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ADDIS ABABA UNIVERSITY
COLLEGE OF DEVELOPMENT STUDIES
CENTER FOR WATER RESOURCE MANAGEMENT



**INVESTIGATING THE CHALLENGES OF WATER SUPPLY
AND SANITATION: THE CASE OF SULULTA TOWN,
OROMIA, ETHIOPIA**

BY
NEGGESSA DAMISE MANGASHA

JANUARY, 2020
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RESOURCE MANAGEMENT, ADDIS ABABA UNIVERSITY**

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Addis Ababa University

College Of Development Studies

This is to certify that the thesis prepared by Neggessa Damise Mangasha entitled "Investigating the challenges of water supply and sanitation. The case of Sululta town, Oromia, Ethiopia" submitted in partial fulfillments of the requirements for the Degree of Master of Science in Water Resource Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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DECLARATION

I hereby declare that this M.Sc. thesis entitled "Investigating the challenges of water supply and sanitation, the case of Sululta town, Oromia, Ethiopia" is my own original work and all sources of material used for this thesis have been duly acknowledged.

Name: Neggessa Damise Mangasha

Signature: _____

Date: 15, January, 2020

ACRONYMS

CSA	Central Statistics Authority
EWCA	Ethiopian Water Works Construction Agency
HHs	Household heads
IWRM	Integrated Water Resource Management
OUP	Oromia Urban Plan Institute
STWSO	Sululta Town Water Supply Office
SPSS	Statistical Package for Social Science
UN-HABITAT	United Nations Human Settlements Program
UNICEF	United Nations Children's Emergency Fund
WHO	World Health Organization
WSBs	Water Services Boards
WSPs	Water Services Providers
WSRS	Water Services Reform Services
WSS	Water Supply and Sanitation
WSTF	Water Services Trust Fund
WUP	Water Utilization Perspectives
WWDA	Water Well Drilling Agency

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ABSTRACT

Improving water and sanitation service provision requires actions that address social, administrative and financial dimensions. Water supply and sanitation services are two of the most important, interconnected and vital sectors that have a significant roles in improving the livelihood of communities. The aim of the study was to investigate the challenges of water supply and sanitation. In this study the research questions were identify major challenges of water supply and sanitation, assess effects of inadequate of water supply and sanitation and were identify source of water supply in Sululta Town. The study used descriptive research design, and to select the target population and interviewee, simple random sampling technique was employed in the study to select the required information from 391 households. Both primary and secondary data sources applied for the study. The primary data were collected via questionnaires, interview, Focus Group Discussion and field observations. Whereas the secondary data were extracted from different published and unpublished materials. The findings of the study revealed that rapid population growth and urbanization, institutional capacity, inadequate finance and technology capacity were the major challenges of water supply and sanitation, the majority of HHs consumed less than 11-15 liters/ person/ day individually which was below WHO minimum standards of 20 liters/person, Disease outbreaks and socio-economic impacts were the major effect of inadequate of water supply and sanitation in this Town. The idea obtained from FGD (Focus Group Discussion) show that, households susceptible to high costs to buy drinking water from vendors and were exposure to unprotected water sources that caused diseases because the water interrupted for a long time. Hence, good management, increased awareness, access to adequate water supply and basic sanitation, interconnectivity of the people and government, giving attention on water supply and sanitation, increase building capacity and increment of discussion among concerned body are the most important to solve the problem faced in Sululta Town.

Keywords: Sanitation, Water supply, Challenges, Sululta Town

CHAPTER ONE

Introduction

1.1. Background

Water is an indispensable resource for human survival, essential to socioeconomic development and environmental life. Sufficient quantity, safe and affordable potable water is crucial for life and economic growth. Water is one of the precious gifts to man-kind and lack of access to safe drinking water and basic sanitation is one of the problems affecting billions of people around the world (Hesperian,2005).

According to WHO (2000), access to safe water and sanitary means of waste disposal is universal needs and indeed basic human rights. Besides, they are essential elements of human development and poverty alleviation and constitute an indispensable component of primary health care. Hence, provision of adequate sanitation services, safe water supply, and hygiene education represents an effective health intervention that reduces the mortality caused by different disease. Inadequate sanitation, poor hygiene and unclean water result not only in more sickness and death, but also in higher health costs, lower productivity and retention rates of girls and perhaps most importantly the denial of the rights of people to live with dignity.

Over 1 billion people lack access to clean water; nearly all of them live in developing countries. Yet, 2.6 billion people, 40% of the world population, half the developing world lack even a simple improved latrine (Elimelech,2006). For example in Africa more than 47 % of urban households are without access to safe water. Expanding access to basic water supply and sanitation, incorporated with hygiene education can reduce the burden of water-related diseases significantly by improving the lives of a large part of the world's population. Since provision of sanitation breaks the vicious cycle of poverty and initiates a virtuous cycle of economic well-being, it should be a vital ingredient in the poverty alleviation programs (Rajneesh, *et al.* 2002).

Water supply and sanitation a core precondition for development and wellbeing of people. Many urban of Africa country faced the problem of water supply and sanitation where level of access to water and water related facilities are said to be very low (Charles ,*etal.* 2015). For examples many urban of Ethiopia faced by the problem of water supply and sanitation that the water is only provided for few hours every day or a few days a week/water supply shortages/, uneven distribution and quality deterioration. In the Sululta town, the situation is not different from such realities.

1.2. Statement of the problem

Water is precious, vital for life, national development and for the environment. If we can use water properly, it is instrumental for growth and reduces poverty. This will can limit sustainable economic development and cause poverty (MoWR,2016).

The world today the challenges facing many countries in their struggle for economic and social development is increasingly related to water and sanitation (WUP,2003).

In the developing world the water supply and sanitation is still very inadequate Only 62% of the people in African countries have access to improved water supplies, and only 60% have access to improved sanitation (WHO,2000).

Global Water Supply and Sanitation Assessment also indicates that the majority of the world's population without access to improved water supply and sanitation services live in Africa (UNICEF,2000).

According to the study of Christopher, *et al.* (2011), urban sanitation presents one of the most significant service delivery challenges related to poverty alleviation and development in the decades to come availability of water sources throughout the world is becoming depleted by the rate at which populations are increasing.

In Ethiopia, millions of people lack access to clean water although the country has several rivers that do not cease to flow. Similar to the urban water sector in many developing countries, there are serious constraints to meet the challenge to provide adequate water for all urban residents. Ethiopia's abundant water supply has not yet benefited the population to any significant extent. In 1990, for instance only 19% of the country's population had access to a safe drinking water supply (Dagnet,2011).

According to the Getachew (2002), specified that, water supply and sanitation situation in Ethiopia is very poor, as most of the population does not have access to safe and adequate water supply and sanitation facilities. The consequences of poor water supply and sanitation

in the country is severe. Lack of access to improved water causes low economic productivity. Sanitation facilities are also in worst condition. Due to unreliability of safe and unassailability of safe and sufficient water supply and adequate sanitation facilities the estimated service level could be in much less situation (Dessalegn,1999).

All the above studies conducted on water supply and sanitation at international and national levels. But in large Town in terms population size 60,000-174,999, does not adequate research yet carried out in detail. Also, there is no previous study done in Sululta Town, in this regards of investigate the challenges of water supply and sanitation. But some studies were conducted which mainly focused on the solid waste disposal that a types of urban sanitations in Sululta town by (Lammessa, 2017). Also his findings indicated that the solid waste disposal of Sululta Town could not satisfy the residents due to weak capacity of municipality service of the town and the population increased.

The population of Sululta town increasing year mainly due to proximity to Addis Ababa city. Sululta town is one of the fastest growing towns in Oromia in terms of population. The population size of the town was calculated to be close to 52,126 (OUPI, 2014). But, now the population size of the town was calculated to be close to 1, 32,837. According to the data obtained from the Sululta municipality office (SMO, 2019), the number of household's heads are 17,377 in the Town who lived in four kebele 01, Qaso Wasarbi, N/M/Abichuu and Walee Lubee. This population influx mainly resulted from dynamics of change such as natural increase (birth and death) and migration (rural to the town, small urban areas to the town, large urban areas like Addis Ababa to the town) which increases the population growth of the town. The growth of high population and expansion of the town towards neighborhood rural areas resulted the town to re-structure its urban plan (STWSO, 2019).

So that this town has been suffering from inadequate supply and sanitation. Thus, his study focused on solid waste disposal rather than core of sanitation like toilets, hygienic practices. So that, to get the solution, this research tried to investigate the challenges of water supply and sanitation in the study area, Sululta Town. Generally, this research studied about toilets, challenges of sanitation and water supply, impacts of inaccessibility of water supply and sanitations and source of water supply and challenges of water supply and sanitation in Sululta Town. Then it forwarded the recommendation based on the real problems.

1.3. Research questions

In order to achieve the research objectives and seek answers for the state problems, the following major research questions are drawn.

1. What are the major challenges of water supply and sanitation in the town?
2. What are the effects of inadequate water supply and sanitation?
3. What are the source of water supply and types of toilets in the Sululta town?

1.4. Objective

1.4.1. General objective

The general objective of the study is to investigate the challenges of water supply and sanitation in Sululta town.

1.4.2. Specific objectives

The specific objectives are:

1. To quantify the source of water supply and type of toilets in Sululta Town.
2. To assess the effects of water and sanitation inaccessibility in the Town.
3. To identify the major challenges of water supply and sanitation in the Town.

1.5. Scope of the study

The scope of the research was conducted to investigate the challenges of water supply and sanitation in 4 Kebele namely 01 Kebele, Qaso wasarbi, N/M/Abbichu and Wale lube in Sululta town. The scope of the study was limited to examine the challenges of households water supply and sanitation only (it doesn't include industries and consumptions by other sectors and it does not include the technical aspects of water supply and sanitations) in terms of water supply services in all parts of the town and their sanitation situation that focused on toilets services of the households.

1.6. Significance of the study

The study contribute to a better theoretical understanding of the overall features of water supply and sanitation and it give some guideline information to policy makers, public administrators, water supply manager, municipal leaders, non-government organization researchers and environmental protection agencies who seek to improve challenges of water

supply and sanitation and to minimize related problems in the study area. Researchers and environmental protection agencies who seek to improve challenges of water supply and sanitation and to minimize related problems in the study area. The study also important in putting baseline information to the next work as a springboard for researchers who would like to conduct detailed and comprehensive studies either in the town or other study area.

1.7. Limitation of the study

In the process of collecting primary data, the households' interest was minimum in providing the required data. It was very difficult to made interviews with some officials as they always made appointment to give information and not available on the appointment. Shortage of time and finance were also major challenges to accomplish this paper.

1.8. Organization of the study

The study was divided into five chapters. The first chapter deals with the introduction part which include: background of the study, statement of the problem, objectives of the study, research questions, significance of the study, the scope of the study, limitation of the study and organization of the study.

The second chapter deals with the review of related literature this part would provide the main points of the theoretical framework and review of empirical studies. The third chapter focuses on research methodology which consists research design sources of data, sampling procedure, and sample size, methods of data collection and methods of data analysis. The fourth chapter provides; the presentation and analysis part of the study, results, and discussion. Finally, the fifth chapter presents conclusions and recommendations.

CHAPTER TWO

Literature Review

2.1. Concept of water supply and sanitation

Poor access to safe water and adequate sanitation in many developing countries continues to be a threat to human health. In the beginning of 2000, over 25% of the developing world's urban population lacked adequate sanitation. Studies conducted by UN (2017), states that 80% of all diseases and 25% of all deaths in developing countries are caused by polluted water. This is particularly so in the developing countries where level of access to water and water related facilities are said to be very low. More than 1.2 billion people in the World still lack access to safe drinking water and 2.6 billion lack access to even basic sanitation (Antonio,2005). The 1980s were stated the United Nations International Drinking Water Supply and Sanitation Decade during, which the international community set an determined target of achieving 100% coverage in water supply and sanitation by 1990 (Rajneesh, *et al.* 2002).

More than 80% of diseases in the world are attributed due to unsafe drinking water or to inadequate sanitation practices (USAID,2008). The survival and well-being of a nation depends upon sustainable development and for this, water supply and sanitation which are ingredients of a healthy and productive life, are essential requirements. For the poor people residing in urban slums and rural areas, to achieve a better economic growth rate and higher productivity, priority has to be given to the health of these people, for which provision of public utilities like water supply and sanitation is necessary. Provision of safe and sufficient drinking water with adequate sanitation service in urban areas is an important investment which safeguards health and safety of the people living in urban areas, and protection, conservation and promotion of the environment, especially in developing countries. According to Brundtland (1987), urban sanitation defined as urban sanitation is one that meets the basic sanitation needs of all population. In the next 15 minutes about 90 children in developing countries - six children per minute will have died from disease caused by unsafe water and inadequate sanitation. In 1990, 3 million deaths worldwide were attributed to diarrhea but there were over 4 billion episodes, or more than a thousand times as many. Children under five are the most vulnerable, accounting for 55% of all episodes but for 85% of the deaths from diarrhea diseases (Jamal,2003). But 2.2 million Children less than age of five die each year due to “unsafe water,

inadequate sanitation and lack of hygiene”, diarrhea kills 1.5 million children less than five every year and diarrhea kills more young children than AIDS, malaria and measles combined (USAID,2006).

2.2. Theoretical Review

A general theory on the relationship between water supply and sanitation, the threshold-saturation theory, is proposed. The theory takes into consideration three variables: health status, socioeconomic status, and sanitation level, and attempts to encompass, for the first time in one general theoretical review, numerous conflicting empirical findings. The two-tiered S-shaped logistic form of the relationship that is proposed assumes that at the lower end of the socioeconomic spectrum there is a threshold below which in community water supplies and/or excreta disposal facilities alone result in little detectable improvement in health status. Similarly, at the higher end of the socio-economic scale, it is suggested that a point of saturation is reached beyond which further significant health benefits cannot be obtained by investments in conventional community sanitation facilities (Hillel, *etal.*1981).

Water supply reliability theory can be defined in terms of the shortages that result from failures of a system’s physical components. A reliability factor for a single failure or for a selected time period can be defined in terms of the capacity lost during failure, which is measured as a fraction of the demand rate or the demand volume. Reliability, defined as the probability that a given reliability factor will be achieved, can be increased by adding facilities, storage, pumping capacity, pipelines (Uri Shamir, 1981).

According to the theory of urban planning is governed by social structure, level of development of productive forces, science and culture, natural and climatic conditions, and a country’s national characteristics. This theory has been developed by planners based on Theoretical of urban planning, such as de-urbanism (related to the late 19th-century concept of the garden city) and urbanism (the designs of Le Corbusier, the leader of the school in the 19th century). Urban planning encompasses a complex network of socioeconomic, decorative and water and sanitation problems. The general rule for pre-socialist urban planning involved to some degree the influence of private ownership of real estate and land (Author, 2014).

The theory of change that guides IRC International Water and Sanitation Centre’s Services at Scale (Triple-S). The theory of change explains and justifies the course of action in achieving

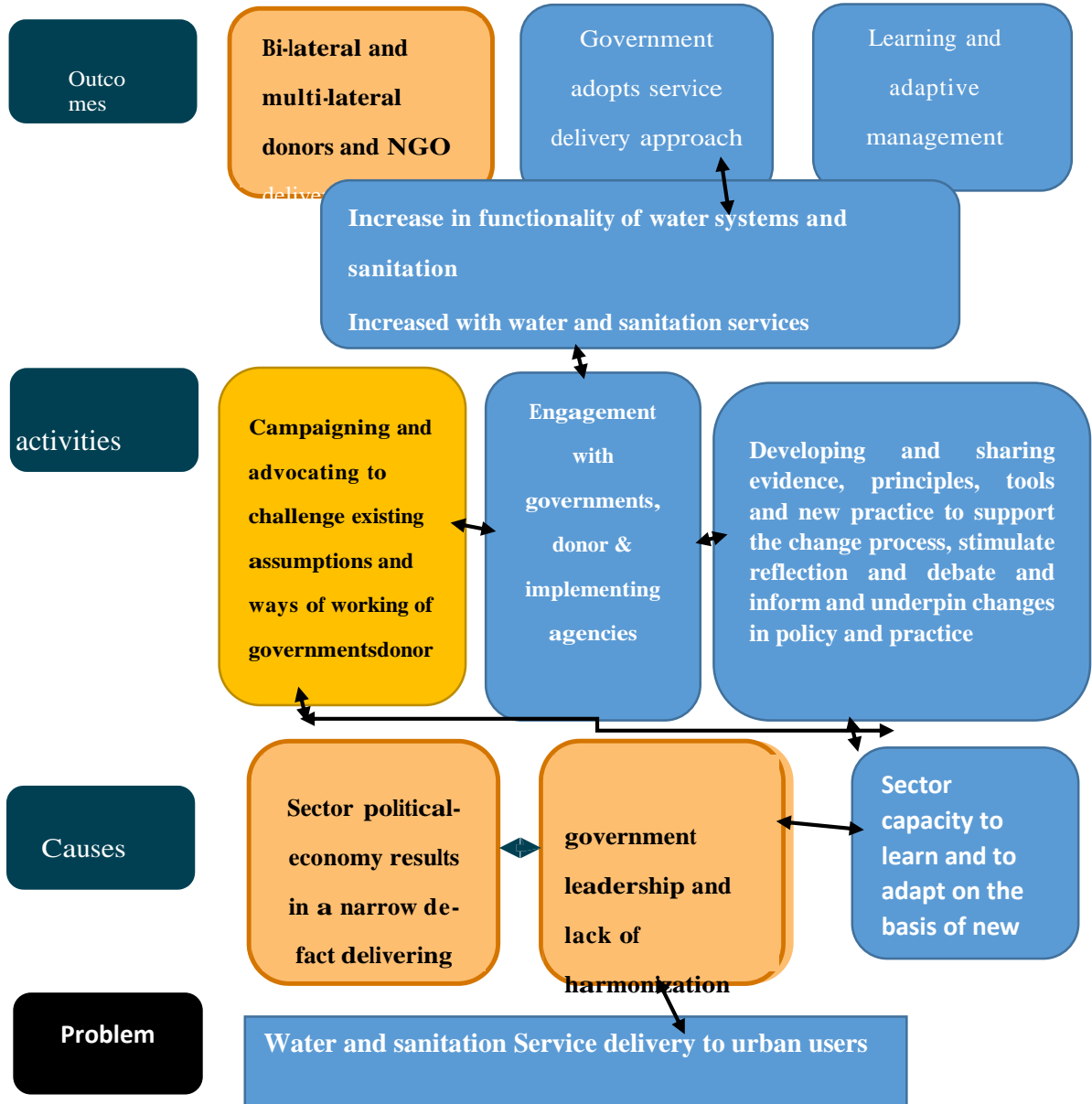
its goal of contributing to provision to all people of urban water services. Triple-S (urban water supply Services) promotes urban water services by helping to catalyze change in the urban water sector. Triple-S is guided by an understanding that current, de-facto, practice is overly focused on the provision of new infrastructure and as a result contributes to a failure to provide urban water services. Triple-S brings to a package of knowledge, strategies and tools that we believe can support the required change towards a more appropriate paradigm one that we refer to as a service delivery approach. At the heart of our approach to change is a vision of how the urban water sector needs to function if sustainable water services are to be provided; and a set of guiding messages intended to inspire stakeholders to start creating change in their own context. This approach is informed by our understanding of the water sector as a complex adaptive system, consisting of multiple actors and relationships, all of which need to work together effectively for services to be delivered. While the vision of sustainable and appropriate urban services provided to all is universal, the paths by which each country will achieve these are entirely context dependent. Triple-S (urban water supply Services at Scale) is a six-year (2009–2015), multi-country learning initiative to improve water supply. It is led by IRC International Water and Sanitation Centre (IRC) and funded by the Bill & Melinda Gates Foundation (Taylor, 2009).

PILLARS OF CHANGE. The Triple-S theory of systemic change in the water sector is built on three pillars. These three pillars provide a vision of a water sector capable of delivering sustainable services.

1. A service delivery approach
2. Harmonization and alignment
3. A learning and adaptive sector

Triple-S theory of change in the urban water sector and sanitation.

Figure 1: Theoretical framework of water supply and sanitation



Source: Literature review, (2011).

2.2.1. Urban Sanitation

The sanitation sector is serious issue like water supply. Some 2.6 billion people, half of the developing world, live without improved sanitation. Sanitation coverage in developing countries (49 per cent) is only half that of the developed world (98 per cent). In sub-Saharan Africa the coverage is a mere 36 per cent, and over half of those are without improved sanitation. Similarly, nearly 1.5 billion people live in China and India without access to improved sanitation services UNESCO (2006). The Tree Strategic Pillars for Improved Sanitation and Hygiene. An enabling framework to support and facilitate an accelerated scaling-up through policy consensus, legislation, political commitment, intersect oral co-operation, partnership, capacity building linked to performance contractual agreements, supportive supervision, research and monitoring. Sanitation and hygiene promotion through participatory learning, advocacy, communication, social Marketing, incentives or sanctions to create demand and forge behavior change. Improved access to strengthen the supply of sanitation through appropriate technology solutions, Product and project development, and support to local producers and artisans.

In Ethiopia more than 250,000 children die every year from sanitation and hygiene related diseases. A low number of households (between 6 and 18 percent) have access to improved sanitation. Less than 1 percent of the health budget is dedicated to sanitation and hygiene improvement.

Health - diarrhea prevention, mortality decreased, curative care reduced and nutrition improved.

Socio-economic - fitter workforce, less time caring for the sick, less money spent treating sickness.

Educational – enhanced girl child school attendance and attaining higher levels of education

Social – privacy, dignity, safety and a cleaner environment.

Gender – women stand most to gain from improved sanitation and hygiene benefits.

Political – women represent 50 percent of the electorate, making sanitation an important political.

In developing countries, rapid population growth and urbanization is creating an added demand for housing, infrastructure services including sanitation services. Providing sanitation services especially for the poor who are living outside the designated residential areas like illegal settlements or slums is a challenge. The World Bank estimates that almost 26% of the global urban population, over 400 million people, lack access to the simplest latrines (World Bank,2000).

Sanitation is any system that promotes proper disposal of human and animal wastes, proper use of toilet and avoiding open space defecation. However, sanitation is the collection, transport, treatment and disposal or reuse of human excreta, domestic wastewater and solid waste, and

associated hygiene from urban sanitation is not simply a technical problem related to engineering constraints, but also a question of the integration of water and sanitation infrastructure planning within land development and management plans. In addition, these plans need to be mixed with a new set of management processes that are orientated towards attaining urban sustainability goals (Ingle *et al.* 2011). The drainage and solid waste collection services are not adequate in most of the developing countries. The systems are either poorly planned and designed, or operated without inadequate maintenance, which means that the existing services are often of poor quality.

Most of the city wastes are dumped and discharged directly to the open environment. As a result, untreated urban wastes pollute surface as well as ground water sources. The situation is even worse in the area of low-income settlements. Septic tanks and feeder networks regularly discharge effluent into street gutters, open streams or drainage canals. This creates unpleasant living conditions, public health risks and environmental damage (Arlosoroff,1999).

According to World Health Organization defines sanitation as group of methods to collect human excreta and urine as well as community waste waters in a hygienic way where human and community health is not altered. The main targets of sanitation is to minimize the spreading of diseases by adequate waste water excreta and other waste treatment, proper handling of water and food and by restricting the occurrence of causes of diseases.

According to Korkeakoski (2006), the purpose of sanitation is hopeful people enough clean water for washing and drinking. Additionally, health and hygiene education is involving to sanitation in order to make people diagnose where health problems create and how to better sanitation by their own actions. Essential part of sanitation a household is considering to have adequate access to sanitation if a waste disposal system, either in the form of a private toilet or a public toilet shared with a reasonable number of people, is available to household members. However, sanitation is the collection, transport, treatment and disposal or reuse of human excreta, domestic wastewater and solid waste, and associated hygiene from urban sanitation is not simply a technical problem related to engineering constraints, but also a question of the integration of water and sanitation infrastructure planning within land development and management plans. In other word, safe waste disposal through the provision of toilets is a major priority as it builds the first barrier to direct and indirect excreta-interrelated diseases.

In the field, water supply and hygiene education, which would include sufficient water supply and soap; toilets maintenance; and the actual training and education, are important complements to

toilets construction (Steve ,2004). Centralized sewerage systems are usually not within reach of the municipalities due to the high costs for sewers and treatment facilities. For example WHO (2000), the sewerage system in Addis Ababa caters only for about 3% of the city's population. In addition, many Ethiopian cities aspect difficulties in implementing a water-based sanitation system (i.e. water-flushed toilets) as a result of water shortages and inappropriate water supply system. According to, access to sanitation includes safety and privacy in the usage of these services. Coverage is the proportion of people using improved sanitation facilities such as public sewer connection, septic system connection, pour flush latrine, simple pit latrine and ventilated improved pit latrine. There are two types of urban sanitation. Those are on site sanitation and offsite sanitation. On-site sanitation is the main part of excreta disposal in most sub-Saharan African cities and will remain the most appropriate level of service for the urban poor in the medium term. Offsite systems are kinds of sewerage where part or all of the excreta are transported away from the household for treatment or disposal at a central point. Sewerage may be transform where only liquid matter is piped away (small-bore sewerage) or where sewerage works on a non-constant flow principle (shallow sewers) and does not take storm water (WHO,2000).

2.2.2. The state of urban water supply in Ethiopia

The water supply and sanitation sector in Ethiopia is one of the least developed and is mostly characterized by service deficiency of physical infrastructure as well as by inadequate management capacity to handle policy and regulatory issue and to plan, operate, and maintain the service. Regarding this, World Bank (2000), indicated that though Ethiopia is often referred to as the “water tower” of Africa, only a quarter of the country's population have improved access to water sources. Rushing streams from the Ethiopian highlands form tributaries of famous Blue Nile, Tekeze, Awash, Omo, Wabeshebele and Baro-Akobo-rivers which flow across borders to neighboring countries. Six billion cubic meters of water run out of Ethiopia as the Blue Nile River to the Sudan and Egypt. But as recurrent drought drives more and more rural people from their traditional farmlands to urban centers, Ethiopia faces growing urban water crises. Ethiopia has one of the highest urbanization growth rates in the developing World. According to data obtained from the CSA, the country's urban population was growing at 4.8 per cent per annum between the 1995-2000.

The urban population in Ethiopia in 1984, the first census period, was 4.3 million forming 11 per cent of the total population. In 1994, the second census period, the urban population was 7.4 million. Total urban population had increased by 12 per cent from that of 1984.

Interns of urban centers, in 1984, Ethiopia had 312 urban centers with population of over 2000. In 1994, the second census period, the urban centers in the country grew to 534 registering an increase of 71 per cent over that of 1984 though the definitions of the two censuses are not the same (Tegegne,2000).

The growth has been much higher for some intermediate towns. The rapid growth of urban population has placed tremendous pressure on the management capacity of municipalities for service delivery and local economic development. The water supply and sanitation sector in Ethiopia is one of the least developed and is mostly considered by service deficiency of physical infrastructure as well as by inadequate management capacity to handle policy and regulatory issue and to plan, operate, and maintain the service (Benner,2003).

Safe drinking water is the birthright of all humankind as much a birthright as clean air (Rao,2002) while access to clean water can be considered as one of the basic needs and rights of a human being health. This phenomenal growth has also burdened many municipalities with the problems of inadequate housing, poverty and unemployment, inadequate water and electricity supply, and poor sanitation systems. Available data also indicate that in the next 25 years (1994-2020), nearly 30 per cent of Ethiopia's population will live in cities. This kind of rapid urban population growth will inevitably call for huge investments in housing, urban infrastructure, water and electricity supply, sanitation systems and environmental protection programs and programs to alleviate poverty and unemployment in the cities of people and dignified life is based on access to clean. Water is very important in different of ways; these include domestic and productive uses. Domestic water use takes the form of drinking, washing, cooking and sanitation, while productive water uses includes those for agriculture, Beer brewing, brick making etc. Safe drinking water matched with improved sanitation contributes to the overall wellbeing of people; it has significant bearing on infant mortality rate, longevity and productivity. However, the majority of the world's population in both rural and urban settlements does not have access to safe drinking water.

According to WHO (2003), only 16 percent of peoples in sub Saharan Africa had access to drinking water through a household connection (an indoor tap or a tap in the yard). Not only their poor access to readily accessible drinking water, even when water is available in these small towns there are risks of contamination due to several factors like inappropriate waste disposal and lack of water supply infrastructure such as pipe line for water (Mengistu,2008).

This implies that the challenge will involve well trained municipal management and resource capacity, responsive urban governance and well trained and motivated personnel and sustaining

services such as water, electricity supply, local revenue collection and administration to meet the ever growing demand for better and more quality services and infrastructures (Asseffa,2006).

2.2.3. Water supply and sanitation strategy

The intention of this strategy is to translate state water policy into action with setting of short, medium and long-term action programs to achieve policies of water related issues. The objective of water supply and sanitation strategy is to provide guidelines on the provision of efficient, reasonably price and sustainable water and sanitation service for the people of Ethiopia, including watering for livestock. Specifically, the water supply and sanitation strategy aims at: Identify appropriate, effective, reliable and affordable water supply and sanitation technologies based on the acceptability of the community through participate the population for the choice of technology, Create feasible public information and awareness management system to informing people about all issues related to water and sanitation, distributing technical information through various media outlet, encourage water conservation with demand management and regulating measures, Provision of a sustainable service within an affordable price range, it also promotes site-specific water tariffs that take into account the financial, economic and social status of beneficiaries and allow the involvement of local communities in setting tariff to assure the ability and willingness to pay of the consumer, Promote subsidization based on the local serious condition by focusing the direct beneficiary. *"Determine a 'social tariff' for poor communities which minimally covers operation and maintenance costs"* and Set a particular flat rate tariff for community service of public stand and hand pump (MoWR,2002).

The Ethiopian government water policy adapted both economic and non-economic approach to save water resource without affecting the future water demand. Economic approach or pricing methods is one of the mechanisms of demand management to use water efficiently and equally in a sustainable manner. In addition, the non-economic approach done through awareness creation for the people to save the water and increase supply (Olmstead and Stavins,2009).

Water is precious, vital for life, national development and for the environment. If we can use water properly, it is instrumental for growth and reduces poverty. In contrast, if water is not properly used the quality will deteriorate and supply becomes limited. This will can limit sustainable economic development and cause poverty (MoWR,2002).

2.2.4. Water resources management policy

The Ethiopian Water Resources Management Policy has set out a proclamation, No. 197/2000,

which sets principles, goals, priorities and objectives related to water resources management and utilization. However, the focus will mainly be on the development of blue water resource in Ethiopia. This policy will help in integrated water supply and sanitation with other sectors to ensuring protection, conservation and distribution system, which is able to share resources within the agreements. These are the objectives focused on the water supply part:

- Promote integrated and comprehensive management of water resources to avoid fragmented system.
- Enhance the planning and program of water sector include the protection and conservation of water.
- Recognize that water is a vital, scarce and socio economic resource, therefore manage and utilize the available water resources in planning, long-term aim and a sustainable basis.
- Ensure water supply fulfils the requirement of the household basic needs, after this the others allocation involved on efficient and equitable manner based on the criteria of socioeconomic development.
- Encourage the private sector participation and involvement in the management of water resources (MoWR, 2001).

In order to achieve the above-mentioned policy, several sets of guiding principle were formulated. Some of the fundamental guiding policy principles on water policy are:

- Water is a natural resources commonly possessed by all Ethiopia people.
- Citizens should have access adequate water with acceptable quality to satisfy their basic needs.
- Water resources development will be emphasized an integrated approach structure, participatory approach and decentralized management system.
- Water resource management will be ensured reliability, social equity, economic efficiency and sustainability.
- Promote the participation of stakeholders and users; particularly women in the appropriate place of water resource management ladder (MoWR, 2001).

Dublin international conference stated guiding principles to use water in sustainable manner. One of the principles is, since water is limited and vulnerable resource, needs effective integrated management between different sectors. The development of all social and economic should be

with the protection of environment. On the other hand it advocates that, the management and development of water resources should be on a participatory approach of users and policy makers together in all planning, implementing and decision-making level (Edwards ,1988).

Integrated water resources management (IWRM) attempts avoid fragmentation/conflict or aimed at the coordinate of different stakeholders to meet their interest. IWRM is the interlink age of the management of water, land and other related resources to increase the socio economic benefit at equitable manner without affected sustainability for the future needs (UN ,2017)

As a principle, the Ethiopian water policy encouraged IWRM to fulfil the needs of different water users sectors by giving priority for domestic water followed by livestock. The others user of water; irrigation, hydropower, ecosystem, industry and mining are taking priority based on their contribution for the social and socioeconomic developments. However, in this regard, some writers pointed out, the Ethiopia water resource management has institutional and natural problems. The institutional problems are the planning, implementation and decision-making in the financial and technical works. Besides, lack of clear water policy limit the water development performance. Whereas, the natural problems that hinder the effective distribution of water throughout the country is the variation of water availability in time and space, which limit to distribute evenly. According to (Konjit ,2015) there is limited evidence that shows Addis Ababa face physical water shortage but there is a weak water resource development and management implementations. In addition, there is top down level of decision-making without the participation of different water user stakeholders and communities in the planning.

2.2.5. Water Supply and Sanitation Worldwide and in Africa

According to UNESCO (2006), every person needs 20 to 50 liter of potable water a day for their basic needs: drinking, cooking and cleaning, but more than one in six does not have access to such amount of potable water.

Africa has the lowest total water supply coverage of any region, with only 62 percent of the population having access to improved water supply. The situation is worst in rural areas, where coverage is only 47 percent. According to the JMP (2010), around 2.6 billion people do not have access to basic sanitation; and as a result of poor access to basic sanitation 1.5 million peoples die each year. Many of these people live in south East Asia and sub-Saharan Africa. Sanitation coverage in Africa also is poor, only 60 percent of the total population in Africa has sanitation coverage, with coverage varying from 84 percent in urban areas to 45 percent in rural areas (JMP, 2010). Ethiopia is often referred to as the “water tower” of Africa, only a quarter of the country’s population have improved access to water sources. The water supply and sanitation sector in Ethiopia is one of the least developed and is mostly characterized by service deficiency of physical infrastructure as well as by inadequate management capacity to handle policy and regulatory issue and to plan, operate, and maintain the service (World Bank, 2000).

The poor access to readily accessible drinking water, even when water is available, there is risks of contamination due to several factors like inappropriate waste disposal and lack of water supply infrastructure such as pipe line for water (Mengistu,2008).

2.2.6. Sources of water

The source of water supply for different town from ground water and surface water. According to Sijbemsa (1989), there are different source of water.

Groundwater: Groundwater is water used by humans comes mainly from land such as traditional wells, deep wells, springs, hand pump etc. It inclines to be of higher microbiological quality (having undergone natural soil filtration). However, it is relatively problematic to extract. More technology and energy is required (compared with other water sources) to bring water from within the earth up to the surface. **Household connection:** Household connection, is a water service pipe connected within house plumbing to one or more taps (e.g. in the kitchen and bathroom) or tap placed in the yard or plot outside the house. **Public tap or standpipe:** Public tap or standpipe is a public water point from which people can collect water. Many low-income households that are

incapable to afford a household connection are relying on public water points. Increasingly, households with a private connection are selling water to their neighbors. Intermediate service providers: this includes private providers or community based organizations supplying water in unserved areas (UN-HABITAT,2006). Surface water: Surface water originates from rain water. It is the main source of water supply in many areas. It includes rivers, tanks, lakes, manmade reservoirs and sea water. Surface water is prone to contamination from human and animal sources. As such it is never safe for human consumption unless subjected to sanitary protection and purification before use.

2.2.7. Effects of water and sanitation inaccessibility

According to UNICEF (1999), there are a number of potential welfares to improved access to water supply, in addition to the reduction of disease. Although water and sanitation are the primary requirements of human being. That is reasons why many communities offer for placing a high priority on improved water supply usually relate to benefits outside health. Time saved:-Women and girls can pass many hours a day collecting water from distant sources and thus the time saved by taking a safe water source closer to the household can be very significant. The time saved is used for much needed leisure or, possibly (but not necessarily) activities relating to improved child care, or economic production. Less time spent fetching water is one less possible excuse for not allowing girls to attend school or in some extreme cases, even to marry. Energy saved: - women who walk long distances to collect water can burn as much as 600 calories of energy or more per day, which may be one third of their nutritional intake. Closer sources of water can thus recover the nutritional status of women and children (and hence health and wellbeing) (UNICEF,1999). Prevention of injuries: - When girls are forced to carry heavy loads of water over large distances, there is a danger of lasting spinal column and pelvis injury and deformations. Closer water sources minimize this (UNICEF,1999).

But unimproved water and sanitation services have many negative impacts on people livelihood. Among which; health and socio-economic are the major.

2.2.7.1. Health impacts

The change of water and sanitation in under developing countries is widely driven by the need to minimize the incidence and widespread of infectious disease caused by harmful microorganisms. The majority of harmful diseases that affect humans are derived from faeces and transmitted by the faecal-oral route. Harmful disease transmission may occur through a variety of routes including food, water, poor personal hygiene and flies (Ahmad and Nalubega 2001).

Approximately 3.1% of deaths worldwide are attributed to unsafe water, sanitation and hygiene practices. Africa carries the heaviest burden, with 4 to 8% of all disease in Africa being related to poor water, sanitation and hygiene. In Ethiopia, water and sanitation related diarrhea accounts for approximately 20% of all deaths in children under the age of five, taking the lives of close to 100,000 children annually. According to FDRE (2005), demographic and Health survey, only 8% of Ethiopian households have water on their premises and only 38% have a toilet. In addition, poor water and sanitation is the source for many other health problems including chronic intestinal parasites that attribute to high prevalence of malnutrition, anemia, diarrhea, cholera, malaria, trachoma, intestinal helminthes retarded growth.

2.2.7.2. Socio-economic impacts

Water supply and sanitation inaccessibility will restrict to escape poverty and aggravate the problems of exposed and marginalized groups especially those affected by HIV/AIDS and other diseases (Alaci and Alehegn,2009). According to Ethiopian Ministry of Health (2005), the well-known negative synergy of diarrhea disease, malnutrition and opportunistic infections are known to have short-term health impacts and long term debilitating effects. In the long term, child development is impaired resulting in growth retardation and diminished learning abilities.

2.2.8. The major challenges of water supply and sanitation.

To supply adequate clean water and deliver sanitation facilities to urban residents, the world came across many difficulties, which are connected to capacity of the nations, (i.e. technological and institutional), shortage of finance, rapid urbanization and declining of global water resource.

2.2.8.1. Lack of capacity

According to Adeel, *et al.* (2008), capacity is a flexible concept and encompasses the public sector, academia; community based organizations and the private sectors, and ranges from the individual to institutions to society as a whole. Capacity can be described in terms of the human technological, infrastructural, institutional and managerial resources required at all levels from the individual through to national governance. Not only does capacity have to be built within each of these levels, but it has to be institutionalized and local communities need to be empowered to use it effectively.

2.2.8.2. Technological capacity

New technologies are very important to Passover barriers to water and sanitation service provision. Technological capacity includes the advancement and application of new technologies, the technical skills needed to effectively construct, operate and manage a technical solution; the translation of information regarding technologies to promote informed decision-making when implementing a technical solution; the availability and accessibility of spare parts (Sijbems, 1989).

2.2.8.3. Institutional capacity

There is a need for institutions that bring together many disciplines, such as the natural sciences, public health, engineering and the social sciences. Integration and interaction between institutions and different sectors of population at decision making, executive and participative levels is required to plan and execute actions in a coordinated way. This integration is the basis for multi spectral approaches to ensure that planned goals are achieved and actions converge to solve environmental, water and health problems (Confalonieri, *et al.* 2008).

2.2.8.4. Inadequate financing

Historically, water and sanitation has suffered from severe under financing. This results from inadequate internal financial capacity in the poor countries to achieve water and sanitation

goals; poor political decisions for allocation of development aid; an overall reduction over time in development aid and the limited cost recovery potential in poverty stricken regions (Confalonieri, *et al.* 2008). Also stated that, to ensure that resources for safe water and sanitation are used effectively at the local level, the local capacities to design, finance and manage improved service delivery must be greatly enhanced.

2.2.8.5. Population growth and urbanization

Population growth and rapid urbanization will create a severe scarcity of water as well as tremendous impact on the natural environment. Population growth and rapid urbanization will create a severe scarcity of water as well as tremendous impact on the natural environment. According to UNPP (2006), in Challa (2011), in less developed countries, urban population will grow from 1.9 billion in 2000 to 3.9 billion in 2030, averaging 2.3% per year.

Besides having less or not invested in urban infrastructure, Africa is urbanizing faster than any other region. Between 1990 and 2025, the total urban population is expected to grow from 300 to 700 million; and by 2020, it is expected that over 50% of the population in African countries will reside in urban areas. According to Cleoplace (2007), in order to meet the established millennium development goal of ‘halving the unsaved population by 2015’; urban Africa will require 80% increase in the numbers of people served. This objective would require, on average, about 6,000 to 8,000 new connections every day. Political commitment to these goals, backed by resources and action is essential if utilities are to prevent a widening of the gap between ‘saved’ and ‘unsaved’ households. According to the 1994 Ethiopia population census report showed, the total urban population was 7,323,122 (13.7% of the total population), after ten years (i.e. 2004) the total urban population increased to 17,588,735 (32.89%) and by the year 2015 urban population is going to increase by 22,925,177 (32.26%) Ethiopia Central Statistical Authority (1994, 2004 and 2015 projection). In order to meet the future water demand, cities will need to tap their water supply either from a deep ground or surface sources situating a far distance away from the urban area (Challa ,2011).

2.2.9. Institutional Development

The waters sector has several institutions charged with the responsibility of ensuring adequate water and sanitation services to the entire citizens of the country.

Clearly, improved IUWM will require engagement with a complex array of administrative, political, institutional, social, economic challenges in cities. There is a need, therefore to

stimulate changes in policy and practice in urban water management within institutions, other levels of government and civil society. An underlying hypothesis is that without institutional change it will not be possible to achieve a paradigm shift towards more integrated management. The new paradigm is likely to require; Changes in holistic environmental thinking, Changes in institutional structures and frameworks, Change in use of means and resources, Changes in managerial methodologies and approaches & Changes in approaches to financial planning and management. Developing and managing institutional improvements is a difficult process. The waters sector has several institutions charged with the responsibility of ensuring adequate water and sanitation services to the entire citizens of the country. These mainly came after the enactment of the Water Act, 2002 which looked forward to; the separation of the management of the water resources from the provision of the water services. The separation of policy formulation on water issues from the day to day administration and regulation. Decentralization of the functions in the water and sanitation sector to the lower level state organs. The involvement of non-governmental entities in the management of water resources. The involvement of the non-governmental entities in the provision of water services .

Ethiopia's target for water and sanitation is to increase access to safe water and sanitation in rural and urban areas through raising the standards of the country's overall water resources management, storage and harvesting capability FDRE, 2005. This the government has put down many measures and various institutions in the past decade to ensure that the community members and the entire citizen fraternity receive adequate water and sanitation supply in the country. According to Federal Water Resources Management Policy 1999 and the Water Sector Strategy 2001, the following institutions, and institutional arrangements, are responsible for the governmental delivery of water supply services. Those are Ministry of water resource, Regional Water Resource Development Bureau, Zonal Water Resources Development Offices, and Woreda Water Resources Development Offices (MoWR,2016).

Community participation of the conventional wisdom is that without community participation, there is little likelihood of sustainability being realized (Narayan,1995). This is in part a pragmatic recognition of Governments' inability to deliver services, but in part an ideological proposition which values concepts such as 'empowerment', and 'capacity building' for their own sake. Even from a strictly practical approach, a number of the issues mentioned earlier illustrate the need for capacity building at the community level as well as at the level of Government or NGO. Education in health and hygiene, training in maintenance and the handling of cash, and involvement of women in community institutions and decision-making, are key activities needed to create local capacity to manage. On the

part of Governments and NGOs, listening and learning from the community, developing respect for existing methods of organization, problem-solving, conflict resolution, and decision-making, are essential components of such capacity-building work. This exposes the need for a cadre of staff in the Government or NGO which can fulfill these external support and capacity building functions.

To quote from the work of Abrams (1996), on the review of the African domestic water and sanitation: “It is generally agreed that community engagement and empowerment is the solution to the sustainability of water supply and sanitation services. There are the established informal Small Service Providers which are responsible for the provision of the water services to the rural settlements and the poor urban settings. These usually provide their services through the use of tankers and jerry cans and are usually run by self -help groups, women groups who provide water services to the local level community set ups. It is important to note that there are proposals to formalize water and sanitation services provision in the poor urban and rural areas. These proposals include the Community Project Cycle which makes funds available for local communities that are willing to comply with minimum service standards and the Urban Poor Concept which has been implemented in some of the poor urban settings (Kahariri,2010).

2.3. Empirical Review

From the agreements and resolutions of this Millennium Summit and other world conferences organized by the UN in the past decade, the so called 'Millennium Development Goals' (MDGs) evolved. Water plays a prominent role in all of these goals. The Millennium Development Goal of halving by 2015 the proportion of people without access to adequate and affordable safe drinking water will be hard to achieve in Africa due to low levels of existing coverage, but this will become almost impossible if sustainability levels cannot be improved (Reed,2004).

At the Millennium Summit in September 2000 the Member States of the United Nations (UN) reaffirmed their commitment to working towards a world in which sustaining development and eliminating poverty would have the highest priority (World Bank, 2010). The growing population of most developing countries is disproportional in urban areas. This places considerable pressure on already overburdened budgets to increase the water supply and waste water infrastructure. Moreover, little or no resources are left to supply, let alone, improve water supply and sanitation (Helweg, 2000).

It is estimated that majority of all water supplies in sub-Saharan Africa are not functioning (Baumann ,2005), and despite the frequency with which it appears in development discourse, the reality remains elusive.

Recent field studies in Ghana, Kenya, Uganda and Zambia have indicated that the actions of many stakeholders in the rural water supply sector undermine the provision of truly services (Reed, 2003).

Much talk of sustainability is simply rhetoric, since it is often in the self-interest of NGOs, bilateral and multilateral agencies, governments and the private sector to limit the water supplies. Hence, a history of top-down service delivery by governments and NGOs frequently leaves a legacy of dependency in the villages on external assistance. 80% of all diseases in the world are caused by inadequate sanitation and polluted water supplies (WHO, 2003). Consequently, in the event of a failure in the water supply the urban do not make any attempt at repairs as it is not perceived to be their responsibility. Communities participated in all stages from planning to implementation. However, it is emphasized that there must be common features for the success of the water supply and sanitation services under a community management approach. Management skills on how to handle group dynamics, institutional arrangements and monitoring and evaluation of the systems are the important element for success of managed water supply and sanitation services (Schonten and Moriarty,2004).

It is however noted that successful people management of water supply and sanitation services needs on-going support and guidance even if communities are well trained and organized to operate the system (Harvey,2002). In India the government also tried to provide water supply based on the demand orientation. The India Infrastructure Report, a recent authoritative document on approaches to infrastructure provision in the country acknowledges the benefits of a demand orientation in infrastructure provision consisting improved assessment of users' needs for the services and demand management. In rural water supply and sanitation, the demand-responsive approach is already being implemented in some parts of the country with elements such as self-selection of service types, participation of NGOs, CBOs, and increased participation of women in the community (Mani, 2000).

Governments and private sectors are the important organs to ensure institutional support for water supply service under management approach. The water supply and sanitation sector in Ethiopia is one of the least developed and is mostly characterized by service deficiency of physical infrastructure as well as by inadequate management capacity to handle policy and regulatory issue and to plan, operate, and maintain the service. The national safe water supply coverage has reached 42.2% (MoWR, 2007).

The Ethiopian government (subsequently the regional governments) adopted the National Water Resources Management Policy in 1999 (MoWR, 1999) so as to increase and sustain water supply services in both rural and urban areas. The overall goal of the policy is to enhance and promote 'efficient, equitable and optimum utilization of water resources' for socioeconomic development. The policy follows the principle that the water supply sector has to ensure that every Ethiopian citizen has access to water of acceptable quality to satisfy their basic human needs. Like any other sector, water supply needs institutions (organizations) which are responsible for the provision of water supply and sanitation: Planning, financing, monitoring, and maintenance of water supply and sanitation activities. In this case water sector is characterized by complex institutional arrangements, and a variety of channels and sources of funds are used to finance the sector (OECD,2003).

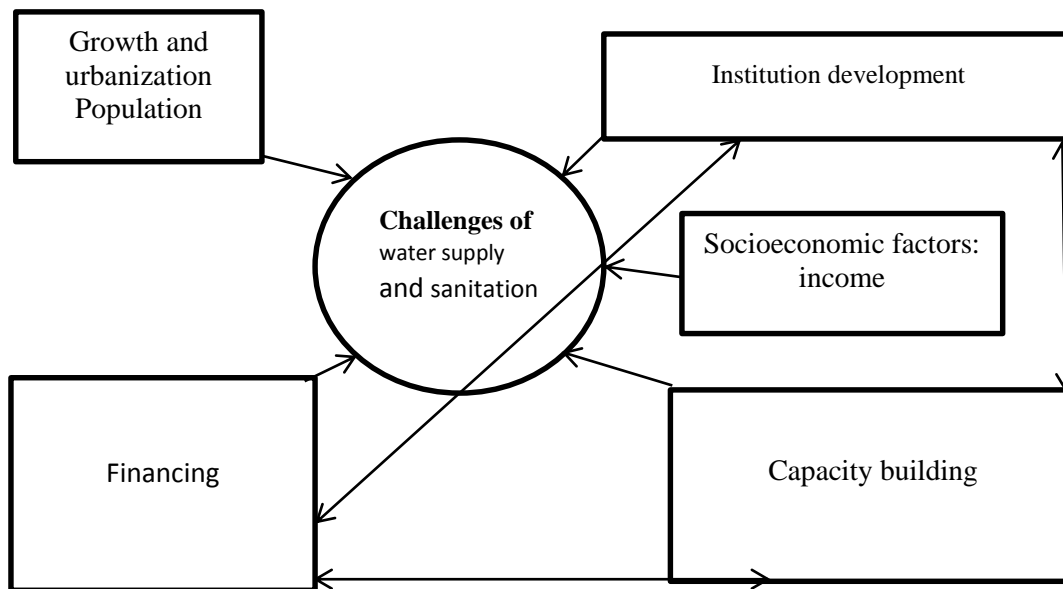
Based on the decentralization principle, the government of Ethiopia established the Ministry of Water Resource (MoWR, 1995) at the federal level. The Water Supply and Sanitation Authority (WSSA) reduced to a modest department level within the Ministry's functional structure. The management of water resources at the national level is carried out by the Ministry of Water Resources.

Ministry of water resources is responsible for formulating policies for the water sectors at national level, for long term planning strategies, the setting of generic standards and for the

coordination of projects and their funding together with foreign donor agencies (MoWR, 2006). It is also responsible for legislation with regard to utilization and protection of water resources as well as the allocation of water between regional governments. It also provides technical assistance and advice upon request to the regional governments of the country

2.4. Conceptual framework

The conceptual framework based on the objectives and research question. For the sake of access urban water supply and sanitation system, the support of governments, regional and community are very essential. This informs the conceptual framework below figure: 1.



Source: own construction, (2019)

Figure 1:-Conceptual framework of challenges of supply and sanitation

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter describes with research methodology, description of the study area, methods and designs implemented. It also dealt with research paradigm which dictates the choice and justification of an appropriate methodology, methods and relevant tools.

3.1. Description of the Study Area

Sululta Town is one of the urban centers of Oromia Special Zone Surrounding Finfinne (Addis Ababa), Oromia National Regional State, the capital city of Ethiopia and African Union. The town is situated at 25 km to the north of Addis Ababa along Fiche road segmental 10,214 ha area.

The astronomical location of Sululta Town is 9°5'- 9°12'30'' N Latitude and 38° 43'- 38°50'30'' E Longitude. Relatively, Sululta Town is found to the north of Addis Ababa, to the south of Chancho Town, to the southwest and to the South East of Sululta District, to the East of Walmara District.

Altitude of Sululta Town varies from 2528 m in the northwest and 3081 m a.s.l. in the south east of Sululta. As the town is found very close to the foot of Entoto Mountain chain, it falls under highland or temperate agro-climatic zone.

The only data types obtain for the analysis of climatic condition of Sululta town is temperature and rainfall data. The monthly and annual temperature data is found from National Meteorology Service Agency obtained from 2004 to 2015.

The analysis of mean monthly and mean average annual temperature of the town shows that the town has experienced a cold temperature that can be categorized in the temperate climatic zone. Sululta town area is categorized under the thermal zone range of < 10-20°C, which is cool temperature sensation.

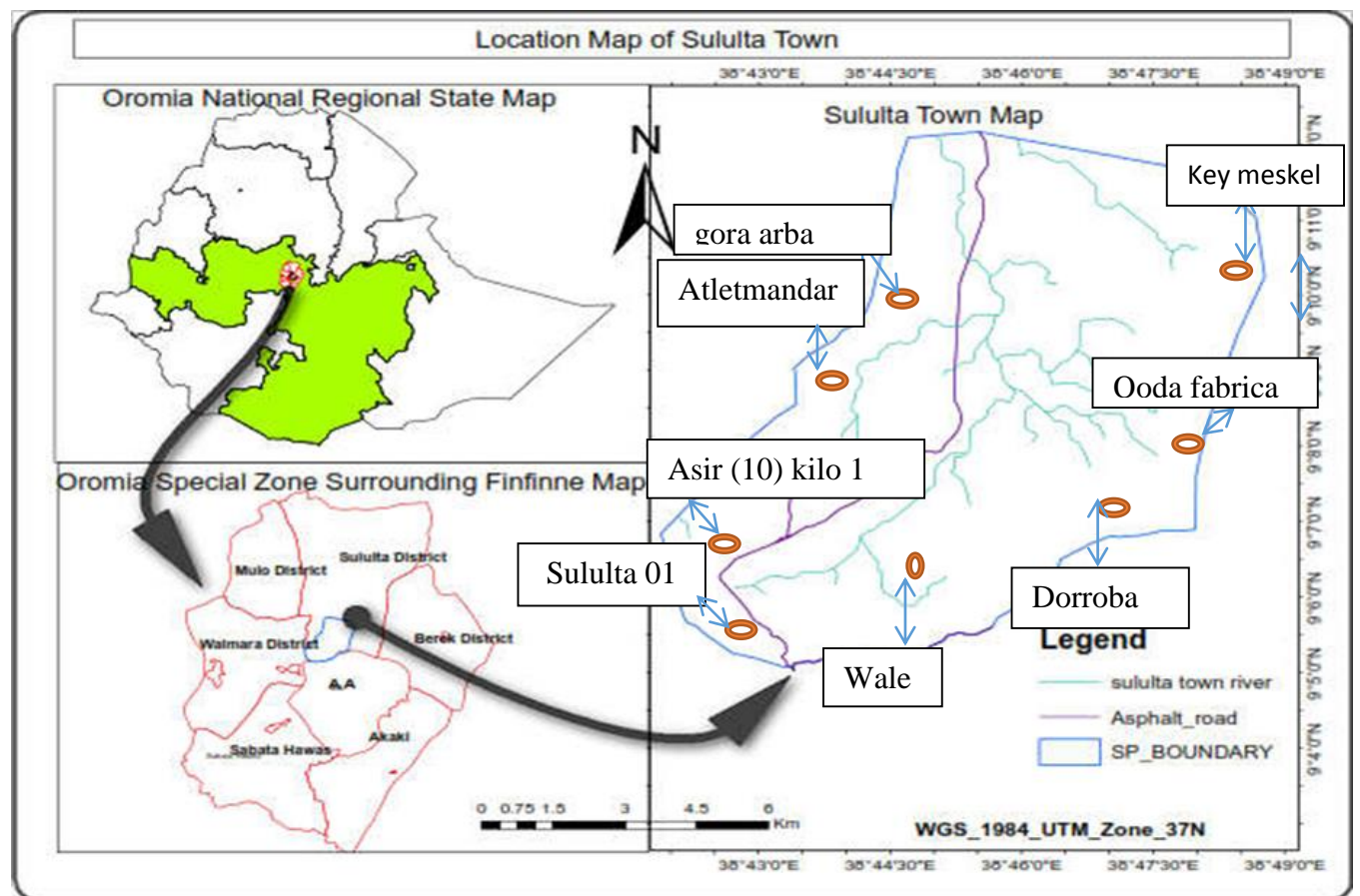
Thermal zones are mainly based on the relationship between altitude and temperature and hence are function of altitude. Thus, the mean average annual temperature of the town 14.3° is closer to the cool temperature sensation category. Therefore, Sululta Town has a cool temperature that to a lesser extent needs room heating intervention whenever the temperature tends to fall below 10°C.

Sululta town gets rainfall almost throughout a year. The pattern of rainfall varies on monthly basis throughout the year. that the average monthly rainfall ranges from 3.4mm in the month of December up to 332.7mm in the month of July. From 2004 to 2015, the town has got average annual rainfall of 1232.3mm which enables the town to be categorized under big rainfall places of the country.

Heavy rain received in summer (June to August) and light rain is in spring season (December to February).

Sululta Town is one of the fastest growing towns in Oromia in terms of population. The demographic feature in towns around Addis Ababa has unique features unlike most urban areas in the region. The study population for this research was consist of the heads of households in the town. According to the data obtained from the municipality at (2014), the number of households in the town totally 6888 of which four in kebele 01, Qaso Wasarbi, N/M/Abichuu and Walee Lube.

The location map of the study area is given in below.

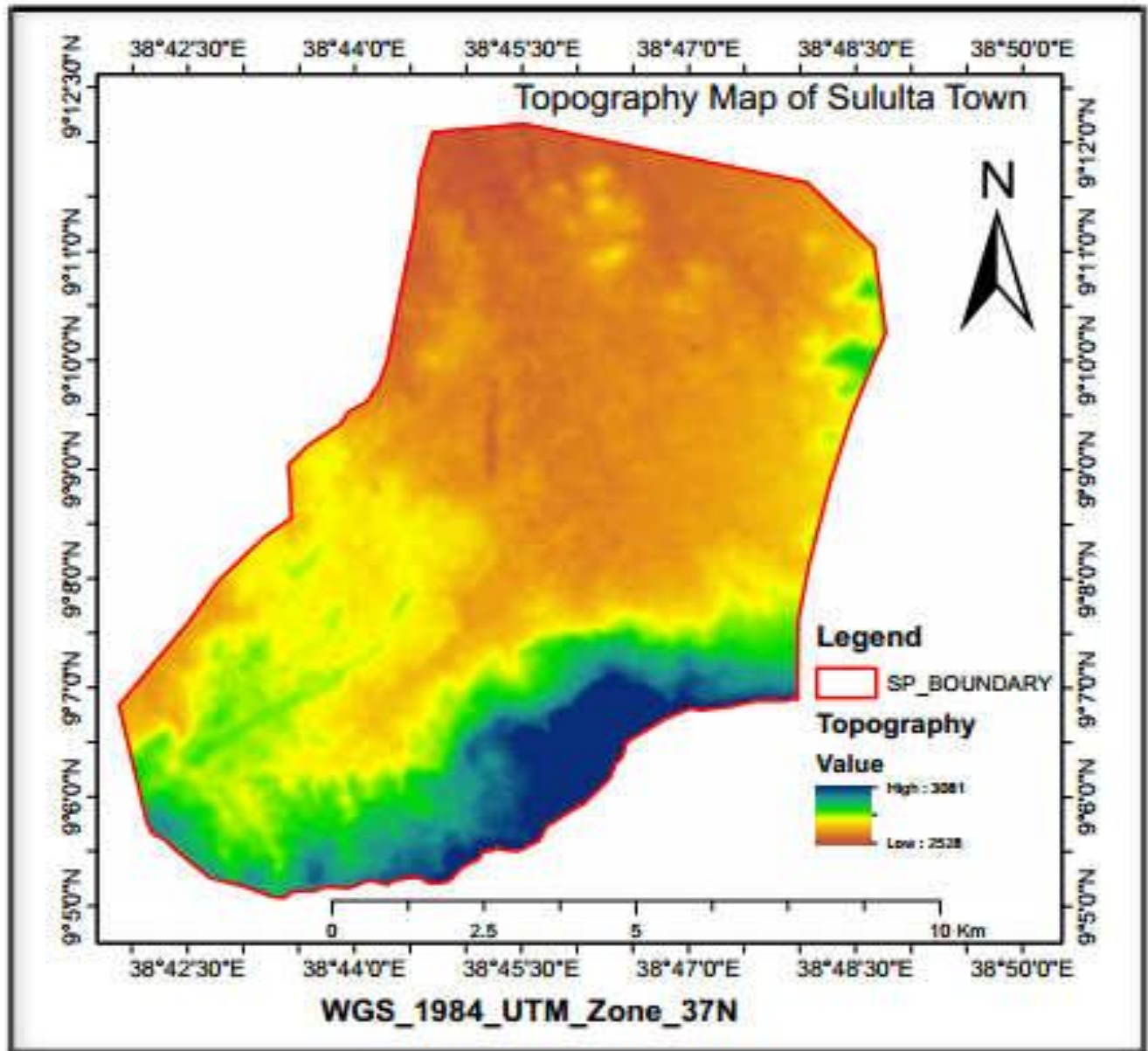


Source: Sululta municipality, 2019

Figure 2:-Location map of Sululta Town

3.2. Topography

Altitude of Sululta Town varies from 2528 m in the northwest and 3081 m a.s.l. in the south east of Sululta. As the town is found very close to the foot of Entoto Mountain chain, it falls under highland or temperate agro-climatic zone.



Source: Sululta municipality, 2019

Figure 3:-Topographic map of Sululta Town

3.3. Research Design

Descriptive research design was employed to investigate the challenges of urban water supply and sanitation in the study area. Descriptive research design was applied because it enables to describe the existing situations of the challenges of urban water supply and sanitation exists in the town. Generally, descriptive research design sets out to describe and to interpret what it looks like at individuals, groups, methods and materials in order to describe, compare, contrast, classify, analyze and interpret the entities and the events that constitute the various fields of inquiry. It aims to describe the state of affairs as it exists.

3.4. Sampling Technique and Sample Size

Simple random sampling technique was employed in the study to extract necessary information from study area households. According to the data obtained from the Sululta municipality office (SMO,2019), the number of household's heads were 17,377 in the Town who lived in four kebele 01, Qaso Wasarbi, N/M/Abichuu and Walee Lubee. The sample was drawn from these household's heads (17,377). Sululta Town has only four kebeles and the study consisted of these four kebeles to make a representative sample. As to the sample size determination, from among different methods, the one which has been developed by Yamane (1967), as cited by also konjit (2015, see also Boniface, 2014) was used, by considering the level of acceptable margins of error at 5% (or 95% confidence interval):

$$n = \frac{N}{1 + N(\delta)^2}$$

Where n = is the sample size

N= is the total number of households

δ = is the margin of error

$$n = \frac{17377}{1 + 17377(0.05)^2} = 391$$

Therefore, the sample size for this study was 391 households.

With regard to the sample households a total of 391 households were selected have a chance to drawn for a data collection by using simple random sampling as shown in table below:

Table 1:-Number of sample of households from those four kebeles

Selected Sample kebeles	No of Households	Sample Households	
		Frequency	Percentage
Kebele 01	6833	154	39.39
Qaso Wasarbii	4876	110	28.13
N/M/Abichuu	4175	94	24.04
Walee Lubee	1493	33	8.44
Total	17377	391	100.0

Source: Sululta municipality office, 2019

3.5.Sources of Data, Data Collection Instruments and collection Procedures

3.5.1. Sources of Data

Both primary and secondary sources were used to collected data for this study. These sources were used to collect necessary information that addresses the research questions and objectives of the study. Primary data was collected from sample households of each sample kebeles of the town. To collect secondary data resources such as books, journal articles and government documents were needed.

3.5.2. Data Collection Instruments

The questionnaire was having different parts. For examples the questionnaire was consisting of questions related to household's profiles also the questionnaire was incorporate questions related to challenges of urban water supply and sanitation of town. The questioners were also included both open and close ended questions. Particularly open-ended questions are used to extract response and further explanation. The questioners were filled by data enumerators by asked sample respondents from the selected 4 kebeles of the town. To supplement the data collected through questionnaire the researcher also conduct structured interview with different experts of offices. For examples Sululta water supply and sanitation department head, elders and healthy stations.

Observation was techniques for qualitative data collection. Direct observation of the activities was undertaken and general living conditions of households also observed to cross check the information gathered survey, focus group discussion and interview. In relation to this, almost all

the data collection activities at the field that people undertake in the study kebeles photograph using digital camera.

Focus group discussion was one of the techniques used to collect qualitative data. Focus group discussion guide used as a tool to collect the qualitative data in the study. Two focus group discussions were employed in the study, for “*Qasoo Wasarbii*” and “*Kebele 01*” and I could not obtain FGD for the rest of kebeles because of lack of interest of households. The data needed for the study were collected from focus group discussion by using FGD guide. Each focus group comprised 7 individuals who are living in the same kebele of the study area.

3.5.3. Data collection Procedures

First questionnaires were prepared. Secondly, the questionnaires adopted in English language were translated into Amharic and Oromic versions to make them easily understandable by households. Finally, the actual data collection. For households the purpose of the study was briefly explained and encouraged to cooperate. On the other hand, interviews were conducted with interviewees on the basis of appointment. Data from secondary sources was obtained by getting permission from concerned officials.

3.6. Method of data analysis

This section deals with presentation, analysis and interpretation of data gathered from households of Sululta town. Both qualitative and quantitative methods were used to analyze the data. Quantitative method was used for close ended questions and qualitative methods for open ended questions and interviews. Following the completion of the data collection the data were coded and entered into Statistical Package for Social Science (SPSS Version 23) software for analysis. Data were analyzed using different quantitative and qualitative statistical procedures and methods. Descriptive statistical tools were used to analyze the quantitative data. The important statistical measures that were used to summarize and categorize the research data were, pie chart, percentages, tables, graph, frequencies, minimum, and maximum.

CHAPTER FOUR

Results and Discussions

This part mainly deals with the analysis, interpretation, and discussion of the results obtained from the sample survey, through structured questionnaires, interviews, observation and document analysis. A total of 391 structured questionnaires were distributed, and the entire questionnaires which were distributed to the households were properly filled and returned.

4.1. Socio-Economic and Demographic Characteristics of Sample Households

This study had tried to constitute different sample households with various socio-economic and demographic characteristics. The socio-demographic features of the respondents include age structure, sex, marital status, average monthly income and household size. Since socio-demographic characteristics of a given population have their own implication and relation with the water supply and sanitation in such particular place. A total of 391 householders were interviewed in selected Sululta town of Oromia region.

Table 2:-Gender of the households

Gender	Frequency	Percent
Male	147	37.6
Female	244	62.4
Total	391	100

Source: Own survey, 2019

As shown in Table: 2 above, the percentage of male and female household heads/respondents accounts 37.6 %and 62.4% respectively. This was due to the fact that most of the time females stay and work inside their house rather than working outside. Such higher number of women provides a special advantage for this research since women have better knowledge than men about challenges of water supply and sanitation.

Table 3:-Age categories of the respondents

Age category	Frequency	Percent
20-30	71	18.2
31-40	133	34.0
41-50	128	32.7
>50	59	15.1
Total	391	100.0

Source: Own survey, 2019

In the above table: 3, out of the total households, about 133 HHs (34%) of sample households belong to maturity age group (31-40 ages). Higher number of maturity ages of respondents provides special advantages for this research's because to get clear information and to identify the challenges of water supply and sanitation in properly. Because about water supply and sanitation was very serious issue rather than another issues.

Table 4:-Marital status of the respondents

Marital status	Frequency	Percent
Single	78	19.9
Married	289	73.9
Divorced	24	6.2
Total	391	100.0

Source: Own survey, 2019

In the above table: 4, the marital status of the respondents indicated that single (19.9%), married (73.9%), and divorced (6.2%). More often, the quantity of water used was related the married households are, likely to be high consumers of water. The interest of this group was therefore not surprising. It must be noted that household water fetching exerts a lot of pressure on large households in the area where almost all adult members are expected to partake in

the water supply activity.

Table 5:-Educational status

Educational status	Frequency	Percent
Illiterate	7	1.8
1-8	68	17.4
9-12	201	51.4
Diploma	71	18.2
Degree	37	9.5
Master	7	1.7
Total	391	100

Source: Own survey, 2019

The level of education as indicated in the table: 5 above, 1.8%,17.4%,51.4%,18.2%,9.5% and 1.7 % had educational status, Illiterate,1-8,9-12,Diploma,Degree,Master respectively. With respect to an educational level, greater numbers of respondents were educated. These also contributed for the accuracy of information gathered from such households. These educational characteristics of sample households also resulted in a positive impact to get brief and different perceptions.

Table 6:-Family size of the respondents

Family size	Frequency	Percent
1-3	121	30.9
4-6	193	49.4
>6	77	19.7
Total	391	100

Source: Own survey, 2019

The family size of respondents indicated from the above table: 6, out of 391 households, 193 HHs (49.4%) household's family size 4-6 also the family size of respondents indicated from the above table out of 391 households, 121(30.9%) and 77(19.7%) household's family size 1-3 and >6 respectively. The majority households were had 4-6 that better advantage for the accuracy of

information gathered from such households. Because large family size more susceptible by the challenges of water supply and sanitation and more consumer than small family size.

Table 7:-Income of the respondents

ETB	Frequency	Percent
<1000	118	30.2
1000-4000	201	51.4
>4000	72	18.4
Total	391	100

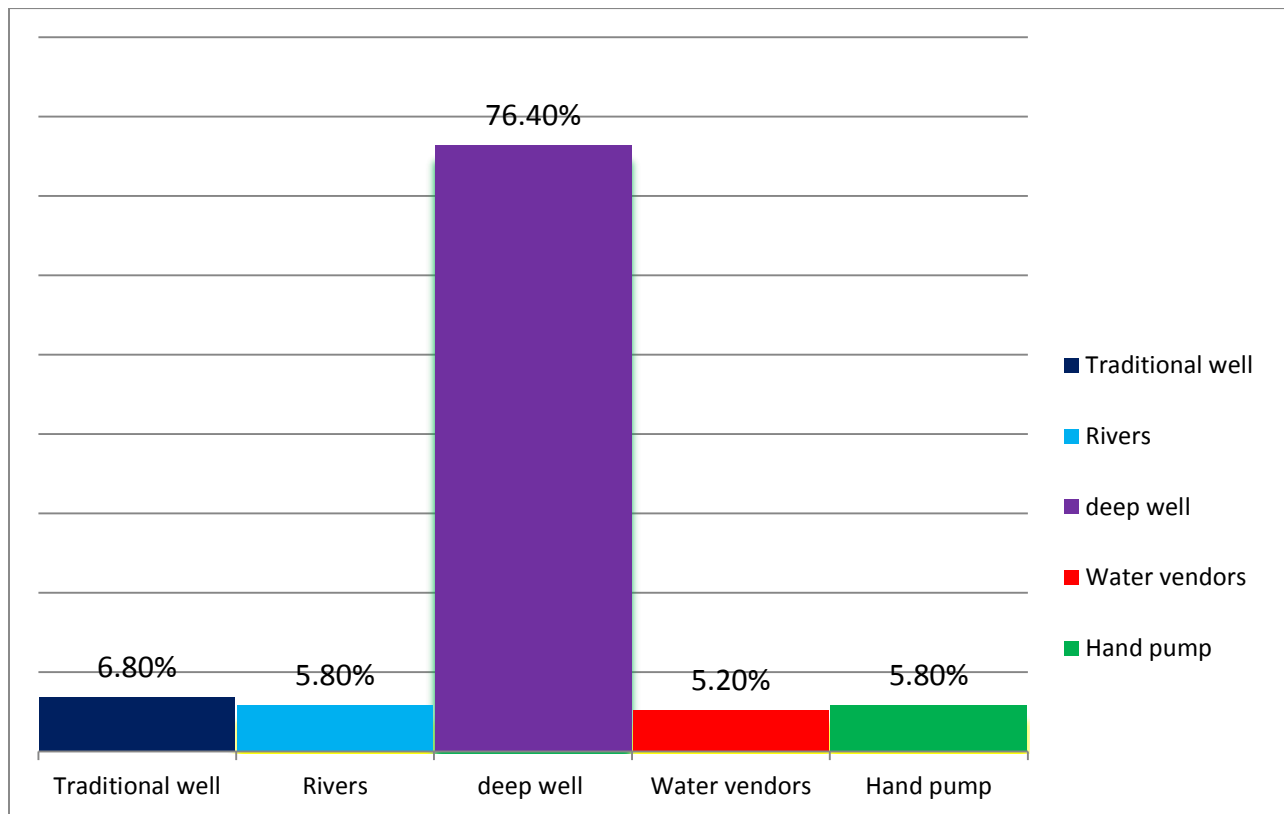
Source: Own survey, 2019

As showed in above table: 7, household income was the most determinant factors of individual living standard in general and consumption in particular. As shown in table:7, out of 391 interviewed households, about 118 (30.2 percent) earn less than 1000 birr per month, those who earn between 1000 birr to 4000 birr per month constitute 201 (51.4 percent) of the households and the rest 72 (18.4 percent), households earn more than 4000 birr in month respectively.

4.2. Sources of water

The source of water supply for Sululta town from water surface and ground water. A total of eighth potential depth wells have been drilled in the different place at different times. The depth wells named as below Sululta 01, key meskel, gora arba, atlet mandar, asir (10) kilo, wale, dorroba/omo dorroba/ and qoda fabrica/new depth well/ in between 1988-2010 E.C. The discharges of those depth wells were different. For examples the operating yield of gora arba was 12 l/s. But the operating yield of Atlet mandar/qaso wasarbi/ is 2.4 l/s. On the whole, people get water from two main sources. Such as, piped system and non-piped systems. Piped water supply was the safest and reliable sources of water while non-piped systems are unprotected and unsafe, which include rivers, hand pump and other. Hence, as Sululta town was fast growing town, the residents have been supplied with piped water by SWSO. SWSO was the Producer and supplier of pipe water system for households (SWSO, 2017).

The below figures show the source water supply in Sululta Town.



Source: own survey, 2019

Figure 4:-Source of water for the society in the study area

From the above figure: 4, the major source of water was from deep well that came through pipe.

Out of 391 households, 76.4 % (299 HHs) were used from the deep well source of water that piped. 6.8%, 5.8%, 5.2% and 5.8% households used from the traditional well, rivers, water vendors and hand pump which are non-piped water system. Hand pump more preferable than traditional well in terms of quality. The depth of them different. For examples the depth of traditional well (10m-50m) but the depth of hand pump (above 50m).

Generally the households which got water from deep well source of water they used that piped sometimes they used from different non-piped water sources. Especially when water not availed/interrupted they used from non-piped like from river, hand pump, traditional well and water vendors.

Table 8:-Purpose of water for households

Purpose of water		Source of the water for the society in the area					Total
		Traditional well	Rivers	Deep well	Water vendors	Hand pump	
Drinking	Freq	6	11	78	5	5	105
	%	5.7	10.5	74.4	4.7	4.7	100
Washing	Freq	10	3	81	2	5	101
	%	9.8	3.3	80.4	1.6	4.9	100
Garden	Freq	7	0	33	7	5	52
	%	13.5	0	63	13.5	10	100
Bathing	Freq	3	3	47	0	6	59
	%	5.1	5.1	79.4	0	10.4	100
Animal	Freq	30	0	20	0	5	55
	%	55	0	36	0	9	100
Other	Freq	0	1	18	0	0	19
	%	0	5.3	94.7	0	0	100
Total	Freq	27	23	299	20	22	391
	%	6.8	5.8	76.4	5.4	5.6	100

Source: own survey, 2019

From the above table: 8, for examples 27(6.8%) of sample households used it for drinking, washing, bathing, garden and for different animal from traditional well accordingly survey data. Other sources have also their own contribution for different functions. This implies how the households are exposed to other unprotected water sources. Thus, it was important to give due to attention in protecting such sources, to make them safe sources for drinking purpose.

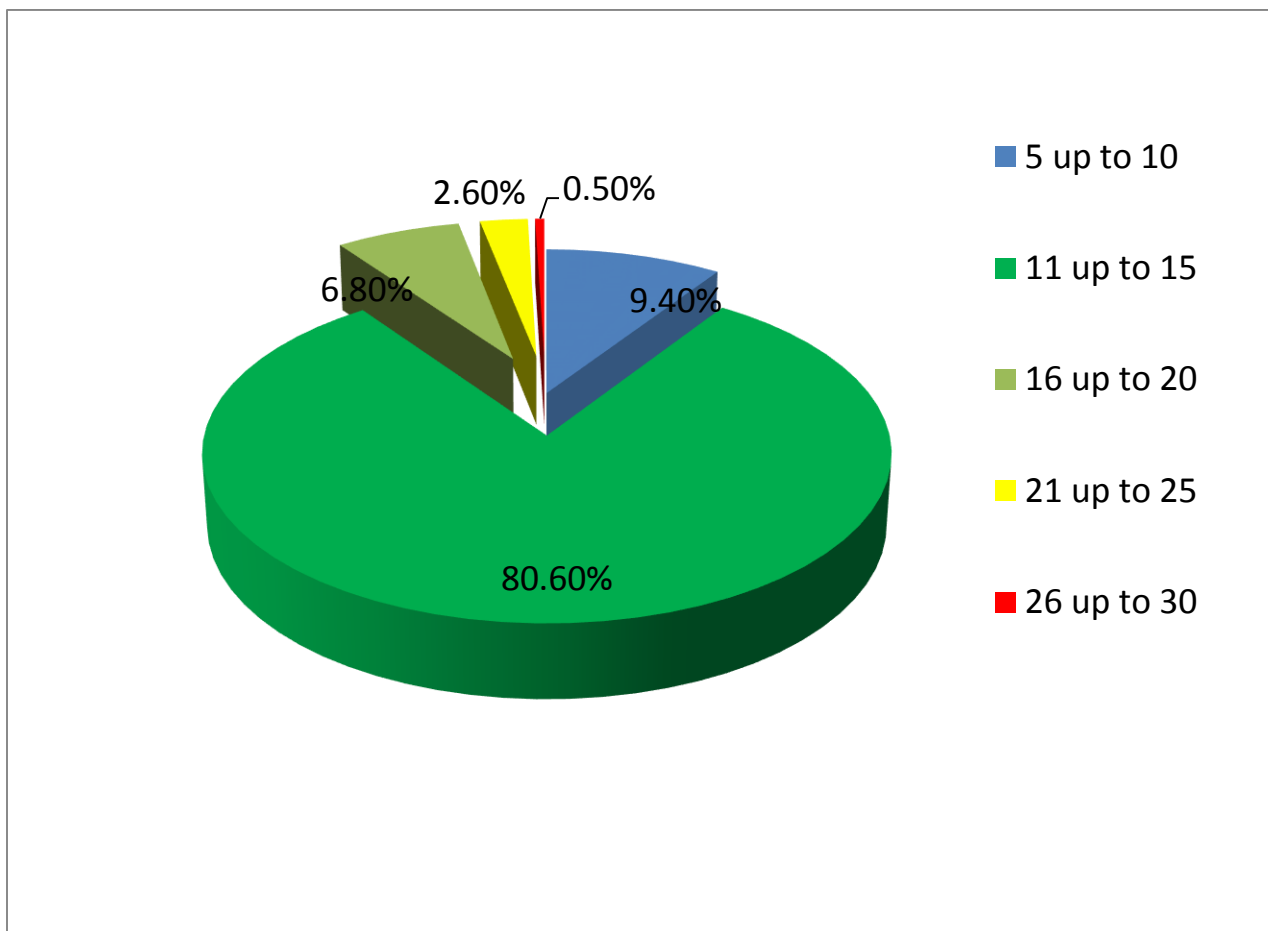
Coordinating either by making these different sources safe for drinking through different mechanisms such as adopting the culture of boiling and filtering these sources of water or used them for functions other than drinking can help to solve the shortage of pipe water supply or to reduce the burden of demand on pipe water supply and can ensure optimal use of water.

With regard to its quality the suggestion given was that even though the water was treated, it was not somehow good because water occurs especially during different season with suspensions of impurities and small particles.

Moreover, When interview the Sululta healthy station experts they were said that the majority of households this Town attacked by different diseases which caused water borne, lack of good sanitations and water related diseases like amoeba, jardia, typhoid, trachoma, scabies, and typhus.

4.3. Water consumption

As the below Figure: 5, indicated, about (9.6%) of the sample household head/one person used water less than 10 liter per day, while 315 HHs(80.6%), (6.8%) ,(2.6%) and (0.5%) household heads/only one person used water 11-15 liters, 16-20 liters, 21-25 liters and 26-30 liters/per /day respectively. Based on the below Figure: 5, in this study area the majority of 315 households or (80.6%)HHs consumed less than 11-15 liters/ person/ day individually that below WHO minimum standards of a person minimum requirement water which is 20 liters (WHO ,2000).



Source: own survey, 2019

Figure 5:-Amount of water consumed by household head (individually liter per person per day).

Table 9:-Travelling Time to collect water from their house

/time/	Frequency	Percent
< 30 minutes	164	41.9
30minutes to1 hour	37	9.4
1 Hour	84	21.5
over 1hour	106	27.2
Total	391	100.0

Source: own survey,2019

As the table: 9, data collected from the households indicate the distances household traveled was less than 30 minutes, from 30 minutes to one hour and more than one hour 164(41.9%), 37(9.4%), 84(21.5%) 106(27.2%) respectively. From this, one can understand how much it was difficult for households to collect water from these distances. As a result they buy and consume water little by little at relatively high cost from a nearby vendor.

4.4. Water distribution

The system of distribution was the most important aspect of water supply in any community. The type and efficiency of water supply system greatly affect the rate of household consumption. The process of distribution starts from the place of production or the source of supply. In Sululta water service office: water distribution was crucial tasks. Water distribution works were started from the place of water production. Then stored in different reservoir. The water supply system of the town consists of 5 reservoirs. Those are; Asir kilo one reservoir, kajima, shuffune and Sululta kombolcha reservoir and Asir kilo two reservoir. The reservoir had different capacity. Kajima /tullu gudda/ reservoir which had 500 m³, shuffune reservoir which had 300 m³, asir /10/ kilo reservoir which had 200 m³, Sululta kombolcha which had 50 m³ and Asir /10/ kilo 2 which had 50 m³. The reservoir at the kajima /tullu gudda/ was the major reservoir of the source of water supply. From there water was distributed to the different parts of the town through pipelines of different sizes. Finally, the water reaches the consumers in two types of water supply systems, meter connection and public water points or stand pipes. In Sululta town there was the problem of water supply service. In Sululta town water demand and water supply was not balanced. The water

demand was 1433292.9 m³/year but the water supply was 910141 m³/year. Generally the Sululta water supply coverage 63.5%.

In the past years the Sululta town's water coverage was low, for example at 2012, the demands of water 3731.28 m³/a day, but the water supply was 1455.2 m³/a day, so the water coverage was 39% in Sululta Town at 2012. But in 2019, the coverage was 63.5%. Because the water demand was 1433292.9 m³/year but the water supply was 910141 m³/year. In line with this, the general manager of SWSO stated that, water supply coverage of the town was inadequate. But last year STWS started to drill three deep wells with incorporate Addis Ababa city, which will be completed at the end of this year (2020). However, this does not guarantee everlasting mean the solution for Sululta town's water supply problem, it is rather to minimize the short term severe. Bringing long term solution of water supply problem in the town was beyond the capacity of STWS; as there are financial, material and technical constraints. The manager also stated that, Sululta town was naturally rich in both ground and surface water resources but the problem was how this water reaches the people. Frequent interruptions in production coupled with limited capacity of reservoirs and unfair distribution of water points on one hand and the growing need on the other hand are ever widening the already existing unbalanced gap between the demand for and supply of water. According to the elders of study area "Jaarsaa biyyaa obbo Agaree Nigusee" said that we were exposure to unprotected water sources that caused diseases because the water interrupted for a long time. Also when carried out FGD (Focus Group Discussion) in Kebele 01 with households said that the shortage of water forced the community to buy water from vendors at high costs.

4.5. Effects of water and sanitation inaccessibility

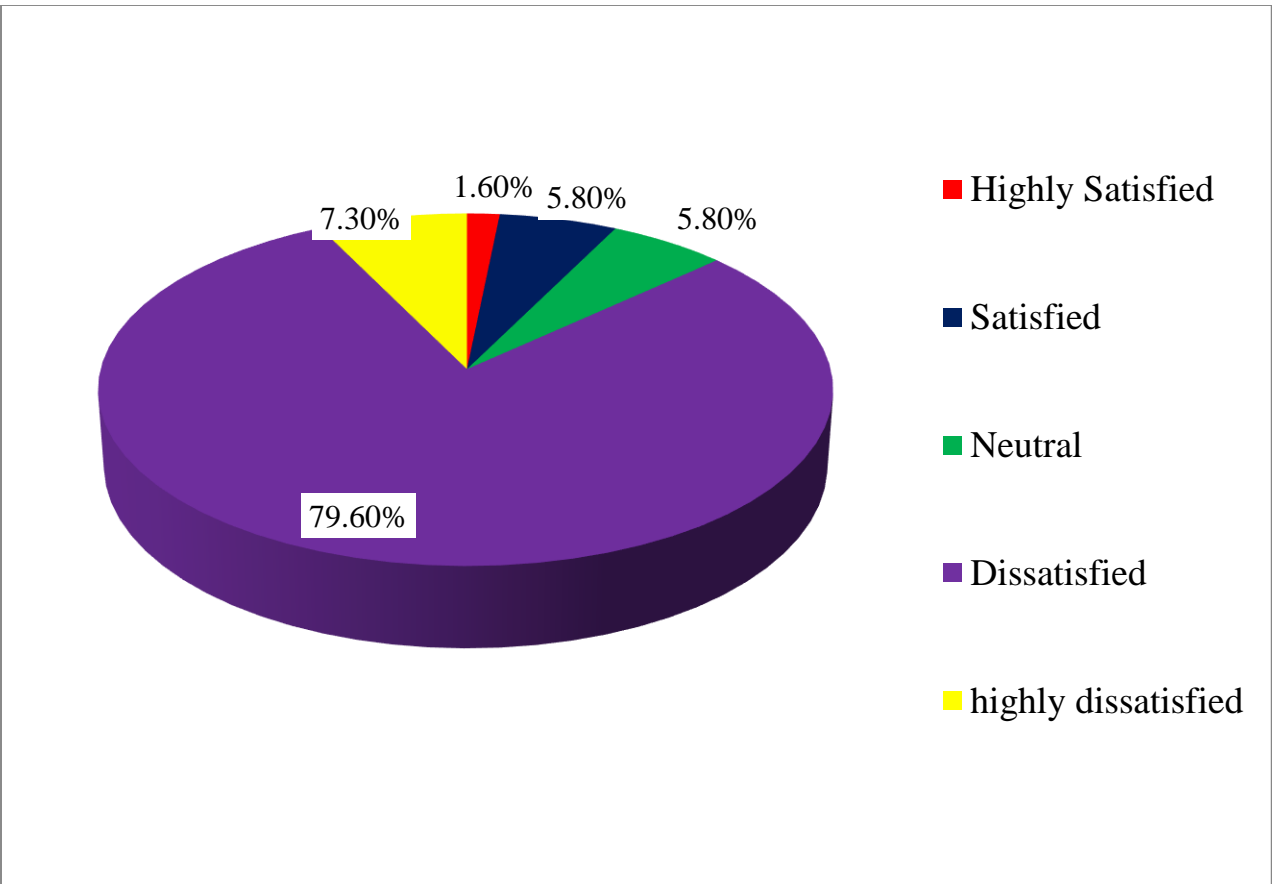
Inaccessibility of drinking water and sanitation facilities influences everybody's health, education, life expectancy, well-being and social development. This includes the risk of exposure to pathogens and hazardous substances that could affect public health at all points of the sanitation system from the toilet through the collection and treatment system to the point of reuse or disposal.

Table 10:-Effects of inadequate of water supply and sanitation in Sululta town.

HHs	Frequency	Percent
Disease outbreaks	191	48.8
socio-economic impacts	139	35.5
Both	55	14.1
Other	6	1.6
Total	391	100.0

Source: own survey, 2019

According to above table: 10, out of 391 households, 191(48.8%) households were believed that in accessibility of water supply and sanitation cause of disease outbreaks and 14.1% respondents said water supply and sanitation inaccessibility can be cause for both (disease outbreaks and socio-economic impacts). But 35.5 % households said that water supply and sanitation inaccessibility can be cause socio-economic impacts). According to the women of study area “Aayyoo Warqituu Taaddasaa “said that we were prone to different diseases because we need dirty river not only this one, she said that before 3 decades our river was very clean, we were drunk it and the population were very small and I knew this all surround because I was born and grew in here. But now, our river damaged by different waste Town, we had no solution. The government forgotten us. Also when carried out FGD (Focus Group Discussion) in Q/Wasarbi with households, they said that households susceptible to high costs to buy drinking water from vendors. Moreover, When interview the Sululta healthy station experts they were said that the majority of households this Town attacked by different diseases which caused water borne, lack of good sanitations and water related diseases like amoeba, jardia, typhoid, trachoma, scabies, and typhus. The below figures indicated Level of satisfaction on Water supply and sanitation service



Source: own survey, 2019

Figure 6:-Level of satisfaction on Water supply and sanitation service of Sululta town

From the above Figure: 6, in 391 households, 311 was dissatisfied by the existing water supply and sanitation services. This study revealed that 79.6% of the respondents not satisfied by the existing water supply and sanitation services that contradicted the finding of Konjit (2015). This implies that even though additional deep wells should drilled by the government and different sector for the town because the people not satisfied existing supply of water and sanitation service. Also when interviewed the manager of sululta town water supply service said that the people not satisfied as well because the water demand and water supply was not balanced. Because of the the government was not budgeted the finance for water supply. But we used the the money which collected from the households. As a result the sanitation service was very less in this town also the amount of water that reaches households was not adequate, existing water supply characterized by inequitable and inefficient distribution system; low coverage; unscheduled frequent interruption and less quality.

4.6. Water interruption

In the Sululta town water interruption was very serious issues. According to the below table: 11, indicated the majority households are get water after the week.

Table 11:-How long Days of water not available/frequency of water interruptions/

Days of water not available	Households	Percentages
1-3	68	17.4
4-6	104	26.6
7-9	119	30.4
Above 9	100	25.6
Total	391	100.0

Source: own survey, 2019

Based on the above table: 11, in the 391 households, 119(30.4%) households are get water after 7-9 days. Also 68(17.4%), 104(26.6%) and 100(25.6%) households were get water after 1-3, 4-6 and above 9 days respectively. This findings show that there was no equal water distribution among the households of the town that similarity with the finding of the (Charles,2015). Hence, although it was difficult to solve the problem at once, it was better to give notice in advance and make the interruption by shift or rotation rather than serving some areas continuously while other suffer from continuous water interruption.

Table 12:-Source of water when water not available

Source of water when water not available/ interrupted	Frequency	Percent
hand pump	53	13.6
traditional well	27	6.9
water vendors	20	5.2
Rivers	77	19.6
All	214	54.7
Total	391	100.0

Source: own survey, 2019

As showed above table: 12, of the total 391 respondents from four Kebele of Sululta town interviewed households the alternative water sources they use when there is water interruption in the study areas are traditional wells, rivers, water vendors and hand pump. This findings revealed 77(19.6%) majority households are used rivers that compatible the findings of (Rowan ,2011). Also the others 53(13.6%), 20(5.2%), and 27(6.9%) households used hand pump, water vendor and traditional well as source of water when water is interrupted respectively. But in this study area 214(54.6%) households was used from all (from river, hand pump, water vendors and traditional well) when water was interrupted.

Table 13:-Time spent by queue on alternative source of water

Time taken(minute) by queue on alternative source	Frequency	Percent
< 30	51	13.1
31-50	55	14.1
51-70	88	22.5
71-90	105	26.8
Above 91	92	23.5
Total	391	100.0

Source: own survey, 2019

As indicated in the above table: 13, the percentage 13.1 % households expended ≤ 30 minutes by queues at water points. Around 63.4% they spent above 31 up to 91 minutes and 23.5% Households spent more than 91 minutes, which are more than the standard time for water that was far away from the WHO time standards i.e. 30 minutes.

4.7. Major challenges of water supply and sanitation

In this study area there were so many challenges of water supply and sanitation. As indicated in table: 14 below, rapid growth of population and urbanization were highly affected water supply and sanitation in the study area.

Table 14:-Challenges of water supply and sanitation in Sululta Town

Challenges of water supply and sanitation	Frequency	Percent
Rapid population growth and urbanization	175	44.7
Institutional capacity	107	27.4
Inadequate finance	95	24.3
Technology capacity	14	3.6
Total	391	100.0

Source: own survey, 2019

As indicated in above table: 14, rapid growth of population and urbanization was highly affected water supply and sanitation in the study area. The data collected from household in the study area showed rapid population growth and urbanization 175(44.7%) of the total 391 household interviewed. Increased urban population had direct impact on water supply and sanitation. This finding was in line with (Asnake,2012) that 44.7% agreed on the rapid population growth and urbanization expansion were major cause of this challenge of water supply and sanitation.

This indicates the rapid population growth and urbanization expansion in developing town proximity to Addis Ababa challenge water supply and sanitation because as the population size increase their needs also increase, the demand of water rise, so to fulfill the demand of the society,

the financial capacity of the office was limited. Also the steady growth of town's population due to natural increase and migration coupled with the expansion of the town imposed high burden upon the utility office of Sululta town, WSS and it becomes difficult to accommodate the ever growing population. The problem exacerbated by the failure to design optimum use of water for the town due to underestimation of population growth based on national population growth rate. According to the data obtained from the municipality at (2004), the number of households in the town totally 6888 of which four in kebele 01, Qaso Wasarbi, N/M/Abichuu and Walee Lubee. According to the data obtained from the Sululta municipality office (SMO, 2019), the number of household's heads were 17,377 in the Town who lived in four Kebele. In addition to the under capacity rate of production which lowers down the actual production of water supply, water loss has further reduced the amount of water supply that can reach the customers. This challenge exacerbated by choice of inappropriate technologies that cannot meet appropriate standards.

Measures to enhance the access of urban water supply schemes and sanitation facilities should emphasize on choice of technology and development of supply chains in relation to technology choices that makes access to spare parts and fittings easier and cost effective.

Also infrastructure development and as well as the interaction of above listed challenges were the major challenges of water supply and sanitation in the study area. Institutional capacity was the second challenges WSS in Sululta town 107(27.4%) of the total interviewed household. This indicated that shortage of skilled manpower was the critical issue faced by the WSS office. This challenges was also the most limited factor in the fulfillment of its desired service provision. In addition to this, in adequate equipment facilities and other material resources further exacerbated the nature of the problem. Also the technical capacity of the operative in the STWSO were less developed. In addition to institutional capacity lack of institutional coordination was exacerbated challenges of WSS in the study area.

Inadequate finance also the third challenges of WSS 95(24.3%) as observed from the response of the interviewed respondents. Delivery of urban water supply and sanitation services requires a high level of investment. Lack of sufficient funding has limited the quantity and quality of water supply and sanitation service of the WSS office. Moreover, lack of effective cost recovery mechanism often inhabited the WSS office from sustaining even the existing service and fulfilling its mandates.

The major stakeholders in Sululta town water supply activities include Regional Water, Mines and Energy Resources Development Bureau, different private company, WSS office and the community. However, there were no coordinated linkages among the bureau and WSS office except for technical support, implementing construction works of water. Thus, the poor institutional coordination hindered the efforts to achieve WSS office goals. Management problems caused by inefficient organizational structure, understaffing, low salaries and lack of staff motivation and inability of the WSS office to retain trained and experienced staff is the main constraint to service delivery.

4.8. Types of toilet used in Sululta town based on ownership

In Sululta town, three types of toilets' were used: public toilets which used, private toilet which used individually and open defecation on the field. On the average, 79.5% (311) of the households had used private toilet and; 8.9% (35) of the respondents had used open defecation on the field as well as, 11.5% (45) of the households had public toilets.

Table 15:-public toilet users in the study area

HHS	Frequency	Percent
Yes	45	11.5
No	346	88.5
Total	391	100.0

Source: own survey, 2019

In the above table: 15, as response of the households revealed in study area of the 391 interviewed only 45(11.5%) households had used public toilet while households of interviewed respondents 346 which (88.5%) were not used public toilet. In this area the finding of this study revealed that only 11.5% of the households had public toilets that related to the findings of (Zemenay,2012).

Table 16:-users of open defecation in the study area

HHs	Frequency	Percent
Yes	35	8.9
No	356	91.1
Total	391	100.0

Source: own survey, 2019

From the above table: 16, Users of open defecation/8.9%/ in the study area were lower than private toilet and public toilets. This indicates that, there were open field in the study area which the society used for defecation illegally which prone water to pollution highly, because the excreta from human around water source directly mixed to the river by running off water during rainy season. The finding of this study revealed that 8.9% was related to the finding of (Vanroijen and Teddasse,2009). Also since the urbanization explosion was expanded, the emigration of the society from rural to urban was high who didn't have habit of toilet use that increase the user of the open defecation in the study area.

Table 17:-Private Toilet users in the study area

HHs	Frequency	Percent
Yes	311	79.5
No	80	20.5
Total	391	100.0

Source: own survey: 2019

In the above table: 17, As response of the households revealed in study area of the 391 interviewed only 311(79.5%) households had used private toilet while households of interviewed respondents 80 that (20.5%) were not used private toilet. This study revealed 79.5% have private toilets that related the findings of (Charles,2015).

4.9. Types of Toilets based on the construction

As the below table: 19, indicated, in the Sululta town, different types of toilets were constructed: pit toilets with walls but without roof, pit toilets with wall and roof, and pit toilets without house. On the average, 43.9 % (172) of the households had toilets with a wall and roof; 24.4% (95) of the respondents had pit toilets with walls but without roof, 22.8% of the households had pit without house/open pit toilets/. The remaining 8.9% (35) of the households had no toilets. Lack of proper access to sanitation was the major cause of spreading diseases in Sululta town which was harmful to human life.

Table 18:-Types toilets based on their construction

Item/ types toilets	Frequency	Percent
pit with wall and roof	172	43.9
pit with wall but without roof	95	24.4
pit without house	89	22.8
None	35	8.9
Total	391	100.0

Source: own survey, 2019

The above table: 18, indicated the majority of the households had toilets with a wall and roof but the minority of the households had no toilets.

4.10. Materials used after toilets

Households used different materials to wash their hands after toilets. As the below table: 19, indicated, in the Sululta town, the majority of households need different materials after toilets.

Table 19:-Different materials to wash their hands after toilets.

Item/different materials to wash hand	Frequency	Percent
Water	210	53.7
water and soap	88	22.5
water and different leaf/ash	54	13.9
None	39	9.9
Total	391	100

Source:own survey,2019

As the above table: 19, indicated, in the Sululta town, when asked about materials used for washing hands after toilets, majority 53.7% (210) of the respondents in the town were used water only, 13.9% (54) were used water and ash, and 9.9 % (39) were not washed their hand, 22.5% (88) were used water and soap. Studies have documented that hand washing at critical times with soap reduce the risk of diarrheal diseases (Curtis and Cairncross,2003). But, in contract to the finding of (Curtis and Cairn cross, 2003), the finding of this study revealed that only 22.5% of the respondents washed their hands with soap and water.

Table 20: -Government prepared the community for their water and sanitation

Government prepared community	Frequency	Percent
Yes	151	38.6
No	240	61.4
Total	391	100

Source: own source, 2019

As indicated in the above table: 20, different problems regarding to preparation of government in terms of management and sustain water supply and sanitation in properly. Out of 391 HHs, 240(61.4%) HHs said that the government did not play the expected role means that the government did not manage the water supply and sanitation properly. According to the HHs responses moreover 151(38.6%) HHs said that the government prepared the community to

managed sustain their water and sanitation. In generally, the government did not prepare community to manage and sustain their water and sanitation in wisely manner.

Table 21:- According to Household's suggestion Measures should be taken to overcome the problems in the future

Item	Frequency	Percent
good management	165	42.2
adequate finance	86	21.9
increase awareness	100	25.6
enhance building capacity	40	10.3
Total	391	100

Source: own survey, 2019

As indicated in the above table: 21, the researcher identified different problems of inadequate of water supply and sanitation in Sululta town. 165(42.2%) of HHs said that in the future the measures should be taken to overcome problems which was occurred in the Sululta town for inadequate water supply and sanitation ,good management was the primary important. Means the concerned body should managed water and sanitation for the people. The other problem observed in the town was finance issue. But 86(21.9%) HHs responded that there was no adequate finance for the water supply and sanitation in their town. According their response the government should allocate enough finance for the water and sanitation. 100(25.6%) HHs and 40(10.3%) HHs said that measures should be take on increasing awareness and enhancing building capacity respectively. Generally, major issue of water supply and sanitation in Sululta town was the problem of good management as mentioned above 42.2% HHs responded the measures should take good management to solve the problem in the future.

Table 22: - Access to improved water and sanitation services

HHs	Frequency	Percent
Yes	20	5.1
No	371	94.9
Total	391	100

Source: own survey, 2019

As indicated the above table: 22, the majority of households 94.9% had no improved water and sanitation services. But only 5.1 percent households said relatively have improved water and sanitation services.

Table 23:-Respondent’s opinion on the level of priority wss service with other social service

WSS is first priority when compare with other social service	Frequency	Percent
strongly agree	33	8.4
Agree	61	15.6
Dis agree	162	41.5
strongly Dis agree	135	34.5
Total	391	100

Source: own survey, 2019

Based on the table: 23, above, the response to the survey question regarding the level of priority given to SWSS service, compared with other basic services such as electricity, safety and security, transport and telecom other similar municipal services, shows that 8.4 percent (33 HHs) strongly agreed and 15.6 percent (61 HHs) agreed with the idea that WSS service was the first priority.

On the other hand, 34.5 percent (135 HHs) of the respondents strongly disagreed and 41.5 percent (162 respondents) disagreed with the idea that WSS service was the first priority.

Water supply and sanitation deserves an equal attention as other sectors such as education, health and roads. However, WSS allocations leave a great deal to be desired as compare to these sectors. This more likely reflects a lack of sector readiness to absorb resources rather than a low priority for water supply and sanitation. The above information shows that there was a knowledge gap for giving the priority of sanitation and water and lack of sufficient information concerning how much lack of sanitation affect human health and the aesthetics of the community at a household level at large.

CHAPTER FIVE

Conclusion and Recommendation

5.1. Conclusion

The study has tried to investigate the challenges of water supply and sanitation in Sululta Town, Oromia, Ethiopia. The households not satisfied the existed water supply and sanitations services because the water demands of the Town increased due to expansion of urbanization and population growth. The source of water supply for Sululta town from water surface and ground water that were from rivers, water vendors, traditional well, hand pump and deep wells. The majority of HHs consumed less than 11-15 liters/ person/ day individually which is below WHO minimum standards of 20 liters/person. The impacts of water supply and sanitation inadequate were susceptible different disease and socio economic factors. Shortage of adequate water supply and sanitation services exposed the community for different susceptible water related diseases and impacted the socio economic development of the town. The findings show that inaccessibility of water supply and sanitation caused a disease outbreak and rapid population growth and urbanization, institutional capacity, and inadequate finance were the major challenges of water supply and sanitation at the study area. In Sululta town water demand and water supply was not balanced. The water demand was 1433292.9 m³/year but the water supply was 910141 m³/year. On the average majority households had used private toilet and but some of households had used open defecation on the field and public toilets. Majority of the households had toilets with a wall and roof and some of households had pit without house/open pit toilets/. But there were the households that had no toilets. Lack of proper access to sanitation was the major cause of spreading diseases in Sululta town which are harmful to human life. Regarding materials used for washing hands after toilets, the findings show that, majority of the households in the town were using water only but there were households not washed their hand after toilets. The government did not play the expected role.

5.2. Recommendation

This research has revealed the main challenges that households in the Sululta town face to get water and sanitation from the utility services. The following recommendations are forwarded:

Growth actions that match with the town development must be carried out to come across the water supplies of the town and heartening of investments which relating with water and sanitation. Additionally, the improvement of new water supply sources and expansion of the existing sources should be measured in order to meet increasing demand for water and sanitation facilities. There should be provision of alternative sources of water supply in strategic locations of the town. In addition, promoting sanitation and public toilets, awareness creation on personal hygiene (mainly hand washing) and environmental sanitation should be carried out by all concerned bodies, schools and offices of the Town. Because refining the current water supply and sanitation service in the town in terms of quantity, trustworthiness meaningfully adds in improvement the socioeconomic benefit of the people in the Town.

The municipality wants to professionally organize and participate with town health office and town health extension workers to promotions community alertness on sanitation and faithfully follows up how they exercise. All concerned body must focus on educating sanitation by encouraging household toilets construction and use were developing.

Including the community at all levels of water supply and sanitation program and permit private sector involvement in different components of water supply and sanitation services. Specially, the government and donor community must encourage the women, to solve the exist problem of water supply and sanitation. Further, the community also actively involved in environmental protection especially sanitation rather than expecting everything from the government. Roof top is essential for the community especially in the summary season. To reduce open defecation and improve sanitation the municipality should build many public toilets specially the areas where poor people lived. Because public Toilets a room or booth shared by all people for urination and defecation consisting of at least a bowl fitted with or without a seat and connected to a waste pipe and a flushing apparatus. Health and hygiene education should be connected to sanitation in order to make people be aware of where health problems originate and how to improve sanitation by their own actions.

Sululta water supply office, Sululta sanitation office and concerned body must be integrated with different stakeholders such as different private company, healthy sectors, different factories, governmental organizations and etc.

Generally, In order to improve water supply and sanitation of Sululta town the followings are recommended: Increasing of institutional capacity and skill of personnel in the institution, increase technology capacity for toilets like water closet tanks, encouraging different investments which focus on water and sanitation concerned government office, Contribute to improved public health, increase women participation, the government must follow or expand the new life style (like condominium), protect water sources from pollution and giving attention by all concerned body.

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Appendices

Appendix 1

Questionnaire number _____

Questionnaire

My name is Neggessa damise from Addis Addis Ababa University. I conduct a stud on **Investigate the challenges of water supply and sanitation. The case of Sululta town, Oromia, Ethiopia.** The aim of this questionnaire is to collect data needed for a thesis and to make the paper fulfill document and problem solver your kindness help is needed. The information that you provide is highly important for the success of this research. Moreover, the information you provide is used only for academic purposes and it will be kept strictly confidential. I highly appreciate in advance to your kind cooperation.

Questions answered by sample Households.

Household Questionnaire.

- 1) Personal Background
- 2) Age
- 3) Sex
- 4) Levels of education
- 5) Family size
- 6) Marital status
- 7) Monthly income

Name of Interviewer

Section A: socio-demographic data

Date of interview.....

1. Age: 20-30 31-40 41-50 >50

2. Sex: Female male

3. Educational Level?

a) Unable to read and write (Illiterate)

d) Junior school (9-12)

b) Primary school (1-8) complete

e) College diploma c) degree

f) masters and above

4. Monthly income:

<1000

1000-4,000

>4 0 0 0

5. Family size (number of people in the household).

1-3

4-6

>6

6. For how long have you been live here? -----

7. marital status-----

Single

married

divorced

Section B: source of water and water supply situation.

1. How many liters of water do you consume in a day individually? (Household head, l/p/d)

5-10ltrs 11-15 ltrs 16-20ltrs 21-25 ltrs 26-30ltrs >31ltrs

2. A) Are there days when water is not available?

Yes No

B) If yes, how many days is the water not available?

1-3 days 4-6 days 7-10 days *above*

3. What the source of water in your area?

Rivers deep wells water vendors

Hand dug *traditional wells*

4. How long do you travel to collect water from the source?

< 30 minutes between 30minutes to 1

Hour over 1hour

5. How much time you spend with queuing on alternative source of water at the water point?

< 30 minutes between 31minutes to 50 between 51minutes to 71

Between 71minutes to 91 over 91

Section C: Challenges of Water supply and sanitation.

1. What is the challenges of water supply and sanitation in your area?

Variables	✓
Rapid population growth	
Low levels of income /in adequate finance	
Institutional capacity	
Technology capacity	
Other/specify	

2. How in adequate water supply and sanitation affect your livelihoods?

Variables	✓
Disease outbreaks	
Socio economic factors	
Both/disease outbreaks and socio economic factors/	
Others (specify)	

4. What is your perception about wss is first priority when compare with other municipality service?

- | | |
|-------------------|----------------------|
| 1) Strongly agree | 2) agree |
| 3) Dis agree | 4) strongly disagree |

5. Water for what purpose?

- | | |
|-------------|------------|
| 1) Drinking | 2) washing |
| 3) Garden | 4) bathing |
| 5) Animal | 6) none |

17. If you don't have private connection/yard so far, what do think the reason?

18. How do you explain the overall water and sanitation facility of your village?

19. What are types of toilets based on their constructed?

- 1) Pit with roof 2) pit without roof but only wall
- 3) Only pit 4) none

20. Did the government agency adequately prepared the community to manage and sustain their water supply and sanitation?

- 1) Yes 2) No

21 .What are some of the problems you face in your attempt towards the provision of water and sanitation services in sululta town?

22. Are you satisfied with the role the government plays on provision of water and sanitation services?

- Highly satisfied [] satisfied [] dis satisfied [] highly dis satisfied []

21. Are you satisfied with existing water supply and saniation services?

- Highly satisfied [] satisfied [] dis satisfied [] highly dis satisfied []

22. What measures should be taken to overcome the problems in the future?

- 1) Good management 2) increase adequate finance
- 3) Increase awareness 4) enhance building capacity
- 5) Integrated with different stakeholders

23. After toilets by what material wash your hand?

- 1) Water only 2) water and soap
- 3) Water and different leaf 4) none

SECTION F: Interview with different officials.

Age _____ sex _____ your responsibility or position in the organization
_____ Years of experience in the office _____

1. What strategy is set by your office to provide improved water and sanitation facilities to the urban dwellers?
2. What is the condition of water and sanitation facilities in urban?
- 3 .Are there other approaches you think should be employed to ensure sustainable water supply and sanitation services in sululta town?
4. Are there any water and sanitation related problems on the life of the urban residents and the environment
5. What are the challenges in providing improved water services to the urban residents?

SECTION G: Focus Group Discussion

1. Suggest ways you think the water supply and sanitation in sululta can be achieved. What are the challenges in providing improved water services to the urban dwellers?

2. What is the order/rank of challenges of water supply and sanitation in your area?

3. What are water and sanitation problem faced that you and your family been faced? If the answer yes how can overcome that problem faced?

4. What are your perception on the government prepared the community to manage and sustain the water and sanitation in their area?

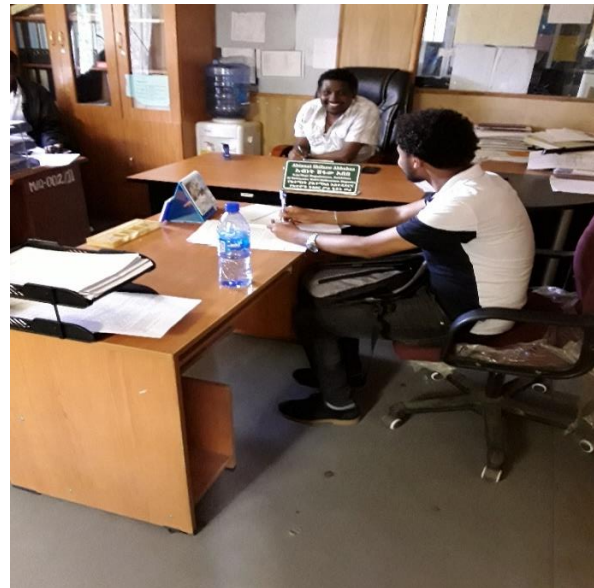
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Appendix 2

Picture 1:- Methods of data collections



a) interview with swsso expert



b) Interview with Sululta municipality expert



c) When households fetch water



d) focus group discussion with households

Source: own survey, 2019

Picture 2:-The housing condition of toilets



a) public toilets in Kebele 01



b) private toilets in wale lube

Picture 3:-Time spending at water point by queue



b) water collection in Q/wasarbi Kebele

Source: own survey, 2019