



WOLKITE UNIVERSITY

COLLEGE OF SOCIAL SCIENCES AND HUMANITIES DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

Challenges of Pure Water Supply: The Case of Gurage Zone Wolkite Town South West Ethiopia

A Senior Research Submitted To Department Of Geography And Environmental
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Environmental Studies.

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DECLARATION

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This is to certify the senior essay prepared by Abraham Mohammed, Abdulakim Zakir and Mihert Damtew. Entitled the assessment of challenge of pure water supply Gurage Zone in case of Wolkite town which is submitted on partial fulfillment of the requirement for the bachelor of art degree in Geography and Environmental Studies?

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ABSTRACT

Shortage of potable water for drinking is one of the main problems in Ethiopia, especially in Wolkite town. Hence, the main purpose of the study is to assess the challenge of pure water supply in Wolkite town. For the study, both primary data were collected through questionnaire and interview. Data was collected through various data collection instruments were analyzed through descriptive statistical methods. As result, it was founded that population growth, lack of water project construction and lack of sustainable management are major challenges of pure water supply. Pure water shortage is high in the town which brings poor health status that leads loss of productivity force that leads to decline in house hold income. The researcher also gives recommendation that municipal authority should expand water project and sustainable use management.

ACRONYMS

CHM- Cultural Heritage Management

CSA- Central Statics Authority

EWP- Ethiopia Water Project

GTP- Gross Transformation Plan

GWSSA- Global Water Supply and Sanitation Assessment

MOFE- Minister of Finance and Economics

MOWRD- Ministry of Water Resource Development

NGO- Nongovernmental Organization

RDBR- Rural Development Bureau Report

UNDP- United Nation Development Program

UNICEF- United Nation International Children's Emergency Fund

US- United state

WBF- World Book Encyclopedia

WHO-World Health Organization

CHAPTER ONE

1. INTRODUCTION

1.1. BACKGROUND OF THE STUDY

Water is important for life. We use it in our homes for cleaning, cooking, bathing and washing the cloth. It is precious resource that satisfies human's basic need. However, water is not evenly distributed on earth due to the geological process of the past. It is large in coverage in one part and scarce in another side and this shows as the large water bodies like oceans, seas and other water bodies around in the continents of Australia, Europe, some part of Asia and small water bodies even with no enough water in Africa can better justify the difference in the distribution of water on the earth (WBF 2011).

Although the world as a whole has plenty of fresh water, some regions have pure water shortage because of poor water supply management. Shortage also occurs because of some cities do not make full use of their supply. They have plenty of water but not enough storage of tankers, treatment plants and distribution pipes to meet the people's needs (WBF, 2011)

In many countries, water scarcity represents a crucial constraint to food production and major poverty and hungers. Shortage of pure water supply is a problem of the continent of Africa generally as well as Ethiopia specifically because of different factors like topography, drought, climate, mismanagement and others (NAS 2001

Ethiopia has large water bodies and of course it is called "water tower of east Africa" (Rami, 2013). Nevertheless, pure water supply is the question in many parts of the country. Likewise, though not a recent phenomenon there is serious challenge of pure water supply in Wolkite town; the result from different factor mainly natural and human made factor those are increasing number of population and rural to urban migration are major problem, miss management and unattainable use of the existing water resource and nature of topographic lack of easily accessible ground water and skilled man power, (Zemenu, 2012).

1.2 STATEMENT OF THE PROBLEM

Ethiopia is situated in the horn of Africa. This was prone to drought and subsequent famine, faces acute and recurrent water shortage and pure sanitation. Besides the natural causes, water stress has been aggravated by lack of constricted project, unsustainable developments, increasing population growth, scarcity of finance and population of surface water also pose a series problem for drinking water supplies in the country. The growth and expansion of urban centers also result in increase in demand for pure water supply of pure water. Those in most of the cities, quite significant portion of the demand for pure water supply is not sufficient, there is wider gap between the demand supply of potable water (Jacob, S, 2009).

Water born disease is one of the numbers of cause of infant mortality in Ethiopia. About 300000 children under the age of five die every years. It is estimated that over 80% of Ethiopian lacks safe water supply's .This is one of the worst rates in the World (WHO, 2008).

The need for undertaking this research is investigate the challenge of pure water supply in urban area at Wolkite town, due to different challenge nature of topographic and manmade factor, increasing number population, shortage of water, challenge of electricity power, poor management and unattainable use of the existing water resource. The existing source of Wolkite town water supply is from ‘Bozebar’ large spring which is located far away from town. To this along the gravity main pipe line a lot of unplanned connections are made directly from the line without separate storage due to new settlement and poor administration of water supply construction of different institution and companies.

The study focused on the major problems challenging pure water supply in the town. Therefore, it tried to fill the gap by gathering more reliable data and good analysis depending on the reality of current situations and the investigate the sustainability of urban water supply structure by solving challenge of pure water supply in Wolkite town.

1.3 OBJECTIVE OF THE STUDY

1.3.1 GENERAL OBJECTIVE

The general objective of the study was to investigate the challenges of pure water supply of Wolkite town.

1.3.2 SPECIFIC OBJECTIVES

The Specific objectives of this study were:

1. To identify the sources of pure water in the study area;
2. To examine the unbalance between the demand and supply of pure water in the study area;
3. To identify the main challenges related to manmade and natural factors;
4. To analyze the measures taken to solve the problem of Wolkite town.

1.4 RESEARCH QUESTIONS

1. What are the sources of pure water in the study area?
2. What are the cause unbalance between the demand and supply of pure water in the study area?
3. What are the main challenges related to man-made and natural factors?
- 4 What are the analysis measures taken to solve the problems of pure water supply in the study area?

1.5 SIGNIFICANCE OF THE STUDY

Since pure water supply is a crucial issue in different aspects and for different cases. It is believed that the findings can provide better understanding about the problem and may be used as an input for other concerned bodies and also it would use us a base for further investigation for interested individuals regarding to this topics. The study helps decision makers, residents and non-governmental organizations understand the population and take actions accordingly.

1.6 SCOPE OF THE STUDY

The study was conducted in Southern Ethiopia, Gurage Zone that is limited to the area of Wolkite town,, focusing on the challenges of pure water supply in the Wolkite town. The challenge of pure water supply exists over the town in general, and many tackling process are on the way to satisfy society's want. Moreover, the study focuses on the status of pure water supply and factors, which result with problem facing to water in the study area.

1.7 LIMITATION OF THE STUDY AREA

While we were conducting this research there was some limitations such as lack of related written materials, on-availability of sufficient data, time and money which was faced throughout my research and lack of financial. Even if the researcher, he has successfully accomplished the study with the available data and information obtained from the organization under study.

1.8 OPERATIONAL DEFINITIONS

Water refers to the chemical compound with the chemical formula H_2O water molecules are contains one oxygen and two hydrogen atom connected by covalent bond and also water color less, odorless and transparent liquid. Pure water refers to safe of drinking, free from pathogens which are introduced to water through faces and dirty containers. As my study challenges are the constraints or the scarcity of water in Wolkite town and also the supply of water means the provision of water by public utilities, community endeavors or by individuals usually via a system of pumps and pipes.

1.9 ORGANIZATION OF THE STUDY

The contents of this research are divided in to five chapters. The first chapter is introduction; statements of the problem, objective of the study, research question, scope of the study, limitation of the study, and significance of the study are included. The second chapter includes review of literature that builds major conceptual and rational framework of the study. The third chapter deals with description of the study area and sample design. The fourth chapter discusses data presentation and data analysis, and the fifth chapter discuss conclusion and recommendations.

CHAPTER TWO

2. LITRETURE REVIEW

This chapter deals with the theoretical over view of challenged of pure water supply it assesses water availability. Global access to clean water source of drinking water supply, water supply access in Ethiopia, water supply policy and practices in Ethiopia, demand of pure water supply, challenges of pure water supply and future prospects.

2.1 WATER AVAILABILITY

Water is the most wide spread substance on earth. It covers more than 70% of the world surface. It forms oceans, seas, lakes, river and underground water, in solid state, it exists as ice and snow cover in polar and alpine regions .The total amount of water on the earth is about 1400 million kilometer cubic. About 97.5% of this amount is salt water and only 2.5% is fresh water. (Lalzac, 2007).

The greater portion of fresh water (around 69%) is in the form of ice and permanent snow cover in the Antarctic, the Arctic and in the mountain regions. Around 30% exist as fresh ground water. Only about 3% of the total amount fresh water on the earth is concentrated in lakes, river, soil moisture and relative shallow ground water basins (Lalzac, ,2007).

Water is the important in a number of ways. These included domestic and productive uses. Domestic water use take of the form drinking, washing, cooking and sanitation while productive water use includes those for agriculture, industry, recreation, transportation, and food processing (Chala, 2011).

2.2 WATER SCARCITY

Water scarcity is a major problem that caused by both natural and man-made aspects, such as drought, shortage of rainfall and environmental degradation, deforestation, inappropriate land use respectively. For this reason it affects a large number of world's population life, especially less developed countries like, Ethiopia.

During the 1970`s major drought affected an average of 24.4 million people per year killed over 2500 people and created number of environmental refugees a trend that contained in 1980`s. about 1.5 billion people do not have enough and safe supply of drink water and at list 5 million people die every year from water born disease that could be prevented by implement in drinking water supply and sanitation (Tomas, 2003).

In less developed countries, 61% of the people living in rural areas and 26% of urban dwellers do not have access to safe pure drinking water. Each year five million die from preventives water borne diseases. In part of china, India, Africa, and North America water is withdrawn from underground reservation faster than it is replenished by precipitation (Tomas, 2003).

2.3 SOURCE OF PURE WATER SUPPLY

Pure water is water that required and necessary for a life of human being so that must be free from severity contents like acid, chemicals, pollution and other contaminated substances. It can be gains from rain and ground water.

There are three main sources of water. This are rain surface water (ocean, river, streams, tanks, spend and lakes.) and ground water shallow wells, deep wells and springs.

Rain is the prime sources of all water. A part of the rain water sinks in to the ground to from ground water parts of its evaporates backs in to atmosphere and some run off to from stream and rivers which flow ultimately in to the sea. Some of the water in the soil taken up by plants and is evaporated in turn by the levels. These events are spoken as`` water cycle (Thotosun, 2010)

Surface water originated from rainwater. It is the main source of water supply in many areas. It includes rivers, tanks, lakes, and man-made reservoirs, seawater. Surface water is prone to contamination from and animal sources. As such, it is never safe for human conception unless subjected to sanitary protection and purification (Chala, 2011).From the above source of water to use from drinking purpose are the following. Spring is components of the hydrosphere specially; it is any natural

situation where water flows to the surface of the earth from underground. Thus, a spring is a site where the aquifer surface meets the ground surface (Abraham, 2011).

In 2005, 40% of house of collect water from unimproved sources, primary surface water 30%. The most common source of drinking water are protected spring 34% over half 52% of the population in rural areas spends over 30 minutes for one trip to fetch drinking water. These people primarily women over 15 years old 80% and girls less than 15 years about 9% (Abraham, 2011).

2.4 DEMAND AND SUPPLY PURE WATER

Demand and supply of pure water supply is obviously imbalanced in developing countries like Ethiopia. This indicates the existence of higher demand of pure water for productive, sanitation purpose and, even though the provision of pure water is at low level and far from the user's expectation that leads displacement of local people, health problem, economically and social impacts of a community.

Water is an essential nutrient for all known form of life. But the actual situation shows that especially in most developing countries, the provision of pure water is at low level perhaps recognizing the harm full consequence to health economic productivity and overall quality of life it's in adequate supply. Most institution that have aim to address this problem seem to be concerned on the supply side while neglecting the demand side .never the less the better has also significant police implication in term of demand management. Increasing population, will increase per capital demand also there should be increased personal water usage due to more use of application such as dishwasher and power (EEA, 2012).

2.5 GLOBAL ACCESS TO CLEAN WATER

In 2010 about 85 percent of the population (674 billion) people had access to piped water supply through house connection or an improved water source through other means than house. Including stand pipe, spring supplies and protected well. However, about 14 percent (884 billion people) did not have access to an improved water resource and had to use UN protected wells from spring, canals, lakes or rivers for their water (WHO and UNICEF, 2010).

2.6 DRINKING WATER SUPPLY IN ETHIOPIA

Ethiopia is one of a country which highly experienced with vulnerability of a shortage of available drinking water supply from sub-Saharan countries. Access to water supply in Ethiopia is among the lowest in sub-Sahara Africa and the entire world. While access has increased substantially with funding from external aid, much, still remains to be done to achieve the millennium development goal of having the share of people without access to water sanitation by 2015 to improve sustainability and to improve service quality (MOFED, 2010).

Ethiopia has long been characterized by limited by access to drinking water. In 2004, only 36% of the country population to 47.3% and by 2007 this figure had reached 52.7%. Even through coverage of safe drinking water supply has gradually increased at the national level the rate is still very low. In adequate quality of dirking water also remains a major cause of health problem in rural area of Ethiopia (Degnet, 2011).

The unavailability of pure drinking water in most rural location is one of the main causes of diahorrea among children under the age of five. The negative health impact of contaminated water exacerbated because more than 90% of household consume this water untreated. The problem of drinking water supply is further compounded by physical distance. A recent estimate reveals that about 52% of the population traveled half an hour or more to collect water every day (Degnet, 2011).

2.7 WATER SUPPLY POLICY AND PRACTICE

The government implemented a water management policy in 1991. The Ethiopia water resource management out line some fundamental police principle. The aim is to promote inefficient utilization of the country water resource. Regulation on water resource have been developed and were approved by parliament in the year 2000 (Mida and Lisa, 2009).

Ministry of water source was established to manage to the water resource of Ethiopian, includes the development of new and sustainable policy, “strategies program, implement water sector laws and regulation, conduct study and research activities provide –technical support to regional water bureaus and offices and sign international agreement”(MOWR,2007).

The ministry itself admits failures in the country’s rural water supply. Main problems are mainly shortage of skilled work force, the poor project management, missing monitoring and evaluation, poor maintenance and UN satisfactory long-term water quality control (Mida and Lisa, 2009).

In 1991 national water management policy implemented, considered achievements have been registered. Several potable drink service institutions were built throughout the country. Many people in the rural and urban have become beneficiary of the water supply service. Before in 1991 the national water usage of the country stood below 20%. However due to government height attention for the sector the national water access by 2012/2013 fiscal year reached 61.1% similarly, the rural water supply access are increased to 56.71% and 80.72% for urban respectively (MOWR, 2010).

2.8 FUTURE PROSPECT OF PURE WATER

Globally, Asia has the lowest overall figure per pure water coverage. Almost two third of those without access to improved water supply live in Asia and Africa despite its much lower population size compared with Asia like the global population access to improved water supply. Africa also has the lowest percentage coverage for improved water supply, which only 62% of the population have access to improve water supply global population projection suggest that the world population of 6.053 billion by 2025, a 30% increase. There will be enormous strain on existence service and substantial further service provision will be needed to meet in the population increases and address the backlog (World Bank, 2000).

2.9 CHALLENGE OF PURE WATER SUPPLY

In the provision of adequate clean water, the world faced many challenge which are related to capacity of the nations (i.e. technological knowhow and institutional), in adequate finance, rapid urbanization and declining of global water resource (Chala,

2011). Capacity can be described in terms of the human technological, infrastructural, institutional and managerial resources required at all levels from individual to national governance (Degnet, 2011).

Innovative technologies are essential to overcome barriers to water supply. Technological capacity includes the development and application of new technologies, the technical skill needed to effectively to construct, operate and manage at technical solution. There is a need for institution that brings together many disciplines such as a natural science, public health, engineering and social science. This creates integration and interaction between institution and different sector of population (Zeyda and Tesfaye, 2004).

Historically water has suffered from severe under financing. This result from in adequate internal financial capacity in the pure country to achieve water goals; poor political decision for allocation of development aid; an overall reduction over time in development aid; the limits cost recovery potential in poverty stricken region. For example according to 2005 water supply and sanitation millennium development goal need assessment report by the government of Ethiopia estimate the investment requirement for the next ten years (2006-2015). The total government allocation and commitment for water supply over the next seven years have been project (US \$ 12 million for rural and USA \$ 6.6 million for urban). In additional, poor targeting of aid and multiple of actors and structured compound the financial short, fall (UNDP, 2006).

Population growth and urbanization will create a sever scarcity of water as well as tremendous impact on the nature environment. In less development countries, urban population will grow from 1.9 billion in 2000 to 3.9 million in 2003, averaging 2.3% per year. For example (Challah, 2011) reveals that the 1994 Ethiopian population census report total population was 7,323,123 (13.7% of the total population), after ten year (i.e. the total population increased to 17,588,735 (32.89%) and by the year 2015 urban population is growing to increase by 22,925,177 (32.62).

Increasing global water scarcity, not only is the numbers of those requiring better water supplies very large, water itself is becoming scarcely. The number of people

living in water scarce and water stressed areas over the world estimated to increase approximately six fold from 1995 to 2025 to reach 2.8 billion (Chala, 2011)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 DESCRIPTION OF STUDY AREA

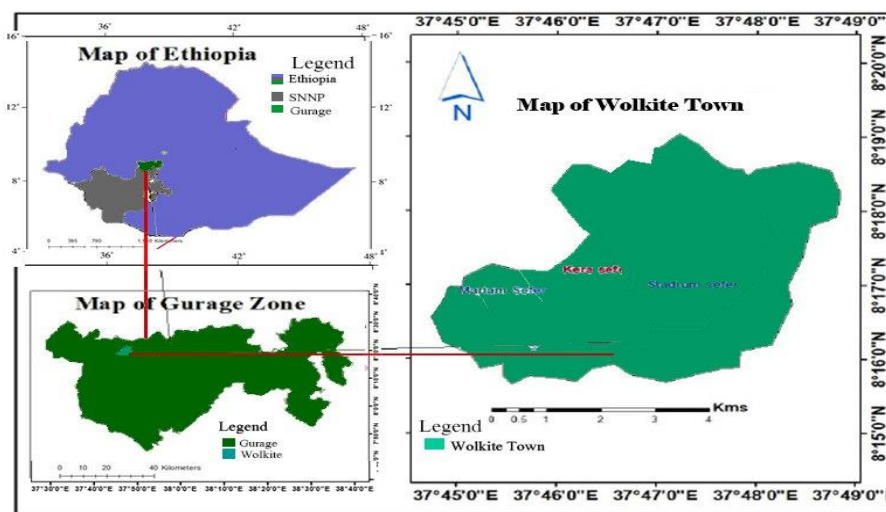
3.1.1 LOCATION OF THE STUDY AREA

Wolkite is the capital city of Gurage Zone of Southern Ethiopia. The town is located on the main road of Addis Ababa to Jimma town at distance of 150 km south-west of Addis Ababa. The town is situated in south-west plateau about 80 km to the west of the main Ethiopian rift valley on water divide of “Rebu”, “Megecha” and “Wabe” rivers. The city stretches some 12 km towards south-west direction of Gubre sub-city which is recently being part of Wolkite town and the place of Wolkite University. Astronomical location of Wolkite town is 08° 16’ 60” north latitude and 37° 46’ 60” east longitudes. The town has an elevation of 1,910 and 1,935 m above sea level.

3.1 FIGURE LOCATION WOLKITE TOWN MAP ETHIO-GIS LAB, 2023

3.1.2 TOPOGRAPHY

The topographic feature of Wolkite town is generally as mountains, plains, plateau



Location map of Wolkite town

and valley. Generally, Wolkite town has leveled topographic feature and the altitude of this

woreda ranges from 1910 to 1935 meters, above sea level. (CHM, 2010)

3.1.2 CLIMATE

Wolkite has an average annual temperature of 18.6 °c and an average rain fall of 1244 mm from: Its climate has seasonal variation. The Wolkite town is characterized by small rain from March to May, heavily rain from June to September and the amount of rainfall become being decreases from October to February.

3.1.3 POPULATION

Wolkite town is one of the towns in Gurage zone, which has the population number approximately 28,866 in 2007, of which 15,074 were males and 13,792 females. (CSA, 2007).

3.1.4 ECONOMIC ACTIVITY

Agriculture is characterized by mix the farming is the main economic activity and livelihood resources of people the town. The locations of the town, trade and hotel business are the dominant economic activity. Agricultural activity of the area, also considered as the important livelihood asset as they are used as source of food, income, and transportation means. (RDBR, 2007)

3.1.5 SOCIAL SERVICE

There are different social services that take place in Wolkite town including education, water supply, electricity, health service, trade, building hospital, public and private drug vender, and telecommunication. The town is located on the main road that connected of Jima town with Addis Ababa from these social services.

3.2 RESEARCH DESIGN AND METHODOLOGY

3.2.1 RESEARCH DESIGN

The research design that would be used in this study is descriptive survey. Descriptive survey can collect detail information about a given subject and uses it in order to address the research problem on challenges of pure water supply; both quantitative and qualitative approach will be used to address the objective of the study. Quantitative approach is using by the researcher to show many responses are involve in each analysis by numerical. While, a qualitative approach is use to interpret data in word.

3.2.2 SOURCE OF DATA

In order to achieve the stated objectives, both primary and secondary data were collected from primary and secondary sources, primary data was collected directly from respondents by questionnaires and interviews. Secondary data was collected

from different written materials, published and unpublished books in library, internet and more related documents such as different books.

3.2.3 METHOD OF DATA COLLECTION

The study would be used different methods of data collection instruments to that has, demand or target to be appropriate to collect data for the study. The study is developing through both primary and secondary source of data. Primary data collection is necessary to get information from participant using questionnaires, interview and observation and focus group discussion.

3.3.1 QUESTIONNAIRE

Questionnaires would be used to collect quantitative data, thus primary data obtained from questionnaires would be distribute to the residents of the town.

3.3.2 INTERVIEW

Interview would use to collect relevant primary data also the researcher is conduct to obtain data from Wolkite town residents and interview with the head of water office.

3.3.3 FIELD OBSERVATION

Field observation would be used to collect the data from study area, by the researcher. This means the researchers will observe the challenges of pure water supply of the study area and collect the data through note taking.

3.3.4 FOCUS GROUP DISCUSSIONS (FGD)

The main uses of focus group discussion is to make the data more reliable to collect the fact information, so the researcher discuss the challenges of pure water supply with different persons and collect the data from those persons, the researcher discuss with six(6)local elders and three(3) head of water bureau and other town residents.

3.4 SAMPLING TECHNIQUE AND SAMPLE SIZE

3.4.1 SAMPLE TECHNIQUE

In the study, simple random sampling would be employed and it provides every member of the population with in equal opportunities is becoming a sample. The simple random sampling techniques were used to obtain representative sample in a reasonable time and money and to collect the required primary data. The sample population selected as a sample by simple random sampling. This technique was easy way to select the respondents in the sample based on their access and willingness.

3.4.2 SAMPLE SIZE

The study would be conducted on the challenges of pure water supply at Wolkite town. The total populations at Wolkite town of 28,826 by whom 15,074 are males and 13,792 are females. According to 2007 CSA the total population of this town was 250 household from this town select from 50 are male and 200 female by using random sampling techniques, because of it give equal chance for the respondents select.

$$n = \frac{N}{1 + N(e^2)} \quad . \quad \text{Where; } n = \text{sample size}$$

$$N = \text{Total population of household}$$

$$E = \text{error margin by percent (10\%)}$$

$$n = \frac{250}{1 + 250(0.1^2)}$$

$$= \frac{250}{1 + 2.5}$$

$$= \frac{250}{3.5}$$

$$n = 71.4 = 71$$

Therefore the sample size of the study was 71 respondent

3.4.4 METHOD OF DATA ANALYSIS

Researcher had been used both quantitative and qualitative techniques in the study of percentage table and the frequency table were used and analysis clearly for group who want to used the study as a part of their solution oriented of their factor. After gathered all the necessary qualitative data through questionnaire and interview analysis were performed. Sampling descriptive statistical analysis method was used

for analysis of quantitative data frequency, percentage, and the qualitative data obtain from interview analyzed and interpret with qualitatively.

3.4.5 ETHICAL CONSIDERATION IN THE FIELD WORK

The study would be conducted by the provider of different ethical consideration. The researcher would be legitimate which means acceptance and embedding of the research in its environment or study area and also accountability of the will sees by smashing the research study on their time.

CHAPTER FOUR

4. DATA PRESENTATION AND ANALYSIS

This part of the paper deals with the results of questionnaires related to backgrounds of the respondents, source of drinking water, the nature of daily supply and demand of water and major challenges related to drinking water and duration of time for daily water supply service.

4.1. ATTRIBUTES OF THE RESPONDENTS

TABLE 4.1 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS BY SEX

Sex	Frequency	Percentage
Male	15	21
Female	56	79
Total	71	100

Source: *Field survey, 2023*

Table 4.1 presents the demographic characteristics of the respondent included in the sample and majority of the respondents (about 79%) are female and the rest (21%) are male. As it can be observed from the table the number of female respondents is greater than male respondents. This is because of that female more responsible about requirement of drinking water and they know how water is required for daily at home and for how often water service obtained from the local area than males.

4.2 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENT BY AGE

TABLE 4.2 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENT BY AGE

Age	Number	Percentage (%)
21-30	35	49.3
31-40	18	25.4
41-50	15	21.1
51-60	3	4.2
Total	71	100

Source: *Field survey, 2023*

The data in table 4.2 shows whether the respondents are economically active or not. As it can be concluded from table 4.2, majority of the respondents about 49.3% are between 21 and 30 years of age. This age group is economically active group and the 4.2% are between 51 and 60 years of age. Which economically are inactive.

4.3 BACKGROUND OF THE RESPONDENTS BY EDUCATION

By this portion the literacy rate of the respondents are assessed various form from unable to read up to degree educated respondents

TABLE 4.3 BACKGROUND OF THE RESPONDENTS BY EDUCATION

Educational rank	Frequency	Percentage
Can't read and write	6	8.5
Can read and write	17	24
1_8	12	17
9-12	10	14
Diploma	16	22.5
Degree	10	14
Total	71	100

Source Field survey, 2023

Table 4.3 shows that the majority of the respondents about 24%, can write and read while about 8.5% of the respondents cannot write and read. About 17% of the respondents have attained primary education and about 14% have access to secondary (9-12) level of education. From the total respondents about 22.5% comprises diplomas and only about 14% of the respondents have the first degree.

4.4 SOURCE OF DRINKING WATER SUPPLY OF WOLKITE TOWN

There is the different water supply for Wolkite town. These sources of drinking water supply the followings are presented in the diagram below.

FIGURE 4.1 SOURCE OF DRINKING WATER SUPPLY IN WOLKITE TOWN

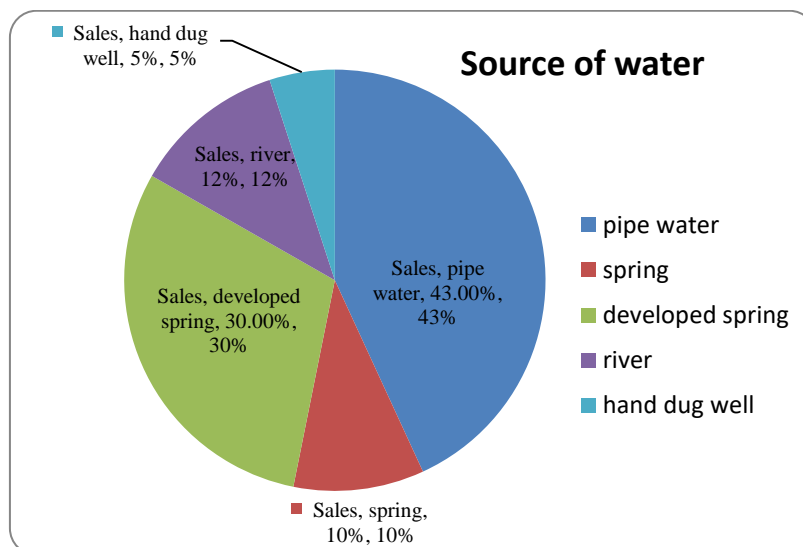


Figure 4.1 source of drinking water (field survey, 2023)

As presented on figure 4.1, majority of the respondents, about 43% of the respondents use pipe water followed by 10% of the respondents using spring water. So as presented in the figure, from 60 respondents only 43% use pipe drinking water and the rest 57% of the respondents use drinking water from river, spring, hand dug well and developed spring which is less pure than pipe water that may expose urban dwellers to different water born disease such as ameba, and cholera.

4.5 SHORTAGE OF PURE WATER SUPPLY IN WOLKITE TOWN

Provision of pure water is a priority which cannot be denied in a given town as water is the most essential and integral part of human basic needs and is the urgent demand of any population. According to the data obtained from institution water office Wolkite town and household of Wolkite town, the town is experiencing the pure water shortage. There are many reasons for water shortage. Some are natural and others are as the results of results human activity. The natural causes include limited source of water, and seasonal fluctuation, human causes includes population growth and over urbanization. Due to effects, springs fluctuate with their volume especially April and May which are source of pipe water. The other source of pure water shortage in the town includes financial problem, lack of skilled man power and absence of appropriate water resource management.

FIGURE 4.2 SHORTAGE OF PURE WATER SUPPLY IN WOLKITE TOWN



figure 4.2 shortage of pure water supply (field survey , 2023)

TABLE 4.4 SHORTAGE OF PURE WATER SUPPLY BY RESPONDENTS' RESPONSES

Options	Number	Percentage (%)
Yes	69	97.2
No	2	2.8
Total	71	100

Source: *Field survey, 2023*)

As depicted on table 4.4 majority of the respondents (about 97.2%) face a problem of shortage of drinking water. According to the data Wolkite town municipality lack of skilled man power, small number springs and depends of groundwater to dig out are some source of water shortage in the Wolkite town. But only 2.8 percent of the respondents do not face drinking water shortage problem.

TABLE 4.5 RESPONDENTS REPLY ON SEVERITY OF PURE WATER SHORTAGE IN WOLKITE TOWN

Severity of pure water supply	Number	Percentage (%)
Very high	19	26.7
High	21	29.6
Medium	20	28.2
Low	11	15.5
Total	71	100

Source: *Field survey, 2023*

As presented in table 4.5, majorities of respondents, about 29.6% face high level of shortage in the town and about 26.7% of the respondents face very high pure water shortage 28.2% of the respondents faces medium pure water shortage and 15.5% of the respondents face low level of shortage of pure water.

According to the data from Wolkite town municipally this severity of shortage depends on different problem such as distorted of projects water, seasonality of springs and distance from water resource. During the rainy seasons spring volume decreases. So fluctuation in volume increases severity of pure water shortage. On the other hand, people near to water source are less suffered and people far from water sources are suffered more by shortage of drinking water.

TABLE 4.6 THE UNBALANCE BETWEEN PURE WATER SUPPLY AND DEMAND

Options	Frequency	Percentage (%)
Balance	0	
Un balance	69	100
Total	71	100

Source: *Field survey, 2023*

the data in table 4.6 shows that majority of the respondents (about 100%) argue as they do not have accesses to balance and demand and supply in the town. the demand for water continuously increases with population growth while the supply of pure water is low due to over urbanization, shortage of water and lack of constructed projects. Only about 100% of the respondents get unbalanced water demand and supply

TABLE 4.7 DURATION OF PURE WATER SUPPLY SERVICE IN WOLKITE TOWN

Time	Frequency	Percentage (%)
24 hours	-	-
12 hours	6	8.5
6 hours	15	21.1
<6 hours	50	70.4
Total	71	100

Source: Field survey, 2023

The duration of water supply has also revealed on the table above. As depicted in table 4.8 in assessing the length of time for water supply service respondents were asked for how long they get pure water supply per day. Accordingly, majority of the respondents (70.4%) gain pure water supply service for less than 6 hours per day and 22.1% of the respondents gain 6 hour pure water supply per day. Only 8.5% get 12 hour pure water supply service per day such as from springs. This shows that majority of the respondents (about 95%) get pure water supply service for less or equal to 6 hour per day. Based on the finding, there are no respondents who get pure water supply service for 24 hours per day. This table shows that service delivery of the town is in its infant stage and it is insufficient to satisfy the urban dwellers. This is due to the transition natures among village and the number of population in each village, as the population number increase the duration of service increases.

4.6 CHALLENGES AND PURE WATER SUPPLY IN WOLKITE TOWN

There is still big gap between the supply and demand of pure water. This is due in adequate finance (pure water supply suffered from severed from sever under financing budget preference) inadequate man power, weak coordination among office, failure to implement policies effectively as they were written on the paper, lack of other institutions (such as NGO) that involve in provision of water, electricity power, shortage of water, rapid population growth, failure to mobilize the community and letting them actively participate in provision are major problem. A part from this water tube were built long time before so that they are bursting, in case there is no permanent person who repair them and there is no water resource management itself in the town.

The following table shows the response given by the sample respondents related to the major constraints.

TABLE 4.8 THE MAIN CAUSES OF THE UNBALANCE OF PURE WATER SUPPLY AND DEMAND

Causes	Frequency	Percentage (%)
Increase in population	34	47.9
Lack of sustainable management	11	15.5
Lack of constrictive projects	26	36.6
Total	71	100

Source: *Field survey, 2023*

Rapid population growth and urbanization will create sever scarcity of water as well as tremendous impact of the nature environment. According to the data from the town. Municipal Authority water sources in the town were constructed from small number of population previously but know a day is increasing. While pure water sources are constant this creates imbalance between pure water demand and supply in the town. For example population in the town accounted about 28,826 in the year 2007 and it increasing 40,865 in the year 2016. The total population of the town increasing by 12,039 which has adverse effect on water resources. Urbanization like population growth increases on number of urban dwellers migrating from rural to urban. As urbanization expands a population increases the demand for increases.

As presented in table 4.8, in the same manner most of the respondents explained that the dominant causes for the imbalance of pure water demand and supply is continuously increasing of population in the town. As population increase the demand for pure water increases and about 36.6% of the respondents explained that the cause for imbalance is lack of constructed project, due to lack of finances, absence of skilled man power and raw materials. Besides this lack of sustainable management comprise about 15.5% of the respondents. This is because water resource is under management of the municipal of Wolkite town, which results in insufficient distribution of water resource.

The other challenge is absence of constructed projects which is because the town has no water development administration rather it is administration and workers are paid by the municipal rather than constructing projects and lack of man power, electricity power and raw materials are major causes for the absence of constructed projects. Population of springs because of that they are exposed to pollution easily by air, animals, flood and lack of self-belonging among people and still the other challenges for the existence of pure water supply in Wolkite town.

4.7 THE MEASURES TAKING AND HAVE BEEN TAKEN IN ALLEVIATING PURE WATER SHORTAGE WOLKITE TOWN

In respects of alleviating the recurrent pure water shortage in Wolkite town the municipal Authority has been taking some measures. This protection including developing springs, distribution of pure water in villages and establishing protection to water resource. There was also construction of shallow wells in cooperation with china government but this was unsuccessful due to deep position of groundwater in turn requires high finance and man power. Although this happened according to municipality of the town this unsuccessful shallow well would be constructed in corporation with Korea government in the near future and the municipal Authority planned to establish its own water resources management in the town.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

The main objective of this study was to assess the challenges of pure water supply of Wolkite town. The main challenge of pure water supply were discussed in this study depending up on the data being collected. In order to achieve the objective of this study data were collected both from primary and secondary sources. By using different books and internet services review literature parts was prepared. This literature review part focuses on issue related with challenges of pure water supply. Sample size was identified by using lottery sample technique. The collected data were analyzed, summarized and presented using quantitative and qualitative methods of data analysis. The study area was described in terms of location, climate and topography. After completing this works. the data was presented by considering the objective of the study depending up on the data collected from different sources. The study also included that summary, conclusions were drawn and potential recommendations were forwarded to address the issue.

5.2 CONCLUSION

In Wolkite town according to municipality, the government is attempting to reduce the challenges of pure drinking water supply by using shifting mechanisms in hours but the survey indicate that no respondent has access to 24 hour service in the town. Due to shortage of pure indicate that no respondents found to using non pipe water sources (river, developed spring, spring hand dag well) which exposes people different water born disease such as cholera, ameba and giardia.

As the data from the survey shows that females are the section of the society who is challenged more to travel more to fetch water. The level of pure drinking water supply is at its infant. As the survey shows majority of respondents gain low level of pure water supply this indicates that that the demand pure water continuously increase with population growth but the supply is less satisfactory which resulted from lack of constructed projected, lack of sustainable management, population

growth and urbanization. Establishing protection to water resource, construction of shallow wells, developing spring is some measure taken by the government.

5.3 RECOMMENDATIONS

Based on the main findings discussed some recommendations which are believed to have important implications of the town are drawn as follows:

- ✓ Mobilization of community resource for spring development and protection construction of hand dug well and construction of public tap;
- ✓ The government should be support community to access clean water;
- ✓ Establishment of appropriate water resource management;
- ✓ NGO and local government should engage in water resource management;
- ✓ Creation of awareness about the protection of water resource and sustainable use of management;
- ✓ Establishing environmental preservation to sustain source of water and creation of self- belonging among people;
- ✓ Creating coordination among different sectors in the town;
- ✓ Incorporate other institutions such as NGO which can give provision of water; and
- ✓ The community also one of the major responsible to reduce water problem

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APPENDIX
WOLKITE UNIVERSITY
COLLEGE OF SOCIAL SCIENCES AND HUMANITY
DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL
STUDIES

You have been selected to participate in the study designed to collect information on the challenge of pure water supply in Wolkite town. As a result kindly ask you to share your opinion and experiences, taking few minutes from your schedule of time. The genuine response you provide is highly valuable and determines the effectiveness of these investigation purposes, be sure that we will treat your responses confidentially and will not be used for any purpose other than research. No need of writing name.

Put your answer in the box provided designating "X" or "for each close ended question and write your answer in the space provided for each open ended questions.

Thank you in advance

For your cooperation!

Appendix Background information of the respondents

1. sex

Male Female

2 Age_____

A 21-30 B 31-40 C 41-50 D 51-60

3 Family size

1 -3 7-9

4-6 >9

4, Marital

A. Single B. Married C. UN married

5. Educational background

A. Illiterate B. Able to read and write

C. Primary school completed D. Certificate

E. Above certificate

6. Households head

A. Wife B. husband C. both husband and wife

7. Occupation

A. Daily labor B. Farmer

C. Civil servant D. Merchant E. Other

Appendix II: Questionnaires to the community

1. From where do you get water quite often?

A. Private pipe B. public pipe C. other

2. Is there shortage water in your house?

A. Yes B. no

3. What are the major challenges of pure water supply in you locality

A. Lack of pure water project

B. Population growth D. Others

C. Lack of sustainable management

4. How long the pure water supply service you gain per day

A.24 hours B. Less than C. 6 hours

D. Others E. 6hours

5. How far the location of your pure water source from your home if you do not have access to pip water?

6. Is the water demand and supply unbalance in your locality

A. Yes B. No

7. If your answer for question no 10 is "NO" what are the cause population growth

A. Lack of sustainable management

B. Lack of constructed project

C. Other _____

8. What measures do suggest so as solving related to challenges of pure water supply in your locality?

A. Construct project

B. Proper water management policy

C. Environmental conservation

D. Specify of other

9. What type alternative measures do you taken when there is water in your locality?

10 .How do you generally explain the water supply service of the town?

III, Interview with the employees of town municipal

1. What is the pure water supply problem in Wolkite town?

2. How do you explain the unbalance between demand and supply pure water?

3. Where is the source drink the coverage of pure water supply of the town?

4. What is the main challenge of do you faced in providing pure water supply in the town?

5. What type of measures has been taken for insuring the availability pure water shortage in the case of town?

6. What is the population growth and the lack of sustainable management could be the causes for the shortage of pure water?