qaadataa in gura biyaha iyo guriga ku soo meyaaqdo?	
219	Yaa biyo inta badan?	1 Adult labdumar 2 Adult 3 ilmaha Lab 4 ilmaha Female
220	Miyuu sidoo bamka / gacanta u dhashay dumiyey in mid ka mid ah sanadkii la soo dhaafay?	1 Haa 2 Meyaa
221	Sidee si joogto ah ayaa si fiican u bamka dhaleen / gacanta dumiyey inta lagu jiro mid ka mid ah sanadkii la soo dhaafay?	1 Marka toddobaadkii 2 Marka laba Isbuuc ka 3 Marka quarter a 4 Mar in lix bilood 5 Mar sameyaa ah
222	Ma sidoo bamka dhaleen / gacanta go'an si dhakhso ah marka ay jabto?	1 Haa 2 Meyaa
223	Waa maxay inta jeer ee biyaha?	1 a More mar ka badan maalintii 2 Marka maalin 3 Marka laba maalmood

		4 Mar oo saddex maalmood 5 Mar toddobaadkii 6 kale
224	Ma inta jeer this filan baahidaada?	1 Haa 2 Meyaa
225	Sidee badanaa aad jeclaan lahayd inaad biyo ku heli karaa?	1- In ka badan laba jeer maalintii 2- Marka maalin 3- kale
226	On maalmood in aad biyaha aad u hesho, inta saacadood ayaad badanaa biyo heli waayo?	
227	Waa maxay inta jeer ee nadiifinta ceelka?	1- Marka ee quarter a 2- Marka ee lix bilood 3- sameyaa ah Marka 4- Ma nadiifiyo ee sannadkii la soo dhaafay
228	Ma biyo la heli karo (ka ilaha ugu weyn ee aad) sanadka oo dhan?	1- Haa 2- Meyaa
229	Waa kuwee bilood samayn aad la kulmi yaraanta? Multiple	
230	Guud ahaan, sidee urta biyaha?	1- Meyaa urta 2- urta xun
231	Guud ahaan, ma biyaha dhadhan?	1- Haa 2- Meyaa (Faylasha)
232	Guud ahaan, waxa aanu biyaha u eg?	1- Clear 2- daruur / wasakh
233	Ma biilasha ah in aad hesho sax ah?	1- Haa 2- Meyaa
234	Ma waxaad sameeyey cabasho la xidhiidha adeegga biyo la cabbo oo aad ka mid ah sanadkii la soo dhaafay?	1- Haa 2- Meyaa
235	Si yuu waxaad ka caban?	
236	Maxay ahayd natiijada cabashada	? 1- talaabo degdeg ah laga qaaday 2- tallaabo la daahin qaaday 3- tallaabo Meyaa qaaday
237	Guud ahaan, aad ku qanacsan tahay adeega biyaha la cabbo aad?	1- Qanacsan 2- li'i
238	Waa maxay heerka aad ku qanacsan tahay?	1- Buuxi 2- Qayb
239	Waa maxay sababaha aad uga xun? (Liiska ilaa saddex)	
240	Ma waxaad laaluush ah adeeg kasta ee la xiriira biyaha la cabbo ee hal sanmeyaa la soo dhaafay bixisay?	1- Haa 2- Meyaa (wareysi dhameystiran)
241	Waayo, waa maxay ujeedada aad ugu dhawaan bixisay laaluush?	1- Si aad u hesho xiriir / si ay u helaan biyaha 2- Si aad u dhammeeyo shaqada dayactirka 3- kale
242	Sidee badan ma aad bixiso?	
243	ahayd laaluush ka dalbaday (ama aad bixiso on adiga kuu gaar ah)	1- dalbaday 2- Bixiyay on aniga ii gaar ah
244	Ma shuqulka aad samaysay dabadeed bixinta laaluush ah?	1- Haa 2- Meyaa

Curriculum vita

1. Personal information

Name: Dereje Abate

Sex: male

Age: 30

Date of birth: 1985GC

Place of birth: Ambo

Marital status: single

Religion: Christian

Nationality: Ethiopian

Current Address: Jigjiga

Cell phone: 0939198213

Email derejeabate7@gmail.com.

2. Languages spoken and written

Excellent in English, Amharic, A. Oromo and good in Somali

3 .Education Back ground

Ambo Senior Secondary and Preparatory School

Haramaya University, BSC in Environmental health

4) .Experiences

8 years work experience in Environmental health office