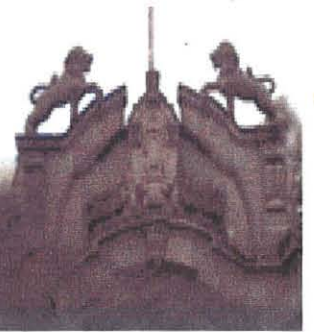


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***Evaluation of Rural Water Supply and Sanitation Project Planning  
Process from Sustainability Perspectives: The Case of Misrak Badawacho  
Woreda, Hadiya Zone, SNNPR, Ethiopia***

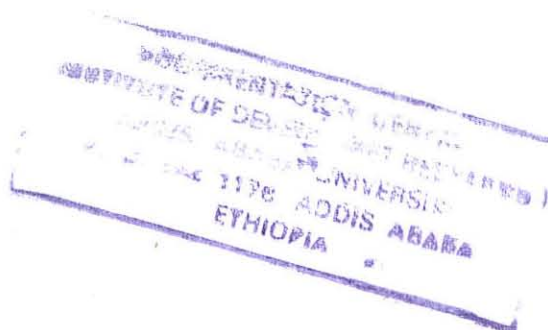
***A Thesis Submitted to the College of Development Studies of Addis Ababa University  
in Partial Fulfillment of the Requirements for the Masters of Arts in Development  
Studies, Water and Development***

***By: Ashenafi Yohannes***

***Advisor: Yohannes Abera (PhD)***

***June, 2011***

***ADDIS ABABA***



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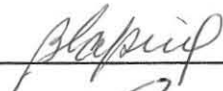
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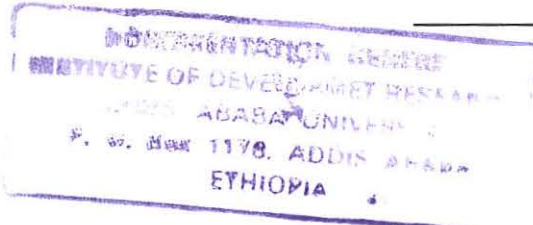


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## ACKNOWLEDGEMENT

I remain indebted to a number of individuals and institutions who gave me moral, financial and material support during my study and in the course of the research work.

First of all my heartfelt thanks and appreciations go to my research advisor Dr. Yohannes Abera Whose ideas, professional comments were quite instrumental in shaping the study. I have benefited a lot from his dedicated professional assistance, Valuable and constructive comments to complete this study due time. My gratitude also goes to Dr. Mulugeta Feseha for his respectfulness, encouragement and close follow up during the study in the college and constructive comments during proposal development.

I would like to extend my thanks to Misha Woreda Education office for sponsoring my study and to the Embassy of France in Ethiopia for funding part of the research expenses. I am also very much indebted to Sintayew Woldemichael and Daniel Erkocho for the facilitation they made and their moral support.

I acknowledge gratefully the Misrak Badawacho Woreda water resource office participants who shared their experience and knowledge. My special thanks go to Mulugeta Dejene and to those people working in the offices who have been greatly cooperated me in providing all the required information and facilitated in different ways the data collection activities.

Last but not least, I express my sincerely gratitude to all my friends and family members who have been taking care of me in the course of my study and the research work.

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## **List of Acronyms**

BoWR	Bureau of Water
CLTS	Community-Led Total Sanitation
DRA	Demand Responsive Approach
IRC	International Water and Sanitation Centre
MDG	Millennium Development Goal
MoFED	Ministry of Finance and Economic Development
MoH	Ministry of Health
MoWR	Ministry of Water Resource Resources
NGO	Non Governmental Organization
ODF	Open Defecation Free
O&M	Operation and Maintenance
PRA	Participatory Rural Appraisal
RWSS	Rural Water Supply and Sanitation
SNNPR	Southern Nations Nationalities and People Regional State
SPSS	Statistical Program for Social Science
UAP	Universal Access Plan
UN	United Nations
UNCRD	United Nations Center for Regional Development
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
UNSW	University of New South Wales
USAID	United States Aid for International Development
WASH	Water, Sanitation and Hygiene
WATSANCO	Water Supply and Sanitation Committee
WCED	World Commission on Environment and Development
WHO	World Health Organization
WSP	Water Sanitation Program

## **Glossary of Local Terms**

Kebele	Government's Smallest Administrative Unit
Woreda	District Level of Administrative Unit above Kebele
Zone	Administrative Unit between Region and Woreda Comprising a certain Number of Woredas

## ***Abstract***

*Sustainability of rural water supply and sanitation project is related to the project planning practices such as demand responsive project planning; participatory project planning; holistic consideration of key sustainability criteria in the planning process; and community based operation and maintenance system. The aim of this research is to evaluate rural water supply and sanitation project planning process from sustainability perspectives. To this end, the study was undertaken in four rural water supply and sanitation projects among rural communities in Misrak Badawacho woreda. The study was conducted by applying both qualitative and quantitative methods. The findings of the study reveal that water supply and sanitation project planning practice did not consider inclusion of sustainability criteria in the holistic way. A long-term view of sustainability with respect to all primary criteria in water and sanitation related decisions were not yet taking place in the woreda. Failing to consider key sustainability factors in the planning process, poor decision-making and poor planning process has contributed to project failure. The study also discloses that when key factors were considered in project planning, projects lead to sustainability and when not considered lead to project failure. Sustainability of water supply and sanitation projects are highly related to the project planning phase. Particularly, consideration of sustainability criteria is very crucial and necessary in water supply and sanitation project planning and decision-making processes. There is a need for holistic consideration of the long term implications to all the sustainability areas. Yet, such aspects are given less attention in the sector development projects.*

# CHAPTER ONE

## Introduction

### 1.1. Background

Safe drinking water and adequate sanitation are very crucial for life, health, and human dignity. Access to safe water and adequate sanitation have multiple benefits in the overall development of a society such as having healthy society, address gender imbalances in education, improves productivity and contribute to economic growth as well. Due to inaccessibility of clean water and adequate sanitation women and children living in the world's poorest communities often spend hours each day walking miles to collect dirty and unsafe water and without sanitation communities are further exposed to diseases and the lack of privacy required for dignity. High incidence of vector-borne disease, intestinal disease, trachoma, and arsenic poisoning in developing countries is strongly correlated with unsanitary practices and the absence of nearby sources of safe water. Although these diseases are deadly, they are easily preventable with provision of clean water, basic sanitation and good hygiene. Once these services are in place, with less disease and more time for education and work, communities can continue to escape the spiral of poverty (WHO & UNICEF, 2010; UN, 2008). These services are basic and building blocks of development and key to poverty reduction.

The problem is more serious in Africa and Asia. A report by World Health Organization (WHO) and United Nations Children's Fund (UNICEF) indicated that less than one-half of all Asians have access to improved sanitation and two out of five Africans lack improved water supply (WHO and UNICEF, 2000). As a result, water and sanitation related diseases are wide spread in the continents. So, the provision of clean water and adequate sanitation to the people of the developing world has been ongoing quests which have occupied the minds of development experts and governments for many years. Although a great deal has been done and an enormous amount of money has been spent, coverage level remains inadequate. To solve this significant problem, United Nations has declared a number of ambitious goals. The water supply and sanitation development progress was recognized by extensive problems and successive failed goals. The 1980s were declared by the United Nations to be the International Drinking Water Supply and

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Sanitation Decade (United Nations, 1980). The decade did not see the fulfillment of what was hoped for since many of the projects already completed are not in satisfactory operating conditions (Eade and William, 1995). The World Bank reported that 1.2 billion people still did not have a safe drinking water supply and more than 1.7 billion people lacked basic sanitation (World Bank, 1992). The other declaration is the United Nations Millennium Declaration, in which the UN member states commit to reduce extreme poverty and reach a series of quantified and time-bounded targets, known as the Millennium Development Goals (MDGs). The target concerning water supply and sanitation is to “halve by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation” compared to the reference year 1990 (UN, 2008). The WHO and UNICEF Joint Monitoring Program on water supply and sanitation (JMP) reported that 884 million people were still without an improved water supply and 2.6 billion people lacked adequate sanitation (WHO and UNICEF, 2010). The targets do not look like meeting what was hoped for at least in terms of sanitation and rural water supply if the right steps are not taken to ensure sustainability of the sector development projects.

Digging a well is easy but digging a well that will continue to provide benefits to a developing community for many years after construction has always been extremely difficult (UNSW-water research center, 2010). The greatest challenge facing different development actors in the water supply and sanitation sector is real sustainable progress on behalf of the 2.6 billion people still without access to improved sanitation and 884 million people without access to safe drinking water (WHO & UNICEF, 2010). Without a well functioning water supply and sanitation system it is very difficult to realize the United Nations’ ambitions. If the targets are to be achieved, increasing the number and scope of water supply and sanitation projects is unquestionable. However, there is also evidence that increasing the sustainability of projects would also significantly improve progress towards water and sanitation coverage. Increasing coverage is directly related to the functionality and non-functionality of water supply and sanitation schemes (Selamawit, 2007; Barnes, 2009). Due to variety of constraints, the sustainability of water supply and sanitation facilities continues to be poor in many countries. After decades of

learning and practice, the proportion of sustainable projects in the water and sanitation development sector is still quite low. It is an alarming fact that, breakdown rates of water supply systems in sub-Saharan African countries exceed 50% (UNICEF, 2007). In global terms, it is estimated that, 30% to 60% of existing water supply systems are inoperative at any given time (Brikké and Bredero, 2003) and the globe is littered with failed water supply and sanitation projects (UNSW-water research center, 2010; Moe and Rheingans 2006).

In this regard the condition of Ethiopia is not different from the situation of the rest of the world in general and developing countries in particular. Although it is reported that 33% of the water supply schemes in the country are non-functional due to different reasons (MoWR, 2007; ADF, 2005), the figure is much higher in Southern Nations, Nationalities and Peoples Regional State, (SNNPR), between 50% and 57% of the rural water supply schemes fitted with hand pumps were not operational up to 1997 (Sebsibe Alemneh, et al, 2002). In the region, there were 1,304 hand dug wells, 1,678 shallow wells, 421 deep wells, 2,686 spring developments with distribution points and 255 springs with network distributions, constructed by the regional government and NGOs in recent years (BoWR, 2006). However, it has been noted that about 23% of the water supply schemes are non-functional at any given time (BoWR, 2006), implying negative impacts on coverage and on the attainment of the UAP. In Ethiopia, the portion of the population with access to improved water supply and sanitation has risen in the last decades. According to MoH 2008/09 report, the national water supply coverage arrived 61.5% and 88.6% rural and urban respectively and at 66.2% for both. Out of 16,546,667 households only 9,878,199 households have latrine and excreta disposal coverage at national level is 60% (MoH, 2009). The unsustainable development of projects has aggravated the problem of inaccessibility of clean water and adequate sanitation and reported at different times by many development actors. Therefore, lack of sustainability of projects aggravated the existing poor coverage of water and sanitation. In Ethiopia where over 85% of the population lives in rural environments, the MDGs will be reached only if a serious effort is made to ensure sustainability of water supply and sanitation projects in rural areas.

The Government of Ethiopia is adopting a more ambitious Universal Access Plan that aims to achieve 100 percent and 98 percent coverage for water supply and sanitation, respectively, by 2012 (UAP, 2006). The Government has set ambitious targets for water supply and sanitation, whether by the MDG or UAP. More recently, the government also prepared the five years Growth and development plan which confirms the plan already developed for rural water supply and sanitation. The practicality of such plans requires additional analysis especially at the project level from sustainability perspectives, beginning from the early phase of project planning since it would affect the success of the projects.

Although the causes of project failure are complex and varied, planning process that fails to consider key sustainability areas could be one possibility. Key sustainability areas are those aspects of a project which must be effective and appropriate in the long-term in order for the project to provide sustained benefits (Mathew, 2005; Brikké and Bredero, 2003). A set of five key sustainability areas are proposed if water and sanitation system is said to be sustainable. The system should be sustainable with respect to environmental, economic, social, technical and human health criteria (UNSW-water research center, 2010; Brikké and Bredero, 2003). A successful project requires critical consideration of these factors in the early phases of project planning. The faulty in planning, at times lies with the implementing agency, often due to lack of awareness of unsustained development projects and the need for improved planning and long term evaluation of projects (UNSW-water research center, 2010; Barnes, 2009). The failure of water supply and sanitation projects and waste of large sum of money reported each year suggests that there is urgent need for improving the way these projects are planned.

## **1.2. Statement of the Problem**

The Non-functionality of water supply and sanitation project is one of the crucial problems in the Ethiopian water supply and sanitation sector development. For example, about 33% of the water supply schemes in the country are non-functional due to different reasons (MoWR, 2007; ADF, 2005). Even, the figure is much higher in Southern Nations, Nationalities and Peoples Regional State, (SNNPR), between 50% and 57% of

the rural water supply schemes fitted with hand pumps were not operational up to 1997 (Sebsibe Alemneh, et al, 2002). Recently, it has been also noted that about 23% of the water supply schemes are non-functional at any given time (BoWR, 2006), implying negative impacts on coverage, attainment of the UAP and MDG concerning water supply and sanitation. This disappointing result of water supply schemes development efforts in the past have often been associated with poor planning, appraisal and implementation of the projects. In relation to this the decisive question need to be answered is, how to increase sustainability of such development projects and how to plan for sustainable projects to go beyond it in order to ultimately improve water supply and sanitation coverage.

Although different development actors are contributing a large amount of fund for rural water supply and sanitation project development in order to reduce inaccessibility of the rural population to safe drinking water and sanitation, the problem is still there. The effort made by all stakeholders to improve the services is undermined by non-functionality of the sector development Projects. Projects often fail due to poor planning, many times because they do not define the problems well or take important factors into consideration, the needs and views of everyone involved in and affected by the project. Effective planning provides detail and structure to project work plans and establishes a way to continue the project after the grant funding ends, meaning it is sustainable. Many projects in the past were designed and implemented in a top-down fashion, with little or no real participation of the supposed beneficiaries in planning, designing and implementing projects. Investments have often been driven by international financing institutions and the government, and not by the demands and wishes of project beneficiaries. As this very difficult reality come to light it becomes increasingly clear that sustainability is an issue to be addressed at the very beginning of development program. If sustainability is not assured there is little point in spending the money except for very short-term welfare purposes.

Water supply and sanitation projects in Misrak Badawacho are not immune from the above concerns. A number of schemes that are completed and handed over to the

beneficiary communities are non-functional for years; while many others stay non-functional for months. The woreda water resource office and different development actors in the sector are trying to solve the problem after projects failed. However, the root causes of sustainability problems in relation to project planning need be known. It is assumed that the problem starts from planning of the project itself (i.e. the project owners and users did not own to plan by themselves; the demand is not established; the key sustainability criteria are not considered; the baseline survey is not conducted; community based operation and maintenance is not practiced; and there is no well established system of monitoring, evaluation and no strong integration of project activities). According to Barnes (2009) poor planning due to inappropriate planning tools and low capacity is in the center of the complex underlying issues in the rural water supply and sanitation service provision which in turn result in unsustainable projects and then end up with perpetuated water and sanitation-related poverty. The success and sustainability of a project is an issue that needs a close investigation. Thus, this study is designed to evaluate rural water supply and sanitation project planning process in terms of sustainability. The result informs project planners and other practitioners whether or not the project planning approach used in that particular case was successful and should be used elsewhere or to look for remedial measures depending on local conditions.

### **1.3. Objectives of the Study**

This study has the following general and specific objectives.

#### **1.3.1. General Objective**

The overall objective of this research is to evaluate rural water supply and sanitation project planning process from sustainability perspectives.

#### **1.3.2. Specific Objectives:**

This study tries to address the following specific objectives:

1. Investigate demand for improved water and sanitation services
2. Describe the planning process which resulted in the existing projects
3. Evaluate the project planning process in terms of sustainability

#### **1.4. Research Questions**

The study tries to answer the following research questions:

1. What is the existing project planning approach adopted in practice?
2. What determines the success and failure of rural water supply and sanitation projects?
3. How did the project planning process take place in the study projects?
  - Is the five key sustainability criteria considered in the planning process?
  - Is the planning process participatory?
  - Is there a well guiding terms of reference?
  - How is operation and maintenance system planned?
4. How is the current project planning process in practice related to the sustainability of the projects?

#### **1.5. Significance of the study**

The findings from this study will support the discussion and debate among Regional and sectoral WASH actors to address the problems of sustainability in the early phase of project planning. More specifically policy makers, project planners, water supply and sanitation actors, NGOs, community water boards and committees can benefit from the study for taking corrective actions in the planning phase to sustain rural water supply and sanitation projects. The findings of this study can also be used as a reference for other researchers and students planning to undertake their research around rural water supply and sanitation.

#### **1.6. Scope of the Study**

The study mainly concentrated on evaluating project planning approaches used in practice. The study focus on rural water supply and sanitation projects in Misrak Badawacho Woreda, South Nation Nationalities and peoples Regional State (SNNPRS). Since the scope of rural water supply project sustainability evaluation is very wide and the issue it encompasses is many, this study only looked in to demand for the services; participation in the project planning process; project planning and design; holistic consideration of sustainability criteria; and community based operation and maintenance.

Other factors like institutional arrangements, behavioral changes and others are not within the scope of this study. The study concentrates on rural water supply and sanitation projects in woreda. Hence the results and findings of the study basically reflect the situation in the woreda or other woreda with similar conditions.

### **1.7. Limitation of the Study**

Poor quality and coverage of secondary data in the zonal and woreda offices, secondary data are not well documented. Data on some issues are in the hands of individual experts. In some cases, even these experts were already transferred together with the data. Besides, most of the available data are estimated with out field survey. The evaluation of rural water supply and sanitation planning requires the inputs of different professionals. Thus, the researcher may not be technically sound enough to answer all questions related to technical designs of the systems and health related issues. However, the over all and major elements of the project planning process was tried to be evaluated.

### **1.8. Organization of the Study**

The thesis is organized in to two parts with five chapters. The first part includes chapter one up to chapter three, whereas the second part includes chapter four and five. Chapter one is the introductory part, which deals with the background, statement of the problem, objectives of the study, significance of the study, scope of the study, limitation of study and organization of the report. In chapter two basic concepts, related literatures, and the research framework are reviewed. Chapter three describes the research methodologies employed, background of study area, and current status of the sample projects. Chapter four and five are devoted to a comprehensive description and analysis of major findings of the study. Finally, conclusions and recommendations of the study are presented.

## CHAPTER TWO

### Related Literature Review

#### 2.1. Sustainability of Water Supply and Sanitation Development Projects

##### 2.1.1. Defining Sustainability

The Report of the World Commission on Environment and Development (WCED) often called the Brundtland Commission and named “Our Common Future” defined “Sustainable development” as “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). This definition has an obvious focus on how we ought to live and think with respect to future generations. The report also points out the importance of using resources in an appropriate way, equity and fighting poverty for achieving sustainable development. Here “sustainability” is considered primarily in terms of continuing to improve human well-being, whilst not undermining the natural resource base on which future generations will have to depend. The term “sustainability” in the context of this research, however, is limited in its meaning. It is not used to refer to the tension between development and the natural environment, but rather to refer to the narrow context of service delivery in the fields of water supply and sanitation in a developing country-Ethiopia. This means that a “sustainable” water or sanitation development project fulfils following criteria (UNSW-water research center, 2010; Brikke and Berdero, 2003)

1. It continually provides recipients with the intended human health and lifestyle benefits;
2. It does so without significant adverse effect on other people, the environment or other services (existing or potential).
3. It provides the services for which it was planned, including: delivering the required quantity and quality of water; providing easy access to the service; providing service continuity and reliability; providing health and economic benefits; and in the case of sanitation, providing adequate sanitation access.
4. It functions over a prolonged period of time, according to the designed life-cycle of the equipment.

Water supply and sanitation development project is said to be sustainable if it has ability to maintain or expand a flow of benefits at a specified level for a long period after project inputs have ceased (USAID, 1994). According to this report, a water supply system is sustainable when: it is functional and being used, able to deliver an appropriate level of benefits, continues over prolonged period of time, its management is institutionalized, its operation and maintenance, administrative and replacement costs are covered at local level, it can be operated and maintained at local level with limited but reasonable external support; and it does not affect the Environment negatively. On the other hand, “unsustainable” water and sanitation projects and services are those that break down and are not repaired, those that continually pollute another community’s potential water source, or those that are unaffordable to the recipients in the long-term (UNSW water research center, 2010; Abrams, 2000).

### **2.1.2. Factors Affecting Sustainability of Water Supply and Sanitation**

#### **Projects**

Several factors undermine the sustainability of improved water supply and sanitation services. Sustainability of rural water supply and sanitation services (RWSS) is a complex issue that depends upon many interrelated factors. Policy context, institutional arrangements, initiation and demand by beneficiaries, community engagement, technology choice, operation and maintenance costs, ongoing contact, poor construction, financial and economic issues, spare-part supply, maintenance, and monitoring systems are among the factors that are crucial for ensuring the sustainability of rural water supply and sanitation projects (Harvey and Reed, 2004). In addition, the sustainability of RWSS is also affected by natural and environmental factors such as recurrent drought coupled with erratic rainfall, and depilation of ground water sources. Thus, the dimensions of sustainability of a water supply scheme and its service delivery are multifaceted. There are five key sustainability area such as technical, social, financial, environmental and human health issues to address (Brikké and Bredero, 2003; Mukherjee and Wijk, 2000). The following discussion looks at five different but interrelated dimensions of sustainability.

### ***Technical factors***

This refers to the reliable and correct functioning of the technology and, for water supplies, the delivery of enough water of an acceptable quality. Important dimensions of technical factors include: technology selection; complexity of the technology; technical capacity of the system to respond to demand and provide the desired service level; a technically good design; technical skills needed to operate and maintain the system; the availability, accessibility and cost of spare parts; and the overall costs of O&M.

### ***Community/Social/ factors***

Under these factors vital aspects include: demand for an improved water supply and sanitation service; community participation in all project phases; the capacity and willingness to pay; management through a locally organized and recognized group; financial and administrative capacity of management; Socio-cultural aspects related to water; and individual, domestic and collective behavior regarding the links between health, water, hygiene and sanitation.

### ***Economic Financial sustainability***

Systems can only function if financial resources meet at least the costs of operation, maintenance, and common repairs. Equity elements relate to who pays for all this and how fairly payments are shared between and within households.

### ***Environmental and human health factors***

The following are major issues to be considered under these factors: quality of the water source (this will determine whether the water needs to be treated, and will influence the technology choice); adequate protection of the water source/point; the quantity of water and continuity of supply; and impact of wastewater or excreta disposal on the environment. In dry areas, lack of drainage of wastewater has created new risks of insect breeding that have brought outbreaks of malaria, dengue, and filariasis.

In order to meet the definition of sustainability, water supply and sanitation services must fulfill a number of “sustainability criteria” components that, when fulfilled in

combination in the long-term, will ensure that a service is sustainable. In relation to this several authors and institutions of discourse in the water sector have proposed a set of primary sustainability criteria to ensure the sustainability of the projects. The most commonly proposed criteria are economic sustainability; environmental sustainability; social sustainability; human health sustainability; technical or infrastructural sustainability (UNSW water research center, 2010; Brikké and Bredero, 2003).

Each primary criterion can be elaborated into several secondary criteria. Secondary criteria are normally used in decision-making to identify a most sustainable solution. In the context of community-managed water and sanitation services, secondary criteria should be used only to eliminate unsustainable options from consideration, rather than to identify an optimal solution, since it is the beneficiary community who ought ultimately to choose the technical solution (UNSW water research center, 2010). The following table contains examples of secondary criteria that might be used in a water and sanitation development project for a small community.

**Table 2.1 Primary and secondary sustainability criteria**

No	Primary criteria	Secondary criteria
1	<i>Economic</i>	Capital expenses affordable
2		Ongoing expenses affordable
3	<i>Social</i>	Community accept the project idea
4		Community understand the way system works
5	<i>Environmental</i>	The wastewater or product does not pollute the environment
6		The wastewater or product does not pollute someone's water source
7	<i>Human Health</i>	The water source is clean
8		The sanitation product can be disposed of or used safely
9		The water will not get contaminated in the system
10	<i>Technical</i>	The parts are available locally
11		The system does not have complex parts or overly complex Construction
12		The system can be expanded when the population increases
13		The system provides enough water to meet need all year round.

Source: (UNSW water research center, 2010; Barnes, 2009)

Although the causes of project failures are complex and varied, literature addressing failure in water supply and sanitation projects points specifically to the early phases of project planning, and implicating poor planning in many unsustainable small-scale projects (Mathew, 2005; Brikke and Bredero, 2003). In particular, several authors criticize planning that fails to include consideration of key sustainability factors (Brikke and Bredero, 2003; Dunmade, 2002). Key sustainability areas are those aspects of a project, such as economic or social considerations, that must be effective and appropriate in the long-term in order for the entire project to provide sustained benefit. UNSW water research center (2010) proposed a set of five key sustainability areas, stating that if a water or sanitation system is sustainable with respect to environmental, economic, social, technical and human health. These factors can be considered a water-sector-specific adaptation of the 'triple bottom line components (economic, social and environmental).

The fault in planning, at times, lies with the implementing agency, often due to lack of awareness of unsustainable development projects and the need for improved planning (Barnes, 2009). This is exacerbated by failure to conduct long-term project evaluation (Moe and Rhiengans 2006). Therefore, sustainability of water supply and sanitation projects will be evaluated using the above mentioned criteria particularly in relation to the planning phase.

## **2.2. Community Participation in Rural Water Supply and Sanitation**

### **Project Development**

In developing countries like Ethiopia there are many abandoned schemes, installed by well-intentioned government authorities that were constructed without any consultation and participation of user communities. When these system broke down no one in the village repair them, since people felt no sense of ownership. User participation in design, implementation, and management of water and sanitation programs is seen by the World Bank as a way of increasing efficiency, equity, and cost recovery and of facilitating extension of service coverage to poor communities (Wright, 1997). This implies that water supply and basic sanitation services provided without active community

participation in planning and management are often not properly operated and maintained, hence not sustainable.

To ensure effective community management of rural water projects for achieving sustainability, both internal and external factors must be taken into consideration because they have important contribution to the success and failures of the water projects. Internal factors like lack of community cohesion, lack of management skills, unrepresentative water communities, technical issues, strong traditions, misplaced priorities and financial problems must be given priority under community management model (Schonten and Morriarty, 2004). On the other hand, external factors such as non-existence or weak supply chain, lack of standardized technologies, poor design and construction faults, interference with politicians and environmental issues have big impact on the sustainability of the system and therefore need proper handling (Schonten and Morriarty, 2004; Harvey and Reed, 2004).

The concept of community participation has assumed an increasingly important role in water supply and sanitation development projects. Programmes and project, planners have come to realize that community participation, among other things, is essential for projects to be successful. Therefore, the decade approach emphasizes that community participation in water supply and sanitation projects should involve at least the following areas (WHO, 1984):

- a. communities should be involved in the planning of projects;
- b. communities should be responsible for the implementation, operation, and maintenance of the projects;
- c. the whole community should participate in the evaluation and modification of the projects.

If the project did not sufficiently involve the community, who therefore did not feel that the project was theirs. As a result, demand for the improved services suffered, and the services became unsustainable. Demand and community involvement (of both men and women) are key factors in generating long-term community commitment to improved services and in sustaining the services. Involvement also makes the community members

responsible for the choice of technology and makes community members aware of the financial, managerial and technical implications of their choice, including the future O&M tasks associated with the technology (Birkke and Bredero, 2003).

### **2.3. Operation and Maintenance**

Increasingly, governments, external support agencies and local communities are recognizing the importance of integrating O&M components in all development phases of water-supply and sanitation projects, including the planning, implementation, management, and monitoring phases (Brikké and Bredero, 2003). National government plays a vital role in creating an “enabling environment” within which an O&M policy framework can be developed, one of the key elements of sustainability. Government can foster such an environment in a number of ways, including through legal provisions, regulations, education initiatives and training programmes, and by communicating information.

Experience has shown that the effectiveness of O&M is not solely connected to engineering issues, and personnel involved in O&M assessment and development should cover a range of relevant disciplines: social development, economics, health, institutional and management aspects, and engineering. It is important that the process be consultative and carried out in partnership with the operators and users of the services. An economic alternative to investing in new water-supply projects is to rehabilitate defective services but, as with a new scheme, the rehabilitation option must include analyses of the community’s preferences and needs, and of the capacity of the community to sustain the system (potentially with the support of the water agency). When assessing the potential for rehabilitation, the community and the agency together need to study the reasons for the system’s breakdown, analyze the problems involved, and formulate recommendations for feasible alternatives to rehabilitate the system. Rehabilitation should not be confined to replacing broken equipment or infrastructure. It is also important to look into the reasons why the system was not sustained and is in need of rehabilitation, including poor management, lack of maintenance (especially preventive maintenance), lack of skilled personnel, poor-quality materials and equipment, etc. However, to ensure that long-term

benefits do, in fact, accrue, the projects must be sustainable, which means appropriate technologies must be selected, and O&M should be integrated into project development from the early phase of project planning or the beginning (Brikké and Bredero, 2003).

#### **2.4. Water Supply and Sanitation Projects and the Planning Process**

Even though projects are different in their characteristics there are basic features in describing and understanding of a project such as Goal, objectives, time, scale, and type. Considering the common features, the most commonly used definitions of a project is “an investment of scarce resources with a definite objective, time horizon and geographical boundary” (MoFED, 2006).

The project is in fact just a phase in the process of service provision. When water supply and sanitation is seen as a series of projects where the construction is the element which enjoys most of the attention, rather than the provision of a service, then it is hardly surprising that the projects are unsustainable. According to Abrams (2000) a service includes the initial construction phase but is primarily an ongoing business of supplying water to consumers over a long period of time. Both initiation and ongoing phases are essential in the provision of services which are critical to sustainability. In terms of sustainability, there are activities which can be done or which can be omitted in both the initiation and the continuation phases which will either promote sustainability or mitigate against it. Certainly there are a number of incorrect things which can be done or correct things which can be omitted which will mean that the service has no chance of succeeding from the beginning. Therefore, to attain the sustainability of water supply and sanitation projects special attention should be given to project planning processes Abrams et.al. (undated).

##### **2.4.1. Project Planning**

According to BCID (2003) Planning is a primary function of management, which involves deciding in advance what to do, how to do it, when to do it, and who should do it. Therefore, the process of project planning is to define each major task, estimate the time and resources required and provide a framework for management review and

control. Planning will involve identifying and documenting scope, tasks, schedule, risks, quality and staffing needs. An adequate plan process and project plan will ensure that resources and team members will be identified so that the project will be successful (MoFED, 2006; BCID, 2003). The planning process must assist stakeholders to make informed decisions about water, sanitation and hygiene services, particularly in terms of identifying and providing services to those communities who do not have access. Planning includes data collection and analysis, stakeholder participation, strategic decision making, project identification and prioritisation, and allocation of resources to implement plans (MoFED, 2006).

#### **2.4.2. Approaches to Project Planning**

There are different approaches to which planners can follow and use as appropriate in project planning to address actual problems. According to MoFED 2006, there are three different approaches to project planning.

##### **2.4.2.1. Top- down Approach**

The top-down approach to project planning is applied by central agencies and works outwards from a starting concern with national conditions. It is a kind of command and control, in other words professionals have dominated the process and there is usually little if any active participation by interested stakeholders. This approach concentrates power at the top over resources and is generally less sensitive to local needs, resources and capacities. However, it is most logical and best approach to new endeavors (MoFED, 2006). But in today's environment, where public are calling for less governmental oversight, regulation and control, and increasing participation in planning and management activities, top-down approaches are becoming less acceptable (Loucks and Bee, 2005).

##### **2.4.2.2. Bottom-up Approach**

With in the past decade water resources planning process have increasingly involved the active participation of interested stakeholders. Bottom-up approach to project planning is people centered approach which is used to plan projects from grass roots level as a

bottom line (MoFED, 2006; BCID, 2003). It demands series grass roots community level participation in determining and implementing plans and projects that suits local needs and priorities. Plans developed primarily by professionals without significant stakeholders' involvement have little chance of success, even if they are technically flawless since they do not take in to consideration stakeholders support (Loucks and Bee, 2005). Therefore, Stakeholders must involve in the planning process and must be included in the decision-making process as early as possible. This will help gain their cooperation and commitment to the plans adopted. Participating stakeholders will have a sense of 'shared' vision of goals and priorities among all stakeholders (Loucks and Bee, 2005). However, the approach can sometimes lead to proposals which are good in local terms but which do not fit national priorities and constraints. Moreover, the approach might be restrained by lack of expertise, government financial capacities and proper guidelines on how to plan and implement the project (MoFED, 2006).

#### **2.4.2.3. Participatory Approach**

Participation is important to top-down and bottom-up projects, something different to each. The concept of participation in the top-down approach to project planning is getting people to do what the central authorities decided is good for them but in bottom-up it is the community members themselves who make decision about their projects (MoFED, 2006). Therefore, a balance must be struck between the two extremes by taking into account of both national and grass-root community level realities in project planning. It is important to consider both approaches at a time as participatory approach to develop increased sense of ownership, commitment and confidence of stakeholders on a project since this helps to improve the success and sustainability of a project under consideration (MoFED, 2004). If the stakeholders of a project are too many, it is better to start project planning using top-down approach for the preparation of a framework project document on which to hold discussion with the concerned stakeholders. On the contrary, if the stakeholders of a project are small, it will be appropriate to use blended top-down and bottom-up approaches at a time to plan development projects (UNCRD, 2000; MoFED, 2006).

### **2.4.3. Baseline Survey on Water, Sanitation and Hygiene (WASH)**

The survey is very important to set baseline figures for Water, Sanitation and Hygiene (WASH) indicators against which the effectiveness and success of the WASH program could be assessed. It provides objective, measurable and representative data for project planning, evaluation and problem analysis purposes. In addition, it is expected to identify bench mark data for important indicators on the availability, accessibility and utilization of water schemes; knowledge and practices of personal and environmental hygiene (Save the Children-USA, 2010). The support agency carries out a participatory baseline survey that includes a needs and problem analysis with the community. According to Brikké and Bredero (2003) all the points listed below should be addressed in the survey:

#### **A. Water supply**

1. Initial service level assumption
2. The advantages of the technology options
3. The motivations, expectations and preferences of the users
4. Availability of reliable water source
5. Required quantity and quality of water
6. Water treatment is needed
7. Materials, spare parts and skills needed to sustain the desired service level
8. The ability and willingness of the community to pay for the services
9. The management capacity of the community
10. Appropriate structure to manage and sustain the desired service level
11. The costs (capital and recurrent) of the options considered
12. Are financial resources available?
13. Technical, financial and capacity-building assistance the communities expect
14. The availability and capacity of local expertise

#### **B. Sanitation**

A participatory assessment should be carried out to determine if there are problems related to: the existing human excreta-disposal system; hygiene and defecation behavior (among men, women and children); the hygienic environment; and human excreta-related diseases. Also necessary are: a participatory assessment of the cultural, social and

religious factors that influence the choice of sanitation technology; a participatory assessment of local conditions, capacities and resources (material, human and financial); and the identification of local preferences for sanitation facilities, and possible variations (Brikké and Bredero, 2003). Planning for Water, Sanitation and Hygiene (WASH) services should address the following major issues (Mukherjee and Wijk ,2000; UNSW, 2010; Barnes, 2009; Mathew, 2005) :

- the number of consumers, where they are located, and what their WASH requirements are
- especially identify and prioritise the number of people currently without access to adequate WASH services
- existing WASH services, including existing infrastructure and current water services providers
- water resources and other physical features of the area
- proposed water infrastructure and water resources to be used
- approximate capital and operating costs of the WASH services
- targets (timeframes) for new water and sanitation infrastructure and services for different communities
- financial arrangements for new infrastructure and operations (including tariff structures)
- operation and maintenance arrangements for existing and future infrastructure
- a time frame and actions for implementation of the plan (including list of projects)
- arrangements for monitoring and evaluating services, especially to enable consumers to give feedback on quality issues and service providers to act on the feedback.

## **2.5. Approaches to the Provision of Improved Water Supply and Sanitation Services**

The “demand” for water and sanitation services is relatively complex and it has a different meaning to economists, engineers and social scientists because they are all concerned with different aspects of planning and designing a project. However, all

professionals in the sector are ultimately working towards the same goal: development of sustainable services (WEDC, 1999). Water and sanitation service providers are often under pressure to improve services, without having the expertise necessary to assess how valuable these improvements would be to consumers. In developing countries, many water and sanitation programs unquestionably take the engineer- dominated supply side approach while the nature of users' needs is neglected that is why improved public health outcomes have not necessarily been achieved though higher access and usage of sanitation facilities by several households has been reported (WSP, 2007). The World Bank and UNDP working paper (1997) summarized the features of this approach as follows:

- a) Supply-driven: implementing agencies staff alone decided to construct water supply facilities to the community based on prevalence rates of water-borne diseases but demand was not a consideration.
- b) Top-down decision-making: intended beneficiary community had no role in determining design and service level issues; no financial stake: and no sense of ownership;
- c) Construct and handover to the community ( hit and down): no attempt was made to organize the community and build its capacity for operations and maintenance of water supply facilities and other post-construction activities improving hygiene practices
- d) Overall results: The emphasis was on increasing coverage, without the necessary safeguards at community and government levels to ensure sustainable operation and maintenance of service of facilities. The water supply programme had limited impact on the intended objectives; many of the facilities built but did not last very long.

A new water supply and sanitation planning approach called the demand-responsive approach (DRA) is now becoming accepted in many developing countries. As the old supply- driven agenda followed by governments and donors cannot meet the challenges created by rapid urbanization, population growth, industrial development, and concern for the environment. Water supply and sanitation systems that have not met demand of

consumers have problems of under use, poor maintenance and poor cost recovery (Whittington, 1998). The introduction of DRA to rural water supply and sanitation projects has improved the sense of community ownership and the commitment to implementing rural projects by the project implementer and the recipient community. The approach has also improved the sustainability of rural development infrastructure and instilled a commitment to O&M with total community participation (Aheeyar, 2004).

According to Gross et al, (2001) demand responsive programs give each community and the various groups in that community an informed choice of services and management systems. This means that all locally relevant groups, or stakeholders, get information on all relevant aspects and implication of the various water supply options. The information may include amount and quality of water provided; the purpose for which this water will be adequate; potential implications for health and socio-economic development; investment recurrent costs involved; approximate walking distances; requirements and possibilities for sharing of service and costs; prospects for service regularity and reliability; and differences in ease of maintenance and administration. As a result, demand-responsive approach that bases itself at grass-root level admits the participation of all relevant stakeholders starting from the early stage of need assessment and project identification to their implementation and to their final monitoring and evaluation. Therefore, this approach enhances the sense of ownership of the user communities on the proposed water supply and sanitation projects, thereby improves the sustainability of the projects. Misjudgments by planners about the nature of consumer demand are an important contributing factor to the poor performance of public water and sanitation systems in developing countries. However, project designs should reflect the demand of users for the service being provided, not only in terms of its technical characteristics, but also in terms of its management and financing throughout the project cycle (Deverill P. and Smout I., 2004).

During the last decades, the failures of the water supply and sanitation sector have been recognized and the search of new methods to plan and provide water supply and sanitation services in the developing world is constantly ongoing. Consultant companies,

universities and other bodies of research, non-governmental organizations, international organizations and national development agencies are all working to replace traditional approaches with new. Participatory planning, bottom-up, circular systems, household-centered, demand-driven, user-participation, holistic approach and system function, are examples of commonly used buzz-words, developed into concepts and incorporated in the new approaches, presented as planning supports. The planning supports can be divided into a few different categories: strategic planning methodologies, defined as long-term planning approaches aiming for overall goals; models and terms of references, being more concrete supports for planning water supply and sanitation projects; frameworks for planning water supply and sanitation systems, aiming for a more holistic system approach; and toolboxes for planning water supply and sanitation systems, collections of a variety of tools, supporting different parts of the planning process (Törnqvist, 2007).

## **2.6. The Core Problems for Sustainable water supply and sanitation projects**

Several researchers emphasized that failure to consider the five key pillars of sustainability in decision making is a major contributor to unsustainable rural water supply and sanitation projects. According to Brikke and Bredero (2003) Poor decision-making which fails to consider all facets of sustainability is one of the common barriers to sustainable water supply and sanitation services. Poor planning process that does not take in to account all potential impacts, Unwillingness to perform adequate pre-investment evaluations of the sustainability of proposed technologies with in the local societies, decision support tools that unable to integrate the cause-effect linkages are common barriers to sustainable water supply and sanitation projects (Brikke and Berdero, 2003; Dunmade 2002). The failure of planners to consider the implications of technical options with respect to all aspects of sustainability is one of the root causes for unsustainable sector development project. Insufficient initial consideration of technical criteria, analysis of economic criteria during-decision-making, environmental and human health criteria, and careful consideration of social criteria are the major pillars of sustainability of a give project (Barnes, 2009). Therefore, it is very important to identify, examine and consider such factors in decision-making process so that the enormous waste of economic resources can be avoided.

The planning phase of a development project is critical. Poor planning has been implicated in countless failed projects. Project evaluation literature, reveals a need to set a decision-making strategy in an appropriate planning process, and suggests that the implementation gap evident in the water and sanitation development sector stems also from area of planning that are peripheral to decision-making (Barnes 2009;Törnqvist, 2007). In this respect several authors tie project sustainability to early phase of communication with the beneficiary community and stakeholders' participation in the planning process. Participation of stakeholders in planning is generally acknowledged as important in yielding the sense of community responsibility in public projects (MoFED, 2006; Cairncross, 1992; LaFond, 1995). A World Bank study of sanitation programs of the 1980s concluded that the success or failure and rates of progress are determined principally by consumer demand and preferences for improved services (Cairncross, 1992). The beneficiary community's desire for services, however, is still often overlooked and only token acknowledgement in planning (Sobsey, 2006).

Evaluation of past projects have concluded that the need to begin water supply and sanitation projects with an assessment of the local knowledge and solutions that have already been put in place ( Barnes, 2009; Cairncross ,1992; LaFond, 1995). This is because any kind of development is affected by human passions, value, visions and worldviews, and discussing these factors is an important initial step. The process gives an appreciation of stakeholder values, and can provide a basic level of agreement more easily than discussion of options. Those who are working to supply water and sanitation to rural and developing communities on sustainable basis must consider the above factors in project planning. The table below review planning-related factors that are integral to sustainability.

**Table 2.2: Planning-related factors integral to sustainability of water supply and sanitation projects**

<b>Aspect of planning</b>	<b>Summary</b>
<i>Interpersonal relationships</i>	Relationships between development staff and community members, and within the community, must be characterized by trust and genuine care.
<i>Skills and character traits of local and project personnel</i>	Important traits of personnel are commitment, passion, compassion, integrity and skill.
<i>Timing of planning</i>	Significant time must be given to planning to allow for relationship building, genuine community engagement, thorough data gathering and unforeseen circumstances.
<i>Community initiation and demand</i>	The community must genuinely desire the project.
<i>Community engagement</i>	The community must be genuinely involved in all aspects of project planning.
<i>Technology choice</i>	All sustainability criteria must be considered in selecting infrastructure.
<i>Operation and maintenance costs</i>	Detailed calculation of operation and maintenance costs should be performed by, or with, community members. Before construction begins, the community must devise a plan for meeting these costs.
<i>Ongoing contact</i>	There should be ongoing contact between a support organization and the beneficiary community.
<i>Government involvement</i>	If possible, government representatives should be involved in the project planning.
<i>Adaptive planning</i>	Continuous evaluation should feed back into project planning practices, and development organizations should be open to self-improvement.

Source: (UNSW water research center, 2010; Barnes, 2009)

## 2.7. Empirical Literature Survey

Researches with the aim of making rural water supply and sanitation project sustainable designed and implemented for long time. Some of them are mentioned below.

Harvey and Reed (2004) in their field research in Ghana, Kenya, South Africa, Uganda and Zambia have identified eight factors that are crucial in achieving the sustainability of rural water supplies. These are policy context; institutional arrangements; community and social aspects; technology and the natural environment; spare-part supply; maintenance system; and monitoring. The other is a study conducted in Philippines by Barnes (2009)

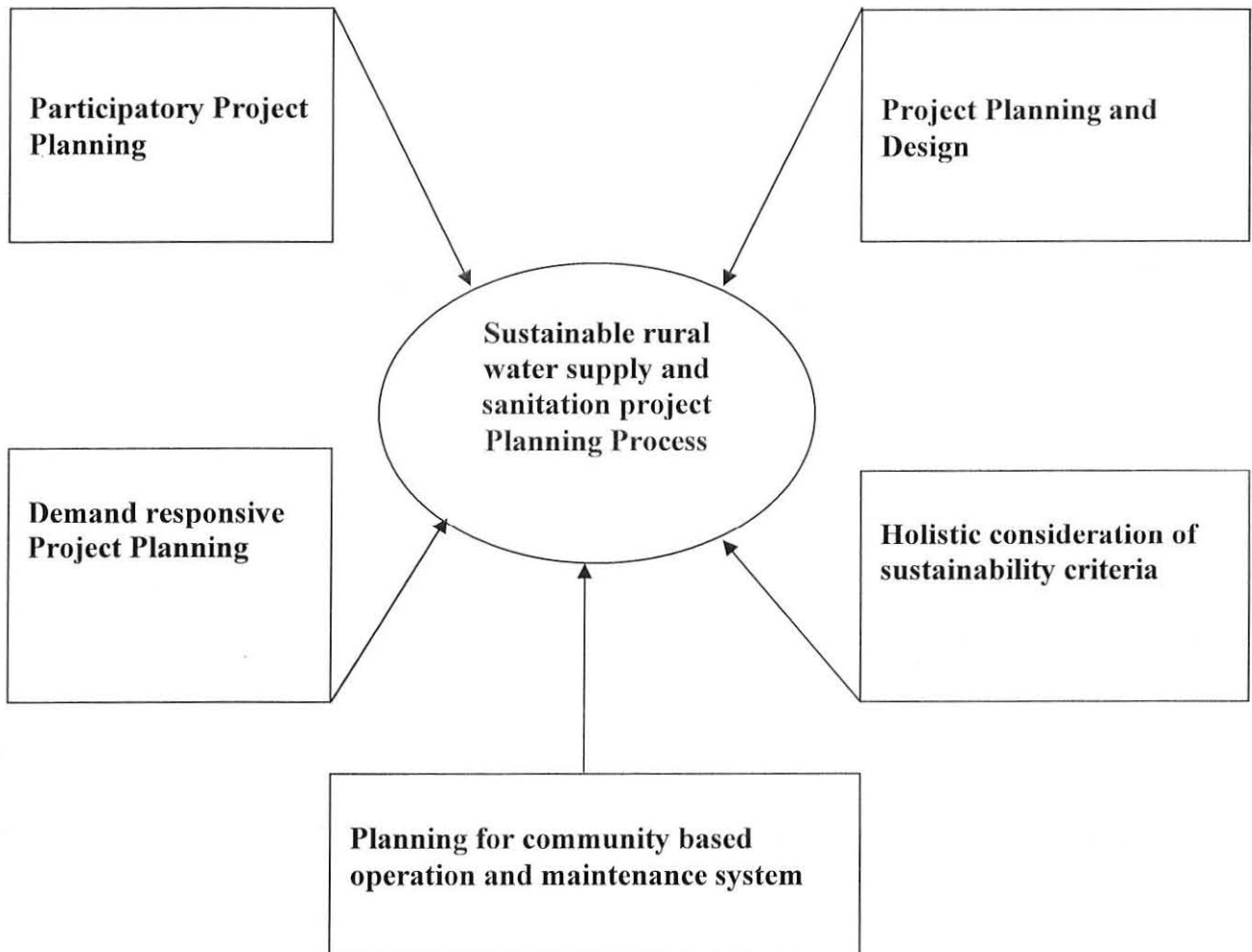
has indicated that sustainability of water supply and sanitation projects is determined by planning and decision-making related factors.

At national and regional levels there are researches conducted on sustainability of water supply schemes. The research entitled "Determinants of Sustainable Rural Water Supply System in Ethiopia" conducted by Zelalem (2005) has indicated that the sustainability of rural drinking water supply system is determined by community participation and involvement; women's participation and involvement; cost sharing and cost recovery; community awareness raising and education; water resources and base-line survey; repair and maintenance service; water users management body and structure; and institutional support. The other research was master's thesis conducted by Misgina in 2005, entitled "An Assessment of Challenges of Sustainable Rural Water Supply: The Case of Ofla Woreda in Tigray Region" has tried to identify key sustainability factors. The most recent research conducted by Dinku (2010) entitled "Assessment of sustainability on rural water supply schemes: The case of Adami Tulu" has indicated that the sustainability of rural water supply system determined by human and institutional factors. Most of these researches are focusing on water supply component only and limited sustainability criteria. However, there is no research conducted in the study area which includes both water supply and sanitation components in the previous years. Sanitation, in particular, is given much less attention in practice, even though "water-supply and sanitation improvements" are often mentioned together in project documents. There is need to conduct a research which include both water supply and sanitation components and all the factors that contribute to sustainability problems in the region in order to improve future planning process. It is fundamentally important to integrate the water, hygiene and sanitation practices, because poor hygiene or inadequate access to sanitation facilities can jeopardize health benefits gained from improving access to water supplies (Brikke and Berdero, 2003).

## **2.8. Conceptual Framework**

Sustainability of rural water supply and sanitation projects is related to the early phase of planning. The sustainability is result of a number of interrelated factors considered in the

planning process. Hence based on the literature reviewed, the researcher has tried to develop conceptual framework for the analytical exercise of the study. Accordingly, the following key points are formulated as a conceptual framework as stipulated in the Figure below.



*Source: Adopted from Barnes (2009), UNSW-Water research center (2010) and Water aid (2011)*

## **CHAPTER THREE**

### **Back Ground of the Study Area and Research Methodology**

#### **3.1. Overview of Badawacho Woreda and Sample Projects**

This section provides background information on the study area, touching on its location, climate, water resource, infrastructure, the health status and water supply coverage. It is hoped that, insights into such characteristics will enhance the readers understanding of pertinent issues which influence the water and sanitation situation and consequently affect sustainable of the projects.

##### **3.1.1. Geography and Water Resources**

###### **Location**

Badawacho is one of the 77 woredas in the Southern Nations, Nationalities and Peoples' Region of Ethiopia. It is approximately located between 70 05' 00" to 70 16' 00" North Latitude and 370 46' 00" East to 380 06' 00" East Longitude is relatively bounded by Alaba woreda of Kembata Tamboro Zone and Siraro woreda of Oromiya in the north, Kadida Gamela and kachabira woredas of Kembata Tamboro in the west, Damot Gale, Damot Weyde and Boloso Sore Woredas of the newly formed Wolayta Zone in the south (USAID, 2000). However, currently the woreda is divided in to East and west parts. This study was conducted in the East or Misrak Badawacho. Woreda's capital, Shone, is situated at about 345 Kms away from Addis Ababa on the asphalt road running from Addis to Arba Minch. What is special to Badawacho woreda in terms of location is that it does not share any boundary with other woredas of Hadiya Zone since it is separated by the presence of Kembata Alaba and Tembaro Zone between Badawacho and other woredas of Hadiya Zone.

###### **Climate**

No meteorological station is available in the woreda. Thus, the following explanations are mainly based on the topographic map and qualitative information of the key informants as well as field observation. According to the 1:50,000 topographic map, elevation of the

woreda ranges between 1580 m.a.s.l around Bilate River in the western part of the woreda and 2200 m.a.s.l at Geshgola PA marked by Tito peak in the north eastern part of the woreda. Having this altitudinal range, the whole woreda is divided in to two major traditional agro- ecological zones namely weina dega and kolla.

Months between July and October are the major rainy months for Badawacho woreda while March to May are the second rainy months with some amount. Months between November to February are usually dry in Badawacho when most people face shortage of drinking water for themselves and their livestock.

### **Water Resources**

Water resources are basic necessities for the agricultural community. Seasonal and temporal variations in the rainfall created sever water shortage In Badawacho, there are several intermittent rivers that dry up during dry months. But, there are very few permanent rivers that can serve the inhabitants all year round. These are Bilate, Bishan Guracha, Angachicho and Shapa rivers. Their total length is about 66 km as calculated from the 1:50,000 topographic maps. This gives a drainage density of 1 km to 9 km<sup>2</sup> for the whole woreda. In reality, the drainage density for the whole woreda is about 1 km to 18 km<sup>2</sup> since most of these permanent rivers are located along the outer margin of the woreda. There is no any lake in the woreda except some ponds. From this, one can understand that the woreda's inhabitants have been facing shortage of drinking water especially during dry months.

### **Accessibility to Potable Water Supply**

Lack of potable water is among the most important factors associated with risks such as water born diseases in the study area. The main sources of drinking water were both unimproved traditional and improved sources. Before the new projects, the major sources were rivers and ponds. Although water was available in the villages in wet season, most shallow wells run dry during the dry seasons, with extended dry periods. According to Water, Energy and Mines Department of the Zone, about 54.8% of Badawacho's inhabitants were accessible to potable water in 2009.

### **3.1.2. General Characteristics of the Sample Projects**

During the last, two or three decades considerable effort have been devoted to improve the water supply and sanitation conditions of Misrak Badawacho which is the most drought stricken area of the region. The schemes constructed by different Non governmental organization (NGO'S) and donor's have been handed over to the Hadiya zone water mineral and energy department, there by the woreda water desk of direct responsibility for operation and maintenance.

The rural drinking water supply schemes are implemented by government, NGOs and donor's agencies. However, NGOs are the dominant implementing agency in the woreda. The traditional approach of rural water supply has frequently resulted in services that have not been sustained in the woreda. Government, donors, and NGOs tend to pay more attention to build new facilities than to ensuring the use of existing ones. Roles for project planning, implementation, cost recovery, operation, and maintenance are poorly defined. The implementing agencies have not constituted the woreda coordination Committees to work together. All these indicate projects are more of supply driven.

Inadequate delivery of rural water supply services, due to aging infrastructure, institutional constraints, and fiscal difficulties is inhibiting the access of communities to basic water supply infrastructure services. Existing facilities are often poorly designed and insufficiently maintained, and do not adequately provide urgently needed basic services. The capacity of concerned bodies must be developed to enable them to implement sub sectors and to undertake operation and maintenance (O&M) of the constructed systems. In line with the Government's policy to use a decentralized community management approach, the Project will enhance the coverage of basic water supply facilities; contribute to improving living and health conditions and improve the institutional, organizational, and managerial capabilities of the sector agencies.

In Misrak Badawacho woreda, the level of services ranges from a hand dug wells on spot to deep boreholes with distribution system. Specifically the water supply schemes in the

woreda are deep boreholes both on spot and with distribution line, shallow wells and hand dug wells.

### **Current Status of Sample Projects**

This part presents characteristics of the sample water sources observed. The oldest water source was constructed in 1992 G.C, whereas the rest have been developed since that time. Water sources observed were deep boreholes fitted with submersible pumps, hand pumps fitted with pumps and shallow wells with hand pumps. Power sources were fuel, electricity and human power. In addition to the improved water supply systems, rivers, ponds and ground water were important sources. These sources were not separated for human and animal uses. People use these unsafe water sources when safe water supply schemes were not functioning. In the study woreda springs, dams, and roof catchments were not common due to the hot weather condition and Geologic condition of the area. Except Jarso-Hadana complete non-functionality was not observed in any of the observed scheme. Among those functioning with some technical breakdowns, water points in Amburse and Gagara exhibit disrepairs of the faucets, pipes and valves, letting water run continuously from the taps. The neatness of the areas surrounding the sources was also carefully observed because it may have an impact on the quality of the water.

As it was observed some of the water sources were 'not neat at all', as demonstrated by poor drainage and water stagnation, bad smell, and in some of the sources by the presence of livestock waste. Fore example, in Gagara drainage was not properly constructed for waste water removal from the communal showers and washing basins. In Wera-Lalo latrine was very near to the borehole which has possibility to contaminate water in the well. Catchments rehabilitation with the aim of increasing ground water recharge was not done almost in all of the water sources. In Wera-Lalo and Jarso-Hadana animal troughs were non-functional. The Gagara scheme has washing stands and communal shower rooms constructed along the water supply facilities in an attempt to make the most of community services. In order to provide clear and broader picture, based on the above designation, out of the total rural water supply schemes existing in the sample woreda, detailed description of the physical status, type, functionality, level of

protection and surrounding neatness of the observed water sources are summarized in the Appendix.

## **3.2. Research Methodology**

### **3.2.1. Research Design**

The study is evaluative research aimed to evaluate project planning process from sustainability perspectives, identify best practices and challenges that hinder project performance in relation to project planning. Moreover, the study is a case study based on collecting, organizing and analyzing information from selected cases.

### **3.2.2. Types and Sources of Data**

In order to attain the objectives of this study, the study uses both qualitative and quantitative data, based on the collection and analysis of both types of data. The qualitative data collected through focus group discussion, observation, and key informants' interview. The quantitative data collected from house hold survey.

Both secondary and primary data sources were used as sources of data. Secondary data related to the sector policies, strategies, water supply and sanitation development plans and programs, other institutions reports, documents and publications, and planning supports, planning frameworks, project planning guidelines and principles, WATSAN committee by-laws and verbal were collected. In addition, relevant books, journals, web sites and other types of documents were used from different sources. Primary data was collected through formal household surveys, Key informants' interviews, observations, and Focus group discussions.

### **3.2.3. Methods of Data Collection**

This research has relied on qualitative methods (focus group discussion, observation, and key informants' interview) in order to bring out current planning approaches in rural water supply and sanitation projects, to examine level of community participation in the project planning process, to explore efforts made in sustaining rural water supply projects. In addition, quantitative research method, small-scale survey was employed in

order to generate data on the demographic characteristics, assess demand for water supply and sanitation services, explore community participation, explore the practice of community based O&M, and examine projects from sustainability perspectives.

#### **3.2.3.1. Document Review**

The starting point to collect important data about water supply and sanitation projects is reviewing the available documents. Sectoral policies, strategies, water supply and sanitation development plans and programs, institutions reports, documents and publications, and planning supports, planning frameworks, and project planning guidelines and principles were reviewed.

#### **3.2.3.2. Household Survey**

Small-scale survey was undertaken in order to collect quantitative information on the following issues: households demographic and socio-economic characteristics, demand for improved water supply and sanitation, community participation in project planning, O&M, and project evaluation from sustainability perspectives. A structured questionnaire for the purpose of collecting data from sampled households was developed and used.

#### **3.2.3.3. Key informants' Interview**

Extensive interviews with 15 key informants (four from the community, three from woreda water resource office, two from woreda health office, two from Zonal water and Energy department, and four from the Ministry of water resources and Energy including national level consultants) were undertaken in order to explore the current planning approaches and practices; the participation level of community in the course of the rural water supply and sanitation project cycles; and implication of project planning in ensuring the sustainability of the water and sanitation services. Key informants were interviewed on their views, based on experience of the planning process of water supply and sanitation projects. Proposed improvements or "solutions" to past failures or successful experiences were also gathered from them.

#### **3.2.3.4. Focus Group Discussions (FGDs)**

Four focus group discussions (Group 1 in Wera-Lalo), (Group 2 in Amburse), (Group 3 in Gagara), and (Group 4 in Jarso-Hadana) were undertaken. The participants in FGDs were men and women of the community members and WATSAN committee members. Each focus group had six to eight members. The discussion with community members focused on demands and needs on the services, level of participation in the project planning process such as selection of type and costs of the technology to be installed; location of water points and other related issues.

#### **3.2.3.5. Observation**

This method was used to gather qualitative data on structural design of the water points and source area; presence of communal showers, cattle troughs and clothe washing basins; reliability of water use; level and quality of services; queues; fencing and drainage of water points; cleanness of the water points and the sources; watershed management; household sanitary conditions such as availability of latrine and present condition, hand washing facilities, and liquid and solid waste disposal condition; and other related information.

### **3.2.4. Sample and Sampling Procedure**

#### **3.2.4.1. Sampling of the Case Projects**

Non-probability sampling technique was employed to select the case projects. Hence purposive sampling method was used to select specific study projects. The selection criteria used were scheme type, non-functionality of water supply schemes, projects with both water supply and sanitation components, availability of planning documents, and accessibility of sites.

#### **3.2.4.2. Sampling of the Respondents**

After the selection of the projects, the beneficiaries of the water supply and sanitation schemes were identified and their lists secured from the documents of water and sanitation committees. Then the samples of respondents were drawn from the beneficiary

household using simple random sampling method. The following table presents the sampled survey respondents from each project.

*Table 3.1 Sampled survey respondents from each project.*

<b>Project Name</b>	<b>Scheme Type</b>	<b>Type of pump</b>	<b>Energy Source/ Power</b>	<b>Number of Water Points</b>	<b>Number of Sampled Respondents</b>
Wera-Lalo	Dip borehole	Submersible	Fuel motorized	2	20
	Shallow well	Hand pump	Human	1	10
Amburse	Dip borehole	Submersible	Electricity	11	25
Gagara	Dip borehole	Submersible	Electricity	3	20
Jarso-Hadana	Dip borehole	Submersible	Fuel motorized	1	10
	Hand dug well	Hand pump	Human	1	10
<b>Total</b>					<b>95</b>

### **3.2.5. Method of Data Analysis**

The process of data presentation and analysis involved the basic qualitative analysis technique. Qualitative data gathered from key informants' interview, Focus group discussion, direct observation and document review first organized and categorized thematically and written up in to narratives. Then the narrative followed by analysis and interpretation. On the other hand, the data from household survey was organized, coded, and processed using SPSS software.

## CHAPTER FOUR

### **Demand assessment in Planning Water Supply and Sanitation projects**

This chapter deals with back ground information of the respondents, and demand for improved water supply and sanitation services in relation to project planning; and then finally it evaluates weather response for the demand was given or not. Even demand varies greatly from place to place and may not be constant for the same community throughout time it must be taken into account before any development activity undergone.

#### **4.1. Background Information of the Respondents**

This section is concerned with the background information of the respondents. The demand of a household to improved water and sanitation services is jointly influenced by socio-demographic characteristics and socio-economic characteristics. The survey result in the table below revealed that 56.8% and 43.2 % of the respondents included in the survey were females and males respectively. It is women who know much about the problems they are facing concerning water demand, accessibility and use, and primarily responsible to shoulder the burden of water collection. Therefore, it has sense to take adequate number of female respondents in this kind of study.

In terms of age structure, the majority of the respondents 32.6% and 27.4% were in the age category of 25-35 and 36-45 years respectively. That means data was gathered from the productive age group and indeed people of this age group are those expected to take actions in the development of rural water supply and sanitation projects. Therefore, the majority of respondents were in the active working age to actively participate in the water supply and sanitation project activities. The average age of respondents was about 41.77 with a standard deviation of 11.404.

Household size is another important factor that determines the amount of water a family requires. Families with more number of family members require more amount of water. This in turn affects the total amount of water required at societal level. It is also said that family size affects household's participation in the development processes. A family with

more members might participate more in laborious activities. The average household size of the respondents is 5.72 (Sd 2.239). Minimum household size of respondents was two, with the maximum of 13.

The survey revealed that 49.5% and 22.1% of respondents were within primary and secondary levels of education respectively. Of the remaining, 26.3% were illiterate whereas 2.1% are certificate and above. This implies, the majority of respondents had certain level of education and they are able to read and write. It is assumed that educational status affect people's attitude towards demand and utilization of clean water. So, more educated households need better quality of life and closer to new ideas than uneducated. Therefore, it is possible to say that more educated households need clean water supply and sanitation service more than uneducated households.

*Table 4.1 Demographic characteristics of Respondents*

Demographic characteristics	Number (n)	Percentage (%)	Mean $\pm$ SD
<b>Age (n= 95)</b>			
20-29 years	19	20	41.77 $\pm$ 11.404
30-39 years	31	32.6	
40-49 years	26	27.4	
50-59 years	9	9.5	
$\geq$ 60 years	10	10.5	
			Median = 43
<b>Sex (n=95)</b>			
Female	54	56.8	
Male	41	43.2	
<b>Family size (n=95)</b>			
$\leq$ 3 person	13	13.7	5.72 $\pm$ 2.239
4-6 person	50	52.6	
7-9 person	28	29.5	
$\geq$ 10 person	4	4.2	
<b>Educational status (n=95)</b>			
Illiterate	25	26.3	
Primary	47	49.5	
Secondary	21	22.1	
Certificate & above	2	2.1	

Agriculture is the basis of the economy of the woreda. The economic livelihood of most people in the area is centralized around rain-fed subsistence agriculture. Petty trading is another important economic activity in the district. Both sexes participate in all the two activities. Major crops produced in the locality are Maize, teff, and others.

The percentage of respondents in terms of occupation showed that 82.1% were farmers and the other (10.5%) were involved in petty trade activities like selling clothes, buying and selling of cereals and small shop activities. The remaining 5.3 % respondents were involved in both farming and business activities and very few (2.1%) of the respondents were government employees. Therefore, agriculture was the main source of income for the majority of respondents.

When respondents were asked about the monthly household income, most of them did not give exact answer due to lack of records and others feared to expose their real income. Most of them gave estimations of what they sold to get money for household needs. The monthly income of the household ranged from 70 to 2000 birr with an average of 353 birr. The figures did not take into account the consumption of home-grown food, other in-kind payments and non-farm self-employment. Nevertheless, the figures need to be used with precautions because they don't depict the reality in the field; they are based on estimations of crops sold and monthly income of few employees who responded during the interview. Wealth of an individual affects ability to pay for water service. If the water fee is high, poor people may not be able to pay for the service.

Though housing condition includes many aspects such as construction materials, persons per room density, availability of kitchen, source of lighting, toilet facilities, etc. However, this study was limited to materials for the construction of roof and wall for the sake of simplicity. The type of house in which families live could imply the status of the household in a certain community. Accordingly, from the total respondents, 38.9% live in Wood wall and corrugated iron sheet houses. The other 61.1% of respondents were living in Wood wall and grass thatched houses. Traditionally, roofs with corrugated iron are considered as an indicator of better economic status. In fact, there are some well-built

thatch roofs that are equally considered as an indicator of wealth. However, living in a grass thatched house doesn't necessarily imply lesser standard of living. The most important thing is how the house is being utilized. Observation revealed that most of the houses were not partitioned for human use and domestic animals, which is very much related to contamination of water. In addition, presence of window is believed to provide enough light and better breathing condition.

**Table 4.2 Socio-economic characteristics of the respondents**

<b>Socio-economic characteristics of the respondents</b>	<b>No</b>	<b>%</b>	<b>Mean ± SD</b>
<b>Occupation (n= 95)</b>			
Farming	78	82.1	
Petty trade	10	10.5	
Farming and Petty trade	5	5.3	
Government Employee	2	2.1	
<b>Estimated Monthly income(n=95)</b>			
≤150	12	12.6	
151-250	27	28.4	Mean =353.37
251-350	36	37.9	
351-500	9	9.5	
501-1000	7	7.4	Median = 300
≥1000	4	4.2	
<b>Housing and House Condition (n=95)</b>			
Wood wall and grass thatched	58	61.1	
Wood wall and corrugated iron roof	37	38.9	

#### **4.2. Assessing Demand for Improved Water Supply Service**

As shown in table 4.3 below, almost all of the households prioritized improved water supply service for drinking and other domestic purposes. According to the findings of this study, all of the respondents put potable water supply development as their first priority issue. However, big challenge raised during focus group discussions was mismatch between service provided and demand of the communities. Majority of focus group discussants agreed that the communities were not given opportunities to express their preferences. This indicates the need for demand responsive approaches in water and

sanitation projects development activities. Concerning challenges of mismatch between the services provided and demand of the communities, one of the national level rural water supply and sanitation consultants suggested his point of view as follows:

*“It would have been better if project experts did not decide on behalf of the community on the type and level of services needed by the community. It is better if they consult and provide facilities that users both want and are willing to pay for”.*

If communities genuinely expressed their preferences during project planning, it is vital for the success of projects. Therefore, initiation of a water or sanitation project by the beneficiary community appeared to be an important first step in planning since it helps the community to express and ensure desire for the project.

All of the respondents in Wera-Lalo and Amburse reported they were paying for clean water supply service. On the other hand, 30% of respondents from Jarso-Hadana and 35% from Gagara were not paying for the service since they obtain water from unimproved and other alternative sources. About 80% of respondents in Gagara, 65% in Jarso-Hadana and 60% in Amburse said that the cost of water being paid was expensive. When respondents were asked about water tariff, respondents in Gagara reported 60cents per 20 liter container where as in Amburse, Wera-Lalo, and Jarso-Hadana they pay 35 cents per 20 liter container. Majority of water users claimed the cost of water being paid was expensive. As a result, some part of the communities depends on unimproved sources. Interview with those using from traditional sources revealed that there are people who fully support the idea of paying service charge but unable to pay in practice since the cost of water was expensive. This could prevent some part of communities from the service in particular and socio-economic development in general. On the other hand, if real demand for the services offered is weak, this can completely challenge prospects for sustainability of the projects. Such situation arises, for example, when water users have alternative water sources as in the case of Jarso-Hadana, which are less costly or much easier to manage. A real need or demand for an improved service or changed practice, which is more profound than the demand often articulated in government or NGO

programmes, is necessary to overcome management challenges which are likely to arise in future (WaterAid, 2011). A WaterAid case study of two villages in Ethiopia found that a significant reason why the intervention to improve water supply in Atsedo Mariam had been more sustainable than a very similar project in Bohona was that water was the main problem in Atsedo Mariam. Women had to leave early in the morning and spend some five or six hours fetching water every day while in Bohona water was not a critical problem for the community – perhaps it was not their first priority’. Thus, not considering all these things might undermine sustainability of the projects.

As in-depth interview with woreda water resource office participants revealed that there are different water schemes to be installed by the coming year (2011/2012). The types and levels of facilities were already predetermined without taking the demand of users into consideration. This is because of the trend being practiced for long time, lack of well trained personnel and financial limitations of the woreda. This indicates the initiation of the project by the beneficiary community was limited. However, interview held with Woreda Water resource office participants revealed that representatives of the communities had contacted to discuss their problems and the support they needed. In relation to this issue a research conducted in Philippines indicted that need identification and project initiation arising from within the community are very important for the success of water and sanitation projects (Barnes, 2009).

**Table 4.3 Percentage Distribution of Respondents by Priority and Payment for Water Supply Service**

Priority and payment for water supply	Response	Percentage (%) assessment of priority and payment for water supply service by Project			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Priority for water among other social problems	Yes	100	100	100	100
	No	0	0	0	0
Payment for clean water supply service	Yes	100	100	65	70
	No	0	0	35	30
Perception about the cost of water being paid	Expensive	43.3	60	80	65
	Faire	56.7	32	20	35
	Cheap	0	8	0	0

The domestic uses of water include drinking, cooking, bathing, and washing. Large number of respondents 50% in Wera-Lalo, 56% in Amburse, 70% in Gagara and 45% in Jarso-Hadana use water for drinking only. However, they use different unimproved sources like ponds and rivers for bathing, clothes washing and animal watering. This might be due to the expensive nature of the provided water supply service.

Majority of respondents (i.e. 80% in Gagara, 60% in Jarso-Hadana, and 40% in Amburse) consumed less than three Jeri cans per day per household for all domestic purposes, but 53.3% of respondents in Wera-Lalo consumed 3-5 Jeri cans of water for all domestic purposes by households per day. The average amount of water consumed per household for all the projects was also found 9.68 liters per person per day. This is very small when compared to that of WHO recommendations, 20 liters per day per person (WHO, 1995). This might be due to inaccessibility and unavailability of water sources, inability and unwillingness to pay, large family size, lack of awareness and un-matching



of facilities. Therefore, it is possible to say that considerable number of respondents did not have access to safe water due to the above mentioned limitations.

**Table 4.4 Percentage Distribution of Household Demand for Improved Water Supply Service**

Demand for water supply	Type of Response	Percentage assessment of demand for water supply service by Project			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Water usage purpose	Drinking	50	56	70	45
	Drinking & Cooking	23	16	15	30
	Drinking Cooking & washing	16.7	12	5	25
	Drinking, Cooking, Washing & Bathing	10	16	10	5
Water consumed per day	<3 Jeri cans	36.7	40	80	60
	3-5 Jeri cans	53.3	32	20	20
	6-8 Jeri cans	10	28	0	20

### 4.3. Access to Water Supply points

Table 4.5 shows that 86.7% of the respondents in Wera-Lalo, 80% in Amburse, and 80% in Gagara said that their present water supply points are near to their residential area, but 75% of respondents in Jarso-Hadana said their water points are far. Majority of respondents in all schemes fetch water once a day, but 70% in Wera-Lalo and 40% in Gagara schemes fetch water twice a day.

Queues were the major problems facing communities in almost all schemes except Jarso-Hadana where the scheme was not functioning. The community was not using this scheme due to its high water price (i.e. motorized scheme with fuel cost) when compared to cheap alternative sources (i.e. Hand dug well with human power). The most striking

feature during the dry season was the long queue which was the biggest problem observed. Water fetcher spend a tremendous amount of time each day queuing for water because the well does not deliver enough water quickly and as a result of the large number of users from neighboring villages. As observation revealed present water points were estimated 40 minutes far on average from beneficiaries' residences. If a woman collected water at least two times a day, she would waste more than an hour with out the addition of time spent on the waiting line. This finding is beyond the recommended limit of WHO, 15 minute, but comparable with other experiences in Africa and Asia. For example, An Indian national survey commissioned by UNICEF found that women spent an average of 2.2 hours per day collecting water from rural wells (Wright, 1997). Consumers' size and scarcity of resource are dominant factors indicated by beneficiaries to this. The beneficiaries assume that too much burden on the schemes due to long lines and high rate of usage would damage the infrastructure. Therefore, to make the service continue for longer period, there is high need for additional water supply sources or source diversification.



*Picture 1: Long waiting lines*

**Table 4.5 Percentage of Respondents about their Access to the Water Points**

<i>Access Condition</i>	<i>Response</i>	<i>% of Respondents on Queues, Fetching Frequency and Distance to the water points by Project</i>			
		<b>Wera-Lalo</b> (n = 30)	<b>Amburse</b> (n = 25)	<b>Gagara</b> (n = 20)	<b>Jarso-Hadana</b> (n = 20)
Water fetching frequency per day	Once	26.7	68	60	80
	Twice	70	32	40	20
	Three times	3.3	0	0	0
Estimated walking distance to the current water supply points	Far	0	0	10	75
	Medium	13.3	20	10	25
	Near	86.7	80	80	5

#### **4.4. Satisfaction on Water Supply Service**

In the table 4.6 below, the survey found that 70% of respondents in Wera-Lalo, 65% in Gagara and 55% in Jarso-Hadana were dissatisfied with the provided amount of water. However, 80% of respondents in Amburse were satisfied with the quantity of water consumed. Observation and interview with the project beneficiaries in Amburse revealed that amount of water was adequate. It was observed that water was available in all the 11 water points, but the major problem in this scheme was very high pressure in the system which frequently breaks down the system due to its powerful pressure in the pipes.

The study disclosed that 76.7 % of respondents in Wera-Lalo, 64% in Amburse, 45% in Gagara, and 55% in Jarso-Hadana were not satisfied with the general service provided. As it was discussed in the above tables the reasons could be time spent in fetching water; low quantity of water and high cost of water. This indicates that there was mismatch between beneficiaries' number (i.e. larger consumer size), and the existing water points. This needs consideration of consumers' size, source potential and amount of water availability, and price of water in the planning phase.

**Table 4.6 Percentage of Respondents Satisfaction on Water Supply Service**

Level of Satisfaction	Response	Respondents Satisfaction on Water Supply Service in %			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Satisfaction on the amount of water consumed per day	Yes	30	80	35	45
	No	70	20	65	55
Level of Satisfaction with the general service	Not satisfied	6.7	64	45	55
	Satisfied	3.3	28	55	30
	Very satisfied	10	8	5	15

#### **4.5. Assessing Demand for Sanitation**

The observation made in all studied households compounds revealed that most of the residents were living in unhygienic conditions. Regarding sanitation, hygiene and waste disposal systems, major problems identified by interviewees were open defecation, liquid and solid wastes left on the open fields and the subsequent smell and fly breeding situation. All systems of defecation were found at risk contaminating food, water, and hand and feet contamination by means of animals and flies. Household respondents were asked about the availability of latrine and other related issues and the information obtained is presented as follows:

In the table 4.7 below, majority of respondents acknowledged possessing sanitation facilities. Among those who had latrine 75% of respondents in Gagara, 65% in Jarso-Hadana, 60% in Wera-Lalo, and 52% in Amburse considered the use of latrines and discussed it as an issue with their family members. Considerable number of households in all projects had their own latrines. However, 63.3% of respondents in Wera-Lalo, 55% in Jarso-Hadana and 40% in Amburse were not regularly using latrine though they have latrine. Focus group discussants indicated that lack of knowledge and bad smell were the

major impediments for the majority of respondents not to use latrines. Simple traditional pit latrines were the most commonly used sanitation facility by most of the respondents. As the observation revealed the majority of improved sanitation facilities were incomplete because they have no wall, roof, and ceiling as follows.



*Picture 2: Sample pit latrines*

As shown in the above pictures, a single type of option was presented to users (traditional pit latrine) while some of the key informants and the group discussants preferring ventilated pit latrines. Therefore, strategies of program implementers should take demand of users' into account if service provision is deemed to be sustainable.

Using ventilated improved latrines rather than traditional pit latrines must be brought if improved health outcomes are going to be addressed. During focus group discussion it was declared that subsidized slab provision for sanitation was remained as history and no slab was provided. Respondents were also asked about the usage of slabs for sanitation services and almost all agreed to buy if provided at low price. Group discussants mentioned that majority of households in their area use latrines constructed by households using their own labor on advice and encouragement from Woreda Health

office, Health Extension Workers and NGO promoters. Interview with the woreda Health office participants revealed that the community learning approach followed was Community-Led Total Sanitation (CLTS). In the Interview, it was highly emphasized that the application of CLTS approach improved the use and coverage of latrine in the studied villages but there was no exact data to discuss the sanitation history. Research conducted by WSP in 2007 confirmed that sanitation coverage (88.8%) in SNNPG has shown significant improvements (WSP, 2007). Currently, this approach is being used to significantly increase sanitation coverage of the region.

Community-Led Total Sanitation (CLTS) being implemented by NGOs and Government in some kebeles of the Woreda showed successful results. It is also currently being scaled up to other kebeles of the Woreda. Taking its output into consideration, interviewees with participants from Woreda health office urged the expansion of such approaches to all kebeles of the Woreda. An opinion suggested by one of the participants from the woreda health office was forwarded as follows:

*“Since the implementation of CLTS approach, there are about nine kebeles that declared they are free of open defecation with minimum costs and in short period of time. Therefore, it is better if other kebeles in the woreda adopts such approaches to achieve best results”.*

CLTS approaches are more effective and very important to attain MDGs related to sanitation. This put something in someone’s mind that revitalization of these approaches must be conducted across the woreda to bring revolutionary changes.

All of the latrine bowls were not covered. This poses a risk as far as human health is concerned due to a high probability of water contamination by flies from the latrines. Apart from water contamination, food and utensils used in households may also be contaminated by the flies. The majority of respondents (i.e. 76.7% in Wera-Lalo, 84% in Amburse, 25% in Gagara, and 75% in Jarso-Hadana) did not put hand washing facilities near to latrines. Observation revealed that in most cases water and soap or ash were not

available for hand washing after attending latrine. Some of the group discussants said that water is a scarce commodity and cost money to acquire, it was not kept at the latrine due to the fear of misuse since the latrines does not have walls, gates and ceilings. They also said that if someone feels like attending the toilet he or she had to go with water for cleaning purposes. Poor hygienic behavior of respondents, type of latrine being used and/or poor utilization of improved facilities might cause water, sanitation and hygiene related diseases. Furthermore, increased access may not translate into improved public health outcomes as evidenced by an assessment done in Goa and Kerala states, India (WSP, 2007). Particularly, improvements of health outcomes because of traditional pit latrine would not be significant as fly breeding and smelling are its major limitations (DFID, 1998). Therefore, protection of source of water is not an end by itself unless verified by long term plans focused on appropriate and continuous hygiene promotion activities.

*Table 4.7 General Characteristics of the Sanitation Facilities*

Sanitation Facilities Condition	Response	% of Sanitation Service and Facilities Demand by Project			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Discussion on the idea of using Latrine	Yes	60	52	75	65
	No	40	48	25	35
Latrine availability for household usage	Yes	73.3	72	80	75
	No	26.7	28	20	25
Regular Latrine usage	Yes	36.7	60	70	45
	No	63.3	40	30	55
Latrine covered	Yes	100	100	100	100
	No	0	0	0	0
Water available for hand washing	Yes	6.7	100	15	20
	No	93.3	0	85	80
Hand washing facilities located near the Latrine	Yes	23.3	16	75	25
	No	76.7	84	25	75

#### 4.6. Satisfaction on the Latrine Facilities

Table 4.8 below, indicates that majority of the respondents (i.e. 46.7% in Wera-Lalo, 48% in Amburse, and 50% in Jarso-Hadana) said that the latrines commonly used were at

a medium distance while 55% of respondents in Gagara said the latrines were at a nearer distance. The observation also revealed that many latrines were located close to the household dwellings. This indicates that locations of the latrines could not be one of the factors influencing behavior of using latrine. For that reason, majority of the respondents (i.e. 73.3% in Wera-Lalo, 68% in Amburse, 50% in Gagara, and 75% in Jarso-Hadana) were satisfied on the latrine usage. Therefore, beneficiaries satisfaction on the service provided is very important condition for the sustainability of the projects.

**Table 4.8 Percentage Distribution of Respondents Satisfaction on the Latrines**

Level of Satisfaction	Response	% of Sanitation Service Demand by Project			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Estimated distance of Latrine from the home	Far	13.3	12	25	25
	Medium	46.7	48	20	50
	Near	40	40	55	25
Latrine Usage and its satisfaction	Not satisfied	16.7	20	30	15
	Satisfied	73.3	68	50	75
	Very satisfied	10	12	20	10

#### **4.7. Personal Hygiene Practices**

There was awareness on the importance of hand washing, taking bath and washing clothes in all villages in the studied projects. However, observation made at the household level shows that villagers rarely wash their hands with soap after using latrines. Hand washing facilities such as Soap and water were not commonly found around latrines. It was also observed that adult men and women washed their hands before eating, while children did not. As indicated in the table 4.9 below, 43.3% of respondents in Wera-Lalo, 56% in Amburse, 60% in Gagara, and 55% in Jarso-Hadana said they wash their hands before eating meals, while 46.7% of respondents in Wera-Lalo said they wash hands after visiting latrine. However, the interview revealed that

respondents were aware on hygiene issues and knows why they should wash their hands after visiting latrine and before eating. Though efforts were being made by village Health extension workers in the project areas to promote hand washing, the impact was limited and water use in most households was unhygienic. Majority of respondents (i.e. 46.7% and 68% in Wera-Lalo and Amburse respectively) wash their body once in two weeks while 36.7% of respondents in Wera-Lalo, 35% in Amburse and 35% in Jarso-Hadana wash their body occasionally. In addition, 36.7% of respondents in Wera-Lalo, 44% in Amburse, and 45% in Jarso-Hadana wash their clothes once in a month, while 45% of respondents in Gagara wash clothes once in two weeks. This indicates respondents were concerned about their personal hygiene. However, it was difficult to conclude that there was real behavioral change among the households concerning the personal hygiene practices.

**Table 4.9: Percentage of Surveyed Households on Personal Hygiene practices**

Hygiene Practices	Response	% of Sanitation Service Demand by Project			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Hand washing occasions	Before meals	43.3	56	60	55
	After Visiting Latrine and Before meals	10	16	20	20
	After visiting Latrines and when hand are dirty	46.7	28	20	25
Frequency of washing body	Once a weak	16.7	16	15	30
	Once in two weeks	46.7	68	30	25
	Occasionally	36.7	16	35	35
	Not at all	0	0	20	10
Frequency of washing clothes	Once a weak	20	16	10	20
	Once in two weeks	20	28	45	25
	Once in a month	36.7	44	30	45
	During holydays	23.3	12	15	10

In General, a real demand for an improved water supply and sanitation service is necessary to overcome sustainability challenges which are likely to arise in the future. If real demand for the services offered is weak, this can completely undermine prospects for sustainability. For example, in Jarso-Hadana where the community has alternative less costly water source (i.e. Hand dug well), the deep borehole with higher cost was completely ignored by the community. Moreover, when latrine users are not convinced of the value of sanitation facilities usage such as Latrine, soap and water on regular basis, better hygiene practices are difficult to maintain. Therefore, lack of demand or low levels of motivation is a factor which can completely destroy the possibility of sustainable service provision. In relation to this a research conducted by WaterAid in 2011 concluded that unless the users truly desire the 'improved' service, in preference to what they have already, then the service will break down.

## CHAPTER FIVE

### **Evaluation of Water Supply and Sanitation Project Planning Process from Sustainability Perspectives**

In the foregoing chapter, attempts have been made to assess demand for water supply and sanitation services of the surveyed respondents. Particularly need, demand, relevant level of services, willingness and ability to pay were assessed. This chapter tries to evaluate project planning process employed in practice from sustainability perspectives. In the evaluation process, planning approach (i.e. demand responsive), beneficiary participation, the consideration of five key sustainability criteria, project planning and design, and community based O&M were used. The following steps were used to evaluate the process.

1. Project planning and design: presence base line survey results and well guiding terms of reference.
2. Full community participation: the extent of beneficiaries' participation in project planning and decision-making processes.
3. Community based O&M and management systems: Detailed and explicit ongoing O&M costs calculation, appropriate skill on O&M and Revenue collection.
4. The five key sustainability criteria: the holistic consideration of key sustainability criteria.

#### **5.1. Project Planning Processes**

##### **5.1.1. Project Planning and design**

###### ***Selection***

The woreda water resource office key informants reported that in the selection of beneficiary communities no socio-economic survey and demand assessment was conducted. In the woreda there are no formal guidelines for the selection of a given village for constructing new scheme among villages with water supply problem. Informally, villages or kebeles with no earlier water supply facilities was mainly used for the selection purpose to decide where new schemes are going to be built. However,

demand responsive approaches give more attention to willingness and ability to contribute to the cost of the project in addition to water and sanitation hardships (Aheeyar et.al, 2004). Once the village was selected, project proponents envisaged that the community would contribute 5% of the capital cost of the project to instill a sense of ownership of the project and to bridge the gap between the basic level of service and the desired level of service.

### ***Technology choice***

A participatory rural appraisal (PRA) was not conducted to identify the water supply technology choice of the community. Irregular meetings were held to inform the community about the water supply project establishment but they were not on regular basis. In demand responsive approaches the beneficiaries need to be provided with a number of options to select the feasible one with the technical support of project personnel. In addition, the community was not made to understand the functions and responsibilities of the project staff and individual community membership. However, the communities need to be informed of the choice and their responsibilities.

### ***Feasibility***

Under the feasibility stage, preliminary assessments where capital and O&M cost were calculated for each of the technically feasible options at the project personnel and office level but with out the full involvement of the project beneficiaries. Even, the cost estimates were not presented to the community; and formal agreements were not reached with the project beneficiaries.

### ***Baseline survey***

Baseline survey is helpful for informed project planning, decisions-making and successful implementation. It gives information about present status of community, water and environmental sanitation conditions to conduct feasibility studies. It is also a foundation for planning, channel to get information from community (Save the children, 2010). So, Terms of reference (TOR) need to be set down before the actual work is commenced. TOR stipulates the specific inputs and out puts guidelines or directions for

implementers, a reporting period, the required budget for execution of the different activities and like. However, there was no as such comprehensive and integrated way of making baseline survey at the community level. Instead of conducting the actual survey, large part of the plan was completed in the offices depending on low coverage of water in the localities and absence of already established schemes. The beneficiary communities were prioritized mainly based on the existing water supply problem and population number. Therefore, the existing project planning and decision-making practices were not based on the base line survey results. Moreover, lack of data base was found to be one of the major problems that delayed the preparation of the plan in the study projects. These days too, it is not accustomed to update the data yearly or in any interval, based on once established base. The woreda is not in a good position in having reliable data for future planning in the sector.

#### **5.1.2. Analysis of Project Planning Process Employed in practice**

The interview with the woreda and zone water resource office participants revealed that there was no uniform planning practices for the Government and NGOs funded projects in the woreda or even in the zone. Every NGO has its own procedure and framework for the planning purpose. However, the key aspects of project planning processes of the four evaluated projects were investigated using interview with the woreda and zone water office participants as follows:

##### **The project life cycle: Planning Processes among Different Projects**

- I. ***Project Identification:*** It largely relies on proposals prepared by experts from either government offices or NGOs and then submitted to the funding agencies. Project staff prepared a proposal as per the requirements of government or the external funding agency with out community consultation on the technology selection, system design, and schedule for construction. Except the case of Jarso-Hadana, in all the projects communities initially asked the water resource office for the services through their representatives.
- II. ***Project preparation:*** It includes the detailed design of the projects. Early interaction between financing institutions and beneficiaries helped to build a

better understanding of the local situation and mutual confidence. Project staff from the offices or NGOs undertook data gathering to substantiate technical surveys but community consultations and baseline surveys were not given emphasis to ensure community involvement and to assess real demand for the services. In the case of Gagara, government officials and professionals were not involved in the planning process almost all of the planning activities were completed by the NGO on the desk and made ready for implementation

**III. *Project Appraisal:*** The project can be appraised once the financing institution and the government have agreed on the details of the project. It involves a comprehensive and systematic review of all aspects of the project. The appraisal covers different aspects: technical (sound design, appropriate engineering and technology), institutional (implementing organization, management and staff, conditions of operations of this institution, need for technical assistance), economic (contribution to the country development objectives, cost-benefit analysis, risk analysis) and financial (cost estimates, availability of funds to cover implementation costs) are not examined in detail. Moreover, crosscutting issues such as poverty, gender, participation and environment examination are not adequate.

**IV. *Project Implementation and supervision:*** In all cases, implementation is the responsibility of the implementing agencies, which generally sets up a project management unit in charge of operational management. Implementation comprises different tasks: procurement of goods and services, contract management, supervision of the construction of physical components, monitoring and reporting, facilitation and training, institutional building, etc. Each community was involved in the construction through provision of labor and some construction materials but was not involved in choosing the basic design of the systems, and scheduling construction activities. Monitoring and reporting is an important part of the activities of the project management unit in the implementing agencies and the basis of the supervision by the woreda water resources office and financing institution's staff. The supervision is a combination of desk review (supervision of procurement and payment,

maintenance of project records, actions to resolve problems) and field visits to resolve specific problems and obtain direct information. However, this was not observed in the studied projects.

- V. **Evaluation:** project evaluation is not carried out by an independent department or agency in all the studied projects. There should be continuous evaluation which feed back into project planning practices, and the woreda water resources office or development organizations in the sector should be open to self-improvement.

Visits by the author to other project sites and informal interviews with other professionals from the offices revealed that the above elements were common to the planning process undertaken for almost all the existing water supply projects in the woreda.

Failure to conduct post-project evaluations results in poor planning due to a failure to recognize the need for improvement, participants from Zonal water and energy department criticized a lack of post-project evaluations. As one informant noted:

*“To speak frankly there were no evaluations conducted on water and sanitation interventions in the zone. Past planning practices were not evaluated in order to take necessary adjustments and adaptations in the current approaches. Much emphasis was given to increase the coverage through construction of new schemes either by the government or funding agencies and NGOs. In many of the water supply development projects, planners were Hydraulic engineers and hydro geologists. They give much emphasis for technical issues such as materials used in the construction, low cost technology selection, geologic conditions, water availability and potential, which were assumed to be the major determinant factors for long-lasting projects. However, attention was not given to what you are saying because there are no trained economists and sociologist to give attention on other aspects of sustainability”.*

This indicates there is need for evaluating the sector intervention in general and the approach used in planning the projects.

Another informant suggested that even when unsustainable projects are discovered and valuable lessons become available, they are deliberately concealed. One of the woreda water resource office participants suggested that:

*“Failure in the sector is hidden that is why many problems are not still solved. Every body in the sector tries to publicize his success rather than correcting the failures, even don't want to listen to others idea. As professionals we are here to provide information, data, and supportive ideas for decision-makers in the sector that improve the project success but sometimes planners and decision-makers driven purely by their intentional objectives and they don't want to listen sector professionals. This was what happened in both Gagara and Jarso-Hadana projects. People should listen to others ideas particularly professionals in the sector, even some times they should speak about the failure since this is very important not to repeat the same problem some where else”.*

Therefore, to plan sustainable water supply and sanitation projects all the necessary stakeholders need to participate in the sector development activities and should be listened.

## **5.2. Planning for Community Based Operation and Maintenance**

Failure to plan for the operation and maintenance of rural water and sanitation services has been a significant cause of failed projects. Except Jarso-Hadana almost in all projects the majority of respondents agreed that their water supply schemes were functional. However, 24% of respondents in Amburse and 15% in Gagara said that their water supply points were Non-functional due to different reasons. In Amburse observation revealed that the major reason was breakage of faucets and pipes due to high water pressure. In Gagara one water point with sex faucets was out of use since there was no adequate water due to low head pressure from the reservoir. Jarso-Hadana was completely Non-functional since there was no enough revenue collection to cover the running costs. Increasingly, however, governments, external supporting agencies and local communities are recognizing the importance of integrating O&M components in all

development phases of water-supply and sanitation projects, including the planning, implementation, management, and monitoring phases (Brikke and Berdero 2003).

All the group discussants were asked about the skill and expertise of beneficiary communities on maintenance and operations of water and sanitation facilities. Most of discussants agreed that the community was doing its best to make the facilities functional for many years through fencing, assigning guards, maintaining, and paying money for the service. However, they believed that the empowerment given to users did not enable them to do whatever they want. Even, in case of maintenance, they have said that the skill that they have did not allow them to maintain major types of faults. One of the discussants from group 3 reported that:

*“We are provided with all the necessary kits for maintenance and operation but the trainings given to all technicians did not allow them to do major maintenances as they know little about it and lack confidence. We usually ask help from Woreda office while water facilities getting problems of functioning. If we were given the chance of good trainings on maintenance which fully capacitate our skill, we would be happy and become skillful to take all the responsibility related to operation and maintenance”.*

The above discussants idea was supported with interviewee from national level consultants for rural water supply and sanitation in the Ministry of Water and Energy. They concluded the need to further empowering users to the extent of Planning and managing the whole issues of water and sanitation outputs as operating, maintaining and upgrading or expanding the schemes are very important. They agreed that this would reduce the burdens of government and other program implementers significantly if all things that would be done by communities are shared accordingly.

In table below, majority of respondents agreed that there were efforts to maintain the non-functional schemes. Yet, the condition was very serious in the case of Amburse since the pipes and faucets break down frequently due to very high water pressure. According

to the woreda water resources office to solve the problem, pressure reducing valve was recommended from Dubai before one year. However, the valve is not still imported.

Almost all respondents (i.e. 86.7% in Wera-Lalo, 76% in Amburse, 85% in Gagara, and 80% in Jarso-Hadana) had no any relevant skill and expertise that enables them to maintain facilities when getting problems of functioning. Majority of respondents (i.e. 76.7% in Wera-Lalo, 80% in Amburse, 65% in Gagara and 70% in Jarso-Hadana) reported that they dig another latrine when former latrine being used is full. Rest of the respondents reported that their place of defecation was open field when the latrine being used is full. Recent three country study and synthesis of CLTS experiences by Evans et. al.(2009) in Water Aid (2011) found that a significant number of study communities that had declared ODF status were no longer Open Defecation Free often less than two years after the end of the intervention. However, there was evidence of some households upgrading or relocating latrines.

*Table 5.1 Percentage Distribution of Respondents on O&M activities*

O&M Environment	Response	% of responses by water scheme			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Current status protected water supply	Functional	100	76	85	—
	Non functional	—	24	15	100
Efforts to maintain water supply facilities	Yes	100	88	60	65
	No	—	12	40	35
Skill on O&M of water supply facilities	Yes	13.3	24	15	20
	No	86.7	76	85	80
When the Latrine being used is full	Digging another	76.7	80	65	70
	Open defecation	23.3	20	35	30

### 5.3. Participatory Project Planning

Another critical factor that determines sustainability of water and sanitation services is community participation in the project planning process in particular and over all project development in general. So, the extent of community participation in the projects development was assessed in this section. Even though, community participation in all the project cycles play pivotal role for the sustainability of water and sanitation services, further attention was not given by implementing agencies. One of the participants from woreda water resources office explained the whole process of project planning approach as follows:

*“Program implementing agencies including the woreda, they are planning water supply and sanitation project development activities based on their specific organization’s objectives and financial strengths. After completing every thing in their offices, they will come and inform woreda water resource office officials and or kebele leaders that they have such plan in specific localities. Then, kebele leaders will try to facilitate the community to be involved in the construction activities, particularly through provision of labor and locally available materials. Finally, when it gets finished, it will be handed over to users and starts to serve villagers till it becomes un-functional. When it becomes out of use and if the problem is simple, local technicians will try to maintain it otherwise remained as it is for long period of time”.*

In general, most of the interviewees and group discussants agreed that the trend of involving beneficiary communities actively starting from project planning to evaluation was weak. In-depth interview participants from woreda water resources office said that it was very difficult to facilitate community participation in the project planning periods. As a result, it is preferred to get beneficiaries involvement at least in the implementation phase. Group discussants also believed that it was very difficult to include the whole community in planning and evaluation but possible to include at least legitimate representatives of the community per village. Otherwise, the current trend of involving only kebele leaders and other higher officials would not be satisfactory and acceptable in the water supply and sanitation issues to mobilize the whole community.

In table 5.2 below, about 73.3% respondents in Wera-Lalo, 64% in Amburse, 60% in Gagara and 80% in Jarso-Hadana were not participated in the planning process. Rest of the respondents participation was limited to passively attending meetings with out idea contribution. Therefore, it is possible to say the participation of beneficiaries remains very poor, even non-existent, in the planning phase. According to Group discussants, absence of community participation in project planning was due to lack of information from their leaders and the approaches used by implementing agencies when planning water supply projects. Moreover, the power to pass decisions on the type and level of service was mostly given to project implementers. One of the group discussants from group 4 put it as follows:

*Government officials and development workers from the NGO were the one who determined the type and level of our water supply service. They did not involve beneficiary community in the project planning activities to select the type and level of service. We were asked only to participate during construction to provide, labor, stone, and wood for fencing. We don't know who involved in the site selection where the water points were going to be constructed. Involvement of beneficiary communities was obscured by Kebele leaders and some officials since public meetings were not announced. After construction was completed some selected individuals were assigned for the scheme handover and management.*

This indicates less emphasis was given for beneficiary participation in the project planning phase and agencies gave greater opportunity for community participation in the implementation phase.

In-depth interview with woreda water resource office participants on the other hand described the fact that the participation of beneficiary communities through their representatives, mostly Kebele leaders, was so significant in the planning phase. Some of them were also explaining the involvement of beneficiary communities in the water point site selection. However, what they did not deny was the limited number of representatives participation and the power given to them during selecting type and level

of service. In addition, they revealed that the level of participation was very limited in the preliminary survey, project planning and design, and evaluation of project outputs except the project implementation. Some participants of in-depth interview from woreda water resources office described that involving beneficiary communities in the planning process was good but it is very difficult as it wastes time, money and energy. They were also explaining challenges that they faced particularly in the planning phase of project cycle due to low level of technical knowledge of the beneficiary community. In fact this might not be the reason, even if the local people may not have technical knowledge they might have traditional and local knowledge concerning their water supply sources and related issues.

The majority did not participate in calculating detailed O&M costs. However, it was claimed that strong community participation in project activities and costs of operation and maintenance is considered as very important because it builds a sense of ownership and commitment among the local people. One of the constraints must involve the explicit calculation of ongoing economic costs associated with potential options, and demonstration that funds can and will be made available to meet the costs of the chosen option with full community participation (IRC, 2003; Barnes 2009). Therefore, Plans of activities should be discussed in the village meetings where communities had opportunities to give their suggestions and comments on what should be done to improve the proposed plan. Communities also should participate in identifying location of the water points, in setting O&M costs, reliable water sources identification and in electing the management body of the schemes democratically.

**Table 5.2 Community Participation in the Project Planning Process**

Participation in the project planning	Response	% of Respondents Responses by Project			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Community participation in the planning process	1. No participation	73.3	64	60	80
	2. Attended meetings but no suggestion	26.7	16	15	20
	3. Contributed ideas in meetings	—	20	25	—
	4. Discussed where to allocate water points	—	—	—	—
Participation in O&M cost calculation	Yes	23.3	20	15	15
	No	76.7	80	85	85

The majority of respondents (i.e. 73.3% in Wera-Lalo, 64% in Amburse, 60% in Gagara & 80% in Jarso-Hadana for water; and 53.3% in Wera-Lalo, 40% in Amburse, 45% in Gagara & 65% in Jarso-Hadana for sanitation) were not involved in making decisions about the water supply facilities. The decision to have the existing type of water supply facilities was mainly made by implementing agencies without the consent of majority. Lesser community involvement in the planning and decision making processes of project cycles i.e. all segments of the community may not be fully consulted at all stages of the project might cause dissatisfaction. Unless they are involved in planning, implementation and evaluation processes, no one would guarantee the match of services with all segments of the population. Of course, there might be budget shortcomings from implementers' side to involve communities in all stages of the project.

The decision to have latrine facility was not primarily decided by family members. This showed that less attention was given to community participation and the decision of "having or not having latrine" was mainly decided by health and water professionals. A village meeting is the place where all issues related to village development,

administration and political situation are conveyed to the villagers by the village government. Water supply and basic sanitation services are among the issues which are supposed to be addressed and discussed by the communities. Majority of the respondents (i.e.72%) in all projects had not participated in meetings; they said that no meetings had been conducted by the village government leaders concerning their water and sanitation services rather much emphasis was given to political and administrative issues.

*Table 5.3 Community participation in decision making process*

Participation in decision-making	Response	% of responses by water scheme			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Participated in the decision making process of water supply project	Yes	26.7	36	40	20
	No	73.3	64	60	80
Family members pass the decision to have latrine	Yes	46.7	60	55	35
	No	53.3	40	45	65
Participated in meetings to sustain the existing water supply facilities	Yes	26.7	28	25	25
	No	73.3	72	75	75

The majority of beneficiary communities were involved in implementation phases of water and sanitation facilities rather than in the whole project cycles. For example, the participation of community in the project planning, management, monitoring and evaluation was very limited as compared to the implementation phase. The type of contributions made during construction of improved water facilities were Labor and provision of construction materials. Majority of households (i.e. 76.7 % & 16.7%in Wera-Lalo, 60% & 20% in Amburse, 55% & 25% in Gagara and 65 %& 25% in Jarso-Hadana respectively) contributed labor and construction materials. The community provided labor during procurement of construction of materials like stones, sands, aggregates, digging trenches and construction activities. This indicates greater attention was given for community participation during project implementation when compared to the project planning. This might show the extent of the gap between users and implementers particularly in planning and the presence of supplier induced demand.

*Table 5.4 Community participation in the project activities*

Participation on Project activities	Response	% of responses by water scheme			
		Wera-Lalo (n = 30)	Amburse (n = 25)	Gagara (n = 20)	Jarso-Hadana (n = 20)
Type of participation during water supply project development	Labor	76.7	60	55	65
	Construction materials	16.7	20	25	25
	Food and drink	6.7	12	15	10
	Money	—	8	5	—
Stage of participation in the over all project development	Project planning	10	8	10	5
	Project management	10	12	10	10
	Project implementation	73.3	76	75	85
	Project M & E	6.7	4	5	—

The extent of community participation in all activities of water supply and sanitation projects is very important to enhance sustainability of the service provision. A high degree of participation also resulted in possessing a detailed understanding of their system which helps to enhance knowledge for independent system maintenance. Successful participatory project management does not only hinge on the mere physical involvement of project beneficiaries in project activities but goes beyond that. Planners and managers of projects who run their project activities without involving the beneficiaries often run into problems. Recent managerial experiences on project performance in many countries have shown that rural people's views and opinions about project performance, their interests and expectations, provide useful signals to planners and managers which when taken into serious consideration promotes successful project management. One of the key informants from the MoWR and Energy suggested that:

*“Strong community participation in the planning and implementation phases of water supply and sanitation projects is very crucial to make the projects long-lasting. Even community participation should give emphasis of the project to the extent that actors/ agents in the sector see themselves as facilitators rather than planners and implementers. This enhances commitment of the beneficiaries to the project”.*

This indicates the importance of involving the recipient community truly in the planning processes. Strong and genuine participation of the beneficiary community evidently produce a sense of ownership and responsibility for operation and maintenance, and then contribute for long-lasting of the projects. It was recognized that issues of ownership and sustainability necessitate the community to have some degree of power over project planning and decision-making. Strong degree of control over project planning and outcomes in turn empower the community to initiate other projects or expand the existing one. Actually this might require the assistance of agency personnel who can guide them with out dictatorial. Therefore, community involvement in planning a water or sanitation project is most critical factor to ensure long-term success.

A high degree of community participation in all the project life cycles might result in possessing a detailed understanding of their system and enhance knowledge of the system. One of the key in formants from the MoWR and Energy suggested:

*“Strong community participation in the planning and implementation phases of water supply and sanitation projects is very crucial to make the projects long-lasting. Even community participation should gate emphasis of the project to the extent that actors/ agents in the sector see themselves as facilitators rather than planners and implementers. This enhances commitment of the beneficiaries to the project”.*

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In general, most of the time community participation is seen or considered as contribution of labor, materials and money. That is why the majority of respondents in the study area participated in contribution of labor and locally available materials during implementation phase of water and sanitation facilities. Their involvement in planning and decision-making process of the project cycle was limited. This might be due to the fact that facilitating community involvement requires both time and effective communication.

Users' participation in design, implementation, and management of water and sanitation programs is seen by the World Bank as a way of increasing efficiency, equity, and cost recovery and of facilitating extension of service coverage to poor communities (Wright, 1997). A major study by Narayan (1995) in WaterAid 2011, which attempted to relate the degree of community participation in 121 rural water supply projects with their subsequent effectiveness (including their continuing sustainability) concluded that the analysis consistently shows that beneficiary participation was more significant than any other factor in achieving functioning water systems and in building local capacity. The project plan was not prepared in a participatory manner. The discussion held with woreda water resources office participants revealed that thorough discussions were not made with users on issues of water supply and sanitation. The water supply and sanitation projects in the woreda was basically intended to be planned by the active participation of beneficiary communities so that they could have necessary information about the project, internalize the project, own the project and ultimately sustain the project. However, an inactive participation program owner (woreda, communities and funding agencies) is a point where the core objective of community participation and management was deviated. Therefore, it is possible to say that planning process at the woreda level was not participatory.

## **5.4. Evaluation of the Planning Process from Sustainability Perspectives**

### **5.4.1. Goals Achievement and Effectiveness**

#### *Reliability of water supply sources*

As indicated in table 5.5 below, the majority of respondents 70% in Wera-Lalo, 72% in Amburse, 75% in Gagara and 65% in Jarso-Hadana reported that the water provided was not sufficient and continues. Group discussants in all the schemes agreed that frequent breakdown and seasonal disruption of water supply were common, especially in months January, February, March and April. In these cases households still depend on supplementary sources or alternative sources in very far areas.

#### *Quality of water*

Majority reported that water from the sample schemes was clean for drinking and other domestic uses. In addition, more than 68% of respondents in each schemes said that no one was sick due to water contamination in their family. However, group discussant from Gagara reported that there was epidemic of “Acute watery diarrhea or Atadafi tekimat ina tiwuket” in their village before five months. This was also confirmed by participants from the woreda health and water offices. This might be due to water handling problems (i.e. water contamination after the source). Participants from woreda water office revealed that chemical testing for pathogens was not regularly conducted. In addition, it was observed that most of the schemes are located in a potential contamination sources, like farm (the use of pesticide and fertilizers) and latrine.

#### *Affordability*

In all the studied schemes there was fee collection for operation and maintenance activities. However, the big challenge on the part of beneficiary community was the amount of money being paid. About 85% of respondents both in Gagara and Jarso-Hadana reported that the cost was not affordable. This might be due to very high running cost for fluoride treatment in the case of Gagara. In Jarso-Hadana project area there is cheap alternative water supply from hand dug and shallow wells fitted with hand pumps. The hand pumps users pay one birr per month but in the motorized scheme they pay 35

cents per 20 liter container which is too much expensive as compared to the hand pumps. Therefore, an affordability analysis of water rates in relation to household income might be conducted to ensure that the proposed water charges did not go beyond the monthly household income. In general it was found that a number of households continued to depend on unprotected sources due to frequent breakdown; longer waiting time; bad quality due to presence of fluoride; high cost of water and other related problems.

*Table 5.5 Evaluation of Goal Achievements and Effectiveness of the Projects*

Respondents Rating of their WS services	Project					Remark
	Response	Wera- Lalo	Amburse	Gagara	Jarso- Hadana	
Sufficient and continues water supply in community	Yes	30	28	25	35	
	No	70	72	75	65	
Clean water for drinking and domestic use	Yes	76.7	80	35	75	
	No	23.3	20	65	25	
No one get sick due to the water any more	Yes	80	68	85	80	
	No	20	32	15	20	
Affordable water for the community	Yes	26.7	72	15	15	
	No	73.3	28	85	85	

### **5.4.2. Holistic Consideration of Sustainability Criteria**

The sustainability of water supply and sanitation project is related to many factors such as technical, economic, environmental, health, social, institutional, and others. So, measuring sustainability is a difficult task. However, this study bases its analysis on some selected indicators that measures different aspects of project sustainability. The key sustainability factors in the sample projects are discussed below.

#### **5.4.2.1. Economic Factor**

The major constraints for the development of water supply and sanitation projects are capital costs and associated costs with operation and maintenance. These costs must be available from any source if people should gate water. This needs support from funding agencies for capital costs and fee collection for operation and maintenance. The explicit calculation of ongoing economic costs associated with potential options, and demonstration that funds can and will be made available to meet the costs of the chosen option are very crucial to make the service sustainable. Accordingly, in the table below, 73.3% of respondents in Wera-Lalo and 56% in Amburse rated fee collection for operation and maintenance as satisfactory. In addition, 44% of respondents in Amburse and 40% in Gagara rated as Good. However, 65% of respondents in Jarso-Hadana reported that fee collection was very poor. This might be due to high running cost in Gagara and cheap alternative water supply source in Jarso-Hadana as discussed in the preceding section. This indicates there must be detail and explicit operation and maintenance cost calculations while selecting options with full involvement of the beneficiaries. On the other hand, Continues support from government and funding agencies for capital expenses was rated as Good by 53.3% of respondents from Wera-Lalo and 56% from Amburse but 55% of respondents from Gagara and the same from Jarso-Hadana rated as very poor. As it was discussed in the previous section, majority of the respondents were poor farmers who earn their cash income only once a year, it needs continues support from funding agencies and government for capital costs.

**Table 5.6 Percentage distribution of respondents on economic factor**

Secondary criteria	Response	Project				Remark
		Wera-Lalo	Amburse	Gagara	Jarso-Hadana	
Fee collection for operation and maintenance	Very Poor	—	—	—	65	
	Poor	6.7	—	—	25	
	Satisfactory	73.3	56	—	20	
	Good	20	44	40	—	
	Very Good	—	—	60	—	
Continues support from government and funding agencies	Very Poor	—	—	55	55	
	Poor	—	—	40	45	
	Satisfactory	6.7	24	5	—	
	Good	53.3	56	—	—	
	Very Good	40	20	—	—	

#### **5.4.2.2. Social Factor**

The sustainability of rural water supply system depends on the enthusiasm of users to provide the necessary time, money, knowledge and labor to keep the system functioning. This willingness may be affected by factors like understandability of the system how it works, chance given for beneficiaries to attend meetings, free and faire election of users' representatives, recognition given to users demand, income level, regular ongoing contact with the scheme management and the beneficiary community. Although all these affect the sustainability of the schemes, this study focused on the understandability of the systems and chance given to attend meetings. Concerning the understandability of the system how it works 60% of respondents in Gagara reported that it was very poor and the rest said poor. This might be due to the complexity of Fluoride treatment plant and other related issues. Moreover, 56% of respondents from Amburse rated understandability of the system as poor. 56.7% of respondents from Wera-Lalo and 50% from Jarso-Hadana rated it as poor. Majority of respondents in all the projects rated announcement of meetings to involve majority in the planning process as very poor and also a considerable number of respondents rated as poor. 63.3% of respondents from Wera-Lalo, 55% from

Gagara, and 60% from Jarso-Hadana rated ownership of the project to take good care of it as poor. Therefore, satisfaction of the users with how the system works and chance given for attending meeting were core social factors for the sustainability of the systems.

*Table 5.7 Percentage distribution of respondents on social factor*

Secondary criteria	Response	Project				Remark
		Wera-Lalo	Amburse	Gagara	Jarso-Hadana	
Understandability of the way system works	Very Poor	—	—	60	—	
	Poor	13.3	56	40	5	
	Satisfactory	56.7	32	—	50	
	Good	26.7	12	—	40	
	Very Good	3.3	—	—	5	
Meetings announced to involve majority in planning process	Very Poor	60	48	35	65	
	Poor	26.7	52	45	25	
	Satisfactory	13.3	—	20	10	
	Good	—	—	—	—	
	Very Good	—	—	—	—	
Ownership of the project to take good care of it	Very Poor	23.3	—	25	30	
	Poor	63.3	4	55	60	
	Satisfactory	13.3	56	20	10	
	Good	—	40	—	—	
	Very Good	—	—	—	—	

#### **5.4.2.3. Environmental Factor**

There are a number of environmental issues to be taken into account in order to improve the sustainability of the projects. The major environmental risks can be avoided with careful planning and designing of the systems. The possible potential problems include quality and quantity of water, drainage problems to divert run off around wells; pollution of aquifer due to the sitting of latrine close to well points; waste water management limitations from communal showers and washing basins due to lack of drainage facilities

and disposal sites; water shed management and protection. However, this study analyzed effort made to clean water at the source and waste water management. Accordingly, 60% of respondents from Gagara and 20% from Wera-Lalo rated the effort made to clean water sources to decrease contamination possibility as poor. As it was observed during field visit this might be due to waste water from communal showers released in the open field in the case of Gagara and presence of Latrine near the deep borehole in Wera-Lalo. However, 66.7% respondents from Wera-Lalo and 65% of respondents from Jarso-Hadana rated as Satisfactory. Pertaining to waste water management using drainage, 75% of respondents from Gagara rated it as very poor. Although 53.3% of respondents from Wera-Lalo, 52% from Amburse and 55% from Jarso-Hadana reported it as satisfactory, 30% of respondents from Wera-Lalo, 32% from Amburse and 25% from Gagara rated as poor. This indicated there was problem of waste water management using drainages.

**Table 5.8 Percentage distribution of respondents on environmental factor**

Secondary criteria	Response	Project				Remark
		Wera-Lalo	Amburse	Gagara	Jarso-Hadana	
Effort made to clean water sources and to decrease contamination possibility	Very Poor	—	—	15	—	
	Poor	20	16	60	15	
	Satisfactory	66.7	28	25	65	
	Good	13.3	56	—	20	
	Very Good	—	—	—	—	
Management of waste water using drainage	Very Poor	—	—	75	—	
	Poor	30	32	25	5	
	Satisfactory	53.3	52	—	55	
	Good	16.7	16	—	40	
	Very Good	—	—	—	—	

#### 5.4.2.4. Human health Factor

Water free from any health hazard pollutants and chemicals are important preconditions for any water supply project establishment since health hazard chemicals and wastewater

from washing basins, communal showers and related sources badly affects human health if not managed properly.

Concerning cleanness of water at the source (i.e. free from chemicals) 60% of respondents from Gagara reported that it as very poor. This could be due to the occurrence of fluoride. However, 50% of respondents from Wera-Lalo, 68% from Amburse and 45% from Jarso-Hadana reported it as Good. In relation to safe disposal of sanitation products, 75% of respondents from Gagara rated it as very poor. Although 50% of respondents from Wera-Lalo, 52% from Amburse and 75% from Jarso-Hadana reported it as satisfactory, 43.3% of respondents from Wera-Lalo, 24% from Amburse and 25% from Gagara rated as poor. This could be due to releasing sanitation products such as waste water from communal showers and washing basins in the open fields. In addition, ponded wastewater around water points could serve as breeding grounds for mosquitoes and water borne and water related diseases. Observation also revealed this. Therefore, it is absolutely necessary to ensure that safe water both bacteriologic ally and chemically are delivered to the communities.

**Table 5.9 Percentage distribution of respondents on human health factor**

Secondary criteria	Response	Project				Remark
		Wera-Lalo	Amburse	Gagara	Jarso-Hadana	
Cleanness of water at the source (i.e. free from chemicals)	Very Poor	—	—	60	—	
	Poor	—	16	25	—	
	Satisfactory	20	16	15	20	
	Good	50	68	—	45	
	Very Good	30	—	—	35	
Safe disposal of sanitation products	Very Poor	—	—	75	—	
	Poor	43.3	24	25	5	
	Satisfactory	50	52	—	75	
	Good	6.7	24	—	20	
	Very Good	—	—	—	—	

#### **5.4.2.5. Technical Factor**

The technical issues relating to the design, quality of construction, availability of spare parts, and skill on operation and maintenance of rural water supply system are the most determinants of water supply sustainability. But this study bases its analysis only on the simplicity of system construction, and availability of water in the system year round.

56% of respondents from Amburse and 50% from Jarso-Hadana reported that availability of water in the system year round was very poor. In addition, 60% of respondents from Gagara and 30% of respondents from Jarso-Hadana reported that water availability was poor. However, 60.7% of respondents from Wera-Lalo, 40% from Gagara, and 20% from Jarso-Hadana reported it was satisfactory.

64% of respondents from Wera-Lalo and 55% from Gagara reported that simplicity of water supply schemes construction was very poor. In addition, 32% of respondents from Amburse and 45% of respondents from Gagara reported that it was poor. Observation in the field also revealed that the systems construction in Gagara and Amburse was somewhat complicated. This is because of fluoride treatment plant in Gagara and complicated reservoir situation in Amburse. In the discussion with water committee members, poor construction materials quality was raised as major problem. This indicates much emphasis was not given to construction quality and simplicity of the systems during design and construction of the schemes.

Availability of spare parts at local level or at least at woreda level is very important and contributes to the sustainability of the schemes. In this regard the water committees do not know where spare parts are available because it is the woreda that perform operation and maintenance. Experts in the office explain that at woreda level there is no any type of spare parts. Some of the key informants from the national level consultants suggested that failure to consider key sustainability criteria is a major contributor to failed projects in many cases. However, others expressed doubt on the five sustainability criteria due to the difficulty of incorporating all criteria in to decision-making.

**Table 5.10 Percentage distribution of respondents on technical factor**

Secondary criteria	Response	Project				Remark
		Wera-Lalo	Amburse	Gagara	Jarso-Hadana	
Availability of water year round in the system meet your need	Very Poor	—	56	—	50	
	Poor	13.3	32	60	30	
	Satisfactory	60.7	12	40	20	
	Good	20	—	—	—	
	Very Good	—	—	—	—	
Quality of construction	Very Poor	—	32	—	—	
	Poor	13.3	60	—	—	
	Satisfactory	10	8	60	60	
	Good	46.7	—	40	25	
	Very Good	43.3	—	—	15	

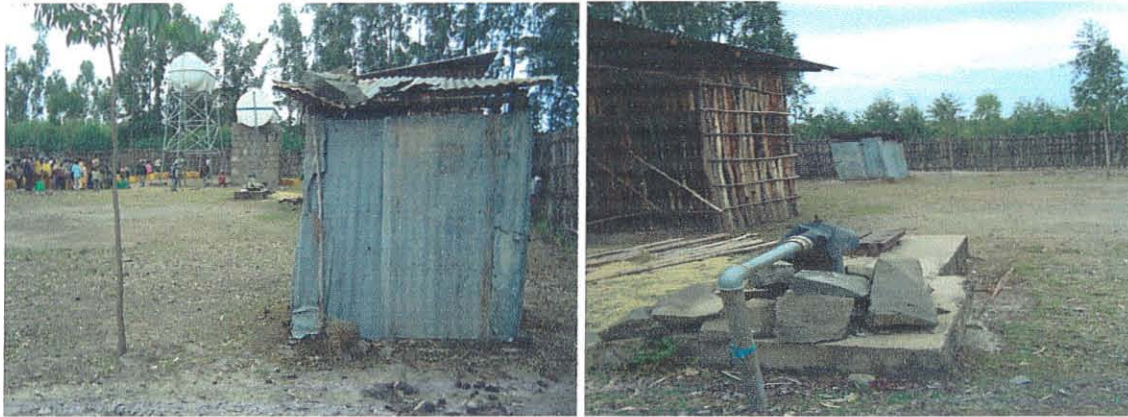
### 5.4.3. Major Sustainability Issues Observed in the Sample Projects

This part presents major problems related to sustainability of the sample projects. Sustainability of such projects could be affected by technical, economic, environmental, health, institutional, and social factors. From the sustainability issues observed at the time of field visit, the major and common ones are listed below.

#### 1. Wera-Lalo

##### Major sustainability issues

- i. Too many users: mismatch between population size and the available water supply facilities. This indicates that population density and growth was not considered in the project planning phase.
- ii. Long time queuing: during dry time people face severe water shortage.
- iii. Lack of alternative sources
- iv. Latrine was built near the borehole site as shown below: This is possible potential source of contamination of water in the well.



*Picture 3: Latrine near deep well*

**Remedial measures**

- i. Rehabilitation and extension of the existing scheme should be considered. In addition, other additional sources of water supply are needed for the neighboring villages.
- ii. Potential source of water contamination such as latrine should be avoided. On the other hand, digging water wells near potential contaminating sources such as agricultural fields should not be encouraged.

**2. Amburse**

**Major sustainability issues**

- i. Frequent system failure due to high water pressure in the distribution system. Break down of Pipes, gate valves and faucets were reported repeatedly.
- ii. Reservoir is located at the top of hilly mountain, which increases pressure very much down the reservoir.
- iii. Poor maintenance rate due to the absence of spare parts
- iv. Power cut off and irregularity of electricity. This resulted in the shortage of water at the time of power failure

**Remedial measures**

- i. Pressure reducing and air releasing equipments should be included in the distribution line.
- ii. In stead of single reservoir a number of reservoirs should be constructed along the distribution system to reduce pressure in the system.
- iii. Major spare parts should be available at least at local level

### **3. Gagara**

#### **Major sustainability issues**

- i. Quality of water is not satisfactory due to presence of fluorine. High concentrations of fluoride (above 1.5 mg/l, the WHO guideline value) can damage bones and teeth.
- ii. High fluoride treatment cost for the local community. The treatment methods used was the Nalgonda system (which uses lime to soften the water), and using alum as a coagulant. With either treatment, the water is then left to settle at the same time it is being chlorinated. The cost of fluoride treatment was very high in this particular scheme when compared to fluoride free source. These chemicals are not locally or even regionally available. The beneficiaries purchase Aluminum Sulphate from Addis Ababa and Lime from Ziway. The cost of Aluminum Sulphate is very costly while lime is relatively cheaper. Treatment processes itself was another big challenge for the local people. As a result, people had shown tendency to use untreated water, which might have health hazards. Moreover, quantity of treated water per day is very low as compared to the number of beneficiaries. There were two fluoride treatment plants each with four meter cub (4000L) capacity. On average, the whole process of treatment takes 5 hours. With in 10 hours about 16000L of water will be treated in both plants. This was not adequate for the beneficiaries.
- iii. Absence of water in the third water point due to low head pressure from the second fluoride treatment plant
- iv. Absence of appropriate drainage facilities and suitable sites to dispose waste water from communal showers.
- v. The scheme is located in the center of farmland. The fertilizer and pesticide might cause contamination of ground water.

#### **Remedial measures**

- i. Searching for alternative fluoride free sources in the surrounding. For example, 'Edo' scheme upgrading and rehabilitation could be one possibility.

- ii. Provision of proper drainage facilities to safely remove waste water from communal showers and washing basins.
- iii. Keep spillage water away from the water points.
- iv. Protection of ground water source deserves urgent attention. Identifying the sources of contamination, regular water quality checking, and application of disinfections is required. This should be repeated at regular intervals.

#### **4. Jarso-Hadana**

##### **Major sustainability issues**

- i. The scheme was constructed with out the consent of beneficiary community. Consequently, people are not willing to pay for the service. The fee collection was very inefficient to recover the running cost since the community was using other cheap alternative sources. For example, the cost of water from the near by hand dung well is one birr in a month per household with out limitation on the amount of water used by the household. The revenue collection is (one birr per family per month) mainly for the salary of operator and purchase of material for minor repairs. However, in the motorized scheme they were paying 35 cents per 20 liter container which is very much expensive as compared to that of hand dug wells in the surrounding.
- ii. The beneficiary community was not interested to use water from the motorized scheme. They preferred hand dug well due to low cost of water. Running cost particularly the cost of fuel was very high as compared to the free human power.
- iii. Poor financial planning and inadequate data collection on the availability of water in the area

##### **Remedial measures**

- i. As finance is one of the big problems for sustainability of the system then the community should be convinced to pay for the service. Villagers should raise sufficient fund at least to cover operation and minor maintenance costs. This

practice has been found to create the sense of ownership and responsibility with in the villagers for proper operation and maintenance.

- ii. Attention should be given to financial planning and adequate data collection on the availability of water to make efficient use of available sources.
- iii. Areas with high water yield should be identified in the early project planning phases and then the appropriate type of scheme need to be selected with low running cost. Therefore, water supply System must be designed for simple, trouble free operation and low running cost.

Generally, sustainability of most schemes is not in a good condition. Most of the sample schemes are not functioning properly. The structures are cracked, the pipes are broken and going to disappear before expected period of time. The schemes are expected to serve at least for 15-20 years. The evaluation of such development projects indicated that the underlying causes of un sustainability is related to the poor project planning and decision-making processes, particularly the failure of planners to consider the implications of technical, economical, environmental, human health and social criteria. For example,

1. In Amburse where necessary part for repair (such as pressure reducing valve ordered from Dubai) cannot be obtained in the country and in Gagara complexity of fluoride treatment plant can be traced as insufficient initial consideration of *technical criteria*.
2. In Jarso-Hadana Gasoline powered pumps where the cost of gasoline is prohibitive and in Gagara where the high cost of fluoride treatment should have been identified by analysis of *economic criteria*.
3. In Wera-Lalo where latrine located near to well site and in Gagara lack of appropriate waste water disposal sites fail to meet *environmental and human health criteria*.
4. In all projects where latrines where not regularly used may have been avoided by careful consideration of *social criteria*.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

The main objective of this research was to evaluate rural water supply and sanitation project planning practice from sustainability perspectives and make analysis on how it relates with sustainability of the projects. A case study research was conducted in the work of Misrak Badawacho woreda water resources office in fulfilling the objective. For achieving the objective, mixed approach of both qualitative and quantitative research methodologies were employed.

Conventionally, different approaches have been used to evaluate sustainability of water supply and sanitation projects and related issues at project level. However, it is very recently that the five key sustainability criteria are being employed to uncover the multidimensional aspect of project sustainability. In this research, technical, economic, environmental, human health and social criteria were applied as a framework for evaluating the sustainability of the sample projects in holistic way. Based on the findings and discussions the following conclusions could be made:

1. Demand assessment and baseline surveys were not conducted during water supply and sanitation project planning phase. Professionals were deciding the type and level of facilities without prior agreement of the beneficiary communities. Demand responsive approaches were not emphasized in project planning processes rather it was more of supply driven approach.
2. Decision-making processes by NGOs were generally found to exclude the involvement of local government in project planning. However, much emphasis was not given to ongoing contact with the beneficiary community post-construction.
3. The participation of beneficiaries remains very poor, even non-existent, in the planning phase, and is often limited to provision of labor and local material during implementation. There was no strong community involvement in the project planning phase of their water supply and sanitation development projects.

Beneficiary communities were mainly involved in implementing water and sanitation projects but not in other life cycles. Even, their participation was not more than labor and materials contribution.

4. It is found that the degree of community engagement in and control over decision-making outcomes was strongly linked to the sustainability of the systems.
5. One of the major sustainability constraints revealed was detail calculation of ongoing economic costs associated with potential options, and demonstration that funds can and will be made available to meet the costs of the chosen option in a long run.
6. In general water supply and sanitation project planning practice did not consider inclusion of sustainability criteria in the holistic way. Likewise, a long-term view of sustainability with respect to all primary criteria in water and sanitation related decisions was not yet taking place in the woreda, which were sometimes performed poorly. When key factors were considered in project planning, projects lead to sustainability and when not considered or absent lead to project failure. Fore example, in the Gagara project, the cost of fluoride treated water is unaffordable in the capacity level of beneficiaries and people were using both untreated water and water from unimproved sources. 80% of respondents in the same project said the cost of water is expensive. Still in Jarso-Hadana community preferred to use hand dug well fitted with hand pump instead of motorized deep borehole due to low cost advantage. This indicates there is a strong relation ship between factors for sustainable projects and sustainability of sample projects.

## **Recommendations**

Based on the conclusion made and lessons drawn to mitigate the major challenges of the unsustainable water supply and sanitation development projects and hence to achieve sustainable projects the following key remarks are recommended.

1. Demand assessment and baseline surveys need to be part of water supply and sanitation project planning process. Since demand responsive approaches are very crucial to make the services sustainable. Therefore, before deciding on the type and level of facilities or type of technology used, be it for water or sanitation, there should be consultation of the beneficiary communities.
2. Participation of stakeholders in all parts of project planning and decision-making should be given due attention. This is very important in yielding community responsibility for operation and maintenance activities, and to have cooperation from stakeholders in the sector development work.
3. Although complete dominance is not always appropriate, a high degree of community participation in water supply and sanitation project planning and decision-making processes should be given to the community since strong degree of participation in the development work positively impacts sustainability of the projects.
4. Projects need to place more emphasis on detail calculation of ongoing economic costs associated with potential options, and demonstrate that funds can and will be made available to meet the costs of the chosen option in a long run. The calculation of operation and maintenance costs associated with technical options considered in the project planning and decision-making processes needs to be with in the capacity level of beneficiary community.
5. Consideration of all the sustainability criteria is necessary in water supply and sanitation project planning and decision-making processes. Although at present it is poorly implemented and not sufficient for sustainable services, incorporating all the sustainability criteria in to water supply and sanitation project development decision-making is necessary. Therefore, there is a need for holistic consideration

of the long term implications to all the sustainability areas. In addition, appropriate water or sanitation related project planning tools and frame works for the future projects should be identified and used in the rural water supply and sanitation project planning processes.

6. Due to its high fluoride content and the resulting cost for the treatment the Gagara deep borehole currently might need to abandon. There is alternative fluoride free source at near by village called 'Edo' which does not incur any cost for treatment. This source should be upgraded and distributed for the two villages.
7. In the Jarso-Hadana project area different well histories shows that underground water is available at very shallow depth, which might not need to dig deep borehole. Due to their low cost and low depth water availability, hand dung and shallow wells are preferable in the area. Therefore, equipment such as Generator and the submersible pump should be transferred to new schemes or other deep boreholes with some technical problem.

To put the points in number 6 & 7 in to effect it needs further research. It is also important to undertake further and detailed study that would address in-depth the issues of sustainability.

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***Annex 1: Functionality Rate of Water Supply Systems in the Study Woreda***

S/N	System Types	Base year status ( Beginning of 2000 E.C)					
		Functional		Non-Functional		Total	
		Number	%	Number	%	Number	%
1	Hand dug well	2	100	—	—	2	100
2	Deep bore hole	28	80	5	20	35	100
3	Shallow Well	9	69.2	4	30.8	13	100
4	Spring with D.	—	—	—	—	—	—
5	On spot Spring	—	—	—	—	—	—
6	Roof Catch.	—	—	—	—	—	—
7	Dam	—	—	—	—	—	—
	<b>Total</b>	<b>39</b>		<b>9</b>			<b>48</b>

Source: Woreda Water Resource Office

## Annex 2

### *Type, Functionality, Level of Protection and Surrounding Neatness of the Observed Water Sources*

<b>Name of the project</b>	<b>Water source</b>	<b>Types of pumps</b>	<b>Functionality of water source</b>	<b>Main reason for functionality</b>	<b>Level of protection</b>	<b>Neatness of the surrounding</b>
Wera-Lalo	Deep borehole	Submersible	Well functioning	No disrepairs	Well protected	Not neat at all
	Shallow well	Indian mark II	Non-functional	Pump disrepair	Not well protected	Not neat at all
Amburse	Deep borehole	Submersible	Functioning with some breakage problems	Disrepairs of the faucets, pipes and valves	Well protected	Somewhat neat
Gagara	Deep borehole	Submersible	Functioning with some breakage problems	Disrepairs of the faucets and valves	Fairly protected	Not neat at all
Jarso-Hadana	Deep borehole	Submersible	Non-functional	No technical problem	Fairly protected	Somewhat neat
	Hand dug well	Afridev	Well functioning	No disrepair	Well protected	Somewhat neat

### Annex 3

Addis Ababa University  
College of Development Studies  
Water and Development

#### Questionnaire for Household Survey

**RESPONDENTS: Community leaders, Water Committees and Community Members**

This questionnaire is part of a research work, which is being conducted to evaluate rural water supply and sanitation project planning process from the angle of sustainability in Hadiya Zone. Answers to the questions will be used as a part of the efforts to find a solution to sustainability problems related to project planning. You are kindly requested to fill the questionnaire as truly as you can and your answer will be taken in confident.

#### General Information

Project: \_\_\_\_\_

Village: \_\_\_\_\_

Questionnaire number: \_\_\_\_\_

#### Part-I- Demographic and Socio-Economic Characteristics of the Respondents

##### 1.1.Respondents Demographic Characteristics

<i>Sex</i>	<i>Age</i>	<i>Household size</i>	<i>Education status</i>
1.Female 2.Male			1. Illiterate 2. Read & write 3. Primary (1-8 <sup>th</sup> grade) 4.Secondary(9-12 <sup>th</sup> grade) 5. Above secondary

1.2. What is your family's Economic base?

- A. Farming                      B. Petty trade                      C. Others, (specify) \_\_\_\_\_

1.3. What is the estimated yearly income of you household?

1.4. What is your housing condition?

- A. Wood walls and Grass thatched                      B. Wood walls and Corrugated iron roof  
C. Stone wall and Corrugated iron roof                      D. Other, (specify) \_\_\_\_\_

## **PART II- DEMAND DRIVEN NESS OF THE PROJECT**

### **A. HOUSEHOLD DEMAND FOR IMPROVED WATER SUPPLY SERVICE**

2.1. Was water a first priority among other social problems to your family?

- A. Yes                                      B. No

2.2. Are you willing to pay for clean water supply service?

- A. Yes                                      B. No

If yes, how much do you pay for 25 liters (One Jeri can) of water? \_\_\_\_\_

2.3. What is your perception about the cost of water you are paying?

- A. Expensive                              B. Faire                              C. Cheap

2.4. Who initiated your water supply project development?

- A. Community                              B. Government  
C. NGO                                      D. Others (specify) \_\_\_\_\_

2.5. What is the estimated walking distance of the current water supply source?

- A. Remote                                      B. Medium distance                              C. Near

2.6. Is there frequent queues?

- A. Yes                                      B. No

If yes, for how long? \_\_\_\_\_

2.7. How frequent do you or family members fetch water each day?

- A. Once                                      B. Twice  
C. Three times                              D. More than three times

2.8. For what purpose do you use water?

- A. Drinking Only                              B. Drinking and Cooking  
C. Drinking, Cooking and Washing Clothes  
D. Drinking, Cooking, Washing Clothes and Bathing

2.9. How much water is consumed per day on average by your family?

In 25 liters of jar can \_\_\_\_\_

2.10. Are you satisfied with the amount of water consumed in dry season?

A. Yes                      B. No

2.11. Are you satisfied with the amount of water consumed in wet season?

A. Yes                      B. No

2.12. How do you evaluate your Satisfaction with the general water supply services?

A. Poor                      B. Satisfactory              C Good

**B. HOUSEHOLD DEMAND FOR BASIC SANITATION SERVICE**

2.13. Have you ever discussed the idea of using Latrine with your family?

A. Yes                                      B. No

2.14. Do you have Latrines?

A. Yes                                      B. No

If No, why? \_\_\_\_\_

2.15. Is the latrine covered?

A. Yes                                      B. No

2.16. Are there hand washing facilities near the Latrine?

A. Yes                                      B. No

2.17. How far away is the Latrine that your family members most frequently use?

A. Remote                      B. Medium distance              C. Near

2.18. Who initiated your sanitation development project?

A. Community                      B. Government  
C. NGO                                      D. Others (specify) \_\_\_\_\_

2.19. How is your satisfaction with the Latrine you are using?

A. Not satisfied                      B. Satisfied                      C. Very satisfied

If not satisfied, why? \_\_\_\_\_



3.5. Have you participated in calculating ongoing operation and maintenance costs?

A. Yes

B. No

If yes, explain how transparent water committee is with regard to income accrued from water services and expenditures?

3.6. Have you ever participated community meetings voluntarily to sustain the existing water supply facilities?

A. Yes

B. No

If No, Why? \_\_\_\_\_

3.7. What function of participation did you have in the over all project development?

A. Project Planning

B. Project Management

C. Project Implementation

D. Project Monitoring and Evaluation

E. Other (specify) \_\_\_\_\_

3.8. Did all family members pass the decision to have latrine?

A. Yes

B. No

3.9. The type and level of water and sanitation services was chosen by the

A. Users

B. Health professionals

C. Water Institutions

D. Kebele leaders

E. Others, specify \_\_\_\_\_

#### **PART-IV OPERATION AND MAINTENANCE**

4.1. What is the current status of protected water supply source?

A. Functioning

B. Not functioning

If Not functioning, what are the reasons? \_\_\_\_\_

4.2. Are there efforts made to maintain water supply facilities when they break down?

A. Yes

B. No

If No, why? \_\_\_\_\_

4.3. Have you acquired the relevant skill about the operation and maintenance of water supply facilities?

A. Yes

B. No

4.4. What is the current status of Latrine?

A. Functioning

B. Not functioning

4.5. What will you do when the Latrine being used is full?

A. Digging another latrine

B. Emptying and using it again

C. Open defecation

D. Others, specify \_\_\_\_\_

4.6. Is there management plan for your water supply scheme?

A. Yes

B. No

If yes, describe the main parts of a simple management plan?

4.7. How does operation and maintenance (O & M) of the water schemes done?

#### **PART-V OVERALL PROJECT EVALUATION**

5.1. Evaluate your water supply and sanitation project from sustainability standpoints.

Identify whether the project is efficiently and efficiently completed or not and the over all Goals of the project are achieved (Use your experience over time).

<b>No</b>	<b>Statements</b>	<b>Yes</b>	<b>No</b>
1	All the scheduled works for the water project were completed on time		
2	Majority of the people participated in the water development project		
3	Key government officials got involved in the construction and maintenance of water project		
4	We have sufficient and continues water supply in our community		
5	We have clean water for drinking and domestic use		
6	We have affordable water in our community		
7	No one get sick due to the water any more		

5.2. Evaluate your water supply and sanitation project from sustainability standpoint (Use your experience over time). Indicate your agreement with the statements given below by marking “X” in front of each number in the five columns.

**1. Very Poor 2. Poor 3. Satisfactory 4. Good 5. Very good**

No	Statements	1	2	3	4	5
	<b>Key Sustainability Factors</b>					
1	Fee collection for operation and maintenance and to acquire funds for the further improvement of the project					
2	Continues support from government and funding agencies for capital expenses					
3	Understandability of the way system works (i.e. how it works)					
4	Meetings announced to enable the majority to be involved in planning process					
5	Ownership of the project to take good care of it					
6	Effort made to improve the cleanness of the surroundings of the water sources to decrease contamination possibility					
7	Management of drainage around the water points (i.e. waste water does not pollute the environment)					
8	Cleanness of water at the source (i.e. free from pathogens and hazardous chemicals)					
9	Disposal of sanitation product safely (i.e. waste water and fecal materials)					
10	Availability of water year round in the system					
11	Simplicity of the system construction (i.e. the system does not have complex parts or overly complex Construction)					
12	The quality of construction (i.e. well built )					

## Annex 4

### Check List for Focus Group Discussion

Project Name----- Date -----

Number of Discussants: Male ----- Female ----- Total -----

1. Did you have voice and say in the development process of the water supply and sanitation systems? (Demands and needs; type and costs of the technology to be installed; choice of scheme type, location of water points and laterines, etc)
2. Who decided on scheme types, technology selection, location of water points etc?
3. Who determines level and type of services?
4. How do you see the match of all users with the services?
5. Did the community meetings held in your community to discuss on water supply, sanitation and hygiene issues?
6. What benefits do you hope for from the new water supply and sanitation systems?
7. How do you evaluate the project planning processes employed in practice so that the project could serve for long time?



## Annex 5

### Discussion Guide for Key Informants Interview with Experts in the Woreda and Zone Water Resources Offices, Woreda Health Office, and Ministry of Water and Energy

Name of Interviewee ----- Position -----

Organization ----- Date of Interview -----

1. How was project proposal developed? How did project planning and decision-making processes take place?
2. Is there any approved standard in rural water supply project planning? (i.e. construction, type of technology, affordability, maintainability, level of service etc).
3. How do you evaluate community participation in project planning?
4. Was TOR prepared for the project plan preparation? If yes, how much the project planners were adhered to it?
5. Have you collected data required for planning and reached on consensus with the users on issues of technology options, siting, maintenance, money-collection and management, integration of sanitation and hygiene activities with water supply development activities?
6. What is being done to make water and sanitation services sustainable?
7. What do you think makes a good sanitation system?
8. What are the most important steps in planning for a good water supply project?
9. Describe a project in your experience that was successful in the long-term. Why was it successful? How was the need identified, the project planned, the technology chosen, and the community involved? Would you do anything differently given the opportunity to repeat it?
10. How important are the following factors in the success of rural water supply and sanitation projects? Having the community involved in planning for the project; having the community initiate the project; explicitly considering all area of sustainability in technology choice (economic, Social, environmental, human health, and technical); the relation ship between the beneficiary community and implementing body.
11. Have you seen unsuccessful projects? Please describe, what went wrong?
12. From your experience, what are the most common causes of project failure in your Zone or Woreda?
13. Was sustainability of the project adequately addressed during the designing stage of the project? How?
14. What strategies are in place to ensure sustainability of the project?

## **Annex 6**

### **Checklist for Direct Observation**

Project -----

Date of Observation -----

#### **A. Water Supply**

1. Location of the scheme.
  - Is it accessible?
2. Status of the scheme
  - Is it functioning?
  - The condition of the source, reservoir, distribution points, pipes, faucets etc
3. Number of people waiting for water
4. Cleanness and Protection around water sources
5. Quality of water (i.e. smell/ test/ color)
6. Quantity of Water

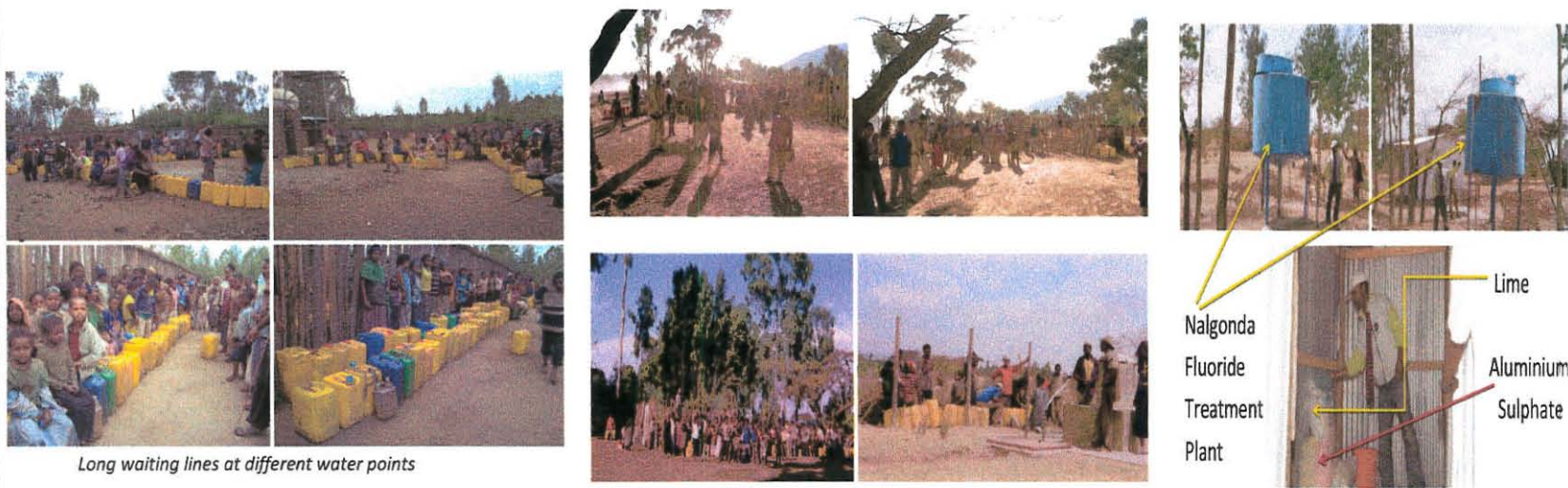
#### **A. Sanitation**

1. Existence of Latrines
2. Cleanness of latrine
3. Observe the existence of hand washing facilities

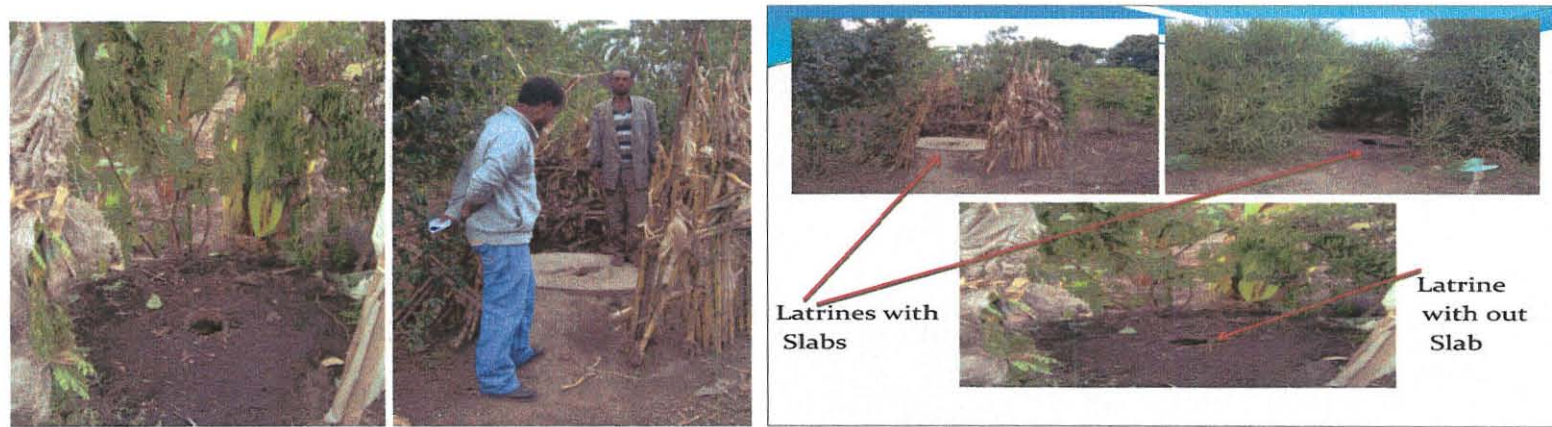
### List and Background of Key Informants

S/N	Name	Organization	Position in the Organization	Educational Level	Profession/ Subject
1	Ato Mulugeta Dejene	Woreda Water Resource Office	Operation and Maintenance Expert	Diploma	Electro-mechanical Engineering
2	Ato Solomon Tekilehanna	Woreda Water Resource Office	Hydraulic and Design Engineer	Diploma	Hydraulic Engineering
3	Ato Tesema Hegana	Woreda Water Resource Office	Head of the Office	Bsc	Chemistry
4	Ato Bereket Wondimu	Zone Water Mineral and Energy Department	Chief Hydraulic & Design Engineer	Bsc	Hydraulic Engineering
5	Ato Mesfin Moloro	Zone Water Mineral and Energy Department	Head of the Department	Bsc	Civil Engineering
6	Ato Biruk Elias	Woreda Health office	Head of the Office	Diploma	Public health
7	Teriku Bekele	Woreda Water Resource Office	Sanitation Expert	Diploma	Sanitary Engineer
8	Ato Asefa Biru	Ministry of Water and Energy	Consultant for World Bank Projects	Msc	Civil Engineer
9	Ato Birhanu Wondafer	Ministry of Water and Energy	Consultant for World Bank Projects	Msc	Hydro geologist
10	Dr. Alemayew Mekonin	Ministry of Water and Energy	Rural Water Supply and Sanitation Technical expert	PhD	Engineer
11	Ato Nuredin Mohamed	Ministry of Water and Energy	Rural Water Supply and Sanitation cordinator	Msc	Civil Engineer
12	Zemene Worku	Ministry of Water and Energy	Rural Water Supply and Sanitation sector Expert	Msc	Environmentalist

*Some Pictures taken during data collection that could help for further visualization of the study projects*



*Water Supply Access Conditions*



*Sample Latrines*