

FUNCTIONING AND PROPER UTILIZATION OF WATER SUPPLY
SOURCES IN DEBRE LIBRANOS WEREDA:
THE CASE DEBRE TSIGE TOWN

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FUNCTIONING AND PROPER UTILIZATION OF WATER SUPPLY
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DEBRE TSIKE TOWN

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Conducted a meeting on the _____

Date of _____ 2013.

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ABSTRACT

Back ground:The availability of an adequate and safe water supply is one of the major requirements for control of a large number of diseases.The functionality and proper utilization of water supply system is influenced by community participation, construction material quality , training, technical support, community satisfaction,training and willingness to sustain the water project.

Objectives: The main objective of this study is to assess the functionality and proper utilization of water supply sources in DebreTsigie town. To meet this objective across sectional study was conducted Using Structured questionnaires and observational check list to collect the necessary data.

Methodology:The data was analyzed, interpreted and discussed. Most of the HHs (52.5%) are females and rest are males. Most of the respondents are rented (48. %). In that town 41.25 % HHs have private pipe but 58.8% have no their own pipe. The main reason for have no private pipefor their own was the facility is too costly to connect.

Results: 230 HHS (71.8%) were using protected water sources. The duration of waiting time needed to collect water at the waterpoints was positively associated with the non-functionality and mal functionality ofwater points (public stand pipe). Community participation towater supply sources development was more associated with private connection in all things needed to construct and public stand pipe in terms of cash. Results from observational checklists showed that 64.4% of HH connections functional ,25.75% are partially functional and 9.8% are totally non –functional.

Conclusion: In debretsige town 50% of public stand pipe are functional .but the rest are partially and totally non functioning..40% of springs are protected byfence from animal contamination and human leg entrance. Considering the modest water service fee, distance from water points,involving community at all stages of water development, and building adequate skill andcapacity to maintain water sources are essential factors to sustain the water system and properly utilize. cash contribution in public stand pipe construction were identified as strengths, lack of contribution in maintenance and follow up for that facilities late response for maintenance and poor coordination were cited as weakness in in that town.

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ACRONYMS

WHO: World Health Organization

PI – principal investigator

M- Meter

KM- kilo Meter

JMP – Joint Monitoring Programmer

UNICEF- United Nation Children’s International Emergency Fund

NGO- Nongovernmental Organization

AD- Advisor

DC- Data Collector

L- Litter

HH- House Holds

NO- Number

RLDS- Regional and Local Development

A.A.U – Addis Ababa University

WMEO- water and Mining and Energy offices

CHAPTER ONE

INTRODUCTION

1.1 BACK GROUND INFORMATION

Fresh water is essential to health not only for its part of production but also for domestic purpose like drinking, washing, cooking, laundry etc...(WHO and UNICEF, 2006).

The availability of an adequate and safe water supply is one of the major requirements for control of large number of disease and to advance the standard of good general health within community. Water consumption is influenced by factors like climate, economic level, and population density, degree of industrialization, cost and quality of the supply. (Zegeye,2004).

Globally,884 million people drink water from unimproved sources (JMP, 2010). Disparities in the availability of safe water constitute one of the primary underlying determinants of global health inequalities. 60% of child diarrhea deaths are attributable to unsafe water, sanitation and hygiene (Boshpinto Velebit and Shibuya, 2008; Pruss-Ustunetal, 2004).

Small community water supply systems have been built for a long time and recently such schemes have been constructed in a considerable number. Some were successful but the overall condition of the facility does not appear good. The determinant factors for the functionality of water supply systems are categorized in to two main categories. These are pre implementation factors which include community participation, technology selection, site selection, demand responsiveness, construction quality, population and training and post implementation factors are technical support, community satisfaction, institutional and financial management, training and willingness to sustain the water project. (Gebrehiwot, 2006).

The people who are not benefit from water supply system are not consulted on matters of site selection, design and construction of facilities. It is difficult to achieve the continuous functioning of water supply without some degree of community involvement. Inadequate maintenance leads to wasted investment and costly renewal of broken down

facilities. The acceptance of small water supply system by community is no means assured. The users may not be satisfied by the supply provided, if it does not meet their expectation: waiting long times to collect water, intermittent service and sufficient supplies during some or many hours daily are common problems (WHO, 1992).

In Ethiopia water facilities have been protected by NGOs and government organization. Also, in my study area these facilities have been constructed on teltele springs near kurfa and pumped to the towns' public stand pipe and household pipe to provide safe and adequate water supplies. But, because of many reasons like people's carelessness and lack of maintenance some facilities are not functional and not properly utilized. So my main objective is to assess their functionality and proper utilization of these sources in that town.

1.2 STATEMENT OF THE PROBLEM

Water is a prerequisite for survival of human being and development. Life of planet earth would be impossible without water, because all life forms bacteria to plants and animals contain it. As a result water is a basic human need for health in deed for survival and therefore it is not exaggeration to call it one of the basic human rights. Without safe water and sanitation there is no real development, safe water is the key way to health (GebreEmanuel,T, 1973).

Globally, 884 million people drink water from un improved sources(JMP, 2010). Disparities in the availability of safe water constitute one of the primary underlying determinates of global health in equalities 60% of child diarrhea deaths are attributable to unsafe water, sanitation and hygiene (Boschi, Pinto, Velebit and Shibuya, 2008, Pruss-Ustun, Kay, Fewtreii and Bartram, 2004), and the quality and quantity of water supply contribute to malnutrition and vector born disease(Fewtreii, Pruss-Ustun, Bos, Gore and Bartram, 2007).

Though water is the soul of existence, the basic necessity is still a luxury for many of the world's poor people. Over 1.1 billion of our fellow citizens do not use drinking water from improved sources. The provision of safe and adequate water supply to community has been one of the important public health intervention concerns for many years. Drinking water and sanitation improvement would reduce the overall incidences of infant and children mortality by more than half(Gebre Emanuel, 1973).

The problems related to water supply are associated with lack of maintenance of previously systems, community involvement when the earlier systems where built and lack of access to adequate water and sanitation. The problems still present and have contributed a lot to the low water coverage(Veissman, 1992).

The adverse health effect of water is not equal in all regions of the world. This difference is because of level of provision, functioning and utilization of protected water sources (Richard, 1986). The functioning and utilization of water supply sources must fit human consumption. However, this situation does not all true for some households of DebreTsigetown of Debrelianosewereda. This may be due to most of the community water supply source are not properly functioning or utilized by the community (Gebre Emanuel, 1973).

The problems of water source in DebreTsigie town are not only the problems of adequacy and quality but it also has the problem of distribution and reliability. There are studies conducted by different students in other town like Asosa, Gurage on water supply generally (Ytayih, 2003). But in the town where my study will be conducted there is no study on water supply source in terms of utilization and functioning, factors that affect proper utilization of the sources, reasons for inadequate production, less coverage and limited consumption.

By assessing the magnitude of water supply source, poor functioning of these source and challenges that the community of the town and service providers in DebreTsigie town, the study can bridge the existing research gap and help to plan or replicate the finding for sustainable development of DebreTsigie water supply and other urban water supply in other part of the country.

1.3 SIGNIFICANCE OF THE STUDY

The importance of improved safe water supply in disease prevention and health promotion has long been identified in the field of public health. The problems related to water supply are associated with lack of maintenance of previously constructed systems, community involvement when the earlier system was built and lack of access to adequate water and sanitation. The problems are still persisting and have contributed a lot to lower water coverage (WHO, 1990).

The findings of this study help to improve community participation during water supply system development and follow up after the development. And by assessing the magnitude of utilization of water supply sources, poor functioning of these sources and challenges that the community of the town and service providers in DebreTsighe town, the study also helps to plan or replicate the findings for sustainable development of DebreTsighe water supply and other urban water supply in other parts of the country.

CHAPTER TWO

LITTERER REVIEW

Water is crucial for human survival and economic development. Provisions of adequate supply of potable water supply in urban and rural areas in both developed and developing countries are essential for life water is the most abundant resource in the world. Instead of this apparent abundant several factors serve to limit the amount of water available for human use (Howard, 1982).

Making water available for bathing, sanitation and drinking reduces the incidence, prevalence and severity of water borne disease and lowers child mortality as well as improves gender equality. As poor women are primary responsible for fetching water. Women in Africa alone spend around 40 billion gourds per year on this activity (WHO, 1992).

The water is located in all regions of world. The problems are that the distribution, quality and made of occurrence are highly variable from one locality to another. It is the most widely occurring substance in the world. 72% of the earth's occupied by water bodies of this 97.2% is in the ocean 2% lies the force as glaciers and ices capes and only 0.8% is the usable portion (Jamie, 1996).

How much water a person needs for drinking and food preparation varies in consider day. According to diet, climate and the work they do, pregnant women and breast feeding mother need more water. The minimum amount of water need for drinking ranges from about 2 liters in temperate climate to about 4.5 liters per day for people in hot climate who have to carry out manual work (WHO, UNICEF and JMP, 2000).

The WHO guide lines for drinking water quantity, guide line value for consumption are based on the assumption of 60 kg adult consuming 2 liters per day of drinking water which should be equivalent to 3 liters per capital per day (WHO, 1997).

Globally, 884 million people drink water from unimproved sources (JMP, 2010). Disparities in the availability of safe water constitutes one of the primary underlying determinants of global health inequalities. 60% of child diarrhea deaths are attributable to unsafe waters, sanitation and hygiene and the quality and quantity of water supply contribute to malnutrition and vector borne disease (Fewtraii, Pruss-ustun, Bos, Gore, and Bartram, 2007). Water also has indirect influence on health: where water is collected from sources distant from the home, time and effort expended on water collection constrains income generating activities, contributing to vicious cycles of poverty (Blackden and Wodon, 2006 and Krishna, 2010).

Protection of water supply from contamination is the first line of defending against disease. Source protection is almost the best method ensuring safe drinking water. However, failures to provide adequate protection, poor site selection, unhygienic practice of consumers near the source. The deterioration of construction materials exposes the community to the risk of water borne disease (Richard, 1986).

The determinant factors for the functionality of water supply sources are categorized in to two main categories. These are pre implementation factors and post implementation factors. The pre implementation factors are community participation, technology selection, site selection, demand responsiveness, construction quality, population and training. And also the post implementation factors are technical support, community satisfaction, institutional and financial management, training and willingness to sustain the water project (Gebrehiwot, 2006).

One of the pre-implementation factors for water supply source is demand responsive approach which is defined as the quantity and quality of water, where community members will choose to consume at a given price (Giza chew, 2005).

In a demand responsive approach, beneficiaries should feel the need for safe drinking water supply, in order to identify safe drinking water supply projects, water projects are more or

less demand responsive to the degree that beneficiaries make choices and carry out resources in support of their choice (Gebrehiwot, 2006).

If there is willingness in the community to provide valued resources in the exchange for services then these community members valued the service. As a result demand for the supply of water will facilitate the management of water supply source and it enhances the rate of sustainability (functionality) of the supply system (Gizachew, 2005).

The human body's basic water requirement depends on climate, work load and environmental factors. If the workload is high and the season is dry the family use large amount of water consumed by one person per day decrease relative to the one that small number of family size. However, Gleick (2006) defined the minimum requirements for human body and found that it is between 3 and 10 liters per day. The amount of water needed for other purposes, including cooking or hygiene, is more variable and depends on cultural habits, socio economic factors and types water supply in terms of quantity, quality and availability.

Gleick (2006) stated that the international acceptable standards for water requirements for basic needs, commonly referred to as basic water requirement which is defined as water requirement in terms of quantity and quality for the 4 basic needs of drinking water, human hygiene, sanitation service and house hold needs. This standard is defined by WHO guideline as 20 liter per capital per day (Admasu. et al, 2002).

Entering the international decade for action, different organizations like UNICEF and NGOs participated in to drinking water provision, however, in sufficient water supply facilities, poor physical structure, low reliability of the services and facility designs, distance and time needed to collect water and low awareness about their uses are some factors affecting the continued functioning and utilization of water supply schemes (WHO and UNICE, 1998).

United nation report of 1988 on management of world's limited water supply indicated that about (1/4) of the world's population have no access to clean drinking water. Data obtained from UNICEF for the year 1992, indicated that 81% of the rural population of the world did not get access to safe drinking water, they draw their water from unprotected sources, community of most countries do not participate in water supply system of

development lack of good management and evaluation of water sources, early constructed water sources were remained without maintenance (WHO and UNICEF, 2000).

In Tanzania a study was conducted in 1970 to determine the state of functioning of water supply sources. Often, villages with wells that are 7 years old. It was found that 37% of pumps were functioning, 42% were malfunctioning. As result of road rises disconnection, 31% were not functioning because of completely worn bush and 22% of the pumps had been removed for disclosed reasons (Akiyus, 1992).

In addition to this in 1981, these well were constructed small with study hand pumps. Then in 1983 across sectional study was conducted in this village to determine their functionality. The result of the study showed that 2 of them were rarely used. 1 because of long distance and the other because of people dislike the color of the water (Akiyus, 1992).

In another way our country Ethiopia has low drinking water coverage. However, even though the coverage is low (35.9%), most of the facilities are not properly functioning. Yitayih Tadesse, who conducted a study on Gurage zone, indicate that all of the surveyed water facilities which accounts 61.1% were functional, 16.7% were partially functional and 22.2% were no longer functioning. The reason for this is lack of maintenance supervision and lack of community participation. Water sources are highly contaminated because of absences of follow up, diversion ditches, fencing and poor drainage system. Construction sources alone do little unless completed with periodic survey and maintenance of previous constructed sources for sustainable safety of drinking water and health benefits of the consumers (Yitayih, 2003).

The continued functioning of water supply depends on a reliable sources that continuously provide adequate water for beneficiary community and reliable of obtaining water from the source , however, lack of appropriate technology, community involvement and good maintenance makes the water supply sources un reliable (Geyer, 1991).

The current deficit of potable water forever increasing population of developing countries especially in Africa calls for improved rational and efficient approach to the management of

available water sources. Ground water is becoming a major source of potable water in many developing countries. This is because; it is the most important component and constitutes about 2/3 of fresh water sources of the world (WHO and UNICEF, 1990-2002).

CHAPTER THREE

OBJECTIVES OF THE STUDY

3.1 GENERAL OBJECTIVES

The main objective of the study is to assess the functioning and proper utilization of water supply sources at DebreTsigetown.

3.2 SPECIFIC OBJECTIVES

- ⇒ To assess the status water supply sources
- ⇒ To determine water consumption rate of the house hold
- ⇒ To asses factors that affect /influence/ the functioning and proper utilization of the facilities.
- ⇒ To identify the type of community involvement, institutional support during and after construction of functional and nonfunctional system.
- ⇒ To forward feasible recommendations for concerned bodies who have interested to perform further studies.

CHAPTER FOUR

METHODOLOGY

4.1 STUDY AREA

The study was conducted in DebreLibanosewereda: The case of DebreTsigie town which is located 90 km from Addis Ababa. The town is also located of altitude of 1650m above sea level, which is dega.

4.2 STUDY DESIGN AND PERIOD

Across sectional study was conducted on water supply sources and house hold connections that have been served by protected water sources at DebreTsigie town using predesigned questionnaires and observational sanitary check list to assess the proper utilization and functioning of water supply sources by the communities of debretsige town from April 12, 2013 to April 20 ,2013.

4.3 POPULATION

4.3.1 SOURCE /REFERENCE/ POPULATION

The source populations were all population those were lived in DebreTsigie town.

4.3.2 STUDY POPULATION

The study populations were those who was beneficiary from public stand pipes, house hold connections (that the water comes from Teltele's spring) and protected spring as well as unprotected who had a chance to be included in the study.

4.4 STUDY VARIABLES

4.4.1 DEPENDENT VARIABLES

- Utilization
- Functionality
- Water consumption rate

4.4.2 INDEPENDENT VARIABLES

- Community participation
- Maintenance and follow up of facilities
- Distance of the source from house
- Time spent to fetch the water
- Types of water source

4.5 SAMPLE SIZE AND SAMPLE POPULATION

The minimum sample size was determined by the following formula:

$$N = \frac{z^2 \cdot p \cdot (1-p)}{d^2}$$

Where d= the margin of sample error tolerated

z= the standard normal variable at 1- α /2 confidence interval

N= the minimum sample size

P= Proportion from the target of the study or prevalence rate

The sources population or reference population were 9805 as information was gained from the town administrator.

Since there was no reliable and published information which showed the prevalence rate of functionality and proper utilization of water supply system in DebreTsgie town. It took the estimated prevalence rate would be 50 % (0.5) and margin of error would be 5% (0.05) then the minimum sample size would be

$$N = \frac{Z^2 \times p(1-p)}{d^2}$$

$$= \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2}$$

$$N = 384$$

Since the study population was less than 10,000. The sample size could be calculated by the following correction formula,

$$NF = \frac{N}{1 + N/NP}$$

$$1 + N/NP$$

Where, N= initial sample size from the above formula

NF- Final sample size

NP- sampled population

$$\text{Then } NF = \frac{N}{1 + N/NP}$$

$$1 + N/NP$$

$$= 384 / 1 + 384 / 1910$$

$$= 384 / 1910 + 384 / 1910$$

$$= 384 / 2294 / 1910$$

$$= 384 / 1.2010$$

$$= 320$$

Therefore, the final sample size was = 320

4.6 DATA COLLECTION TECHNIQUE

A pretested questionnaires and sanitary survey check list were prepared to assess the functionality and proper utilization of water supply source. The water supply source functionality was inspected by sanitary survey check list and interview was done to get necessary information concerning functionality and proper utilization. To get more accurate information the interviewer would be above 18 years old. The sampling interval was 6. Every 6th house was selected and heads of the house or every person above 18 years olds was interviewed. The first house was selected using lottery method.

4.7 PROCEDURE OF DATA COLLECTION

On conducting data collection approval was primary obtained from the Environmental health sciences and technology department and then using data collection tools data was collected.

4.8 PRE TEST

The study questionnaires was pretested in a similar study other than the actual study population prior to the starting of actual data collection to modify its appropriateness, clarity, completeness and easily understand- debility of the questionnaires.

4.9 ETHICAL CONSIDERATIONS

The study was free from serious ethical implication on the people and they were free to express their own feeling. Before actual data collection informed consent was obtained.

4.10 DATA PROCESSING, ANALYSIS AND PRESENTATION

Data was processed by using sorting, tallying and scientific calculator. Then it was combined, organized and presented using tables and graphs. These data were analyzed using statistical totals. Finally it was interpreted using standards and compared to other similar findings.

4.11 DISSEMINATION OF THE RESULT

The result of study or recommendation will be disseminated to the town administer, responsible body's and environmental health officer for intervention of the problems

4.12 OPERATIONAL DEFINITIONS

- ❖ Water: A liquid necessary for the life of most animals and plants.
- ❖ Households: any unity of habitual residence where some consumption or production may be undertaken in common.
- ❖ Safe water: the water potentially protected from contamination
- ❖ Coverage: the proportion of people served with the adequate level of water supply.
- ❖ Spring: a place where natural ground water flow occur.
- ❖ Water supply: is the provision of water by public utility, commercial organizations or by individuals using via a system of pump stand pipes.
- ❖ Functioning: proper physical state of water supply projects in relation to their present conditions at the time of survey.
- ❖ Utilization: the extent of social and health benefits as measured mainly by the proportion of users and per capital consumption.
- ❖ Sustainability: is the continued service of water supply projects over time to serve their own purposes.
- ❖ Reliable water source: one that can provide a yield of sufficient quality through out of the supply system.

- ❖ Functional water sources: any run of does not enter the spring or well, it does not have leakage, it does not have any damage on the protection box and collection box and the hand pump work well.
- ❖ Partially Functional water supply source: the mainhole cover is broken or properly uncovered, run off enter in the water supply system and there is leakage.
- ❖ Improved water supply: provision of water in good quantity or safe for health, good quantity or the required amount of water is available for use any time throughout the year and collection of water need not take much of your time and effort.

❖ **4.13 PROBLEM ENCUONTERED**

- hot sunny days during data collection
- shortage of data collection days

SOLUTION:

- Using umbrella during data collection
- By using data collectors to overcome the shortage of the days.

CHAPTER FIVE

RESULT

SOCIO DEMOGRAPHIC CHARACTERISTICS OF DEBRE TSIKE TOWN

According to this study 52.5% HHs are female, 70 % HHs heads are literate, 55.3% of the respondents are orthodox, From all HHs 48.13% are rented and The dominant occupation is government employer (32.8%).(Table 1)

Table 1: socio demographic characteristics of DebreTsike town study population

Characterizes	No of respondent	Percentage
Age		
8-12		
13-17		
18-22	47	14.68%
23-27	54	16.87%
28-32	59	18.43%
>32	160	50%
Sex		
Male	152	47.5%
Female	168	52.5%
Education status		
Illiterate	96	30%
Literature	224	70%
Grade 1-4	24	10.7 %
Grade 5-8	36	16.07 %
Grade 9-10	48	21.43 %
Grade 11-12	33	14.73 %
Grade >12	83	37.05 %
Owner ship		
Dependent	39	12.18 %
Rented	154	48.13 %
Private	127	39.68 %
Religion		
Orthodox	177	55.3 %
Muslim	57	17.8 %
Protestant	86	26.87 %
Occupational status		
Government employee	105	32.8 %

Daily labor	72	22.5 %
Merchant	98	30.6 %
Others	45	14.06 %
Total	320	100%

SOURCES OF WATER SUPPLY

There are three main sources of water supply in debretsige town .These are private house hold connection 41.25%, public stand pipe 28.2% and shared pipe with the owner of the pipe30.6%.And also alternatively there are 17.8%and21.6%households that use water from springs and public stand pipe respectively. They use springs as alternative sources when there is no water in the town but some use public stand pipe as alternatives if there is no private house hold connection.

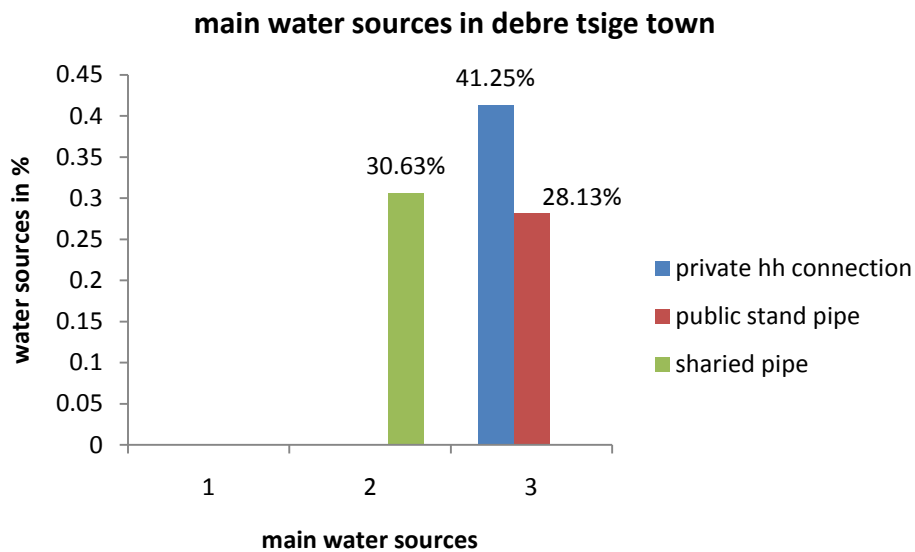


Figure 1. Main water sources used by the community in DebreTsige town

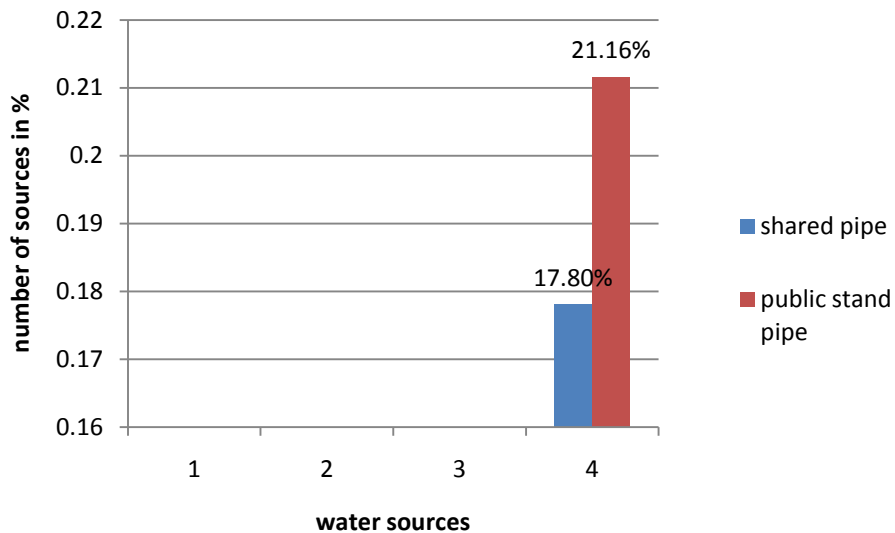


Figure 2. Alternative water supply sources for the community of Debretsige town

USES OF WATER SUPPLY SOURCES FOR VARIES ACTIVITES

Public stand pipe

From the debretsige town people 28.125% households use public stand pipe. 20.5% HH use it for drinking, washing utensils, food preparation, bathing and washing clothes. 2.5% HH use it for animal drinking and 7.8% HH use the water for all activities. And also 26.6% of HHs uses it alternatively.

Private and shared pipe

In the town where my study was done 71.87% HHs use water from their compound privately and shared pipe with the owner the house and their family. Out of them 45.9% use it for drinking, food preparation, washing utensils, bathing and washing clothes, the rest 25.9% and 12.2% use for all activity and animal drinking respectively.

SPRING (alternative sources)

From the interviewed HHs 17.87% use water from protected and unprotected springs alternatively. 12.2% of the HHs use it for animal drinking, washing utensils, bathing and washing clothes and the rest 5% use it for all activities. (Table 2).

Table 2: House hold that use water from the system or facilities for various purpose in DebreTsige town

Utilization	Types of facilities								
	Spring(Alternat ively)	Percent	We ll	percent	Public stand Pipe	Percent	Private pipe and shared	Percent	Total percent
Drinking	24(we serbi)	7.5%			65	20.5 %	147	45.9 %	73.9%
Washing clothes and bathing	39	12.2 %			65	20.5 %	147	45.9 %	78.6%
Washing utensils	39	12.2 %			65	20.5 %	147	45.9 %	78.6%
Cooking	24(we serbi)	7.5 %			65	20.5 %	147	45.9 %	73.9%
Animal drinking	39(Ab ebemola)	12.2 %			8	2.5 %	39	12.2 %	26.9%
For all activity	16	5 %			25	7.8 %	83	25.9 %	38.7%

DAILY WATER CONSUMPTION

In debretsige town 23.12 % hh fetch water >60 liter.19.67 % of hh fetch 31-40 liters from the sources .But it is small comparied to number of family number.

Table 3: Distribution of daily water consumption rate of DebreTsigetwon

Daily water consumption per liter	No of HH	Percent
6-10 liter	17	5.3 %
11-20 liter	54	16.87 %
21-30 liter	43	13.44 %
31-40 liter	61	19.67 %
41-50 liter	27	8.44 %
51-60 liter	44	13.75 %
>60 liters	74	23.12 %
Total	320	100%

DISTANCE FROM THE HOUSE TO SOURCES

78.13% of the respondents travel distance >500m, 21.87% HHs travel from 501 to 1000m. And alternatively 9.68% and 7.5 % HHs travel from 1000 to 1500m and >1500m respectively to fetch water for their needs.

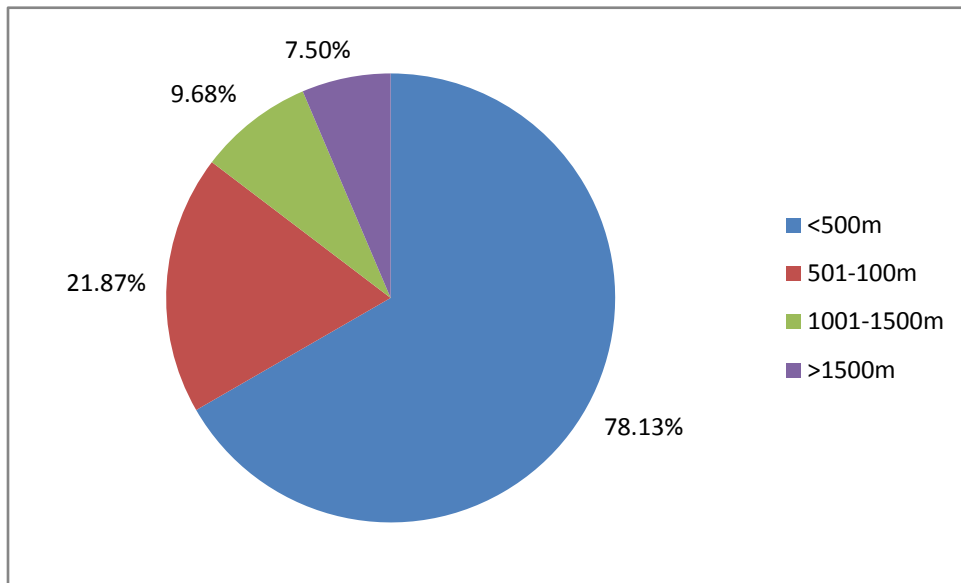


Figure 3. Pie-chart shown the distance of houses of the community from the water source

TIME SPENT TO FETCH WATER

78.13% HHs spent >15 minute, 28.13% HHs spent time from 16 to 30 minute and the rest 9.68% and 7.5% spent from half to 1hour and >1hour respectively to collect water for their household need.

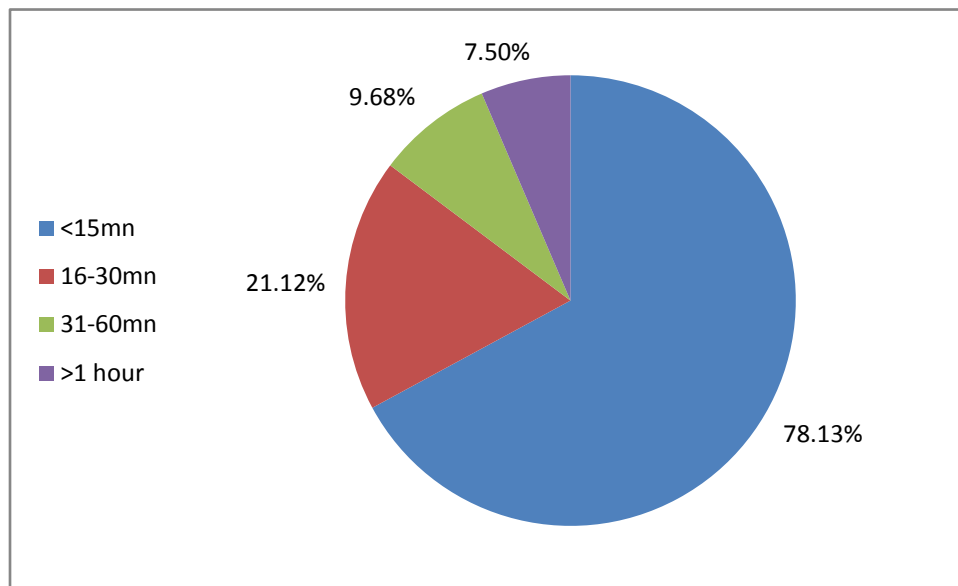


Figure 4. Timespent to fetch water from the sources in debretsige town

REASONS FOR NON CONNECTION OF PRIVATE PIPE FOR THEIR OWNER

58.75% HHs in debretsige town have no private house hold connections because of different reasons .These are 20% HHs respond too cost to connect, 11.87% HHs respond to they have no private compound.

Table 4: Reason for not using (Non connection) of private pipe in the compound in DebreTsigetwon

Reason	No of HH	Percent
Too cost to connect	38	20 %
No consideration for low income households	24	12.2 %
No water line within the vicinity	23	7.5 %
Have no private compound	64	11.87 %
Other	39	7.2 %
Total	188	58.75 %

REASON FOR PROPER UTILIZATION OF PIPE LINE WATER SOURCES

From the interviewed HHs 61.25% are somewhat properly utilize their sources.23.75% HHs respond all of the alternatives listed below,14.63% HHs respond suitable for drinking and 7.2%repond to both no obstacle to collect and have no any impurity.

Table:5 Reason for proper utilization of pipe line water source in DebreTsige town

Reason	No of HH	Percent
Have no any impurities	23	7.2 %

Suitable for drinking	45	14.63 %
Its functionality	17	5.3 %
No obstacle to collect	23	7.2 %
Its quality	12	3.75 %
All	76	23.75 %
Total	196	61.25 %

REASON FOR NOT PROPER UTILIZATION OF WATER SUPPLY SOURCES

From the respondents 38.76% HHs they are not properly utilize their sources. The dominant reason is small volume during summer season, 10% HHs respond others like long time waiting to fetch and mal functionality.

Table6: reasons for not proper utilization of water supply sources in Debretsige town

Reason for not properly utilization of water supply sources	No of HH	Percent
Its non-functionality	27	8.44 %
Small volume	44	13.75 %
Odor problem	8	2.5 %
Its distances	9	2.82 %
Taste problem	4	1.25 %
Other	32	10%
Total		38.76%

THE IDEA TO CONSTRUCT THE WATER FACILITY

From that town water facilities 88.6% of the water facilities were built by community ideas that are both private and shared pipe, 8.7% and 2.68% water facilities were built by water committee and local kebele leader that was at that time respectively.

RESPONSIBLE BODY TO COLLECT WATER FROM THE SOURCES

The dominant sex that collect water for the HH use is female that include mothers and daughter which is 50 %, the second 28.4% is daughter and the rest 13.12% and 8.4 % are both children and son respectively.

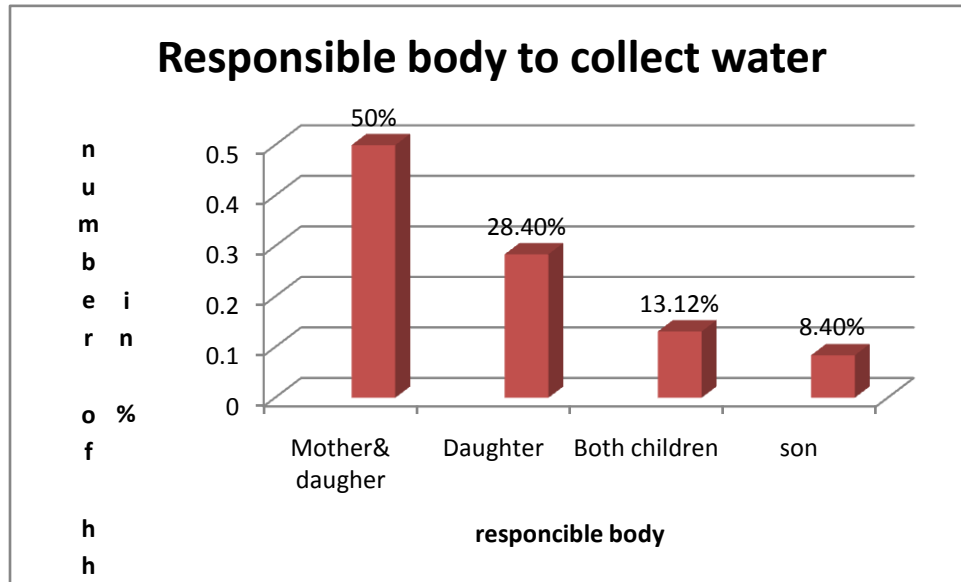


Figure 5. Responsible body to collect water from the source

TYPES OF COMMUNITY PARTICIPATION DURING SOURCE DEVELOPMENT

56.875% of HHs participates in sources development. 41.25 % of HHs participates by all things like in cash, idea, labor contribution and local materials contribution; this is because the above percent of HHs have their own private pipe.

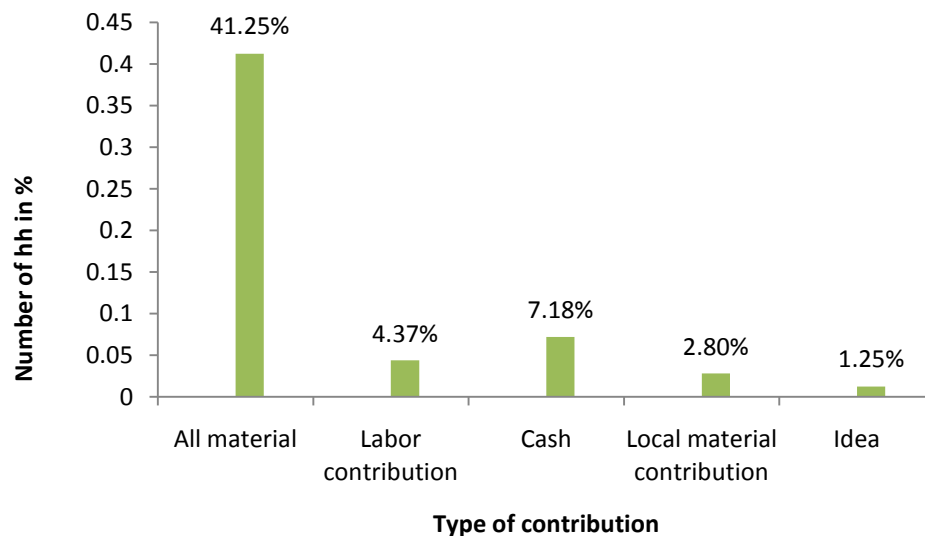


Figure 6.Type of community participation during sources construction

RESPONCIBLE BODY FOR MAINTENANCE AND FOLLOW UP THE SOURCES

Indebretsige town where my study was done there are 88.6% private household connection that is used privately and shared, for those facilities the responsible body to maintain and follow up is the community which is the owner of the facility and for the rest 8.72% and 2.7% water facilities the responsible bodies are water committee (public stand pipe) and no responsible body respectively(spring).

TYPE OF CONTAINER FOR COLLECTION OF DRINKING WATER

The most usable object for collection of drinking water is jerry can and both jerry can and plastic bucket which accounts 44.1 %and 30.3 % respectively.

Table 7: Types of container for collection of drinking water in DebreTsige town

Type of container	No of HH	Percent
Clay pot	20	6.25 %
Galvanized iron bucket	7	2.2 %
Plastic bucket	55	17.18%
Plastic bucket and Jerry can	97	30.3 %
Jerry can	141	44.1 %

Total	320	100 %
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WASHIG HABIT

83.3% HHs wash their drinking water collection object with water before refilling. But 16.56 %HHs wash their collection object with water and some detergent like hard soap (ajacs) and powder soap (omo).(waterand some small stone,bean)

RESULT FOR OBSERVATIONAL CHECK LIST

WATER SUPPLY SOURCES IN STEAD OF FUNCTIONALITY

In debretsige town where my study was done there are 12 public stand pipes which are used by the community. But only 50% of them are functional, the other 25% are mal functional (all of these have no >2 facute) the reason are people are careless during opening and closing ,lack of maintenance and age of the facility and the other 2 public stand pipes are totally un functional. And out of 132 pipes those are used privately and shared 64.4% are functional, 25.75% are partially functional like facuet breakage and 9.8% are totally non-functional .From 5 springs only 40% of them have building,collection box, have fence to protect them some unwanted things like animal and fertilizer contamination, unwanted things entrance by run off but two of them are >1.5km from the sources. And 40 % of them are partially functional because during the day have some taste, growing of small warms, human leg entrance in one of it, the rest 20% is totally non -functional the reason is there is agricultural activities around it, there was slaughtering of animals also and people carelessly wash their clothes above the sources. But now it was eutroficated and in small amount it is serve as for animal drinking.(Table 8 and information from watercommittee)

Table 8: water supply facilities instead of functioning and inDebreTsig town

Condition of facilities	Spring	Perc ent	Public stand pipe	Perc ent	Private and shared pipe	Percent
Functional	2	40%	6	50%	85	64.4%
Partially functional	2	40%	4	33.3 %	34	25.75%
Non functional	1	20%	2	16.6 6%	13	9.85%
Total	5	100 %	12	99.9 %	132	100%

CHAPTER SIX

DISCUSSION

The very low coverage of drinking water supply in Ethiopia has existed for decades (Brehan, 1999). Many other developing nations around the globe share this experience (Gebre Emanuel, T, 1989). Ignorance, poverty coupled with lack of strong community commitment still continues to degrade the immediate environment contributing decisively to the sustained transmission of communicable diseases. The time taken to fetch water from main sources is >15 minutes in this study was lower than that of the findings in Lesotho, in Zambia, Ingonder and elsewhere in Ethiopia. (Burgi, A. 1999). It did not

exceed the guideline value recommended time by WHO (World Bank, 1999), which is set at 15 minutes of walking distance, equivalent to a distance of about one kilometer. Thus children and mothers, who are the common water attendants, spend much time on water collection in the rural settings of Ethiopia. But in Debre Sigit town 78.125% HHs spent <15 minutes to collect water. This is good compared to other places.

The amount of water per capita consumption, about 10 liters and less used by the majority, was significantly different from WHO guideline value set at least 20 liters per capita per day (Webster J and Dejachew G, 1999). This study shows that consumption is inversely related to the duration of time to collect water, distance to the water point, volume of the source, increased family size, and the ability to pay service fees. Inadequate drinking water adversely affects personal hygiene, clean food preparation, and housing sanitation, hence favoring the transmission of water-borne and water-washed communicable diseases. Community's better participation in water supply sources development can be possibly explained by the difference in approaches used by stakeholders for community mobilization. Then in the area where my study was conducted there is no fast response to community where there is private pipe breakage and to connect new facilities.

Community participation in its various forms consisting mainly of labor, cash, local materials and advice or idea contributions is critical and important for developing and using water supply projects (White A.). The moderate rate of participation in the study area, about

56.8%, is very encouraging entrypoint to sustain the community service. The result showed that community members somewhat understand reasons for their participation aimed at efficiency, building a sense of ownership and capacity building for purpose of sustainability

(Burgi, A, 1999). In that town there is no any NGOs which involve in water supply sources development. The extent of community involvement can be indirectly assessed through identifying negative factors involved in initiating the community to participate. The fact that frequent leakage of water systems, inadequateness of water sources, and much time required to collect water from alternative sources discourages the use of water requires close attention to address the issue of sustainability for developmental works to ensure whether or not something continues to work over time (UNICEF, Water and Environmental, 2004). The issue of functionality without addressing this concern will lead to poor community participation, and often forcefully breaking the system in order to access the water for the intended use. This study indicated, although not significant proportion, that 40% of the observed springs which are used alternatively had animal troughs and washing stands. Field observations had given a chance to observe both the negative and positive factors related to water use and physical features of the water schemes. The presence of fences in 40% of water points is a positive participatory response from the beneficiaries reflecting their desire to sustain the technology. But negative attitudes are related to the mishandling of water sources like poor site clearing and not replacing or maintaining damaged water faucets, Stilling of water meter during night. The idea to construct water supply sources in debretsiga town were raised by the water committee for public stand pipe and the owner of the house for household connection. Unfortunately the water desk agents at the Wereda level representing wereda mining and energy office were not yet skillful and resourceful to manage and maintain the existing water sources. The Wereda management lacked tools and the effort to maintain Water Committee capacity to reproduce and manage the local financial sources required to ensure the continued service of water points

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

A very significant share and public stand (58.73%) of respondents who do not have private connections responded that their primary reason not to have private pipes was their inability to afford the connection payment, clearly indicating that policies like subsidizing connection costs and supplying credit facilities for connection payment could enable HHs to get piped connection. This is because in that town people pay 40% of the construction cash to the water committee when they connect it.

In debretsige town 50% of public stand pipe are functional .but the rest are partially and totally non functioning..40% of springs are protected by from animal contamination and human leg entrance. but the rest 60% have no fence and are partially and totalynon functional. Considering the modest water service fee, distance from water points,involving community at all stages of water development, and building adequate skill andcapacity to maintain water sources are essential factors to sustain the water system.various factors are interacting to maintain the intended objectives of any water supply projects. The utilization of water sources mainly depended on their functionality; this in turn depends on the magnitude and type of community participation, the quality and volume of the sources, the whole purpose focused to sustain the continued use and to proper utilizing of water supply sources.

In debretsige town the main reservoir washed 2 times per year and disinfection of the water is also 2 times per year that is At that time of reservoir washing.

Based on the findings of the study, the following recommendations are forward

1: The water and mining energy office (water committee) must give awareness about the advantage of community participation in sources development.

2: the water committee office must decrease service charge or paying 40% of water facility development birr to the office during private pipe development.

3: the responsible body must increase the volume (capacity) of water supply sources.

4: There must be continuous disinfection of water supply sources by some disinfectors.

5: The responsible body must give awareness about the uses of the facility and give fast responses to maintain the facility.

6: The Wereda Water Desks must Strength the technical and management capacity of it , improving the coordination at all levels of management, and maintaining community participation are recommended for future action

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COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCE
DEPARTMENT OF ENVIRONMENTAL HEALTH
SCIENCES AND TECHNOLOGY

Annex -1-

Content

Title: Functioning and proper utilization of water supply system in DebreLianosewereda:
The case DebreTsigetown

Objectives: To assess the functioning and proper utilization of water supply sources at
DebreTsigetown.

1. Socio demographic status of the respondent

- 1.1 Name.....
- 1.2 Age.....
- 1.3 Sex.....
- 1.4 Status of the person on the house hold
 - A. Mother B. Father C. son D. daughter
- 1.5 marital status of the respondent
 - A. married B. Single C. Divorced D. widowed
- 1.6 Number of family member
- 1.7 Religion A.Orthodox B. Muslim C. protestant D. other (specify)
- 1.8 Educational status
 - A. Literate B. Illiterate If literate
 - Grade 1-4.....-Grade 11-12
 - Grade 5-8.....-Grade>12
 - Grade 9-10...

1.9 Annual income

1.10 occupational statuses

A. government employer B. Daily labor C. other (specify) 1.11.
Owner ship

A. dependent B. rented C. owned privately D. other

2. Utilization of water supply source

2.1Whattype of water supply facilities are there?

A. protected spring B. public stand pipe

C. privately house hold connection D. other (specify)

2.2. Do you properly utilize the source? A. Yes.... B. No.....

2.3.IfYesfor pipe, why?

A. Its costB. It i s colorless C. Near the home

D. suitable for drinking E. cleans the clothe easily. F. All

2.4. If yes for spring,why?

A. Have no algae C. Not contaminated by animals

B. No entrance of human leg D. Others (specify)

2.5. If No, why?

- A. colorproblem. B. Taste problem E. Other (specify)
C. odor problem D. distance of it from house

2.6. For what purpose do you use the water?

- + For drinking. A .Always B. some times
+For food preparation A .Always B. some times
+For bathing and washing clothes A.Always B. some times
+ For washing utensilsA. Always B. some times
+ For animal drinking A. Always B. sometimes+ for all purposeA. Always
B. some times

2.7. How much litter of water do fetch per day?

- A.<5Li B. 6 -10 Li C. 11-20 Li D.>20 Li

2.8. Have you satisfied with the quality available? A. Yes B. No

2.9. If yes, why? A.suitable for drinking.... B. Have no any worms

2.10. Do you think that the available water supply source is sufficient for theCommunity?

- A. yes B. No

3. Condition of the facilities

3.1. From where do you get water?

- + Protected spring A. Main source B. Alternative source
+ Unprotected spring A. Main source B. Alternative source
+Public stand pipedA. Main source B. Alternative source
+ Private households'connection A. Main source B. Alternative source
+Shared tap A. Main source B. Alternative source

3.2. Year of construction _____

3.3. Whose idea was it to build the facility?

A. government officials B. NGOS

C. Water committee D. community

3.4. Is the facility accessible by the user? A. Yes B. No

3.5. Who fetches water from the facilities?

A. women B. son C. daughter D. both children

3.6. Time spent for fetching the water?

A. <15 minute B. 16-30 minute

C. 31-60 minute D. >1 hours

3.7. Have you participated in the development process of the water supply sources? A. yes

B. No

3.8. If yes, at what level?

A. during site selection B. during planning

C. during maintenance... D. During construction

3.9. What type of participation did you have during the source development?

A. cash B. Idea

C. laborcontribution D. local material contribution

3.10. Who is responsible for maintenance of the source?

A. Water committee B. NGOs C. community

3.11. Who is responsible for follow up of the facilities?

A. Government official B. community C. water committee

3.12. Do you have private water connection A. Yes B. No

3.13. If yes, what type?

A. private tap inside the compound

B. private tap inside the home

C. shared tap.

3.14. Is the tap currently working?

A. Yes

B. No

3.15. If no why? A. It was broken by user B. no water within the vicinity

3.16. If no connection for your own, what is your reason?

A. It is too costly to connect

B. No consideration for low income households

C. No water line within the vicinity

D. we can get water from unprotected spring

E. Other (specify)

3.17. Have you get water from protected spring or public stand pipe?

A. Yes

B. No

3.18. If yes, how far is the nearest from the house?

A. <500M B. 501-1000m C. 1001-1500m D. >1500M

3.19. Is there obstacles to collect water from the source?

A. Yes

B. No

3.20. If yes, what is the reason?

A. the source is too long from the house

B. the volume of the source is not enough

C. takes longer time to collect

3.21. For private pipe inside the compound, how much do you spent for water per 1 month?

...

3.22. For public stand pipe, how much do you spent for water of 20 liter?

3.23. What type of container do you use to collect drinking water?

A. clay pot B. Galvanized iron bucket

C. plastic bucket D. jerry can

3.24. Do you wash the collection container before refilling?

A. yes B. No

THANK YOU

4. Sanitary observational check list for protected and unprotected spring

4.1. Is the spring sources protected by masonry? A. Yes B.No

4.2. Is there spring collection box? A. Yes B. No

4.3. Is there sanitary inspection hole over the masonry? A. Yes B. No

4.4. Does the inspection hole covered appropriately? A. Yes B. No

4.5. Is there latrine around the spring? A. Yes B. No

4.6. Does animals have access to the spring? A. Yes B. No

4.7. Are there agricultural activities around of the spring? A. Yes B. No

4.8. Is the spring currently functional? A. Yes B. No