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(RLDS)**

**AN ASSESSMENT OF COMMUNITY MANAGEMENT OF RURAL
WATER SUPPLY SCHEMES: THE CASE OF EIGHT PEASANT
ASSOCIATIONS IN NORTH GONDAR ZONE**

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Acronyms

ANRS	–	Amhara National Regional State
ATH	–	Azezo Tekle Haimanot
ATS	–	Alem Tsehay
AUSAID	–	Australian Agency for International Development
B/Nemonia	–	Broncho Nemonia
BPED	–	Bureau of Planning Economic Development
CBOs	–	Community Based Organizations
SWSM	–	Community Water Supply and Management
DDA	–	Demand Driven Approach
DICAC	–	Development and Inter Church Aid Commission
DPED	–	Department of Planning and Economic Development
DW	–	Darna wonberdi
DZ	–	Dabat Zuria
EOC	–	Ethiopia Orthodox Church
EYS	–	Eyadoo Serava
GZ	–	Gondar Zuria
G/Zuria	–	Gondar Zuria
HHs	–	House Holds
INT	–	Intestinal Parasite
LAC	–	Lay Arma Cheho
MOWR	–	Ministry of Water Resources
MAX	–	Maximum
MIN	–	Minimum
NGAZ	–	North Gondar Administrative Zone
NGOs	–	Non-Governmental Organizations
O & M	–	Operation and Maintenance
PAs	–	Peasant Associations
PCD	–	People Centered Development
RWSM	–	Rural Water Supply and Management
RWSs	–	Rural Water Supply Schemes
SAPs	–	Structural Adjustment Programs
SD	–	Standard Deviation
SDA	–	Supply Driver Approach
SNNPRS	–	Southern Nations, Nationalities and People's Regional State
SS	–	Saina Sabia
SSA	–	Sub Saharan Africa
STDs	–	Sexually Transmitted Diseases
TB	–	Tuberculosis
TEC	–	Tsehay Egir Cherkos
T/Culosis	–	Tuber Culosis
WSSs	–	Water Supply and Sanitation Schemes
UNDP	–	United Nations Development Program
WD	–	Woina Dega
WATSAN	–	Water and Sanitation
WB	–	World Bank
WPs	–	Water Points
WSSA	–	Water Supply and Sewerage Authority

Abstract

Due to an entire dependence on unsafe water sources, the larger proportions of rural residents in the target eight PAs have been subjected to water-associated morbidity and mortality. This situation was exacerbated by absence of latrine and inadequacy of hygienic practices of rural inhabitants. Recently, with the aid of few NGOs, some interventions have been made to provide safe water to the rural dwellers, in cooperation with the Amhara regional state and the community. These NGOs develop water points, and finally transfer them to WATSAN committees so as to fill the institutional gap at the grassroots. The general emphasis of this study was to assess the situations of community management after water points were handed over to users. The particular focus, however, was on technical, social, institutional, and financial aspects of schemes in the target PAs, such as Dabat Zuria, Chilla, Alem Tsehai (ATS) or Bihona, Eyaho Serava (EYS), Tsehai Egir Cherkos (TEC), Darna Womberdi (DW), Saina Sabia (SS), and Azezo Tekle Haimanot (ATH) in north Gondar zone. The results of the study revealed that improved water points have not been managed as envisaged due to shortcomings in the approaches followed by interventionists, inadequacy of the emphasis given to the software aspects, and low level of commitment and participation in managing these schemes. Except at Serava, which is a growing small town in Chilga woreda, WATSAN committees have ceased to function in the other PAs. As a result, service fees have not been collected. They do not have financial record system and bank accounts. Out of twenty improved water points, eighteen gravity points have faced breakages of various kinds due to problems in operation and management. Most of these points were not maintained due to financial constraints to cover maintenance expenses. Furthermore, users manifest dependency feelings in that they require the government to maintain broken points. Despite the major community management deficiencies, most users in the study areas utilize improved water points. Vulnerable community members in all study areas use water for free. Participation of women had been good during the construction of improved points, but currently, they only participate as collectors. The institutional arrangement was found very poor. There is no cooperation and integration among WATSAN committees, woreda water desks, and zonal water department. These water offices have shown inadequate capacities to contribute to the continued functioning of improved points. There has been inadequate monitoring and support from local water offices to WATSAN committees.

CHAPTER ONE

1. INTRODUCTION

1.1. Background

Water is the finite and renewable natural resource on which life sustains on earth. It is an integral part of the ecosystem and a social and economic good, which must be managed locally in order to ensure sustainable development. It is a topic of increasing interest on global basis in this era of population growth, climate change and ecological disorder (Benjamensen, 2002:239).

Water is the most widely occurring substance in the world. Over 72 of the earth's surface is covered by water, out of which 97.2 is in the ocean that is unfit for drinking and irrigation with out desalination. Another 2 of the remaining water body lies frozen in glaciers and in the icecaps, and is mostly unreachable. The usable portion is, therefore, only about 0.8 of the total, which is neither evenly distributed nor properly used. Hence, the issue of water availability, access and quality are of fundamental importance in rural water supply sub sector (www.dams.org; Zeyede, 2004:9).

In 1997, more than 1.1billion (20) people in low and middle-income countries lacked access to safe water supplies; far more were without adequate sanitation services. In 2002,166 million people have suffered from water scarcity, while another 270 million were considered 'water stressed' (Pitman, 2002:XVII). By 2025, it is estimated that the affected population will increase to about 3 billion (40) most of whom in the poorest countries (www.worldbank.org).

According to Novicky (1997), over 250 million people, i.e., half of Sub Saharan Africa's (SSA) population has no access to safe drinking water, and almost 300 million lack adequate sanitation services. If the current situation is not improved, 500 million Africans

are likely to be without safe water and sanitation by the year 2020, given the current rate of population growth (www.africarecovery.org). Two-thirds of Sub-Saharan Africa's rural population, and one quarter of urban dwellers, currently lack access to potable water and millions of Africans die of water related diseases (www.africarecovery.org).

Ethiopia, because of its physiographic and climatic conditions, is labeled as 'the water tower'. Despite the availability of huge water resource, however, there is uneven spatial and temporal occurrence and distribution. Between 80-90% of Ethiopia's water resource is found in the Abay (Blue Nile), Tekeze, Baro-Akobo, and Omo-Ghbe river basins in the western and south western parts of Ethiopia, where the population is no more than 30-40%; while the water resource in the east and central river basins is only 10-20%, where the population is over 60 (MOWR, 1999:VII).

The temporal disorder, too, poses serious consequences. The rain rains either earlier the rainy season or too late or quits short in mid season. Hence, the required amount is not available at the right time, posing its own impact on production, human and animal life (MOWR, 1999: VII).

1.2. Objective of the Study

1.2.1. General Objective.

An assessment on the roles of community management of rural water supply and sanitation schemes which were developed by WaterAid Ethiopia /EOC, and later on handed over to the community via district water desks in north Gondar Zone, Amhara region, targeting 20 schemes taken from 8 Peasant Associations (PAs).

1.2.2. Specific Objectives

- Assess the roles of WATSAN committees;
- Identify technical problems of water supply and sanitation schemes;
- Examine institutional arrangements of rural water supply and sanitation schemes in the study area;
- Assess the financial management of developed schemes;
- Analyze the social dynamics of developed schemes, with respect to women's participation, conflict, and equity, as well as perception of sense of ownership and satisfaction among users;
- Identify benefits and changes on the lives of women, children and on the beneficiary community at large;
- Point out the situation of community participation in operating and managing improved supplies.

1.3. Research Questions

1.3.1. Central Research Questions

- How do target communities manage their own water and sanitation schemes?
- Do the schemes bring any change on the lives of user communities?

1.3.2. Specific Research Questions

- What are the roles of WATSAN committees?
- What are the most frequent technical impediments that endanger the sustainability of WATSAN points?
- What does the institutional arrangement of Rural Water Supply in the study area look like?
- How do communities manage the financial aspect of developed schemes, i.e., do they collect user fees; do they have bank accounts and record systems?
- Did the developed schemes bring any change or benefit up on the lives of users?
- What is the situation of gender, conflict, equity, and sense of ownership in the study areas?
- Do users participate in the operation and maintenance of water points?

1.4. Conceptual Framework

People Centered Development /PCD/ (like rural water supply) considers the people both as the means and an object of development. Among its diverse features, PCD focuses on the principal use of human resource both trained skills as well as indigenous knowledge and experiences; conservation of environmental and/or natural resources; spread of ownership of productive assets; assisting vulnerable groups; and applying adaptive and responsive methods in managing resources. Water supply is a peculiar manifestation of PCD. PCD give emphasis to the importance of bottom up approaches and participation of the end users in decision-making, as a means to bring empowerment and equity (Gant, 1987:1-7).

Ethiopia uses population size to classify population and areas as rural or urban. For water supply purposes, a community with a population less than 10,000 is identified as rural. Rural water schemes are also defined as points improved by the joint efforts of users and WaterAid/EOC. They are primarily designed to provide pure water services to the rural poor. Rural WATSAN schemes share some common characteristics. They require low capital costs, mostly use locally available materials, largely based on similar design, relied on the approach and technology understandable to the people who are using it, employ local labor, controlled and maintained by villagers, are flexible to be used or adapted to fit to changing circumstances. The expected outputs of these water schemes are improvements in health, income, institutional strengthening and technological know-how, as well as environmental resilience (Mengesha, 2002: 12).

Sustainability of rural water supply benefits refers to the provision of safe and adequate services at reasonable cost on long-term basis. Specifically, it is the continuance of project benefits after the termination of the project. It relies on participatory processes that pay attention both to the software and hardware aspects of the project. Involving the

end users in all aspects of the decisions believed to have empowering effects on users, so that they could be able to manage developed water points by themselves. Problems at the planning and appraisal stages create loopholes for the emergence of problems that can be a threat to sustaining services. Giving proper attention to software aspects of the project at the planning stage, therefore, help to develop sense of community ownership to enhance users' involvement in project management, and consequently contribute to the sustainability of benefits (Ausguide, 2003:3; Mengesha, 2002:14).

Community management, in the context of rural water supply, is the effective application of the by-laws that provides a wider range of responsibilities to the elected WATSAN committees. These committees were made responsible, among others, to undertake operation and maintenance of water points by mobilizing users and resources. Before the occurrence of any damage on the developed supplies, users should devise the means to protect and/or prevent potential damages. Prevention and/or protection, therefore, refer to practical measures taken in the form of fencing water points using available materials to prevent the reach of animals and children. It also refers to measures taken to enhance the water quality through constructing dams to prevent contaminants (either in solid or liquid form) from entering in to collecting chambers via flood, wind, by animals (www.ilri.org.htm). Users' sense of ownership is also the prime strategy to ensure scheme protection, either through resource contribution, refraining from deliberate damages/theft, or preventing others from doing so (WaterAid, 2000: 13). Community management will not be a success with out adequate financial base. Rural water points were primarily designed to become self-reliant through the effective collection and management of service fees from water users. Service-fee rates were not imposed, they were determined by users themselves, and are different from PA to PA. This was so because of the assumption that users will be at ease and feel responsible in

paying service fees, and consequently contribute to build strong financial base to allow effective community management (Solomon, 2001: 21).

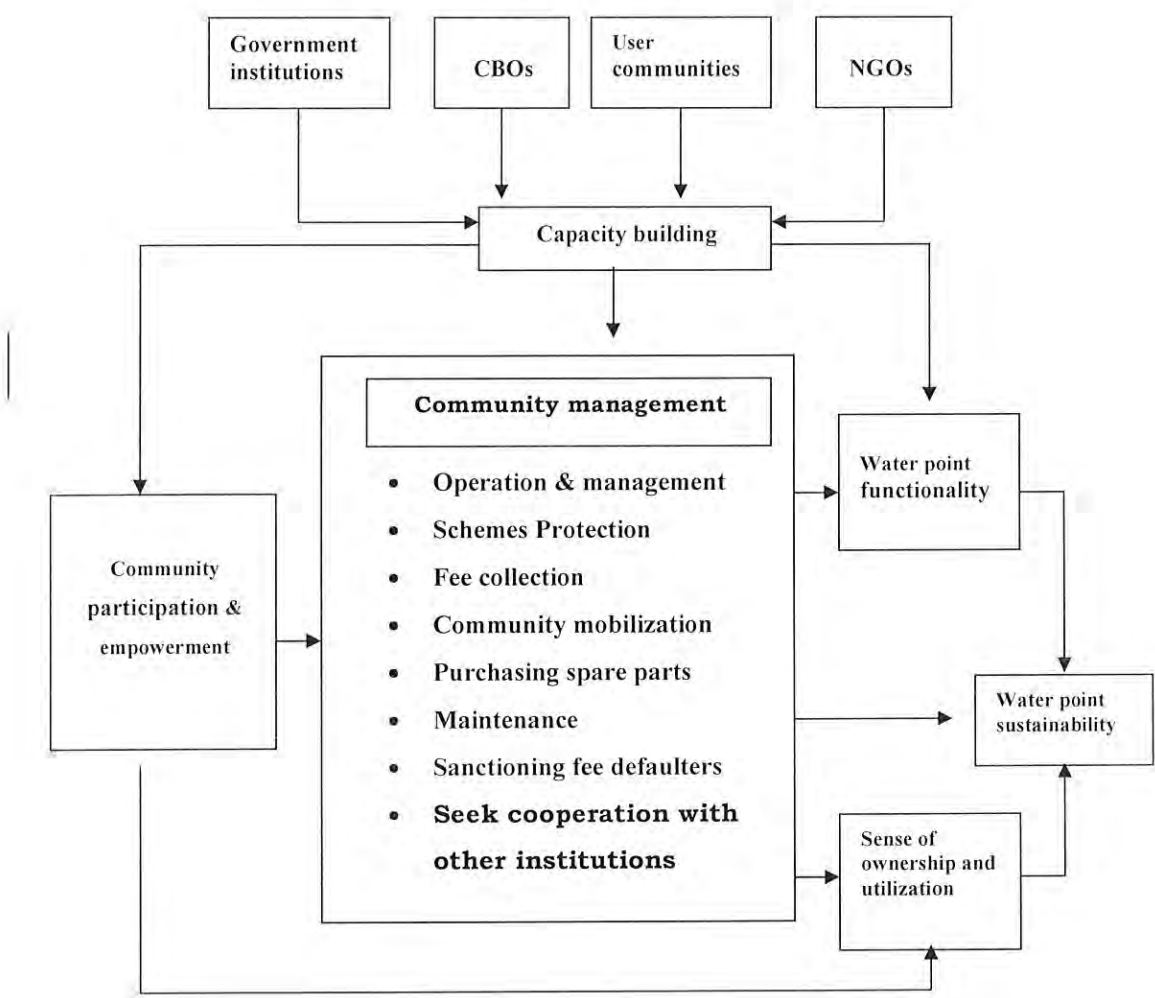
Community mobilization is an essential strategy to carryout successful operation and management on developed schemes. The community should be motivated and sensitized to cooperate with and take its part in all the efforts made to manage water points and extend the benefits of safe water supply. The management of water points will not be a success by the efforts and capacities of users only. There might be cases when the support of potential stakeholders is required, which in fact calls for strong community mobilization efforts (Mengesha, 2002:16). The sustained functionality of water points depends on active community mobilization and involvement. It refers to the continuing operation and functioning of the developed points and provision of services to communities of their respective target area, with fewer occurrences of damages, and consequent termination of services. The absence or inadequacy of community mobilization may even lead to refutation of the developed schemes (www.iboro.ac.uk; Mengesha, 2002:29).

Community participation is widely used both in right and need based interventions. It is a condition in which users exercise their voice and choice in all matters of the water supply initiative. It ranges from information sharing and/or consultation during the phase-in stage of the project to the extent of managing schemes independently after the project is terminated. It is positively associated with the existence of strong community management practices. It has also advantages of cost reduction, increasing efficiency, timely completion of projects and development of sense of ownership and consequently contributes to the sustainability of development outcome. Participation of the community in water supply projects, not only has positive bearings on the success of community management and sustainability of improved supplies, but also it enhances receptivity of

the people for change; enable targets to get information and knowledge, and in general, it has empowerment effects on the lives of user communities (Gant, 1987:7:28; Mengesha, 2001:16). Participation by both men and women as equal partners is essential for sustained interventions. Communities are usually composed of individuals and groups who command different levels of wealth, influence, and ability to express their needs, concerns and rights. Power issues place women at the disadvantaged positions. The role of women in domestic water management has been proved vital, despite the gender equality problems, which are deep-rooted in peoples' perception. Their involvement in all aspects of RWSs is believed to ensure sustainability. In addition to women, attention should also be given to other vulnerable groups, such as the poor, the disabled and the like, to have stakes and enjoy equal access to water points (www.dams.org).

Building the capacity of grass root actors that have stakes in water point management, both during project implementation and even after projects are handed over to the user communities, is a viable way of alleviating managerial and technical capacity constraints. In the rural water supply context, it refers to providing various trainings to elected WATSAN committees, local caretakers and the community at large so as to enhance their capacities that can be applied in managing improved supplies. In addition, it also refers to providing various technical assistance/backup services, equipping WATSAN committees and village technicians with essential practices and experiences, and providing maintenance equipments that can be used in managing improved points (www.ilri.org). Major concepts and their relationship discussed above are depicted in the framework below.

Figure 1.1: Conceptual Framework



1.5. Problem Statement

The national water supply coverage is estimated at 33.2. In rural Ethiopia, which comprises 85 of the total population, the coverage for potable water and sanitation services are limited to 24.7 and 7 respectively. These indicators are among the lowest, even by the standards of Sub-Saharan Africa (SSA) (Getachew, 2002:5; www.cih.uih.no; www.waltainfo.com).

The root of the problems on which this study seeks to focus are, however, those that are created after rural water supply schemes, constructed by WaterAid/EOC, are handed over to WATSAN committees and user communities for their utilization, ownership, and operation and management. The critical challenge, however, that endangers the sustainability of Rural Water Supply Schemes (RWSS) in the study areas, is lack of committed and responsible community organization that operates and manages the system (www.cih.uih.no). WATSAN committees ceased to manage these schemes, soon after the withdrawal of WaterAid/EOC from the project area. This is the turning point where community management roles become apparently failed, and consequent problems become evident (Solomon, 2001:21). The most noticeable signs of such failure, among others, are technical breakages. More than 90 percent of improved water points have faced various types of technical faults. It is, therefore, common to see water point assets damaged and left broken here and there. This situation strikes a number of questions, like the ones that this assessment seeks to answer. All the technical troubles, however, were the symptoms, and the root causes behind are the failure of the elected water committees to execute its responsibilities, and lack of attention by the user communities to take notice of the situation and look for corrective action.

Inadequate vertical and/or horizontal institutional integration and support, between and among the concerned stakeholders, such as WATSAN committees, PAs and non-

government partners, deepens the problem. WATSAN committees, according to their by-laws need to work in close partnership with PA administration, Woreda, zone, and region level sector offices and also with NGOs operating in the project area. Especially, Woreda water desk offices are the closest formal institutions responsible to coordinate and supervise water supply activities in their respective PAs. But these desks have failed to do so due to their structural infancy, lack of proper attention to, and adequate capacity assistance from higher-level sector offices to them to enhance their performance. They do not have the required facilities and budget to carryout their responsibilities. There was also a shortage of trained and experienced manpower that could perform sector roles and hence, extend support down to rural WATSAN committees.

PA administrators also failed to give adequate emphasis to the problems water points are facing. They have the opportunity to influence the community, and link issues to the woreda structure, but they do not assist the WATSAN committees, whose voice is not heard because of the fact that they do not have defined legal status, and are not authorized to affect ownership and management of critical resources, like land. At the third layer of the institutional ladder is the zone water, mines and energy development department. Its institutional structure was highly modified in an effort made to strengthen grassroots structure to make them responsive to community problems, and hence, was not in a position to contribute to water point management. NGOs, on the other hand, give little/no attention to the operation and management problems. They rather give emphasis to new interventions. With all these institutional problems, improved rural water point management does not receive proper attention and support from respective sectors, and remains with all its appalling challenges ([www. waltainfo. com](http://www.waltainfo.com)).

More so, the failure of community management of the target rural water supply schemes, in the study areas, has never been studied yet. This research is, therefore, made to lay

the foundations for future measures that would be taken to improve community management and thereby sustain potable water services, and finally come up with possible solutions (Getachew, 2002:7).

1.6. Methodology

In assessing the situation of community management of rural water supply schemes, a sample survey method, i.e., cross-sectional design was employed. It is an in-depth examination of the factors affecting community management through the collection and analysis of qualitative and quantitative type of data. The following tools of data collection were used in the study.

1.6.1. Desk Review

Research results, policy documents and strategy papers related to water supply, books, journals articles, evaluation reports that explain the performance of water supply projects, monitoring data, population statistics projected and distributed to sector offices for planning, unpublished materials developed for ad-hoc purposes, strategic plans and policy documents of NGOs were extensively reviewed and used to extract secondary information. Issues relevant to the research were also browsed from Internet, as sources of secondary data and as a means to fill the gap related to literature inadequacy.

1.6.2. Household Survey

Structured questionnaire was administered in the survey to generate primary data by soliciting the perception, knowledge, attitude and practices of improved water point users on relevant variables, such as the roles of water committees, technical aspects of water supply schemes, institutional arrangements, community and women's participation, users' fee collection and management, spare part supply problems, maintenance, water source protection, users satisfaction and so on, based on the services they are being rendered.

1.6.3. Key Informant Interview

An in-depth interview was made with individuals of both sexes from agriculture and rural development offices of the target woredas, woreda water desk and zone department officers, personnel working in NGOs who had been involved in the planning and implementation of water points, and hence, have a real picture of the processes in which the construction and management of these schemes have passed through. Health personnel from target woreda health centers were also interviewed using pre-designed interview guide.

1.6.4. Focus Group Discussion (FGD)

Four Focus Group Discussions (FGDs) were conducted at Chilla in Dabat, Tsehai Egir Cherkos in Dembia, Azezo Tekle Haimanot in Gondar Zuria, and Bihona in Chilga districts, with WATSAN committee members, village caretakers, women and vulnerable community members. In each group, 8-12 participants were involved in the discussion, regarding the strengths, weaknesses, opportunities and threats (SWOT) of their respective water schemes.

1.6.5. Observation

In addition to household survey, interview and FGDs as primary data collection methods, 2-handpumps and 18-gravity points were physically observed with checklists to complement the reliability of the data collected with the above methods, and was used to depict the existing physical and technical conditions and/or status of the water points.

1.6.6. Sampling Method

As described above, sample survey was used as research method. Households constitute the basic sampling unit in the survey. The sample has included households who were actually utilizing improved water points from eight PAs, namely, Dabat Zuria (DZ) and Chilla from Dabat; Alem Tsehai (ATS) or Bihona and Eyaho Serava (EYS) from Chilga; Tsehai Egir Cherkos (TEC) and Darna Womberdi (DW) from Dembia; Saina

Sabia (SS) from Lay Armacheho, and Azezo Tekle Haimanot (ATH) from Gondar Zuria Woredas. A total of 250 households were, therefore, purposively taken and surveyed. The reason for the adoption of purposive sampling was absence/lack of developed sampling frame in the study areas. Furthermore, it was also very difficult to develop a new sampling frame at the time of data collection because of the following reasons: It requires high cost the research covers a wide geographical area of five far apart woredas and hence, there was a problem of distance and associated transport cost to move from one woreda to another, and from PA to PA with in the same woreda. Currently, because of repeated merging and unmerging of PAs for administrative purposes, it is even difficult to use available data as it lack completeness. The situation also increases the size of PAs in which home-based inventory become difficult. There was also time constraint to enlist improved water user households from eight target PAs in the five woredas provided that other factors are equal.

The data gathered in the survey was complemented by the data obtained from observation, FGD, and key informant interview. A total of seven 10th and 12th grade graduates, who are living in and around the target villages, were selected and trained to collect the required data using structured questionnaire. Sampled target woredas, peasant associations and sample size is summarized in Table-1.1 below.

Table 1.1: Target woredas, peasant associations, and number of sampled households

Woredas	Peasant Associations	Number of sampled households
Lay Arma Cheho (LAC)	Saina Sabiya (SS)	31
Dabat	Chila	31
	Dabat Zuria (DZ)	31
Dembiya	Tsehai Egir Cherkos (TEC)	32
	Darna Womberdi (DW)	31
Gondar Zuria (GZ)	Azezo Tekle Haimanot (ATH)	32
Chilga	Eyaho Serava (EYS)	31
	Alem Tsehai (ATS) or Bihona	31
Total sample size		250

1.6.7. Data Analysis

The data was analyzed using statistical software, i.e., SPSS version 11, employing both qualitative and descriptive types of analysis, such as ages, ratios, mean, standard deviation and ranges. The data collected through interviews, FGD, and physical observation was also used qualitatively in a way to better complement and describe variables in the existing conditions of community management.

1.7. Scope and Limitation

The scope of this study is aimed at providing the qualitative and quantitative analysis of the situation of community management based on the primary data collected through questionnaire, FGDs, interviews and physical observation of 2-hand pumps, and 18-developed water points. Specifically, it provides an in-depth analysis of the social, economic/financial, institutional and technical aspects of the rural water supply management systems of the study areas.

This study was not without limitations. Some of the limitations were mainly those faced during fieldwork. The survey was deliberately made to cover wide geographical areas, anticipating transport, or vehicle cooperation from EOC water and sanitation project office in north Gondar. It was however, not able to extend its cooperation in providing vehicle and information about past experiences of the study area. Similarly, district level agriculture and rural development offices of the five Woredas were also reluctant to provide the necessary cooperation in getting access to the basic socio economic background data that may have been compiled for some other planning activities. There was also bureaucratic bottleneck to get some sort of assistance, as the heads were tight in excessive meetings. To hold discussion about the situation of existing water supply points with the district water desk, first one has to see the head to get permission to do so. Inter and intra Woredas transport was also a problem due to remoteness of the study areas.

1.8. Definition of Terms and Concepts

Adequate water supply: is one that provides safe water in quantities sufficient for drinking and sanitary, domestic and other household purposes so as to enhance the health and personal hygiene of members of the household .A sufficient quantity should be available in a reliable year round basis to or with in the household (Gabre, 1997:13).

Debbo: Is commonly known in rural communities whereby community members come together and help each other, for example during harvesting time, when a member wants to construct a house, etc (Solomon, 2001: 97-98).

Equb: A traditional credit and saving membership association (Solomon, 2001: 97-98).

Eddir: An association in which members cooperate and help each other at time of funeral, wedding and other local ceremonies community development activity (Solomon, 2001: 97-98).

Hygiene education: Refers to all activities aimed to change attitude and behavior in order to break the chain of disease transmission associated with inadequate hygiene and sanitation (Bergers, 1998: XL).

Palatable water: Water that is pleasant to drink because its taste is good, but it may not be safe to drink.

Polluted water: Water that has come in contact with substances that alter its physical qualities, so that it changes in color, turbidity, taste or smell. Polluted water can be detected by sense organs. As a rule, polluted water should be considered as contaminated water (Gabre, 1977:29-30).

Potable water: Water safe for drinking, free from pathogens, which are introduced to the water in various ways (Gabre, 1977:29-30).

Safer water: Water that doesn't contain harmful substances or microorganisms in concentration that could cause illnesses in any form (Gabre, 1977:29-30).

Sanitation: The establishment of environmental conditions favorable to health. It is the prevention of diseases by eliminating or controlling environmental factors which form links in the chain of transmissions (Gabre, 1997:24).

Sustainability: The continuation of benefits after major assistance from a donor has been completed (Ausguide, 2003:1).

CHAPTER TWO

2. PROFILE OF THE STUDY AREA

2.1. Physiographic Conditions

North Gondar Zone is one of the 11 administrative zones in Amhara National Regional State (ANRS). It is located at the northwestern part of the country, i.e., between 11.5 - 14.2° North, and 35 - 38.5° east of Greenwich Meridian. It has a total area of 48621.28 square kilometres. Out of the total land area of the zone, the five districts from which the target PAs are selected, i.e., Gondar Zuria, Lay Armacheho, Dabat, Dembia and Chilga account for 1548.88 (3.18), 1118.11(2.2), 1192.19 (2.45), 1452.64 (2.98), and 3145.56 (6.46) square kilo metres respectively. 70 percent of the total area of the zone falls under the drainage basins of Tekeze River, and the remaining to Blue Nile river basin. With regard to the topography, it has varied landscapes, dominantly covered with rugged hills and plateau formations, with altitude that ranges from 700 meter in the western lowlands to 4543 meter above sea level at Ras Degen-the highest peak in the country (DPED, 2000:5; EOC /WATERAID Needs Assessment, 2000:4).

Its climate varies from very hot in the western borders to that of very cool at the Semen Mountains. There are, however, three main agro-climatic zones, which correspond to differences in altitude and temperature. These climatic zones are Kola, Woina Dega (WD), and Dega accounts for about 47.9, 34.9, and 16 of the total area of the zone respectively. Wurch also take a share of 1.2 of the total agro-climatic area (DPED, 2000:6).

Each climatic zone has its own average annual rainfall and temperature. In aggregate the Kola, Woina-Dega, and Dega areas have an average annual temperature and rainfall

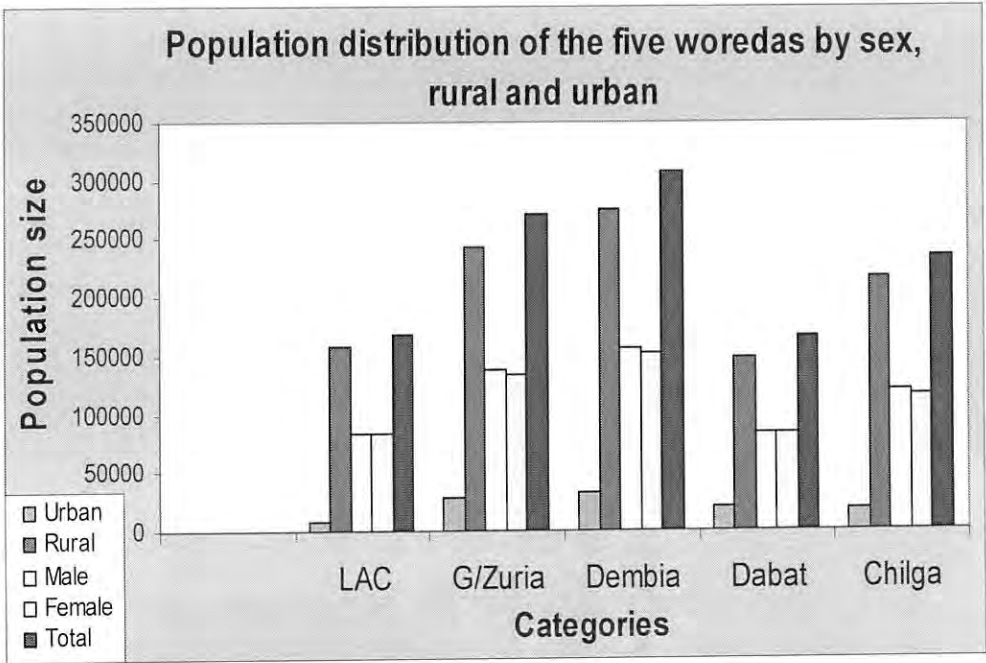
of 20-25⁰c and 700-1000mm, 15-20⁰c and 1200-1400mm, and less than 15⁰ c and grater than 2000mm respectively (EOC/WaterAid Needs Assessment, 2000:6).

2.2. Demographic Conditions

North Gondar Administrative Zone (NGAZ) is, currently, sub-divided into 18 sub administrative districts. In aggregate, NGAZ has a total population of 3,046,591, of which 1,539,454 (50.5) and 1,507,137 (49.5) are male and female respectively. Out of the same total zonal population, 2,614,387 (85.8) are rural dwellers, of which 1,268,659 (48.5) are females and 1,345,728 (51.5/) are males (BPED, 2005:7).

As is shown in graph-2.1, Lay Armacheho (LAC) has a total population of 167001, which is 5.48 of the total zonal population. Its female and male population is estimated to be 83346 (49.9) and 83655 (50.1) respectively. Gondar Zuria (GZ) is the second Woreda that has a total population of 270518, i.e., 8.87 of the total population of the zone. Considering sex, it reveals that male and female account 137439 (50.8) and 133079 (49.2) respectively. Dembia, the third Woreda, has a total population of 306671 (10) with a male and female population of 155920 (50.8) and 150751 (49.2) respectively. Dabat is also one of the woredas from which sample households are taken. It has a population of 166669 (5.46), of which the male and female population accounts 83942 (50.4) and 82677 (49.6) respectively. The last Woreda under consideration is Chilga. It has a total population of 234616, i.e., 7.7 of the population of the zone. and its male and female population is estimated to be 119393 (50.9) and 115223 (49.5) respectively. Graph-2.1 also suggests that the greater proportion of the population in the zone live in rural areas (BPED, 2005:180).

Graph-2.1: Aggregate population size of five Woredas in north Gondar zone urban and rural

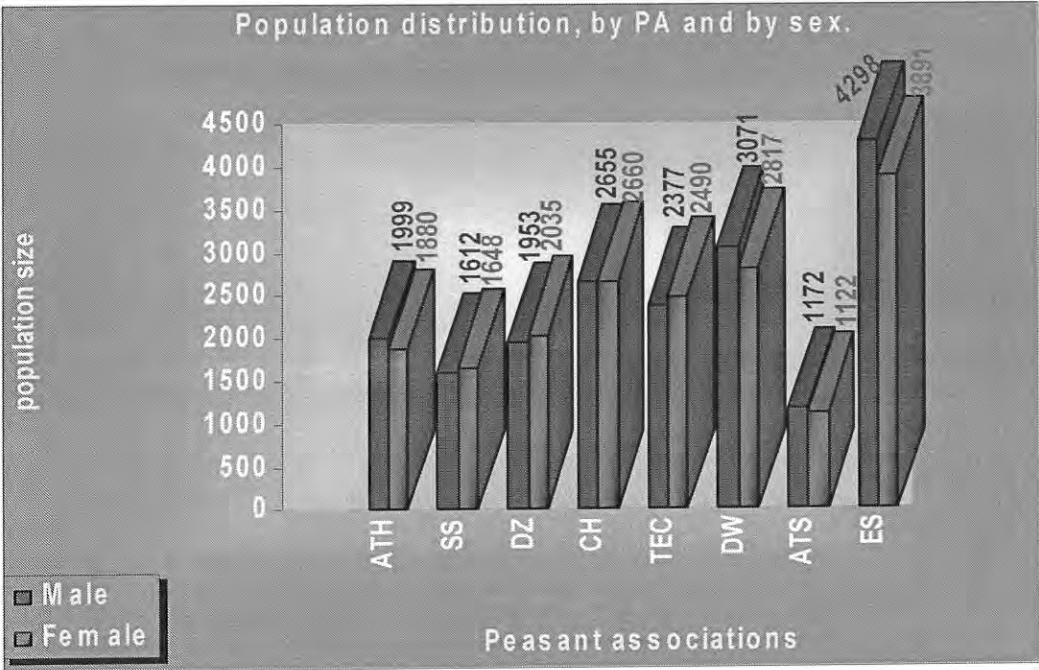


Source: Graphed based on bureau of planning and economic development annual statistical bulletin, 2005: 7.

Graph-2.2 below, is also based on population data projected and distributed by the regional Planning and Economic Development Bureau (BOPED), to all those government and non government institutions, so that they could use it to their own planning and policy issues. The population figure depicted by the graph show the general population estimate of peasant associations (PAs) where water points are located. Water points under consideration are not serving the entire PAs where they are located; they are rather serving parts of PAs or villages known as Gotes. It was, however, difficult to get compiled and usable data regarding the general features of these Gotes, particularly; data pertained to water supply management. As is described by graph-2.2, Azezo Tekle Haimanot (ATH) is located at the southwestern part of the city of Gondar, in Gondar Zuria Woreda. It has a population of 3879, with male 51.5 and female 48.47. It is located between Woina Dega and Kolla agro climatic zones. Alem Tsehai (ATS), and Eyaho

Serava (ES), formerly known as Bihona, are taken from Chilga Woreda. ATS has a total population of 2294, of which 51.09 are male and 48.91 are female. ES, on the other hand, has a population of 8189, of which male and female constitute 4289(52.49) and 3891(48.51). They are located in Woina Dega climatic zone. Chilla and Dabat Zuria (DZ) are taken from Dabat Woreda. They are with in the Dega agro climatic zone. They have mostly degraded, eroded, deforested and rugged plateau. Chilla has a total population of 5315, with male 2655 (49.95) and female 2660 (50.05). DZ, on the other hand, has a total population of 3988, with male 1953 (48.97) and female 2035 (51.03). Tsehai Egir Cherkos (TEC) and Darna Womberdy (DW) are found at the southern and northern edges of the town of Chuahit, and 10 kilometres north east of Gorgora. They are taken from Dembiya Woreda, which is generally categorized as having kola/hot climate. TEC has the total population of 4867, with male 2377(48.84), and female 2490 (51.16). DW on the other hand, has a total population of 5888, of which 3071(52.16) are male and 2817(47.84) are female. Saina Sabia (SS) is the PA taken from Lay Arma Cheho (LAC) woreda. SS is the most mountainous area, highly eroded and degraded due to unwise utilization of resources by the respective population. It consists a total population of 3260, with males 1612 (49.45) and female 1648 (50.55) (BOPED, 2005: 8).

Graph-2.2: Aggregate population size of peasant associations in north Gondar zone



Source: Graphed based on BPED annual statistical bulletin, 2005:8.

2.3. Socio-Economic and Institutional Conditions

Agriculture, particularly mixed farming, as is common in the rest of the nation, is the main economic sector of the region. It provides employment for more than 85 of the population, i.e., of rural ones. In addition, it serves as the major source of income for the same proportion of the population. Despite this, however, the total amount of production and productivity is still very low to support the growing rural and urban population. Population of the north Gondar zone in general, and rural population of the same zone in particular, do not have adequate infrastructure. This is aggravated by population explosion and environmental degradation, which is causing worsened welfare and health conditions (BPED, 2005:186).

2.4. Institutional Arrangement

2.4.1. Funding Agency: WaterAid Ethiopia

WaterAid is an international Non Governmental Organization (NGO) specialized and committed in the provision of safe water for the needy and marginalized sections of society in different countries, like Ethiopia. It focuses, not only on water supplies, but also on sanitation and hygiene promotion activities in its intervention.

It has started its intervention in Ethiopia since 1983, particularly by funding micro-community water schemes, which had been implemented by the Ethiopian red-cross society. The organization has established its country office in Ethiopia since 1991, and has promoted to allocating funds to country programs, as well as to other partner organizations, in the sub-sector such as EOC. It has also started its commitment to fund urban water projects since 1991(WaterAid, 2000:6).

WaterAid Ethiopia insists that the local people should be able to involve in the whole cycle of rural water supply intervention, such as stating water supply as its main priority concern, involve in the planning of the intervention, undertake the necessary construction work and finally, continue to upkeep, maintain, and manage developed water supply points after external support is terminated. All projects use technologies that are relatively low-cost, practical, and easy to operate. By improving not only the quality of water and access to it but also the quantity, WaterAid seeks to enhance the health and socio-economic wellbeing of communities it works with (WaterAid, 2000:21).

In addition to financing rural and urban WSS projects, it has also been supporting capacity enhancement requirements of partner government, non-government and community institutions. As an approach, it has integrated water supply with sanitation

and hygiene promotion, in working with governmental water institutions/offices, or partner organizations, and promotes community management as a strategy of sustainability.

In addition to funding water supply projects proposed from various institutions, it also emphasises on partnership, learning and sharing with other actors, and advocacy, to fill gaps in government, both in urban and rural areas and address the needs of marginalized sections of society. Providing technical assistance to its partners and to all those that have stakes to water supply and sanitation works is also another area of cooperation it is working with all concerned parties. It also focuses on advocacy and/or media campaign to raise the awareness as to how to enhance personal hygiene practices, and the necessary attention as to how to have access to pure water supply and be protected from contaminated sources. Its intervention in the rural areas of north Gondar zone, according to the literature reviewed, was more or less built on the basis of these principles (WaterAid, 2000:15).

2.4.2. Implementing Agency: EOC/DICAC

In 1993, WaterAid and the Ethiopian Orthodox Church Development and Inter Church Aid Commission (EOC-DICAC) collaborated on a substantial six years water supply, sanitation and health education program covering ten Woredas in north Gondar administrative areas of the Amhara National Regional State (ANRS). EOC-DICAC is a Christian humanitarian organization established in 1972 to undertake church related programs, clergy training, and provision of humanitarian assistance and construction of social services. However, in time, and with the advice and support of partners, donors, local government offices and beneficiaries, EOC e extended its mandate to include development programs. WaterAid has been supporting water related projects carried out by EOC-DICAC since the late 1980s. In 1992, it has supported the formation of a water unit and since then has been its main donor both for its unit core costs and for projects.

The following are the main objective of EOC-DICAC water supply, sanitation and health education programs for north Gondar (WaterAid, 2000: 5).

- Provide potable water supply to the village at a reasonable walking distance for the community;
- Reduce the time and energy used by women children in fetching water;
- Improve the health and sanitation status of the people;
- Strengthen the capacity of the village in their operation and maintenance of the scheme, and
- Improve the living standard and productivity of the community.

For the realization of these objectives, EOC has been working with WaterAid as a partner organization, particularly, in undertaking actual construction and other field based activities, with all sorts of technical backups from the host in the rural areas of north Gondar. The project office which was opened to facilitate the intervention since that time is still undertaking similar activities in those areas that have not been covered by the then joint intervention (WaterAid, 2000: 5).

2.4.3. WATSAN Committees

WATSAN committees constitute a group of seven elected members, i.e., chairman, secretary, accountant, inspector, treasurer, auditor and casher. These committees were elected during the first phase of the project, with the help of the project office, to voluntarily serve the community to which they belong. It is composed of both sexes who were trusted to mobilize the community for action to take part in the construction and management of project benefits with the required level of initiation and commitment. They were made responsible to coordinate activities and to mobilize local resources to

be used in the construction of schemes during the project period as a rationale to raise users' sense of ownership. They are also believed to overtake the responsibility of operating and managing developed schemes after external assistance withdrew from the area as per the by-laws on which user communities held consultation and have given their approval and acceptance to its application. In the target area, seven elected WATSAN committee members and two local care takers were provided with various training opportunities so that they could have the capacity to managing their own schemes and consequently enhance and sustain the derived benefits thereof (WaterAid, 2000:27).

2.4.4. Water, Mining and Energy Department (WMED)

In ANRS, water supply was the responsibility of the regional water, mines and energy resources development bureau, and zonal departments of the same sectoral arrangement. In the past, WMED was one of the departments in the bureau of agriculture, but later it has become independent and starts intervening in the sector in its respective administrative zones. Until 2001 it has never had any formal structure of its own extension at the Woreda level. It has, however, been the leading agency in constructing small-scale water supply projects as compared with other similar task oriented organizations. In addition to directly involving in constructing WATSAN projects, it has also been working with different stakeholders who have been intervened in the sector. All WATSAN projects, constructed in different Woredas by different organizations, were coordinated by and later on handed-over to the water, mining and energy resources development department (Mengesha, 2002:8).

It was in charge of promoting and facilitating NGOs' activities, participate in the planning, monitoring and supervising of project activities under the state of construction. It was also responsible to under take operation and maintenance of the existing schemes.

After the decentralization process of the water sector to the wereda level in the region, the system and mode of operation was entirely changed. The mandate to operate water supply activities was given to woreda water desks, the staffs was shifted, budget was also reduced and generally the structure was reduced with the hope to strengthen and capacitate the grass roots structure so that it could respond to local demands and problems. By the time of data collection, it was considered as a desk represented by a single individual (Mengesha, 2002:6).

2.4.5. Woreda Water Desks

Woreda water desks have been established as a result of the decentralization of the regional civil service structure down to the Woreda level, which was enacted by the regional government in the year 2002. These desks were envisaged to contribute to the development of the rural infrastructure and services, primarily, rural potable water supply and sanitation, and in general, to poverty reduction to the rural poor. The decentralization process has caused manpower shortages in all levels of the regional administrative structures. The woreda water desks were structured to constitute technical staff (for installation and maintenance purposes), community mobilizations workers and head desk officer. Most of these posts in the target areas were found vacant or are filled by inexperienced or by those with no adequate educational attainment. In all the cases, the existing manpower does not possess the required training, experience, in general the required capacity that the desk is made responsible at each wereda. Particularly, desks could not assist the rural WATSAN committees in their efforts to uphold the existing facilities to give sustained services. They do not have adequate budget, vehicles and working arrangement; to facilitate maintenance requirements of various PAs. At the time of this research, these desks do not have organized data regarding the profile of the respective water points (Getachew, 2002: 8).

2.4.6. Health Department

The North Gondar zone health department has been collaborative with those government and non-government institutions that have stakes in the provision of rural water supply. The health department, including health facilities, particularly hospitals and health canters, were participating in monitoring the water quality through water sample investigation at a regular interval of time and during the occurrence of reported cases of epidemics. In addition, the department coordinate the existing facilities for periodic chlorination of water points as part of the effort to minimize water associated morbidity and mortality. It has also been directly involved in the sub sector by providing health education independently by its own and in collaboration with other stakeholders dedicated in the provision of potable water supply. Presently, it has institutionalised chlorination as part of its line responsibility in the wereda health office and associated health canters (Mengesha, 2002:7

CHAPTER THREE

3. LITERATURE REVIEW

3.1. Overview of Development Paradigms

The concept of rural water supply and sanitation can better be understood by reviewing development paradigms and approaches that have been adopted since 1950s. These paradigms are broadly categorized into: economic growth and modernization era of 1950s and 60s, when rural development was neglected in favor of urban industrial growth. However, as the benefits of growth could not be trickled down, and due to an increase in poverty, the focus of development was changed to the growth with redistribution era of 1970s, when attention was given to poverty reduction and equity through income redistribution, employment, and basic needs such as nutrition and drinking water. The third policy period, that is, the policy reform era of 1980s, i.e., Structural Adjustment Policies (SAPs), were also adopted as the basic needs approach could not bring changes as envisaged. SAPs were primarily adopted with the aim of implementing measures such as restraining public expenditure, removing subsidies, and letting the private sector and market forces to take over many functions from government agencies in the economies of developing countries (WB, 1981: 24; kleemeier, 1995:5). But, SAPs were also failed as was evidenced in South America and in Africa. And presently, poverty reduction is being pursued widely among developing countries. The approaches discussed below are closely related to the aforementioned development policies.

3. 2. Approaches to RWSs

Water is today perceived by most rural communities as a right to be provided free by the government, rather than as a scarce resource which must be managed locally as socio-economic good in order to ensure its effective use (www.wrc.org). This perception is grown out of the approach that has been adopted before 1980s by those actors involved in water supply. This approach was commonly known as supply driven. According to many writers, supply driven approach is considered as paying little attention to users' ability to pay and willingness, and consequently led to the failure of a large number of rural water supply schemes. These issues, however, are best addressed in the demand-driven approach (Kleemeier, 1995:2; www.siwi.org). In this sub section, an attempt is made to provide a brief review of the two approaches as follows.

3.2.1. Supply Driven or the Basic Needs Approach /SDA/ to RWSs.

Since 1970s, there was a consensus that governments and donors should alleviate poverty in rural areas through providing basic needs such as drinking water, which was largely free at least in capital costs. This approach is now labeled as supply driven (Kleemeier, 1995:1).

The basic needs or supply-driven approach had been adopted for its own elements that were taken to expand water services in the developing nations. The first element is that donors and governments provide the minimum level of improved water services such as hand pumps, to as many people as possible with available funds. The second one was to build up the capacity of government agencies so as to enable them appraise, implement, and manage schemes. And the third one was providing subsidies to rural water supply (Kleemeier, 1995:3).

The assumptions behind basic needs /supply-driven approach towards rural water supply refers to the idea that provision of clean water would contribute to economic growth; government agencies should construct and maintain water schemes; public financing should subsidize water services (Kleemeier, 1995: 5). But, these assumptions were challenged by the rationales of SAPs and the approach was found to be not helpful to gain many achievements because of the following three problems. The first problem was that given the high population growth rates, the strategy of the basic needs approach to water supply would not reduce the number of people with out access to safe water supply with in a reasonable time period. Secondly, the funds needed to achieve universal coverage by 2000 have proved to be very far from being a reality. Thirdly, in too many cases, schemes were not sustainable (Briscoe and de Ferranti, 1988:5).

The long run objective of the basic needs approach has been to improve the health of households through providing safe drinking water. These health benefits were used to justify heavy public investments, as households might not be willing to make the investment (WB, 1993:93). Because of the aforementioned shortcomings, there appears a general recognition that a transformation from a target based, supply-driven approach that pays little attention to the actual practice and /or preferences of the end users to a demand-driven approach, where users get services they want and to which they are willing to pay and responsive to schemes' up keeping is required. This is because the supply driven approach make the rural community to develop the mentality that water is a social right to be provided free by the government rather than as scarce resource which should be managed locally as a socio economic good in order to ensure its effective use.

3.2.2. Demand-Driven Approach/DDA/ to Rural Water Supply

Starting from the later part of 1970s, developing countries experience very poor growth and huge balance of payments deficits. To restore growth, there appears a paradigm shift from micro level-basic needs focused growth and equity approach to macro level structural adjustment policies with central measures such as restraining public expenditures, removing subsidies, and letting the private sector and market forces take over many functions from government agencies (Kleemeier, 1995:5). Such policy prescriptions were incompatible with the assumptions of basic needs /supply-driven approach. This is because in the early 1980s, the strategy of donors aimed once again at alleviating poverty through economic growth based on macro level policy reforms such as SAPs (Riddell, 1987:95; please, 1984:24-30).

By the early 1990s, World Bank (WB) had officially adopted the new approach to water supply. This approach, according to writers, was adopted in order to correct shortcomings of the basic needs /supply-driven approach, i.e., insufficient coverage, high cost, and poor utilization (Kleemeier, 1995:1; WB, 1992:98-133; 1993:92/).

Demand-driven approach primarily proposes the necessity of transferring roles from public sector to the beneficiaries and private entrepreneurs. According to DDA, effective demand of consumers, that is, their willingness and ability to pay, will determine who gets what level of services. Proponents of DDA further argue that the new approach can provide improved and sustainable water supplies, replicable on the scale necessary to reach millions of un-served people who want such services. The central theme of DDA is that communities should receive, via the private sector, safe drinking water, for which they are willing and able to pay (Kleemeier, 1995:1; Please, 1984:24-30/). Proponents of DDA argue that health benefits alone do not generally provide a rationale for public subsidy to water and sanitation services (WB, 1993:93/).

The benefits from improved water supply were those perceived by beneficiaries, i.e., time saved in water collection, color, taste, and odor of the water. Households themselves should finance such benefits (Serageldin, 1994: 19). The immediate objective of water supplies should be not to supply every one with minimum services but to provide the desired level of services to those who were willing and able to pay for it. In view of the supply-driven approach, providing the minimum level of services such as hand pumps, based on decisions other than communities themselves were used to keep costs down. But respondents of DDA argue that rather than deciding to install hand pumps in every community, however, communities should decide the type and level of services, among potential options, and this would change perspectives on how to lower costs.

Under DDA, removing government subsidies by having consumers pay for their scheme, in itself, promote this idea. Consumers would own schemes by lowering construction costs and providing best services. Here, the issue is cost efficiency for each level of service delivery (Kleemeier, 1995:7-8).

In this approach, it is no longer believed that government agencies should be strengthened and expands its presence in rural areas to implement and manage water supply schemes; rather private companies or cooperatives should manage and expand schemes (Roth, 1985: 24). Private financial institutions are also considered as the most appropriate instruments for expanding loans to communities to pay for their schemes and the government should be confined itself as an educator, promoter, regulator, trainer and provider of hydrological information, adjudicate conflicts, and so on (Kleemeier, 1995:89).

Subsidies were possibly, justified if scheme costs were so high as a result of aridity and low population densities that communities could not cover them even by households paying 4 - 5 of their income. This is the case in Sub-Saharan Africa (SSA) and south

Asia. If governments were to redistribute income through subsidies, it would be preferable to do so through providing grants or loan to the community to use it as its members wished, because subsidizing water supply took decision-making away from the community (WB, 1992:104).

The expected role of the community in demand-driven approach differs considerably between urban and rural areas. In urban areas, private companies and cooperatives are thought to handle management, where as in rural areas community organizations would generally have to assume all the management responsibilities, but it is still ambiguous how this would happen in this approach. Government officials are still taken to assume the responsibility of motivating and organizing communities (Briscoe and de Ferranti, 1998:15).

Table 3.1: Differences between demand and supply driven approaches

	Supply-driven/basic needs/approach	Demand-driven approach
Objective	Provide clean and convenient Potable water to as many People as possible	Provide improvements to water supply to which communities are willing and able to pay for it
Service level	Minimum service level/hand pumps, public taps/	Service level for which communities are willing to pay
Role of government	Appraisal, design, construction, operation and maintenance, and training	Information, advice, regulation, training (appraisal, design, construction, operation, maintenance to private sector)
Financing	Donor/government pays full capital costs and subsidizes operation and maintenance in rural areas	Communities pay full capital, operation and maintenance costs, possible subsidies on capital costs in arid or low income areas
Community participation	Extension service mobilizes participation in water point location, user fee collection, etc.	Literature vague on this aspect

Source: Kleemeier, 1995:6.

Handing over RWSs developed in light of the supply driven approach to government institutions and/or user communities with out proper packages to sustain services led to the failure of a number of schemes. 50-70 percent of hand pumps in Southern Nations Nationalities and Peoples Regional State (SNNPRS) were not operational (Sebsibe, et al, 2002:20). Hence, material, financial and technical resources utilized could not help to sustain existing services. Pumps had fallen into despair throughout developing countries; the ability of governments and communities to maintain them has been inadequate. Affordability, in both capital and repair costs, was also a problem (www.lboro.ac.uk). Many hand pumps proved far harder to be repaired at village level as envisaged, due partially, to the problem of design, lack of willingness or commitment, lack of spare parts' availability in the market, high costs of spares, particularly if they are imported, and as a result schemes suffer frequent breakages (www.lboro.ac.uk). Lack of users' affordability and willingness to contribute to the upkeep of their pumps, and generally, failure to

develop the practice of preventive maintenance exacerbates the situation (www.lboro.ac.uk/) Inappropriate technology choice is also a related problem in this regard.

In most cases, ownership of schemes is not clearly established or defined, in such a way users may refuse to participate in maintenance when costs are too high, which may lead users to return to traditional and unprotected water sources (www.dams.org).

Schemes' location may some times be a problem, if the water source is located in some body's piece of land as access may be restricted and users will feel no sense of responsibility to such water sources (lboro.ac.uk).

Basic technical skills are also a problem in sparsely populated rural areas. In Sub Saharan Africa (SSA), there are no different levels of skills at different prices, hence, the few skilled, if they are existed, are often so demanded and are, therefore, peripatetic (www.lboro.ac.uk).

Village water committees are often perceived to take full responsibilities to manage village water sources; yet, many do not last much longer after project implementation. The breakdown of water committees can jeopardize the functioning of water points (www.lboro.ac.uk).

More often, there appears unwillingness to pay user fees expecting water as a free commodity from government. This endangers the sustainability of WSSs as operation and maintenance, asset protection and of quality problems became serious challenges (Barot, 1995:163).

3.3. The Dublin Principles,

According to Mengesha, 2002:9, water development, management, and utilization should be in line with the four principles on which participants of the Dublin conference have reached consensus. These are:

3.3.1. Fresh water is a finite and vulnerable resource, essential to sustain life development, and the environment.

Since water sustains life, effective management of developed water points requires holistic approaches, linking social and economic development with protection of natural ecosystems.

3.3.2. Water development and management should be based on a participatory approach, involving users, planners, and policy makers at all levels.

Participatory approach involves raising awareness of the importance of water among policy makers and general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of projects.

3.3.3. Women play a central part in the provision, management and safeguarding of water.

The pivotal role of women as providers, users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs, and to equip and empower them to participate at all levels in water supply programs, including decision-making and implementation, in ways defined by them.

3.3.4. Water has an economic value in all its competing uses and should be recognized as an economic good

Within this principle, it is vital to recognize first the basic rights of all human beings to have access to clean water and sanitation at an affordable price. Past failures to recognize the economic value of water have led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

3.4. Benefits of Rwss

Rural water supply and sanitation schemes have the potential to act as a catalyst for change in the socio-economic and health aspects of the target communities. Several benefits are anticipated from the development of improved water supplies.

The social and economic benefits are aimed at improving access to, and increasing the quantity and productivity of available water (Davis, 1993:20). The health benefits, on the other hand, concentrate on the combination of issues, such as improving water quality, changing hygiene behavior and improve sanitation condition (Briscoe, 1988:37).

One of the social conditions that could primarily be improved by the provision of water supplies is a reduction in the effort and time required to collect water. Safe physical access to water sources is an important consideration in this regard. Thus, improving physical access to a physically dangerous source can be a major benefit in itself. The locations of some water points are risky and dangerous to women and children. This idea is best explained as:

The community of Borena in Wollo, Amhara region, relied entirely on springs in a series of limestone caves for drinking water supplies. To collect water, several young women climbed down about 10 meters and formed a human chain from the bottom up to the top of the cave. Water

is then passed to each woman in a small gourd and received by the older women sitting at the top. This way of collecting water was extremely dangerous and the young women frequently fall and injured themselves (Davis, 1993: 23).

Such conditions may cause various physical and health hazards or injuries. Carefully planned access, however, ensures physical safety in the collection of water. In addition, it may also have an advantage of increasing water quality. Reducing carrying distances is also another related factor that has its own effect in the social and physical life of user communities. It helps to shorten women's walking hours, i.e., help to reduce the drudgery of fetching water from distant sources (www.africarecovery.org).

Carrying the heavy load of water, either on the head or back, from far distant locations or sources causes various health hazards. Water collectors in rural areas and in small towns use clay pots jerry cans, plastic buckets, drums, and gourds, to bring water for their domestic consumptions. They suffer deformities, headaches and exhaustions due to heavy weight of carrying water. For low-income women, the working day is excessively long. In many African countries, including Ethiopia, the collection and carrying of water and fuel wood over considerable distances can result in women having only few hours sleep a night in the dry season (www.africarecovery.org).

Bringing the collection point closer to the women's homes, i.e., improve the availability of water might probably be achieved by digging wells in the village depending on the nature of topography (www.lboro.ac.uk).

Improving availability of safe water may have economic benefits as well. Increasing the quantity of safe water, and bringing it closer to the point of use, can help to undertake productive activities such as income generating ones (www.lboro.ac.uk).

Adequate quantity of water is required for a healthy living, i.e., for drinking, cooking and washing. The world health organization recommends that the minimum daily amount of water per person should be 27 liters a day (www.lboro.ac.uk). The quantity of water people use is partly related to how much it is conveniently available:

The community of Guameda in wollo, Amhara region, showed that water collectors, on average, collected only 5 liters a day for each person in their household. They spent about 30 minutes walking to and from their water sources because most people preferred to collect water at a particular time, early in the morning or late in the afternoon, rather than throughout a day (Davis, 1993:24).

If water sources are at a long distance from the village, it can significantly restrict the amount of water it is possible to carry home. It does not, however, follow that easy access to a water point meant people use more water.

A survey in the village of Garbota, Sidama, SNNPRS showed that many households had a shallow well in their compounds. It was, however, discovered that the daily consumption, including washing, was only 15 liters a day (Davis 1993:26).

This highlights the need for awareness as to the advantage of adequate quantity of water for health as well as for hygienic living. Adequate water for domestic use may depend on a reliable system and continued functioning of water sources, which in turn is determined by seasonal changes. Some wells and springs may fail in dry season owing to a drop in the water table and, this is the time when water is needed most and supplies become least reliable:

A survey was conducted in Walayta, SNNPRS, on hundred wells in the dry season. The results showed that 60 of the wells dried up for a period

of time during each day causing queuing problems, and 5 of the wells were completely dry (Davis, 1993:27).

During and immediately after the time of construction, supplies may be adequate, but when the population increases or when there is a severe dry period, the source may get dried up (Davis, 1993:30).

3.5. Water Supply, Hygiene Promotion and Sanitation

Improvements in health will possibly be achieved not only by providing safe water supplies, but also in practicing effective sanitation and complementary hygiene promotion activities. Unsafe disposal of human and domestic waste and poor hygienic practices allows easy transmission of diseases, i.e., water provides the vital link in disease transmission (Morgan, 1990:49).

3.5.1. Sanitation and Hygiene

The condition of sanitation has remained poor in the rural areas because of low level of awareness to uses of sanitation services. As a result, many people practice open-field defecation. Children may defecate in or near the household yard. Such traditional sanitation practices are uncontrolled and can pose serious health risks. Sanitation in the rural context refers to the use of pit latrines in addition to complementary hygiene promotion (Serageldin, 1994:44).

Sanitation can be viewed from the individual, household and community perspectives. Community sanitation takes the form of public latrines. It is usually common in densely populated urban areas where the lack of space makes it difficult to build many individual latrines. (UND, 1992:3). In rural areas, where space is not a problem, improved sanitation is often encouraged at the individual household level (Davis, 1993:11). The emphasis of a sanitation program in rural communities should be on education with the aim of changing peoples' behavior, so as to stimulate demand for sanitation services.

The cost of improved sanitation options, however, may be a problem as community members might not be able to afford it even if they do have an interest to do so (Pitman, 2002:3). Therefore, it required flexibility in all steps, and designs should provide options to satisfy variations in demand among potential users. Interventionists in sanitation need also to pay attention on the software aspects of the program, particularly at the initial stages, because latrines will only be built and used if households are convinced of their benefits. It is also vital to adopt a flexible approach to achieve the desired sense of ownership and consequently replicate latrine use within a community (Davis, 1993:12).

3.5.2. Hygiene Promotion

The existence of poor hygiene behavior forms the basis for the existence of many health problems. Like sanitation, the issue of hygiene can also be seen at the individual, household and at the community levels (Davis, 1993:5). Poor personal hygiene paves the ground for the transmission of water associated health risks. Inadequate body, cloth and hand washing increases the chance of contracting skin and eye diseases. Washing hands after defecation, however, reduces the transmission of microorganisms, which might cause diarrhea (Davis, 1993:14).

Improvements to existing methods of handling and use of water at household level could make a difference in health among household members. Cleaning, collection and storage materials, making a distinction between water for drinking and for other domestic use, filtering water by making it settled in storage and so on, can be taken as hygiene related traditional water handling management activities by rural households to increase the quality, and thus, the health of the household (Burgers, 1988:7).

Communal water points need to be kept in a sanitary condition. Water from an improved supply may be safe, but it may get contaminated during collection and carrying (Davis 1993:27). The recognition of existing poor hygiene behavior and launch hygiene and

sanitation promotion and education in a rural community is a step forward to minimize water and sanitation related morbidity and mortality (Davis, 1993:15).

3.6. Rural Water Supply and Management /RWSM/

Both the supply and management aspects of community water schemes can best be explained in three ways. Here, the word community is used to refer to rural beneficiaries (Davis, 1993:1).

3.6.1. Agency Developed-Agency Managed

Typically, agency managed supplies refers to a situation where government water agencies are trying to develop, maintain and manage supplies for sustaining benefits. In some situations, such agencies are the legal owners of community supplies and take the responsibility of managing such supplies. The community may or may not pay for the service depending on the prevailing policy. Members of the community do not participate in the management of water schemes. Their involvement, however, is mostly as consumers (Davis, 1993:1).

Many government agencies, however, face problems in managing community water supplies because such offices suffer lack of foreign exchange to purchase spares from outside. It is aggravated by absence of local private suppliers, poor condition of payment and labor turnover, especially technicians, which results in lack of skills to repair technical pitfalls, shortage of vehicles and overall infrastructure (Davis, 1993:142).

3.6.2. Agency and Community Managed Water Supplies

This method of running the system reduces the burden, and share operation and management responsibilities among responsible agencies and the user community. The community may play an active role in managing the system, but still does not own it. Major repair jobs and decisions affecting the future of the systems are at the hands of the

agency that builds it. This type of management, for instance, was practiced in the community of Dulecha, SNNPRS:

A water supply was a borehole with a distribution system managed by the community with the support of the Water Supply and Sanitation Authority-WSSA. Water committees were formed with the help of WSSA, based on the agency's guidelines, established for community management. A pump operator and a water point attendant were paid of funds collected from the sale of water. The water point attendant sold water at the tap stand-post with the tariff set by WSSA. The revenue was handed over to the treasurer of the water committee. The treasurer and the water committee were responsible for buying diesel for the pump and for paying the two employees (Davis, 1993:143).

This management system faces a problem in maintenance due to capacity problems in government offices. This type of management also faces a problem if partners are non-government institutions, because they may either get phased out or they may not be interested to respond to Operation and management demands (Colin, 1995: 5).

3.6.3. Community Managed-Community Developed

This is the situation where community members develop, operate and maintain their own supplies, such as traditional water wells, hand dug wells and springs with minimum or no external support (Burgers, 1988:6).

These approaches have their own problems. In the first case, the system may supply adequate water as long as the agencies can carryout Operation and management. And if the agency in the second approach withdraw its support, the community may not be able to manage the supplies on its own in the long-term, and in the third one, many of the sources may not provide enough water, they may be polluted, and be located far away

from the village. Furthermore, it may be difficult to get water for certain periods of the year (Davis, 1993:5).

With regard to the first two approaches, supply agencies, particularly government ones, have most often failed to manage water supplies properly in rural areas. On the other hand, water supplies cannot be successfully managed by the user communities, as the planning and development stages, have not prepared the community for regular management tasks (Davis, 1993:6). The rural water supply systems, therefore, suffer deep-rooted management problems and weak institutional arrangements.

3.7. Water and Health

Clean water is an absolute pre-requisite for healthy living. The normal functioning of the human body depends on adequate quantity and quality of water, but if the water is from contaminated sources, it causes numerous water-associated diseases (Zeyede, 2004:24-25).

According to the WHO survey, each day, 30,000 people die from water associated diseases, and in developing countries, 80 of the illnesses are water associated. Safe, adequate and accessible supplies of water, combined with proper sanitation are considered as an element of basic needs. Therefore, water supply is taken as an essential component of primary health care. Safe, adequate and accessible water supplies can therefore, help to reduce many of the diseases affecting underprivileged population, especially, those who live in rural and urban fringe areas. Water associated diseases are of four categories:

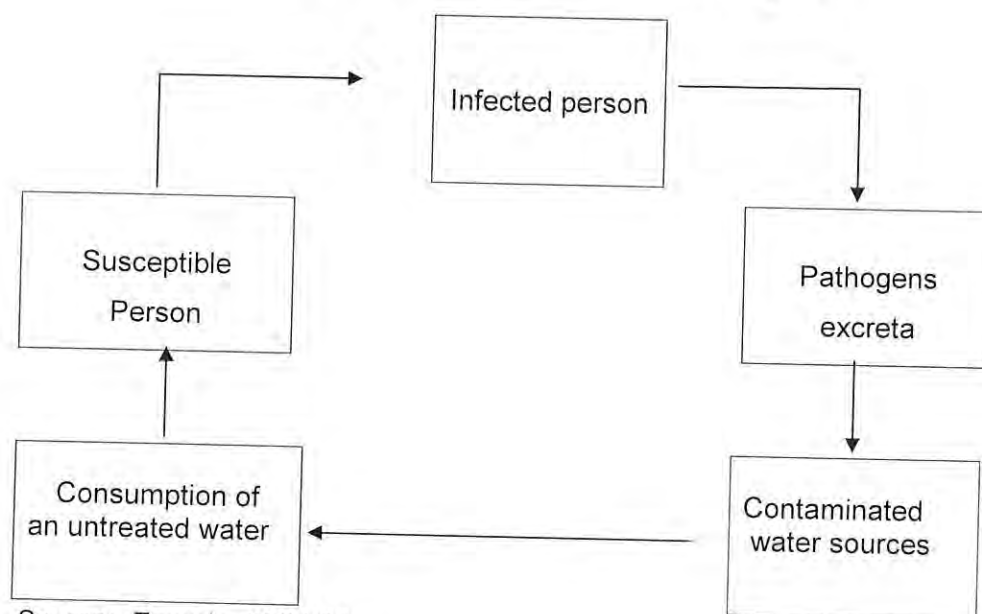
3.7.1. Water Born Diseases

The fact that man cannot live without; water forces him to use it from any source. As a result, many people suffer or die from water born diseases. According to WHO, 80 percent of all illnesses in developing countries are water associated (Zeyede, 2004:1).

Many of the intestinal or infectious diseases affecting human beings are transmitted through water contamination by fecal matter. Pathogens excreted in water by an infected person include all major categories, such as bacteria, viruses, protozoa and parasitic worms and water acts only as a passive vehicle for the infectious agent.

To prevent the occurrence of water born diseases, water treatment is very essential. The cyclical process of water-associated diseases can be understood by looking at the classic water borne diseases infection cycle as is depicted bel

Figure 3.1: Disease Infection Cycle



Source: Zeyede, 2004:30.

3.7.2. Water Washed Diseases (WWDs)

Water washed diseases comprise diseases linked to lack of water for personal hygiene. Lack of good personal hygiene and inability to wash cloths encourages the proliferation of lice, and the problems associated with their presence, such as itching, scratching, skin sores. To prevent these types of diseases, provision of an ample amount of water will be

vital for proper hygienic practices given the existence of good culture of personal hygiene behavior (Zeyede, 2004:31).

3.7.3. Water-Based Diseases

These are diseases caused by infectious agents that are spread by contact with water. The essential part of the life cycle of the infecting agent takes place from an aquatic animal. Many of the diseases in this category are caused by worms, which infect the individual, and produce eggs, which are then discharged in feces or urine. Example: Guinea worm. To prevent this group of diseases, escaping contact with and refraining from ingestion of contaminated water, as well as reduction of intermediate hosts such as snails by using "endod" or Lemma toxin is essential (Zeyede, 2004:32).

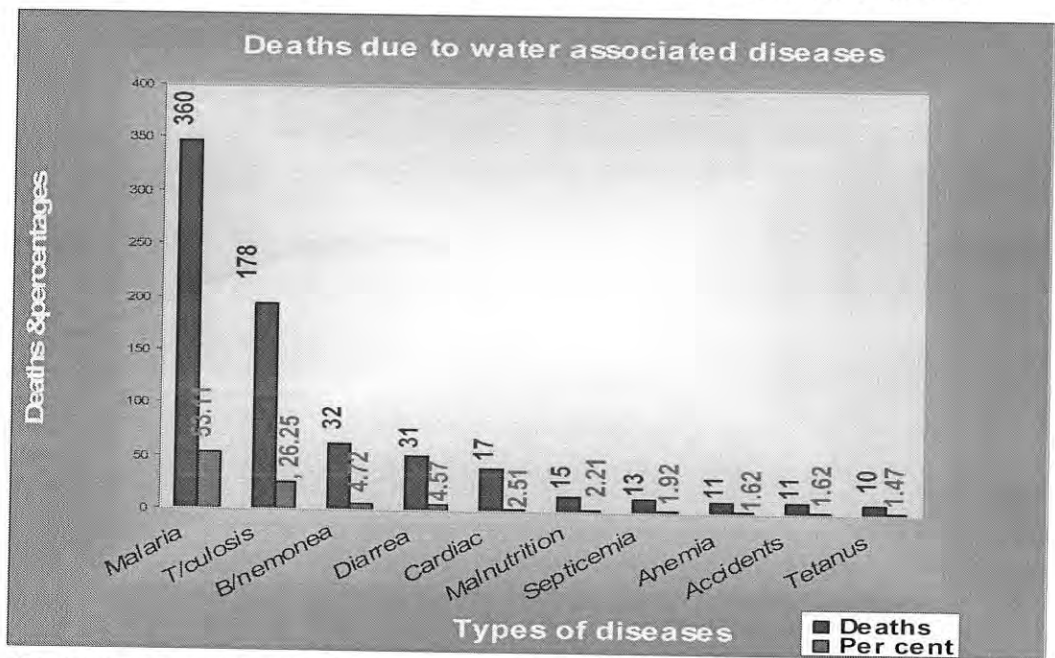
3.7.4. Water Related Diseases

These are diseases transmitted by insects that live closer to water. Infections spread by mosquitoes, flies and other insects that breed or feed in water or near it so that their incidence can be related to the proximity of suitable water sources. Examples are malaria, Sleeping sickness, yellow fever etc (Zeyede, 2004:33).

From water associated diseases one can understand that the supply of adequate and safe domestic water is one of the major requirements for the control of large number of diseases, and to advance health within a community at a reasonable cost (Zeyede, 2004:33). If water supplies, however, are developed without complementary improvements in personal hygiene, food handling and preparation, health results on water-associated diseases will be insignificant. The health related statistics in the study area highlights that water associated diseases take the leading position in causing morbidity and mortality. The following graphs best explain this idea. Graphs 3.1 and 3.2 indicate that most of the diseases and consequent morbidities and deaths are water associated. Graph-3.1 depicts that among the in-patients in hospitals and health centers

of the zone, Malaria (53), diarrhoea (4.57), Malnutrition (2.21) are reported to be the leading causes of death, all of which are categorized as diseases of unsafe and contaminated water known as water associated diseases.

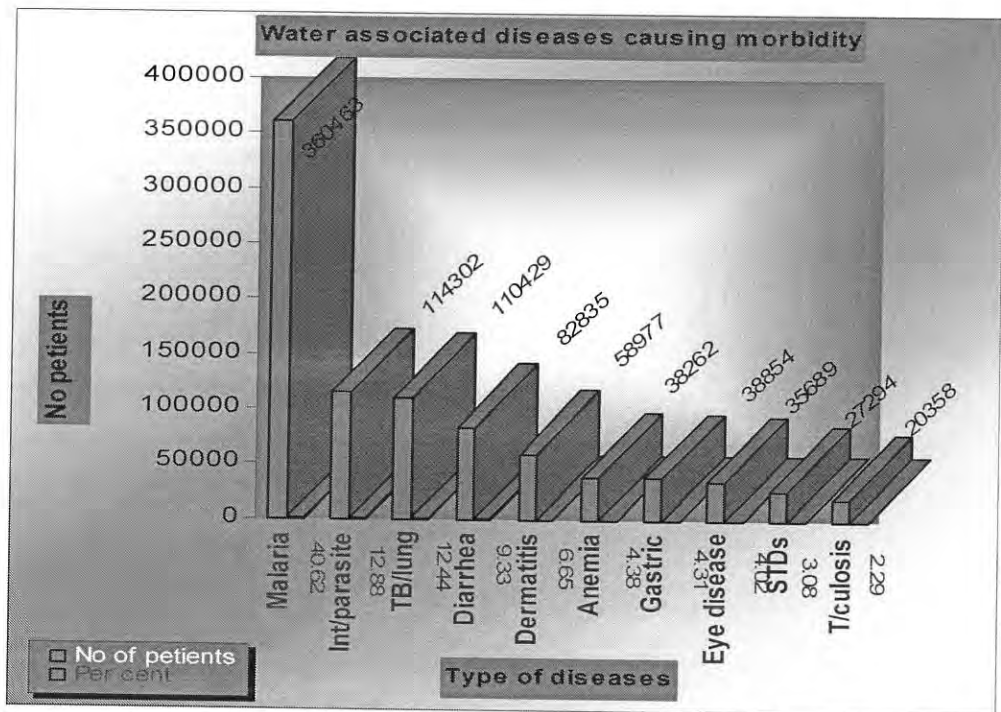
Graph 3.1: Types of the top 10 Causes of death among in-patients



Source: Department of planning and economic development department statistic bulletin.

In graph-3.2, too, among the ten leading causes of morbidity, malaria is the leading cause of illness, i.e., 40.62 of the inpatients, intestinal parasites 12.88, diarrhoea 9.33, dermatitis or skin infection 6.65, and eye diseases 4.02 of the reported morbidity cases. Almost all of these diseases are caused either by poor quality or unsafe drinking water, poor personal hygiene and environmental sanitation practices. These statistics, however, may not reflect the real situation of water-associated diseases in the study area as health related data might be organized from areas that are relatively provided with safe potable water.

Graph 3.2: Types of the top 10 causes of morbidity in north Gondar zone.



Source: Department of planning and economic development department statistical bulletin

The occurrence of water-associated diseases is highly related to the existence of consistent and institutionalized quality control. But in the study area, there is the problem of a clear institutional arrangement that offers responsibility to concerned offices to undertake water quality control. Hence, disinfection is not regularly performed by authorized and identified institutions, but interchangeably by different organizations (PEDO, 2000:3).

3.8. Factors Affecting Project Sustainability

A number of factors have been drawn from experience, field observations and studies as having a direct bearing on the sustainability of results of development endeavors, like WSSs. The following factors are identified from a survey of literature as impacting on sustainability of project benefits.

3.8.1. Partner Government and Donor Policies

Partner Government Policies can have significant impacts on the sustainability of project benefits. Projects are implemented in a wider policy environment. A policy framework that is compatible with and supportive of project objectives is a key factor in promoting sustainability. Hence, the policy framework /policy factors/ needs to be carefully analyzed at the planning stage (Barot, 1995:45).

Projects, which fit with partner government policies, have much better prospects for sustainability, as they are more likely to have high-level political and institutional support both during and after implementation (Ausguide, 2003: 7). In some circumstances, programs and projects may probably be ahead of partner government policies, and may need first to pay attention to awareness and policy change (Ausguide, 2003:3).

Donor policies also have a bearing on the continuation of project benefits because, they influence how contracts are prepared, how long shall be the duration of funding and what should be funded. Donor policies have a direct bearing on the planning horizon. The usual three to five years planning horizon for development programs and projects is often inadequate in terms of promoting sustainable benefits, particularly when: behavioral and institutional changes are included in the objectives, multiple local agencies are involved, the project is intended to cover a wide geographical areas and so on. Although open-ended commitments are not appropriate, phasing implementation over a longer period is a right strategy, which may support sustainable benefits (Barot 1995:48; Roth, 1985:9).

Delivery and contracting mechanisms of donor policies are also another area of concern that has an impact on sustainability.

A strong sense of local ownership and participation in design by both men and women are critical to successful implementation and consequently to sustain benefits. Yet, donor policies may be designed and delivered against this. Hence, the design process, team

selection, contract structures, partner selection and monitoring or reporting should primarily be build on local demand and initiatives and consequently be managed in a way that could result in sustainable flow of benefits (Chavula, 2002:15).

Operation and maintenance is another critical issue that deserves consideration. Donor funding policies have often focused on new investments to the exclusion of supporting operation and maintenance budget. This can have adverse effects on sustainability, particularly, in economics undergoing severe internal budget deficits. New projects require additional operation and maintenance funds that have to be drawn from the same limited pool of funds available to finance other on going programs. As a result, the new investment is not maintained and existing infrastructure or services suffer funding cuts. Such deficiencies may be addressed by adopting longer term and more transitional approach to operation and maintenance cost funding based on realistic assessment of the local capacity.

3.8.2. Participation of Stakeholders

The critical factor that promotes sustainability is the role of stakeholders. Stakeholders can broadly be viewed as those concerned with the project and those who stand to get benefits. Hence, sustainability cannot be achieved without their involvement and support. Beneficiaries, both men and women, should have the opportunity to influence the direction and detail of design and implementation. Allocating adequate time and resources for participatory analysis, and responding to demand-led approaches are important ways to improve participation (Ausguide, 2003:4; WB, 1981:14; WB 1984:27).

Donor-led and top-down projects, generally fail to bring sustainable benefits because they do not lead to stakeholder ownership and commitment. Effective participation can be achieved if:

- Ideas for projects are demand-led;
- Design phase is given adequate time and other resources;
- Specific activities and resources are identified and incorporated in design to implement participatory strategies;
- Identify who/which groups are expected to participate and who will benefit;
- Clearly defining what type and level of participation is to be achieved, and
- Ensure that key team members are appropriately skilled in participatory approaches (Kalbermaten, 1980:11; Ausguide, 2003:48).

3.8.3. Management and Organization

Projects, which integrate with, and build on local management structures, have better prospects to benefits than those, which establish new or parallel structures. The capacity of local agencies to manage or absorb new structures, systems, ideas and funds is often not adequately assessed and over-optimistic assumptions can be made. Enabling management structure requires an adequate institutional analysis during the project design phase, and this in turn, requires specific knowledge, skill and field time (Ausguide, 2003:48). Project designs must take adequate account of the capacity of local administrative systems to support staff and service delivery:

If local staffs are not paid a living wage, do not have travel allowances, their performance is not rewarded... then their ability and willingness to work on program, or project activities must be assessed accordingly.

Competent managerial leadership should be encouraged to guide adaptations and achieve sustainable outcomes. Donor supported programs or projects must be designed and managed so that they permit some flexibility in implementations. Designs must be phased and allowed to evolve as lessons are learnt, field level managers should respond

quickly to changing needs and priorities, and other related financial and management procedures must not be made burdensome.

3.8.4. Finance

In some sectors and circumstances, financial sustainability of projects is unlikely in the medium term. If a project does not deliver clear and equitable financial or economic benefits, which are apparent to the stakeholders, it is most unlikely to be sustained after donor funding terminates. For instance, health service beneficiaries will not pay for government health services, if the service is poor or their expectations on benefits are extremely limited. Better financial analysis is often required, especially in the formulation of economic sector projects like water supply (www.fwr.org).

Counterpart contributions either in cash or in kind, like counterpart staff, office and so on, from partner government or communities are seen as a sign of commitment to the project objectives. Hence, project designers and managers should adequately analyze the planning budgeting and financial management systems within which partner agencies are working.

Donors have traditionally been reluctant to cover recurrent costs, which are generally be taken as the responsibility of the partner government or other stakeholders, and seen as a sign of their commitment to the program /project/ objectives. Approaches to manage recurrent cost financing, therefore, requires:

- An appropriate level of direct financing of these costs over an extended period of time using a down ward sliding scale of contribution;
- Incorporating specific maintenance contracts or agreements with in the scope of the project;
- Putting recurrent cost financing and asset maintenance issues higher on the agenda of both project and policy level consultative meetings, and

- Donor's collaboration within a sector (UNDP/WB, 1998: 6).

In Relation with this, projects should not be designed to be equipped with excessive types of equipment that are beyond the financial capacity of the stakeholders to operate and maintain. User- pays, as a principle, is a critical issue in the financial aspect of projects.

If people are willing to pay for a good or service, then they want it. User pays approaches also generate revenue that can be used to continue the service. Demonstrated demand is a strong indicator of sustainability for both economic and social sector projects. User pays approaches can be used to continue services, even in poor communities and may be the only sustainable solution to service delivery (Ausguide, 2003:45-49).

3.8.5. Awareness and/or training

The provision of appropriate information and/or training for identified target groups is often a key strategy for achieving sustainable benefits. To improve the prospects for sustainability, training should be started at the right time, be conducted throughout the project period and allowed for repetition. Effective training should not only educate but also motivate participants; trainers must be selected on merit, include both men and women, and be of direct relevance to their work. Trainees must also be given the opportunity to apply newly acquired skills on completion. In country training, such as on-the-job training, mentoring and short course competency based training, etc are more likely to support sustainable benefits than overseas courses or long term academic training for a few (Ausguide, 2003:50).

Generating an understanding of, and support for, project objectives among a wide group of stakeholders should be a component of any sustainability strategy. Awareness creation, as an activity component, should be considered early in the design phase.

During implementation, it can include the use of many types of different media and group events such as workshops, seminars personal contacts (lobbying), community meetings and the use of electronic media for instance (Radio, TV, and Web-Sites) can all play a role in mobilizing political, administrative and community support. Establishing formal institutional linkages with counterpart offices and with donors can also form part of an effective sustainability strategy (UNDP/WB, 1998:5).

3.8.6. Technology

To promote sustainability, the technology to be adopted and transferred must be selected on the basis of its appropriateness in terms of technical, financial, as well as gender and socio-cultural acceptability and so on criteria (Kalbermaten, 1980:23).

The quality of any asset will have a direct bearing on economic life of water point technologies. The longer it lasts, the more sustainable the resulting benefits. The appropriate level of quality must be assessed against a number of criteria as:

- User expectations and acceptance for instance, in the design of houses, sanitation systems;
- Costs and benefits, including how investment and maintenance will be financed
- Reliability of supply or delivery systems;
- Local capacity to maintain the asset, including access to spare parts and so on (Colin, 1999: 12).

Stakeholder participation in the selection, testing and operation of new technology is a clear strategy for promoting its sustainable use. Demand-responsive approaches in RWSs are widely accepted as being more helpful than supply-driven one in achieving sustainable use of technologies adopted in projects (Kalbermaten, 1980:33).

Training to support the introduction of new technology is an essential component of a sustainability strategy. It must be relevant, appropriate, continual, and build on existing local capacity (Kalbermaten, 1980:41).

3.8.7. Social Aspects

Development interventions can fail to deliver sustainable benefits due to inadequate attention to the social aspects of target population, such as gender or women's participation, cultural values and preferences, traditional decision-making and governance systems. To introduce new and appropriate technologies, there must be an understanding of the indigenous decision making systems, gender based division of labor, and cultural preferences. For instance, the design of rural water and sanitation systems must take into account the established traditional attitudes to managing human waste and the roles of men and women in collecting and using water (Ausguide, 2003:51; Barot, 1995:17; Reynolds, 1992:8).

Development objectives in some interventions, such as water and sanitation, forest conservation and so on, aim primarily to achieve behavioral change. Such changes require a long period of time (Ausguide, 2003:50).

The issue of gender is another social factor that has a direct bearing on sustainability. A greater participation by women in identification, design, construction and decision-making at every stage of the project is a key part of sustainability strategies. Their participation in all parts of the activity cycle is essential for the promotion of sense of ownership and the resultant continuation of benefits. Ensuring the collection of sex disaggregated data and undertaking a gender analysis to determine the differential impact of costs and benefits on men and women at the planning stage will help to achieve sustainability. For sustainable outcomes, poverty reduction objectives must

specifically address the needs of women given that they are over represented in the poorest section of many societies (Davis, 1993: 43).

Culture is the totality of learned and socially transmitted behavior. It encompassed both the material and ideal components; each having its own impacts on development endeavors. A culture of any community should be well studied before any commitment of resources to ensure sustained benefits (Burgers, 1988:52).

3.8.8. Environment

Environmentally sustainable development is the agenda of most present day development actors. It is defined as development that meets the present generation, without compromising the ability of future generation to meet its own needs. It is strengthened if environmental issues are considered at all stages of the activity cycle (Ausguide, 2003:51).

To ensure environmentally sustainable development, proposed development projects should encompass and show the results of Environmental Impact Assessment (EIA). EIA is a tool for strengthening the environmental sustainability of projects. It provides a framework for identifying, assessing and subsequently managing the environmental impacts of proposed activities. EIA is an iterative analysis of environmental issues, which should be initiated in the pre-feasibility phase, so that it leads to the consideration of alternative design options, and mainstreaming of environmental management measures into designs. It is more effective if it involves communities in identifying and managing environmental risks, and when cultural and social impacts are assessed alongside with ecological issues (Ausguide, 2003:50; Serageldin, 1994:34).

The main concern of environmental impact assessment during the planning stage of development projects is to ensure that non-renewable resources are not over exploited,

the productive capacity of the soil is not depleted or the ecosystem is not damaged in such a way that future generations will not be demonstrably worse-off (Ausguide, 2003:51; Benjamensen, et al, 2002:10).

3.8.9. Political, Economic, Natural and/or Man-Made Disasters

Sustainability can be much more difficult to be achieved in an unstable political or economic environment. Depending on the nature of the project, changes in government policy, civil unrest, war, lack of direction within the executive, a stalled legislative program and failing business confidence, can have an adverse impact on project sustainability, or even make projects impossible (Riddle, 1985:25).

External political and economic factors also have an impact in developing economies. External economic shocks such as rise in the price of oil, or collapse of market situation and so on can frustrate a sustainability strategy. Natural disasters, such as earthquakes, tidal waves, fires, floods, drought and diseases and/or epidemics, and so on have a direct and devastating consequences on implementation, and thus on the sustained flow of benefits. Though these factors cannot usually be foreseen or controlled, contingency planning and risk-management strategies can play an important part in reducing their negative impacts (Ausguide, 20003:51).

CHAPTER FOUR

4. RESULTS AND DISCUSSION

4.1. Sex and Marital Status of Households

Out of the surveyed household heads, 77.6 percent were male, and 22.4 percent were female. With respect to marital status, 62.8 percent of the male and 16 percent of the female samples were married. These constitute 79 percent of the total samples. Out of the male, 2 percent, and out of the female 2 percent were divorced. Furthermore, 8.8 percent of males and 4 percent of female samples, i.e., 12.8 percent of the total household heads were widowed. Besides, out of sampled HHs, 4.4 percent were single, and 4 percent were divorced (Table 4.1). This implies that low proportions of households are living out of wedlock, as marriage is encouraged in the study areas. The result also shows low but balanced level of divorce rate between male and female samples, due to the influence of the culture, and informal conflict resolution efforts through the council of elders.

Table 4.1: Sex and Marital Status of the Household Head

Sex	Marital status of the household head									
	Single		Divorced		Married		Widowed		Total	
	Frequ ency	Perce ntage	Frequ ency	Perce ntage	Frequ ency	Perce ntage	Frequ ency	Perce ntage	Frequ ency	Perce ntage
Male	10	4	5	2	157	62.8	22	8.8	194	77.6
Female	1	0.4	5	2	40	16	10	4	56	22.4
Total	11	4.4	10	4	197	79	32	12.8	250	100

Out of the sampled water users, 22.8 percent were found in the age group of 40-44 years, 16.8 percent were in an age group of 45-49 years, and 13.6 percent in an age group of 35-39 years. Hence, 53.2 percent of the sampled households were found in an age group of 35-49 years. Furthermore, 3.2 percent were in an age group of 18-24 years, which shows the minimum age value category. The proportion of sampled households with in an age group of 64 years and above was found 4.4 percent. The age distribution at Table 4.2 below indicates low proportion of households at early ages, i.e., below 30 years and at higher ages, i.e., above 50 years.

Table 4.2: Age of the Household Heads

Age group	Frequency	Percentages
18-24	8	3.2
25-29	12	4.8
30-34	25	10
35-39	34	13.6
40-44	57	22.8
45-49	42	16.8
50-54	24	9.6
55-59	22	8.8
60-64	15	6
64⁺	11	4.4
Total	250	100

The maximum family size was 12 and the minimum was 1. The range of family size of sampled households was, therefore, 11. About 22.4 percent of the households had 6 family members, 18.4 percent had 5 family members, and 12.8 percent had 7 family members. Out of the total sampled households, 56.4 percent support more than 6 family members (Table 4.3). Table 4.3 below also indicates that the proportion of sampled household heads decreases with an increase in the size of the family.

Table 4.3: Family Size

Family size	Frequency	Percentage
1	9	3.6
2	2	0.8
3	22	8.8
4	30	12.0
5	46	18.4
6	56	22.4
7	32	12.8
8	30	12.0
8	9	3.60
9	9	3.60
11	3	1.20
12	2	0.80
Total	250	100

Out of the sampled households, 68 percent were Amharas, out of which 68 percent were followers of the Ethiopian Orthodox Church. 23.2 percent are Kimant Orthodox followers. They are dominantly found in Chilga woreda, which was one of the five target woredas in this study. 10 percent of the households were Tigrian Orthodox followers, and the rest 3.2 percent were Bete-Israelis. With regard to religion, 90.4 percent were followers of the Ethiopian Orthodox Church, 6.8 percent were Muslims, and 1.2 percent of them were Protestants. Hence, out of the sample households, the majorities were Amharas, and at the same time the larger proportion of the samples were followers of the Ethiopian Orthodox Church (Table 4.4).

Table 4.4: Religion and Ethnicity

Ethnic Type	Religion						Total	
	Orthodox		Muslim		Protestant			
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Amhara	150	60	17	6.8	3	1.2	170	68
Kimant	58	23.2	-	-	-	-	58	23.2
Bete-Esrael	8	3.2	-	-	-	-	8	3.2
Tigre	10	4	4	1.6	-	-	10	4
Total	226	90.4	17	6.8	3	1.2	250	100

4.2. Traditional Water Sources

Before Ethiopian Orthodox Church (EOC) and WaterAid intervened in the study areas, the local communities were largely dependent on unsafe water sources, such as springs, rivers, ponds, and wells for domestic consumption (Table 4.5). Domestic and wild animals also used these water sources as well. About 79.2 percent of the respondents used to use water from the surrounding springs, 5.6 percent from rivers and springs. Depending on the situation of access to, availability and seasonality of these sources, most households had been using more than one source.

Table 4.5: Previously Used Water Points

Traditional water sources	Frequency	Percentages
River	8	3.2
Pond	8	3.2
Spring	198	79.2
Well	5	2.0
River & Well	14	5.6
Spring & Well	2	0.8
Well & others	12	4.8
River, Well & others	3	1.2
Total	250	100.0

As indicated in Table 4.6 below, entire dependence on unsafe water sources posed various health hazards, such as cholera, diarrhea, amoebic dysentery and *Guardia* on 47.6 percent of the samples. In rural areas where open field defecation is commonly practiced and consequent contamination is higher. About 21.6 percent suffered the drudgery of water collection, health risks, as well as shortage of water.

Table- 4.6: Problems Encountered While Using Traditional Water Points

Problems of using traditional water sources	Frequency	Percentages
Health problem	119	47.6
Drudgery	5	2.0
Shortage of water	8	3.2
Health problems and drudgery of collection	8	3.2
Health problems and Shortage of Water	54	21.6
Health problem & others	1	.4
Drudgery & Shortage of water	1	.4
Health problems, drudgery of collection, and water shortage	54	21.6
Total	250	100.0

Regarding who originated the idea of improving water sources in the target areas, 29.6 percent of households indicated that village community members have generated the idea of improving traditional sources, another 29.6 percent indicated PA administrators generate the idea of improving existing water sources. Similarly, 20.8 percent of the households said both residents and PA administrators generate the idea of providing improved supplies, and 17.2 percent indicated it was generated by NGOs (Table 4.7 below). The difference in responding as to who generate the idea of improving existing supplies suggests that the idea was not solely of user communities, which in turn shows inadequate community mobilization at the early phases of the project. Ensuring the existence of felt need, with due consideration of users' preferences and priorities for the service in communities, help to promote sense of ownership and commitment in managing, operating and maintaining the system before decision is reached to build water schemes.

Table 4.7: Initiatives to Improve Traditional Water Sources

Description	Frequency	Percentages
Residents	74	29.6
NGO'S	43	17.2
PA Administrators	74	29.6
Residents & NGOs	1	0.4
Residents & PA administrators	52	20.8
NGO'S & administrators	5	2.0
Residents, NGO'S & administrators	1	0.4
Total	250	100

At the early phase of the project, mass discussion forums were held with the community to convince users and pave the ground for the development of improved supplies. Interviews with donor office representatives, however, indicate that technology selection was entirely the responsibility of project offices. They further explained that observing the hydrological characteristics of the water sources to be improved need professionals' decision on the type and level of technologies to be installed in water points. Absence of community involvement in selecting technology, however, impedes the possibility of ensuring the appropriateness of the technology to the community, and this decision minimizes users' interest or motivation to operate and maintain technologies installed. Furthermore, escaping user involvement in technology selection is indicator of the supply-driven nature of the approach that has been adopted by the interventionists. Users' participation during the construction of water points is the decisive factor to stimulate sustainable management and maintenance of schemes by communities. As depicted in Table 4.8, most of the respondents participated in constructing schemes in different ways. 23.6 percent participated by providing labor only; 40.8 percent were involved by providing local building materials and labor, and 12 percent by providing local building materials only. Most of the respondents were involved in labor and material supplies, as these types of participation are relatively easy for rural communities. They have, however, made no direct financial contribution for the purchase of capital assets, except for the estimated value of their input supplies.

Table 4.8: Participation during the Construction of Scheme

Ways of participation	Frequency	Percentages
Local building material	30	12.0
Food & drinks to laborers & labor	28	11.2
Local building materials, food and drinks to Laborers & labor	13	5.2
Food & drinks to laborers	5	2.0
Labor	59	23.6
Local building material, food & drinks to laborers	3	1.2
Local building material & labor	102	40.8
Others	1	.4
No participation	9	3.6
Total	250	100.0

Almost all of the surveyed water user households are currently utilizing the developed schemes. They have their own reasons as to why they are using improved points. About half, i.e., 50 percent of the samples said they use water from improved points for reasons of good taste and smell, 27.6 percent for good taste, smell and proximity to home and 14.4 percent utilize improved supplies for reasons of good taste, smell, closeness to home and its color (Table 4.9 below). These results indicate acceptance of developed schemes by user communities.

Table- 4.9: The Status and Reasons of Utilizing the Developed Schemes

Reasons to use the developed Schemes	Frequency	Percentages
Good taste & smell	125	50.0
Closeness to home	11	4.4
Good taste, smell & closeness to home	69	27.6
Good taste & smell & its co lour	5	2.0
Good taste , smell, closeness to home & Its color	36	14.4
Not currently using	4	1.6
Total	250	100.0

4.3. Water Collection Materials

About 80 percent of the respondents use Jerricans for collection, and 80 percent use both Pots and Jerricans (Table 4.10). Water collectors in the study area, i.e., women and children are frequently and predominantly seen walking back and forth between water sources and home, carrying Jerricans on their heads. Jerricans are preferred to other containers for their durability and for lightweight.

Table 4.10: Material Used to Fetch Water

Material for Collection	Frequency	Percentages
Pot	5	2.0
Jerrican	200	80.0
Bucket	1	.4
Pot & Jerrican	20	8.0
Bucket & jerrican	20	8.0
Pot, bucket & Jerrican	4	1.6
Total	250	100.0

Size of water collection materials ranged from a capacity of 10 liters to 25 liters, and the mean and standard deviation were 21.9 and 10.7 liters respectively. Regarding the amount of water households fetch for their daily use, the minimum container was 1 and the maximum containers 4, the mean and standard deviation of the number of containers (frequency of collection), households collect per day, according to users' estimate was found 1.9 and 0.8 containers, respectively (Table 4.11).

Table 4.11: Capacity of the Containers, Frequency of Fetching, and Distance.

Description	Unit	Min	Max	Mean	S.D.
Aggregate holding capacity of containers	Liters	10	30	21.93	10.74
Number of times of fetching water per day	No	1	4	1.90	0.80
Water fetched per day	No of containers	1	4	2.84	0.81
Distance traveled per round trip	Minutes	3	60	16.16	9.55
Family size	No	1	12	5.84	2.13
Age of household heads	No	18	80	44.89	13.39

Communities need to have adequate water supplies for their domestic consumption. Participants in FGDs, particularly in Eyaho Serava, however, revealed that the existing supplies are not adequate. Among the study areas, Eyaho Serava faces serious shortage of supply, due, particularly, to an increase in the number of user households. About 20.8 percent and 28.8 percent of respondents said that production capacity of most water points decreased due to an increase in aridity and the growth in number of user households (Table-4.12). They said in mid of the dry season, the production capacity of most water points, particularly, in Serava, decrease significantly, subjecting collectors to stand in long queues. Tap attendants in Serava expressed that households are fetching every fourth day. Each household is allowed to fetch 84 liters of water at a time of its turn. To avoid conflict, they have established their own mode of operation. They keep records instead of queues, to best manage the shortage. An increase in the number of resident households worsens the situation. Serava shares the existing supplies with the neighboring PA and the new military camp, which is built at the western edge of the town. As a result, the supplies become inadequate to uphold water demand of users. Furthermore, as large proportion of the land in the study area has been cultivated for thousands of years, it has deteriorated as a result of deforestation, erosion

and other practices of the rural inhabitants, contributing to drying out or at least diminishing in-water volume of natural springs.

Table 4.12: Potential Reasons for the Shortage of Water Supply

Reasons	Frequency	Percentages
Increase in aridity	52	20.8
Increase in user households	72	28.8
No shortage of water supply	43	17.2
Increase in aridity and Increase in user households	83	33.2
Total	250	100

Interview held with Medical Director of the Aykel Health Center on health problems related to water shortage in Serava town revealed that the inadequacy of water supply during the dry season causes water washed diseases, which are caused by inadequacy or lack of water for personal hygiene. Users do not have adequate water for washing clothes, household utilities, and for as well. This has encouraged lice, and associated problems, like itching, scratching, and skin rash. In addition to these unhygienic problems, the director has also pointed out that the occurrence of eye problems, which is also related to water inadequacy to keep hygiene. These problems were much visible more on children, women, and on the elderly.

4.4. Vulnerable Groups

About 83.6 percent of the households witnessed the presence of these groups in the study area. These respondents said that such members of society have equal right to access and benefit even if they did not contribute their part in the course of scheme development. Results of the FGD at Tsehai Egir Cherchos PA in Dembia Woreda also reinforce this finding. Even at times when user fees have been collected, some of the most destitute and vulnerable members use water for free. Inequality to have access to

safe water was, therefore, no longer a problem almost in all the study areas. No individual or group was marginalized, either because of status in wealth, affordability, ethnicity or other socio-cultural and economic factors (Table 4.13).

Table 4.13: Presence of Equal Access to Vulnerable Groups

Descriptions	Frequency	Percentages
Yes	209	83.6
No vulnerable group	41	16.4
Total	250	100

The tenure type of the location of water points may have a bearing on access to water sources, especially when their location is on individuals' private farms as the issue of resource ownership in rural areas goes further to the extent of owning springs and similar water sources under the ownership of a specific lineage or family. But result of this survey revealed no negative influence on water points in this regard, as 84.4 percent of improved points are located either on reserved grazing areas or in those that are not suitable for cultivation, i.e., communal plots (Table 4.14 below).

Table 4.14: Tenure Type of the Location of Water Points

Descriptions	Frequencies	Percentages
Private	39	15.6
Communal	211	84,4
Total	250	100

4.5. Distance

Distance is a factor that impacts consumption. With an increase in distance from the source, the courage to collect water is reduced, and this might indirectly affect the health of the user communities, i.e., it is inversely related to the frequency of collection. In areas, where there are long distances between water sources and user villages, water collectors, especially women, are forced to spend their productive hours in walking back and forth between home and water points. Distance worsens the drudgery of carrying water across miles and may end up with health risks, such as deformities. Taking the views of households into account, distance measured in the time it takes water collectors for a round trip from home to water points was 3 minutes, the minimum 3 minutes, the maximum 60 minutes, and the average 16.16 minutes (Table 4.11). Spending time and energy on a daily bases in water collection has an impact on productivity.

4.6. Sense of Ownership

Strong sense of ownership is the result of the combined efforts of participatory and community based processes and problem solving efforts and strategies adopted by the collaborative efforts of project holders and the community itself. Such approaches, processes and practices in project design, implementation and management of water supply projects may help to enhance sense of ownership, and hence, sustain project benefits with in a community by communities' efforts.

Regarding ownership of schemes, respondents did not have uniform understanding as to whom, water points belong. About 69.2 percent of the respondents indicated that water points belong to user communities (villagers), and 23.6 percent said they belong to NGOs and 4.4 percent said these supplies are belong to both government and NGOs. About 2.4 percent of the respondents said these schemes belong to government, and 0.4 percent to both villagers/communities and NGOs (Table 4.15). Even if significant

proportion of the samples showed sense of ownership, about 30 percent do not have a clear idea as to whom these water points belong. This may contribute to the low level of users' willingness to participate in the management of existing supplies.

Table 4.15: Responses on to Whom Respondents Think the Water Points Belong?

Description	Frequencies	Percentages
Villagers	173	69.2
Government	6	2.4
NGOs	59	23.6
Villagers and NGOs	1	0.4
Government and NGOs	11	4.4
Total	250	100

Division of labor differ the sexes, and water collection is one of context-specific and the real manifestations of gender-biased division of labor. FGD results and observations revealed that women are the prime collectors of water for domestic use. They are, usually assisted by girls. Women themselves seem to have accepted this role to be their own responsibility. Especially, in the rural parts of the study areas, there is the belief that it is a disgrace for an adult man to fetch water from whatever source in daylight. If the wife gets sick, the husband might beg neighboring women to fetch water for him. In an FGD session at Azezo Tekle Haimanot, one of the participants said:

"Whenever my wife gives birth usually her relatives stay with me and my wife to assist us. They do everything, including fetching water. Whenever they leave to their home, I will ask our neighbors to fetch water for us, if all these fail, I myself fetch at night, because I do not want to be exposed to the community".

This situation contributes to the perpetuation of the induced low and inferior status of women, and has an adverse impact on girls' education. As described in Table 4-16, 50.4 percent of the Households (HHs) witnessed that women play the pivotal role in collecting water. 26 percent indicated that also girls are responsible to this role and thus always assisting their mothers and 18.8 percent said that both women and girls are shouldered the responsibility of water collection.

Table 4.16: Responses Regarding Role of Family Members in Fetching Water

Description	Frequency	Percentage
Women	126	50.4
Men	2	0.8
Girls	65	26.0
Boys	10	4.0
Women and Girls	47	18.8
Total	250	100.0

According to key informant interviews with Dabat, and LAC woreda health personnel, no significant cases were brought to health centers in relation to water-associated diseases. The informants pointed out that health problem might not, necessarily, be associated with water. They could be a result of a number of other factors, such as, climatic conditions and contamination of water while fetching, handling, or using. According to 42 percent of the idea of key informants, trainings and consultations were given to users on hygiene promotion and health education. They said users have shown relative improvements in this regard, following the trainings and consultations. Although contamination of water is the common cause for health problems, carrying water and walking across long distance might contribute to health problems. Except water supply at

Serava, where water is supplied to the residents through distribution points from about four kilo meters away from the village, the intervention in the rest of seven PAs did not reduce the drudgery of collection as most improved gravity water points were built on their previous location. Therefore, the major changes obtained are in terms of improving awareness of users regarding the safe handling of water, and the importance of hygiene, from which health improvements result and medical expenses reduce.

Table 4.17: Changes Effected as a Result of Improved Supplies

Description of changes	Frequencies	Percentages
Reduction of drudgery	42	16.8
Decreased disease incidence	37	14.8
Behavioral change due to hygiene promotion and health education	105	42
Decreased disease incidence and behavioral change due to hygiene promotion and health education	66	26.4
Total	250	100

4.7. Women’s Participation

The FGD sessions have pointed out that women in the rural areas of North Gondar have been subject to a number of age-old problems regarding water supply. These problems can be seen as context-specific, i.e., the inconvenience resulted from the topography. Water collection sources, in most cases, are not easily accessible. There are ups and downs in an effort to get access to the water sources. In summer season, the rain and associated muddy conditions makes collection very challenging. The water becomes so difficult for domestic consumption as it is partly muddy due to incoming flood. As a result, women are obliged to look for pure water from very distant sources, like springs. What is more, the summer season is the period when they are busy with farming activities. In a situation where alternative water sources, such as springs, are scarce, the whole household suffers from water-associated diseases. The situation is worse for women

who have given birth. Both the infant and the mother then suffer from frequent water associated illnesses. To mitigate problems of access to safe water, women's participation in decisions made on water supply and sanitation are critical factors for project sustainability. In this regard, most of the respondents indicated that women have participated before and during the construction of water points. About 22.8 percent of these household heads said that during the project period, women have participated by supplying local building materials, and 18.8 percent said women participated in labor during the project period (Table-4.18). Also the FGD result supported this idea in that community participation, including women, has been better during project implementation period.

The FGD result at Tsehai Egir Cherkos indicated participation after schemes were handed over to user communities, however, was found stagnant, as WATSAN committees have failed to mobilize the community in general and women in particular. Women show poor state of motivation and commitment, as the system as a whole become inactive. Participation during the project period, however, was better because the project office has been taking the responsibility of initiating the community to participate in the process. Women's participation in post-project handover period is limited to collection. They have not been involved in operation and maintenance, fee collection and protection.

Table 4.18: Ways of Women's Participation

Description	Frequency	Percentages
Labor contribution	57	18.8
Local material supply	14	5.6
Provision of food and drinks	4	1.6
Idea contribution	4	1.6
Local material supply and Labor contribution	48	22.8
Provision of food and drinks and Labor contribution	32	12.8
Local materials, Labor and Idea contribution	24	9.6
Local materials, food and drinks, and Labor contribution	18	7.2
All	43	17.2
No participation	7	2.8
Total	250	100.0

The FGD session held at Lideta "Gote," in Azezo Tekle Haimanot PA, can be taken as the best example as to how women's participation after project hand over became so minimal:

Woizero Azalu is a WATSAN committee member in Lideta 'Gote' of Azezo Tekle Haimanot Peasant Association (PAs). She has been trained as village technician by the project. After water points are handed over to users, many technical failures have happened in her village, but Azalu and other village technicians cannot maintain it because of lack of maintenance equipment. She was also one of those households to whom model latrines were built. It is no more functioning because the surrounding peasants forced her to avoid the pit so as to protect domestic animals from falling and dying into it.

The whole idea explains the differential level of women participation during and after the construction phase. In specific terms, it explains the failure of project plan to replicate the

practice of latrine utilization from model-latrine-user households to the rest of community members. It was first hoped that the majority of the residents would easily be influenced to construct their own pit with their own capacity, but the reverse was finally happened in that the non model-latrine-users forced the model latrine users and owners to avoid the pit after an incidence of the fall and death of domestic animals in to the unfenced model latrine pits. It further explains that even if local caretakers were trained to be able to carryout operation and maintenance; they failed to do so because of lack of supportive environment. They do not have maintenance equipments with them, or there is no institution in charge of supplying these materials to local caretakers. The respective WATSAN committees lack the initiation to facilitate and commence users' participation to mobilize resources required to enhance the capacities of these caretakers.

4.8. Community Management

Interventionists in water supply sub-sector are increasingly accepting community management as a broadly applicable and feasible method. It is a process through which poor people own and manage their resources and services, by themselves in their own locality. It entails people taking their own decisions about their lives, rather than being the passive object of choices made by others about them. It enhances people's potential capacity to defend their rights and carryout their responsibilities.

Community management in rural water supply and sanitation meant the execution of the roles and duties of WATSAN committees as per the respective by-laws. FGD sessions and the survey results indicate that WATSAN committees were established, comprising both men and women as their members. In the context of rural water supply, these committees constitute seven elected members, i.e., chairman, secretary, accountant, inspector, treasurer, auditor and casher. Users, with the help of the project office, elected them at the phase-in stage of the project. They included people who were trusted to help the project construction phase successfully. The rationale, behind their establishment is

to fill the gap in government structure in water supply and sanitation sub-sector at the grass-roots level. They were made responsible to coordinate activities and mobilize local communities to take part their share in the construction of schemes during the project period. These committees, however, were established not only to assist the construction phase but also to operate, maintain and manage the developed WATSAN schemes after the project office handover them via Woreda water desks to WATSAN committees. All these managerial responsibilities were not to be implemented in a vacuum, rather the project office developed model by-laws to be adapted and approved by users themselves. Hence, any of the potential operation and management (Operation and management), spare part supplies, financial management, community mobilization and intra committee and users' discipline procedures are based on and guided by these by-laws. Basically, WATSAN committees and users were given similar model by-laws. In addition, each user community was given the right to adapt it to its own perspectives. For instance, meeting schedules, users' fee tariff, period of fee collection, and period of electing new WATSAN committees could be varied from PA to PA. Before they discharge their responsibilities, these committees and user communities were given various trainings on financial, managerial, institutional and operation and management aspects of scheme management. In addition, two local caretakers were also elected and trained on maintenance to handle simple repairs.

Initially when water points were transferred to respective PAs, most of the WATSAN committees have tried to carry out their roles, such as setting service fee tariff, user fee collection and management, assigning water point attendants and so on as envisaged. But these initiatives did not last long. As to observation and FGD results, WATSAN committees poorly manage the developed schemes. Currently, out of the eight target WATSAN committees, seven 87.5 percent have lost their interest, and have ceased to carry out their responsibilities immediately after the evacuation of the

project office. They have become inactive to function as responsible body. They do not have the motivation and interest to carry out their tasks given to them from their own communities. This is because they had never mobilized users to cooperate in the process of operating and managing defunct schemes. They held no meetings or consultations to come up with solutions for the existing problems. Fee collection was terminated soon after few months when schemes were transferred to user communities. They do not have bank account. Water point attendants are not remunerated, broken and damaged supplies have been left with out being maintained, and pure water is wasted. Most water points are not protected. Hence, animals and children have easy access to them, and are causing damages. Those WATSAN committees, that are not collecting user fees, require government and/or other actors to maintain the damaged points, or leave them remain broken which in turn implies the feeling of dependency at the grass- roots level. Externally, they have never lobbied any institution or stakeholder to seek technical, financial or any kind of assistance. They rather expect others to come to them and solve their own problems.

It is only in Serava (one of the target PA) that WATSAN committee has been properly functioning. No WATSAN committee, but Serava, has opened bank account. It has relatively better financial record system. The water source point is well protected and fenced, and the same is true with distribution points. It has developed innovative way of regulating the shortage during the dry season. Tap attendants in Serava are remunerated. They report to the WATSAN committee regularly regarding the situations prevailed and the challenges.

One of the critical issues identified by the physical observation contributing to the physical deterioration of water points is sub sectoral contradiction or competing needs

between the sectors. Some farmers and few water point attendants are cultivating vegetables using water from improved water points. This motive has also been causing some technical faults. In a village of Lideta (Azezo Tekle Haimanot PA), farmers cultivating onion has broken the pipeline between the source and collecting chamber. These farmers construct informal dams to collect water and irrigate their farms. As a result, the collecting chamber and the distribution point are kept dry. Therefore, villagers collect water in an inconvenient and muddy situation at the very source of the water.

In the village of Darna Womberdi-Dembiya district, the water point attendant was cultivating different vegetables using water from the potable water point. The collecting chamber near the farm is opened. He controls the amount of water collected in it with that hole to irrigate his farm. He never thought of the contamination that might happen with the hole and he gives priority to his farm than villagers' potential health risk.

All such problems are created because of lack of strong institutional arrangement, poor sense of ownership to communal services, poor planning and organization to manage the existing schemes. There has been poor state of cooperation between WATSAN committees and PA administrators; this is because PA chairpersons feel they are not responsible to managing water supplies. Absence of effective community management, inadequate community participation and poor state of consequent physical conditions put benefits at risk.

4.9. Cost Recovery and Service Fees

Rural communities have been given the right to set service fee rates for themselves. In localities where construction of water supply schemes was over, elected WATSAN committees call the potential villagers to discuss and set service fee rate, which should be relatively fair and be affordable by users. They had also been given the right to decide the time when it should be collected. Service fee is the backbone of community

management. Regular and consistent fee collection is also an indicator of community awareness, enhanced sense of ownership, and the likelihood of sustainability of developed schemes. It is the source of finance for operation and maintenance. Service fee collection increases communities' confidence to solve their own problems, than expecting others to help them. Respondents were asked whether users should pay fees to the service they are being offered. The result indicated that most of the respondents believe users should pay fees for the service they are being rendered. They do also believe that paying service fees has a number of advantages. About 45.2 percent of the cases argue that service fee would help to undertake operation and maintenance activities, 34.4 percent said it allows to develop additional water points if collected and managed properly (Table 4.19), implying the need for solutions to the current challenges in maintaining water points.

Table 4.19: Responses on the Need for and Reasons to Collect Service Fee

Reasons for paying user fees	Frequency	Percentages
To construct additional water points	86	34.4
To cover O & M costs	113	45.2
To cover admin. Costs	34	13.6
All	17	6
Total	250	100

In addition to their opinion whether service fees should be collected or not, participants were also asked about their own status of fee payment. The result revealed that most of them were not paying service fees. Only 12.4 percent are paying fees with receipts because they are satisfied with the service they get. According to results of the FGD in Bihona, users have reached decisions among themselves not to pay service fees. The amount of tariff, however, was set with their full consent. However, 74.4 percent of the

users indicated that they are not paying service fees due to absence of responsible body to collect it (Table 4.20). Interview results indicated users did not contribute money for capital assets, and capital costs were covered by donors, which results in low level of sense of ownership.

Table 4.20: Reasons for Paying Service Fees

Reasons	Frequency	Percentages
No income	20	8
Fear of embezzlement	8	3.2
Lack of responsible body to collect service fees	18.6	74.4
I have been paying service fees only for two months	36	14.4
Satisfaction	31	12.4
TOTAL	250	100

4.10. Operation and Maintenance

Operation and maintenance is a management issue that is challenging the sustainability of rural water supplies. The majority of the samples revealed that their supplies have been facing different technical pitfalls. The frequency and type of technical faults vary with the type of technologies and from one water point to another. Respondents said that the minimum time these points have been facing technical default was found 1, the maximum 5 and the average time of all breakages was 2.5, (Table 4.11). The linkage between the high frequency of technical pitfalls and poor community management endangers the sustainability of improved water points.

Operation and maintenance is the most challenging aspect of community management that requires skills and resources. Target household were asked to list out the problems they have been facing in operating and maintaining their own schemes. Hence, 15.6 of them pointed out lack of finance and inadequacy of spare parts supply, 15.2 percent

identified lack of finance and trained technicians, and 14 percent indicated lack of trained technician and spare part supply as the major challenges of operation and maintenance (Table 4.21). These are, symptoms of problems that emanate from poor planning, the approach (supply driven) of the intervention; poor management and participation by the user community.

Table 4.21: Responses on causes of technical failures

Causes	Frequency	Percentages
Absence of trained technicians	31	12.4
Financial constraint	38	15.2
High spare of prices	19	7.6
Inadequate supply of spares	6	2.4
Financial constraint and Inadequate supply of spares	39	15.6
Absence of trained technicians and inadequate supply of spares	35	14
Absence of trained technicians and financial constraint	38	15.2
Financial constraint and high spare of prices	20	8
Financial constraint, High price and Inadequate Supply of spares	13	5.2
All	9	3.6
No technical fault	2	0.8
Total	250	100.0

One of the aims of EOC/WaterAid's intervention was enhancing community empowerment. As part of this, various trainings were provided to users and committee members. The FGD sessions and the survey result witnessed the existence of village caretakers, who were trained by the project. However, they were unable to maintain, even minor faults, due to lack of essential maintenance equipments while some water points. About 26 percent of the respondents suggested that few water points that have got maintenance require maintenance, as they are affected, due to lack of care during previous maintenance. About 22.4 percent of the respondents said that the reasons for

frequent operation and maintenance demand are poor efficiency of technicians and 12 percent poor quality of spares and poor efficiency of local care takers (Table-4.22 below).

Table 4.22: Responses on reasons for repeated technical pitfalls

Cause	Frequency	Percentages
Carelessness during construction	65	26
Low level of payment to technicians	6	2.4
Poor quality of spares	56	22.4
Poor efficiency of local caretakers	26	10.4
Poor quality of spares and poor efficiency of local caretakers	30	12
No default more than one	67	26.8
Total	250	100

With regard to Problems specific to spare parts, 36.8 percent of the respondents identified monetary constraint, 25.6 identified inadequate supply of spares, and 21.2 percent shortage of spares supply and costly prices as the most challenging problems of community management (Table 4.23). As to the views of respondents, Price, quality and durability of spares are also problems that deserve consideration. These problems are also aggravated by lack of awareness and poor state of infrastructure in the study areas.

Table 4.23: Responses on common spare part problems

Problems	Frequency	Percentages
Monetary constraint	92	36.8
Inadequate supply	64	25.6
High price	19	7.6
Poor quality	17	6.8
Inadequate supply and high price	53	21.2
No problem	5	2
Total	250	100

4.11. Community - Based Associations (CBAs)

CBAs are forms of civil societies, which have existed since long time ago in Ethiopia. They are locally established self help economic empowerment associations, which are typically organized to respond to immediate and specific needs. In sum, these traditional forms of civil societies have been contributing to the socio-economic empowerment of the poor in the community. They have also been serving as institutional channels in mobilizing community members to participate in various developmental activities. They have also been contributing to peace building processes at a local level. Despite this, however, most of them do have limited range and magnitude in their operation, and many of them have not evolved into strong forces of change with wider vision that can contribute to national policy reform.

FGDs have confirmed the presence of CBAs in all the study areas. As to this survey, CBAs are associations that society has created to ensure its continuity. They have socioeconomic and political roles for the peaceful, cohesive and stable functioning of society. Respondents identify Mahiber, Senbete, Iddir and Equb, Debo Wonfel as existing CBAs in their localities. These CBAs, except Debo and Wonfel, do have significant and potential roles to play in managing rural water supply schemes. Respondents were asked whether they are members to these associations. As indicated in Table 4.24, about 47.6 percent of them were members of Mahiber, 17.6 were members of Senbete, 14.8 were members of both Mahiber and Senbete, 9.6 were members of Iddir, and 3.6 of the respondents were members of Equb. Since almost all of the beneficiaries in the study areas are followers of EOC, most of the respondents are members of these Faith Based Associations (FBAs). They meet periodically in the name of Saints with or without feasts.

Table 4.24: Responses about Users' Membership Status to CBAs

CBAs	Frequency	Percentages
Iddir	24	9.6
Mahiber	119	47.6
Senbete	44	17.6
Equb	9	3.6
Mahiber and senbete	37	14.8
Not member of CBAs	17	6.8
Total	250	100

Regarding the roles of CBAs, most of the respondents suggested that CBAs could assist the provision of socioeconomic services, such as rural water supply in different ways. 26 percent said CBAs have the potential capacity to mobilize community members, 20.8 percent said they help resolve conflicts, and 16.4 percent said CBAs help to forward monetary contributions to water point management respectively (Table 4.25 below). But these potentials were not considered and utilized at the planning stage as a factor to have effective community management. Whenever members of any of these associations involve in conflict, leaders may take various kinds of tradition specific measures, such as denying membership. Members of these CBAs are willing to accept such measures voluntarily than any of the formal structures.

Table 4.25: Responses about the potential roles to be played by CBAs

Potential roles CBAs	Frequency	Percentages
Monetary contribution	41	16.4
Community mobilization	65	26
Punish defaulters of contributions	41	16.4
Resolving conflicts among users	52	20.8
Total	250	100

4.12. Conflict Among Water Collectors

In the context of RWSs, in the study areas, a number of households collect water mostly from developed water points. About 16 percent of the respondents agree with the idea that conflicts become frequent during the dry season, when the rate of production of water points decreases and, long queues become common. As the production capacity of the sources decreased, collection becomes possible only at some specific time of the day, and such situation requires some sort of regulation. However, in areas, where no paid attendants are working, collectors end up quarrelling among themselves.

As to the FGD, conflict settlement in the study area follows both the informal and formal institutional channels. In the rural areas, conflicts are handled by “yehager shimagilewoch”, which literally means council of local elders, who are traditionally responsible to settle conflicts and keep peace in the community. If any of the parties involved in conflict appeal to sue in the formal structure, the informal conflict resolution may be interrupted. Similarly, conflicts between and among water collectors, they are mostly settled by elders and/or CBA members. Elders hold arbitration sessions on day-offs, and the parties involved in conflicts stood in front of them. They are allowed to speak about when, where and how he or she was derived in to conflict. After listening to both parties, the council will forward its decision, as to the norm, which should be made operational by the parties. Then each of them are asked to bring down his or her head, protruding his palms parallel to one another and ask excuse about his or her miss deeds. This is the event that the two parties confess not to see each other as enemies anymore, and become peaceful members or friends with the possibilities of potential interactions between them.

4.13. Technology

Technology selection is one of the issues on which users should have the right to exercise their own choices and voice. In all the study areas, users have been made to accept the type and level of technology selected and supplied by the project office, without their involvement. The acceptance and sustainability of water point technologies, however, could be ensured by letting the end users know the various technological options, i.e., their advantages and disadvantages, the cost and in general the appropriateness of technology to be installed.

Interviews with WaterAid program officers and policy analysts have pointed out that technologies to be installed were selected by professionals since it requires technical know how. User communities have not yet been informed of the costs, benefits and qualities of each option, which indicates the supply-driven nature of the approach. 78.4 percent of the users have shown faucet breakages as the most frequent technical problem, 12.8 percent suggest problems with collecting chambers, and the rest 7.2 percent problems with pipes, animal troughs, washing stands (Table 4.26).

Table 4.26: What are the most technical problems?

Problems	Frequency	Ages
Faucets' breakages	196	78.4
Problems of collection chambers	32	12.8
Problems with valves, pipes and animal troughs, washing stands,...	18	7.2
Hand pump failure	4	1.6
Total	250	100

4.14. INSTITUTIONAL CONDITIONS

Results of FGDs and key informant interviews revealed that WATSAN committees are one of the key informal institutions directly responsible to the management of potable water supply. From the formal ladder, the immediate responsible body to PA level water supply is Woreda water desk, which was institutionalized as a result of the decentralization reform, enacted in 2002. Interview and observation result pointed out Personnel, who were assigned to Woreda water desks during the decentralization process, however, neither have relevant profession nor the experience. They are also poorly budgeted and, in general do not have the adequate facility to carryout their responsibilities. In addition to water committees and woreda water desk offices, there are also zonal and regional water, mines and energy resources development department and bureau that are responsible for the development of potable water supply in the region. NGOs are also the vital stakeholders in the development of the sub sector. Their contribution, however, was limited to technical support to the grassroots structures and their direct involvement at the PA level is minimal.

All the aforementioned institutions are expected to interact, both vertically and horizontally among each other to enhance the coverage of pure water supply in the region. But as to the key informal interviews and FGDs, WATSAN committees do not get adequate assistance and support from the above ladders. On the other hand, they themselves have not shown the initiation and effort to get support from the above ladders. They are not even trying to administer the existing points, by exploiting resources around them. The inadequacy of the interaction and support between each other impacts the required improvement of the sub sector.

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATION

5.1. Conclusion

Water supply schemes developed by WaterAid/EOC in the rural areas of north Gondar were getting worse due to lack of effective community management. WATSAN committees, which were established to shoulder the responsibility of managing and operating the developed schemes, were ceased to function soon after the termination of the project. As a result, water points are seen broken/damaged. Users are not paying fees for the service rendered, and no maintenance was made yet.

This research, therefore, aims to assess the situation of community management of rural water supply schemes developed by waterAid/ EOC-DICAC in North Gondar zone. Specifically, it aims to assess technical, financial, institutional and social factors affecting rural water supply management.

Households constitute the basic sampling unit in the survey. The sample had included households who were actually utilizing improved water points from eight PAs, namely, Dabat Zuria (DZ) and Chilla from Dabat woreda; Alem Tsehai (ATS) or Bihona and Eyaho Serava (EYS) from Chilga woreda; Tsehai Egir Cherkos (TEC) and Darna Womberdi (DW) from Dembia; Saina Sabia (SS) from Lay Armacheho, and Azezo Tekle Haimanot (ATH) from Gondar Zuria Woredas. A total of 250 water user sample households were included in the survey. Purposive sampling was used as a sampling method in the survey because of the absence of developed sampling frame. Both qualitative and quantitative data were collected from primary and secondary data

sources. Questionnaire, interviews, FGD and observation were used as a tool to collect data.

Except in Serava, WATSAN committees are ceased to function. They showed reluctance to execute their responsibilities as per the by-laws, and consequently other specific problems stemmed from their failure.

WATSAN committees are volunteers. They do not have payments, and as a result they have little interest to deal with water management. They do not have any incentive to carry out their roles. They rarely have called community meetings to motivate users' participation in scheme management. As a result, except Serava, all other schemes do not have viable financial management systems. WATSAN Committees have not been collecting service fees, and do not have bank accounts and financial record systems.

Except two hand pumps in Dabat and Dembiya; and distribution points at Serava, all gravity points are physically and technically deteriorated. They have been subject to frequent breakages and thefts. They do not have fences. Most of the gravity points do not have remunerated attendants. The immediate surroundings of some distribution points, like in Bihona, are muddy, open to the reach of children and animals and, hence are not convenient for collection and cloth washing.

Village caretakers or technicians have not been helping communities in undertaking routine maintenance due to lack of repair equipments. Lack of preventive maintenance allows high rate of breakage and continuous leakage of pure water. Despite this, however, most of the villagers utilize these points even if some of them are not convenient for collection. In three of the gravity points such as Lideta, Darna Womberdi and Bihona, owners of the plot where water points are located and attendants are undertaking irrigated farming using the water from the developed schemes. These

farmers need the points to remain broken so that water flows to their farms with the canals they dug for the purpose. They form simple dams for collection and water vegetables whenever they need. This sectoral conflict has worsened the physical condition, and contradicts with the prime aim of potable water supply.

Absence of operation and maintenance is related, not only to scarcity of financial resources and skilled labor, but also to problems of adequate supply of spares. This is aggravated by distance, and inadequate awareness of WATSAN committee members of remote rural villages to purchase it. Some spares may sometimes be expensive and of poor quality.

Stakeholders' participation was so inadequate to stimulate proper management of schemes. In post-scheme handover period, users particularly, women rarely participate in managing schemes, except collecting water. The community develops sense of dependency on government and NGOs for maintenance and new intervention rather than tackling the problem by itself. This is partly, due to misconceptions about scheme ownership.

Lack of motivation and interest, and inadequate awareness among the community in general and WATSAN committees in particular make them unable to create institutional linkages. They were unable to promote interaction and linkages to work closely with all stakeholders. The institutional support to PA level activities was inadequate. NGOs in the study area were not interested to participate in operation and maintenance. Weak participation of stakeholders and inadequate institutional integration has worsened the problems that the rural communities are facing.

Sectoral deficiencies are so acute in that they do not have an appropriate plans and supportive budgets to contribute to the amelioration of scheme management shortcomings.

Vulnerable groups enjoy the right to access and use safe water in all the points. Although community based associations, such as Mahiber, Senbete, and so on, do have the potential to mobilize members for effective participation, and hence to scheme management, they are far less exploited.

The benefits of RWSs are such that users' understanding and/or awareness have relatively improved as a result of the intervention. This has been complemented by the relative improvement in the quality of water from the developed points. Furthermore, there is slight improvement in the health condition of users and reduction in associated medical expenses. But the drudgery of collection faced by women has not yet been reduced as gravity schemes are built on their previous locations as well as lack of supportive arrangements, like caring stands. This is because drudgery of collection partly related to fetching distance and lack of associated physical conditions. Good taste, smell and color are also the benefits listed by users.

5.2. Recommendations

Safe water is an indispensable necessity and right to life. People in rural areas of Ethiopia have long been using unsafe water sources for their domestic consumption. People have the right to life, and water is the prime prerequisite to sustain life. The current global trend in this regard is, therefore, to provide everyone with pure water, which is accessible, safe and adequate so as to improve the health, and welfare of citizens and thereby promote socio-economic development and alleviate poverty.

Providing safe water to rural people is a complex and challenging issue that requires commitment of a great deal of resources. The problem is so deep rooted, and can only be alleviated through integration and participation of all stakeholders such as, user communities, and water-affiliated government and non governmental institutions.

The intervention in Ethiopia, so far, has been minimal and the problem is thus so intact. Even worse, the few supplies that have been provided by the different actors become defunct soon after construction. This is primarily due to poor level of awareness, poor sense of ownership, lack of motivation or incentive for communal services among user groups who are supposed to be responsible in managing these schemes. This might emanate from poor planning, and top down approach that gives less attention to the software aspects of the intervention during the project period. This study has attempted to review the various aspects of community management, on the bases of which the following are forwarded.

- **Extension:** more emphasis should be given to the software aspects to make user communities fertile for the intervention. It should be phased prior to the physical aspects, in a culture-specific and target-oriented approach. Mass sensitization does not bring the required result. Rather, a focus should be made separately on women, youth and adults. Adopting such strategies in an

intervention would help to promote participation and sense of ownership. Extension approaches should target minimizing dependency feeling and promote self-reliance.

- **Capacity Building:** lack of capacity impedes community management. To mitigate the identified institutional problems, integrated capacity improvement should be planned and implemented. This would help to address capacity problems faced by grass roots water sector offices, such as lack of material supply, lack of trained manpower and inadequacy of effective practices and experiences and hence, to enhance the performance capacity of actors. It will consequently contribute to enhancing the required response to the problem at the grass roots.
- **WATSAN Committee Members:** are volunteers elected to serve without any payment. They, however, lost their interest and ceased to carry out their roles. They should, however, be provided with incentives from their own communities, such as exempting them from both monetary and labor contributions, giving them priority in credit facility, and free social services like health and education. They had better work closely with PA administrators. Grass roots actors, including Development Agents (DAs) should integrate and work closely to help them move forward. There should be experience sharing, particularly with good Performers.
- **Establishing Mobile Operation and Maintenance:** the current problems implied communities are premature to take full responsibilities in managing their own supplies. Organizing mobile operation and maintenance team that could maintain severe breakages and thereby teach users to maintain simple breakages. This team would be organized by all or some of the concerned actors and based at each zone.

- **Scheme Attendants /Guards/:** should be recruited from individuals that are not involved in farming. People with disabilities, who are performing some handcrafts, would have been the right person for regular protection. They should be remunerated.
- **Stakeholder Participation:** should be paid adequate attention. Participation should be approached taking into account sex, age, religion, income, education etc., so as to communicate with the different groups, targeting each group's peculiar characteristic. Cultural values, norms and preferences should also be well considered to serve as guiding principle in the intervention.
- **Village Level Operation and Maintenance:** establishing mobile operation and maintenance is a strategy that should be considered starting from the design phase. It should serve as mentor to village level operation and maintenance activities. It should be assisted by training, and practice to local caretakers accompanied by community awareness and appropriate maintenance equipments.
- **Environmental Care:** fencing and afforesting areas around water points with indigenous species may help to enhance environmental resilience and balance ecosystem, and consequently contribute to the reduction in aridity and vulnerability to drought.
- **Investing in High Priority Villages** with intense felt need and paying attention to construction quality during construction phase contributes the sustainability of water points.
- **Spare Parts:** inadequate supplies of spare parts should be tackled by establishing spare parts center, that can import and stock for rural market

demand. This can be integrated with mobile extension unit, with its center at the zone.

- **Traditional Associations:** community based associations such as Mahiber, Senbete, Iddir and so on do have potential roles to mobilize their members to participate in schemes' management at the planning and construction phases. Members are complied with the rules of their association than any thing else.
- **Research and Development:** further research is required to come up with recommendations for strong community management. Research in pre-and-post intervention periods would help to provide viable phase-in and effective implementation, and thereby schemes' sustainability. It may also help to draw lessons for new interventions. In addition, basing designs on well-studied situations may help to carryout participatory and reliable development. It will also help to review and test the current approaches.

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Annex 1: Questionnaire to Households

1. Background Data

1. Name of respondent/household.....
2. Age.....
3. Sex
4. Marital status: (1) Single (2) Divorced (3) Married (4) Widowed
5. Name of peasant Association (PA).....
6. Woreda.....
7. Zone.....
8. Region.....
9. Number of Family members family size.....
10. Religion.....

2. Water Demand Responsiveness

11. From where you have been fetching water before the development of the current water points?
 1. River
 2. Pond
 3. Spring
 4. Well
 5. If other specify-----
12. What sorts of obstacles you have been facing while you were using water sources listed in question number 11?
 1. Health hazards caused by unsafe water
 2. Drudgery of fetching water from distant sources
 3. Scanty of water
 4. If other specify-----
13. Who was/were the pioneer generator of the idea of developing traditional water sources to the present status?
 1. Residents appeal to respective bodies
 2. NGOs' intervened by their own initiative
 3. PA administrators
 4. If other specify-----

14. Have you been participated in community consultations that were conducted before and during the construction of water and sanitation schemes?

1. Yes 2. No

15. If yes, which type of technology you have selected with the help of such consultations?

1. Well water 3. Bono/public tap 5. If other specify _____
2. Hand pump 4. Spring

16. Is the technology in-service the one that you prefer by your own?

1. Yes 2. No

17. Have you been agreed to pay for this technology by your own?

1. Yes 2. No

3. Community Participation

18. Have you been participated during the construction of rural water supply and sanitation schemes (RWSSs)? 1. Yes 2. N

19. If yes, in what ways you have been involved in the process?

1. Supplying local building materials
1. Providing food and drinks to laborers
2. Labor
3. Money
4. If other specify-----

20. Are you currently using the developed water points? 1. Yes 2. No

21. If no, what are the rationales to abandon them?

1. Bad taste
2. Distance
3. Low level of capacity to pay service fees
4. Lack of enough labor
5. If other specify.....

22. If your answer in question number 21, is yes why?

1. It has good taste and smell
2. It is closer to home
3. It has fair service fee tariff
4. If other specify.....

23. Are there any activities how are performing to sustain RWSSs?

1. Yes 2.No

24. If yes, what are the specific tasks you are performing to sustain the benefits of RWSSs?

1. Protect and up-keep RWSSs
2. Paying service fee in time
3. Labor contribution during operation and maintenance
4. Participate in discussions on water issues
5. If other specify-----

25. What material(s) you are using to fetch water?

- | | |
|------------|-------------------------|
| 1. Pot | 3. Jerrican |
| 2. Bucket. | 4 If other specify----- |

26. How many liters the malarial you select in question 25 contain?.....

27. On average, how many times you fetch water in a day?

- | | | |
|------|------|--------------------------|
| 1. 1 | 3. 3 | 5. If other specify..... |
| 2. 2 | 4. 4 | |

28. On average, how many numbers of containers Example, Jerrican of water you in a day?

- | | | |
|------|------|--------------------------|
| 1. 1 | 3. 3 | 5. If other specify..... |
| 2. 2 | 4. 4 | |

29. Do you think that the present water supply is enough to you and your villagers? 1. Yes 2. No

30. If no, what do you think are the potential reasons for the shortage?

1. Reduction of the potential of the water due to aridity
2. The number of the beneficiary community is growing ever
3. The number of households using a single water points higher
4. Sparsely and scattered nature of settlements
5. If other specify.....

31. Are there vulnerable groups, such as the elderly, the disabled the poor etc in your village? 1. Yes 2. No
32. If yes, do they have equal right to access and benefit from the developed RWSSs? 1. Yes 2. No
33. In which of the following your Village water committee handles such vulnerable Groups?
1. Give them equal right to access and benefit RWSSs.
 2. Make them free from user fees
 3. Make them pay user fees as other villagers
 4. If other specify-----
34. What is the tenure type of the specific location of the water point?
1. Private 2. Communal
35. If private does it have a negative influence to use the water point?
1. Yes 2. No
- If yes, what are the measures taken to alleviate such problem-----

36. How do you see the distance between your home and the water point?
1. Faraway 2. Closer
37. If there is a distance between your home and the water point, how long, do you think, will it be in kilo meter or meter? -----
38. How many minutes/hours it takes for you to walk from home to water points (One round)
39. To whom do you think this water point belongs?
1. Villagers 3. Government
 2. NGOs 4. If other specify-----
40. Among your family members who are mostly responsible to fetch water
1. Women 4. Boys
 2. Men 5. If other specify-----
 3. Girls

41. Are there positive changes that are resulted from the supply of safe water and hygiene and health education? 1. Yes 2. No

42. If yes, which day you think a positive change brought about by RWSSs?

1. Reduction of the drudgery of fetching water
2. Improvement of water associated diseases
3. Behavioral change from health and hygiene education
4. If enable use to undertake, income earning activities
5. If other specify-----

43. What are the benefits you feel as a beneficiary of safe water and sanitation services?

1. Betterment of family health
2. Relief from medical expenses
3. The lesson to manage self development
4. The benefits of coordination/cooperation
5. If other specify-----

4. Hygiene Educations and Environmental Sanitation

44. Are you currently using pit latrine? 1. Yes 2. No

45. If yes, what is its tenure status? 1. Private 2. For group

46. Are you/your families happy in using latrine?

1. Yes 2. No

47. If yes, why? Because:

1. Defecating everywhere is risky for public health
2. If makes our village clean and comfortable to live
3. It reduces flies and associated problems
4. It is by itself a civilized practice
5. If other specify-----

48. Referring to question 48, If your answer is no, why? Because:
1. We never get any training as to the benefits of using toilets
 2. We never consider open field defecation as dangerous to health
 3. We afraid that it causes fly and smell problems
 4. Inadequate experience and know-how to construct latrines
 5. If other specify-----
49. Have you ever face any problem in using latrine?
1. Yes 2. No
50. If yes, what are the specific problems you have felt so far?
1. Bad smell
 2. Problem of fly and other small creature
 3. Resistance to internalize the culture of using latrine.
 4. If other specify-----
51. Is the culture of latrine usage replicating in a community? 1. Yes 2. N
52. If yes, why? Because:-----
53. If no, what do you think are the reasons?-----
54. Did the hygiene education and environmental sanitation training help to bring behavioral
55. Change in practice among the community? 1. Yes 2. No
56. If yes, what sorts of personal hygiene and environmental care activities you are practicing?
1. Washing hands during food, using toilets with soap and water
 2. Washing closes
 3. Avoiding solid waste properly
 4. Avoiding liquid waste properly
 5. If other specify-----
57. What challenges you have experiencing in applying these hygiene education and sanitation practices?
1. Shortage of money to buy soaps
 2. Low level of awareness and experience to promote personal hygiene and Environmental sanitation
 3. Lack of facilities to promote solid and liquid waste management
 4. If other specify-----

5. Women's Participation

58. Had women been participated in the processes of developing water points?

1. Yes 2.No

59. If your answer is no, what were the reasons behind?

1. The project gave little attention to women
2. Because of cultural influences
3. The influence of husbands
4. If other specify-----

60. If yes, in what ways they have been participated?

1. Supplying local building malaria's
2. Providing food and drinks to laborers
3. Labor
4. Ideas
5. If other specify-----

61. Do they have been participated in training sessions conducted to facilitate RWSSs? 1. Yes 2. No

62. If your answer is no, why? Because:

1. Negative attitude on women
2. The project gives inadequate attention to women
3. Low level of understanding to the value of women's participation
To project sustainability
4. If other specify-----

63. In which of the decisions/discussions conducted during RWSSs development have you been participated?

1. In decision that is made regarding the need to develop RWSSs
2. In a decision regarding the location of water points
3. In a decision regarding the essential inputs: their type and level of quality
4. Users' fee tariff and time
5. If other specify-----

64. Have ever been members of the WATSAN committee? 1. Yes 2. No

65. If yes, did you have implied your responsibilities? 1. Yes 2. No

66. If no why? Because of:

1. Multiple family responsibility
2. My husband prohibits me to participate
3. Due to socio-cultural and religious affairs
4. Absence of interest to participate
5. If other specify-----

67. Do you think that women were given an opportunity to participate in all the process of RWSSs development? 1. Yes 2. No

68. If no, what do you think is the negative consequence of the absence of women's participation on the sustainability of project benefits?

1. Absence of women's participation will affect schemes' sustainability
2. Their role to influence their sons and husbands so as to protect water points will be absent
3. Their role in maintenance and operation will be absent
4. If other specify-----

6. COST SHARING AND SERVICE FEES

69. Do you think that beneficiaries should pay service fees? 1. Yes 2. No

70. If yes, why? Because:

1. It could enable to construct additional water points
2. It covers M&O costs
3. It helps to cover administrative expenses
4. If other specify-----

71. If no, why? Because:

1. Water is considered as a basic need and hence it should be provided free
2. Villagers are in a low level of living and hence can't afford to pay
3. We believe that using traditional sources of water has no problem
4. If other specify-----

72. Have you ever pay service fees? 1. Yes 2. No

73. If yes how much is the level of service fees?

1. 0.50 cents/month
2. 3 Birr/year
3. 6 Birr/ year
4. 1 Birr/month
5. If other specify-----

74. Referring to question number 72, if no why?

1. I don't afford to pay
2. No one is dedicated to collect fees
3. The collected sum won't be properly used
4. If other specify-----

75. How do you evaluate the level of the users' fee tariff?

1. It is low
2. It is high
3. It is fair
4. If other specify-----

76. What do you suggest about the level of service fee?

1. It should be increased
2. It should be reduced
3. It should be free of charge
4. Remains as it was
5. If other specify-----

77. Have you ever pay your service fee? 1. Yes 2. No

78. If no why? Because:

1. I have no income
2. I afraid that it will be embezzled
3. No one is responsible for collection
4. If yes specify-----

79. Have you ever received receipt for service fees? 1. Yes 2. No

80. Did you contribute money for capital assets during the construction of water
Points? 1. Yes 2. No

81. If no who covers the capital costs?

1. Government
2. The community
3. NGOs
4. If other specify-----

7. OPERATIONS AND MAINTENANCE (O&M)

82. Had your water point been broken/experience technical pitfall?

1. Yes 2. No

83. If yes, how many times it has been broken since construction?

- | | |
|------|--------------------------|
| 1. 1 | 4. 4 |
| 2. 2 | 5. If other specify----- |
| 3. 3 | |

84. What do you think is the frequency of the technical default?

1. One in every 3 months
2. One in every 6 months
3. Once in a year
4. Once in every 2 years
5. If other specify-----

85. Which of the following apple major?

1. Absence trained technicians
2. Lack of finance
3. High spare prices
4. Lack of spares supply
5. If other specify-----

86. Are there trained technicians for maintenance work? 1. Yes 2. No

87. If yes do they have been maintaining technical failures? 1. Yes 2. No

88. Did your village water points experience technical default more than once?

- | | |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|

89. If yes, why? Because:

1. It was constructed with inadequate care
2. The amount paid to local technicians is very low
3. Poor quality of spares
4. Poor technical efficiency of village technicians
5. If other specify-----

90. Is there a problem regarding spare parts? 1. Yes 2. No

91. If yes, which do you think is the most common one?

1. Inadequate supply
2. They are so costly in the market
3. Poor quality of spares
4. If other specify-----

92. Have you ever contributed money for maintenance? 1. Yes 2. No

1. Technical failures have not yet accused
2. The service fees we pay cover maintenance costs
3. No one asks us to contribute
4. We contribute labor
5. If other specify-----

95. If yes, what are the common practices of protection you made to sustain the RWSSs' benefits?

1. Paid guard
2. Fencing
3. Users continuously protect and control
4. Greening the source point
5. No protection
6. If other specify-----

96. Are there any community-based associations in your village?

97. If yes what is the type of community based association existed in your village?.....

99. If yes to which you are a member?

1. Edir
2. Mahiber
3. Equb
4. Senbete
5. If other specify-----

1. Yes 2. No

1. They contribute money
2. Mobilize the community
3. Punish fee defaulters
4. Manage conflicts
5. If other specify-----

102. If your answer in question number 101, is managing conflicts, In what way they are performing this activity?
1. Canceling membership
 2. Putting monetary punishment
 3. Excluding members from socio cultural bonds
 4. If other specify-----
103. Are there additional mechanisms of managing conflicts in addition to the once carried out by CBAs? 1. Yes 2. No
104. If yes, which of the following is the mechanism that is used to solve conflicts?
1. Through PA administration
 2. Through district administration
 3. Culturally through elders
 4. Through water committee
 5. If other specify-----
105. Is there any specific time when conflicts are frequent?
1. In dry season
 2. During harvesting time
 3. During ploughing summer season
 4. Morning and evening in a day
 5. If other specify-----
106. Do conflicts have resulted in any injury or death? 1. Yes 2. No
107. If yes, how could you express the situation among the following?
1. Bleeding and body sore
 2. Death
 3. Disability
 4. If other specify-----

9. TECHNOLOGY

108. Have you been informed of the advantages, costs and disadvantages of the potential technologies to be installed? 1. Yes 2. No
109. If no, who select the technology in service?
1. The sponsoring NGO
 2. Government representatives
 3. Beneficiaries

4. If other specify-----

110. Is the currently installed technology simple to manipulate and use?

1. Yes 2. No

111. If your answer in question number 110 is beneficiaries; from which Perspective they select the technology?

1. From price perspective
2. Availability of spares in the market
3. Material quality/durability
4. It is easily maintained
5. If other specify-----

112. Which of the following is the most frequent technical problem (s) you observe?

1. Faucets
2. Hand pump failure
3. Breakage of collecting chamber and pipeline
4. Problem of animal trough and washing stand
5. If other specify-----

10. WHATSAN COMMITTEES: Capacity building and Institutional Conditions

113. Have you been participating in training sessions given during the construction of Water points? 1. Yes 2. No

114. Was there any training given in post-scheme delivery period?

1. Yes No

115. If yes, may you specify training subjects that were given to villagers?

116. Have you ever asked any technical assistance from government water offices in north Gondar? 1. Yes 2. No

117. If yes, what are the kinds of assistances you have got so far?

1. Spare parts
2. Quality control services
3. Water sample /case/ investigation
4. Management training to WATSAN committees
5. If other specify-----

118. Do government water resource offices have been giving you some sorts of on their own initiative? 1. Yes 2. No

119. If yes, what are the assistances given to you?

1. Training
2. Spare parts
3. Finance for maintenance
4. Professional assistances
5. If other specify-----

Annex 2: Checklists to interview with waterAid

1. Would you explain the importance of water for human welfare in general and human health
2. What are the missions and visions that your organization strives to achieve?
3. What are the rationales or justifications behind for pursuing them?
4. Is there any peculiar approach that is being adopted to facilitate/guide your intervention?
5. What are the strategies, principles or policies that water aid considers valuable/relevant to sustain benefits?
6. Is there any national regional or international legal provision that considers water as a basic human need?
7. How is water aid managing community participation in general and women's participation in particular?
8. How do you think water aid is planning to address the issue of:
 - 8.1 Community management/water committee
 - 8.2 Community involvement
 - 8.3 Operation and maintenance
 - 8.4 Capacity building activities
 - 8.5 Scheme protection
 - 8.6 Spare part supply and technical skills
 - 8.7 Technology choice etc, both at the planning stage and in post schemes' hand over period.
9. What problems/challenges water aid has faced so far?
10. What lessons you have drawn form the developed schemes?
11. What do you like to suggest?

Annex 3: Checklists to interview with woreda/zone water offices

1. Water associated diseases/problems. Their presence, type and magnitude and the
2. Group of society most affected
3. Change in community effected as a result of these pure water supply and sanitation schemes
4. Problems with water (if any) like for example fluoride content etc.,
5. Specific diseases overcome as a result of WSSs (if any)
6. Specific and common personal hygiene and environmental sanitation (if any)
7. Additional opinion (if any)

Annex 4: Observation checklists

1. Name of Peasant Association (PA)-----
2. Technology type
3. Present status
1/ Normal 2/ Broken 2/ Broken but repaired
4. Time it has been broken and stayed un functional and stayed un functional
5. Water committee 1. Functioning 2. Not functioning
6. Scheme protection
7. Fee collection
8. Maintenance and operation
9. Pit latrine utilization 1. Practiced 2. Not practiced
10. Are women the member of water committee?

Annex 5: Checklists to interview with woreda/zone

health offices

1. Water associated diseases/problems, their presence, type and magnitude and the
2. Group of society most affected
3. Change in community effected as a result of these pure water supply and sanitation schemes
4. Problems with water (if any) like for example fluoride content etc.,
5. Specific diseases overcome as a result of WSSs (if any)

6. Specific and common personal hygiene and environmental sanitation (if any)
7. Additional opinion (if any)

Annex 6: FGD guide

1. Strengths of rural water supply schemes
2. Weaknesses of rural water supply schemes
3. Opportunities available in managing rural water supply schemes
4. Threats in managing rural water supply schemed

Annex 7: List of Respondents FGD participants

7.1: Participants at Tsehai Egir Cherkos

S.N.	Name	Sex
1	Priest Dessie Kassa	M
2	Ato Mengist Alebachew	M
3	Ato Taddesse Eshete	M
4	Ato Neberu Mersha	M
5	Ato Kefale Asress	M
6	W/ro Tagegne Jember	F
7	W/ro Fenta Demlew	F
8	W/ro Menen Amare	F
9	W/ro Mulualem Lemma	F
10	Degytinu Tegegne	F

7.2: Participants at Dabat

S.N.	Name	Sex
1	Ato Belete Fentie	M
2	W/ro Agerie Amare	F
3	W/ro Lakech Demsash	F
4	W/ro Misanesh Fisiha	F
5	W/ro Abozin Abebe	F
6	Ato Mihiret Tsega	M
7	Ato Mekuanint Belay	M
8	Ato Sielu Wubet	M
9	Ato Amare Derso	M
10	Ato Tiku Tsegaye	M
11	Ato Mihiret Endalew	M

7.3: Participants at Alem Tsehai

S.N.	Name	Sex
1	W/ro Timbualet Taemalew	F
2	Ato Chekol Melisew	M
3	Ato Kassie Ferede	M
4	Ato Abera Demissie	M
5	Ato Andarge Beriyhune	M
6	Ato Zewdu Taemalew	M
7	Ato Taye Gobachew	M
8	Priest Eshet Malede	M
9	W/ro Adina Alemu	F
10	W/ro Tabot Melkie	F
11	W/ro Cheklie Nega	F
12	W/ro Truwork Selamsew	F

7.4: Participants Azezo Tekle Haimanot

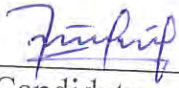
S.N.	Name	Sex
1	Ato Getachew Tessema	M
2	W/ro Emebet Hailu	F
3	Ato Alehegne Merkeb	M
4	Ato Fentahun Kassa	M
5	W/ro Yezina Hailu	F
6	W/ro Belainesh Admassie	F
7	W/ro Seble Zewdie	F
8	W/ro Marie Demissie	F
9	W/ro Zemetu Kassie	F
10	W/rt Melkam Dagne	F
11	W/ro Mantegbosh Adane	F

Declaration.

This thesis is my original work and has not being presented for a degree in any other university and that all sources of materials used for thesis have been dully acknowledged.

Declared by:

Alemu Azmeraw



Candidate

Date: 26/07/06

Confirmed by:

Woldeab Teshome (PH D)



Advisor.

Date: 27/07/06