ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

The role of women in water resource management, In case of Enderta woreda, Tigray region, Ethiopia

By

Amleset G/her

June, 2011

Addis Ababa

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A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Masters of Arts in Geography and Environmental Studies.

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Approval Page

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Acronyms

AGRIS	International bibliographic Information System for the Agricultural Sciences and Technology
FAO	Food and Agricultural Organization
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focus Group Discussion
GWA	Global Water Alliance
GWP	Global Water Partnership
ICCPR	International Covenant on Civil and Political Rights
ICRAF	International Center for Research in Agro forestry
IDRC	International Development Research Center
MDGs	Millennium Development Goals
MOWR	Ministry Of Water Resource
NGO	Non-Governmental Organization
NWRMP	National Water Resource Management Policy
REST	Relief Society of Tigray
TAC	Technical Advisory Committee
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
UNIFEM	United nation Development Fund for Women
WHO	World Health Organization
WRM	Water Resource Management
WWAP	World Water Assessment Programme

Definition of Operational Terms

Culture – is the enduring behavior or attitudes brought about by a desire to follow the beliefs or standards of other people.

Empowerment – it is about people pursuing their own goals, living according to their own values, developing self-reliance and being able to make choices and influence both individually and collectively the decisions that affect their lives.

Empowering women – is a situation that enables women to have equal opportunities with men for participating in development process.

Gender – refers to the Social and Cultural meaning of being male or female that includes socially constructed roles, responsibilities and expectations by women and men themselves in a given society.

Gender equality – means fair treatment for both women and men, according to their respective needs.

Gender mainstreaming – is the process by which reducing the gaps in development opportunities between women and men and working towards equality between them.

Gender stereotypes – reflects those traditional practices that are over simplified but strongly held ideas about characteristics of male and female.

Kushet – village

Patriarchy - a hierarchical social system and way of thinking where 'fathers' or 'patriarchs' rule which has become a major form of domination and subordination. The term 'patriarchal' refers to power relation in which women's interests are subordinated to the interest of men.

Tabia – sub-district

Woreda – district

Water Services Fee (charge):- Fees charged for water supply services only.

Abstract

This study deals with roles of women in water resource management in Enderta woreda, specifically in Didba and Shibta Tabias. The major purpose of the study is identifying factors that affect women's participation in management positions and methods of enhancement. The subjects of the study were 120 dwellers of the two Tabias and 3 officials of the water sector and water project staff members of the woreda. Besides this, documents and observation were used to gather data that can not be obtained through questionnaires and interview, and also documents were used to supplement the data collected from primary sources. The instruments for data collection were interview, questionnaires, observation, FGD and document analysis. The collected data were analyzed both qualitatively and quantitatively. The following are findings and conclusions of the study.

It was evidenced that the role of women in water management is high, especially in domestic level and the willingness to participate in external water issues were increased, but the decision making power never reached equality between men and women. The analysis shows that even though there are few women in the water committee of the local community and the water resource management sector, still their participation in decision making is insignificant. Even today, the society confirms the supremacy of men over women. As a result the policy at national levels as well as the regional level which emphasized on women's participation in water resource management has become elusive its implementations. On the evidence of the study results, there are different barriers for women's participation in management. The most frequently mentioned barriers are socio-cultural barriers, women's low educational success and access in the country and low number of women in the office as managerial staff.

Finally, the main measures to be taken to enhance women's participation in management position is mainly depends on better addressing gender gaps in the country and the level of attention given for gender issues in the water sector.

CHAPTER ONE

Introduction

1.1. Background of the Study

Access to adequate water (in terms of quality and quantity) for cooking, drinking, and washing purposes is a necessity for preserving a population's good level of health (Charlotte, 2001). The earth holds more than 300 million cubic miles of water beneath the land surface and on the surface and in the atmosphere (Andy and William, 1995). However, access to adequate quantities of good-quality water is difficult without proper and effective management of water resources.

Water management has a long history going back to the attempts in prehistoric times in response to seasonal changes in water availability. Water management was crucial during the transition from hunting-gathering to farming and has become yet more important with the emergence of cities, industries and administrative centers (UNICEF, 2009).

Although it has a long history, there are still many inconsistencies and conflicts regarding the practice of water resource management. Water problems are not all related to the scarcity of quantity only (Michael, 1998). One error derived from water resource planning and management begins when male needs and priorities provide a standard against which female interests are measured and often minimized. In most third world countries, household water provision is still a female responsibility. In other words, women are seen as having first line responsibility for the maintenance of family health, they are thought to have a special interest in a responsibility for water and sanitation.

However, the participation of women in decision making process is much lower, only about 4 % (ICRAF, 1999). In developing countries, men are seen to be decision makers and women are not given an equal voice in deciding on key issues which directly affect their lives, including those related to water resource management.

According to Rathgeber (1996), the participation of women in decision making can help to consider various factors when deciding where they will obtain water. Water planners often take a somewhat linear approach to water –sourcing, thinking that women and men will make choices

based exclusively on cost-benefit analysis in terms of time, convenience and water quality. However, numerous other factors come in to play and at different times of the year and for different intended purposes, water choice may be driven by a set of unquantifiable perceptions.

Today, different international organizations, like FAO, WHO, World Bank and other national as well as local organizations and researchers recognized the role of women in water resource management. Despite their efforts, the problem of gender based discrimination exists, particularly in developing countries. In Ethiopia, there is a gender based job classification and low participation of women in water resource management. Obviously, the gender based job classification is high in rural areas.

This study tries to assess the role of women in water resource management in Enderta woreda, a rural community in Tigray, Ethiopia.

1.2. Statement of the Problem

Being one of the most important key elements influencing public health, well being, the preservation of ecosystems and the economic development of a country, water is a natural, yet limited resource indicates that it is 'under pressure' (TAC, 1996). Thus, planning, management and preservation of water is essential. Fundamental to water resource planning and management is an understanding of the availability of water and a notion of how much of it will be needed, in what quantity, for how long and for what purposes.

In addition to the above fundamentals, there is also a need to understand the actors in water use. It is understood that, women are the closest actors for water. As a result the ties between women and water are numerous yet they face considerable inequality, such as limited access to important positions of decision making in water related issues. Only some are recognized by mainstream culture or activism, the ways in which women are tied to water are often used as ways to promote the adoption of sustainable water practice. Gathering, storing and using water takes up the majority of the day for many women throughout the developing world.

However, Women's participation in decision making and as water resource managers is uncommon. Because of the traditional attitudes and beliefs of the society, Household water

provision is still a female responsibility in most African societies, especially in the rural areas (Rathgeber, 1996).

Like those of other African countries, Ethiopian women are not significant decision makers in almost all water management issues. It's not because they are less efficient, but because they have limited access to necessary inputs, as a result of those various cultural norms. The earlier perceptions on the profile of a person who thought to be most likely effective leader led to the assumption that the ideal leader is a man.

In fact, even today many people assume that men can lead and women cannot, based on the argument that women cannot make full time open ended commitment to their careers. This assumption has its own impact on the role of women in water resource management.

Potable water supply coverage is still only 22 % in rural Tigray (REST, 2000). As a result, the distance traveled and time taken to fetch water has negative consequence for health and for economic productivity. The main burden to feed families and negative impact tends to fall on women, who are traditionally responsible for maintaining the household water supply and on their children. Hence, the Relief Society of Tigray (REST) tries to minimize the burden on women and to maximize their participation on water issues. However, the program has problems in its implementation and it is not achieving what it had intended in terms of 'improving women's social status and traditional role structure in water management.'

Consequently, if the intended program was not achieved and women's were remain backward from modern achievements and roles in the water management it needs a study to identify and improve the barriers that hinder the programs achievement as well as women's participation.

Enderta woreda, southern administrative zone of Tigray, is the site for the study. Water for human consumption is collected from deep wells; shallow hand dug wells, springs and minor rivers. Like other parts of Tigray, water for household is collected by women and girls. Similarly, women's role in water issue remains collecting, storing and using for various purposes rather than to participate in decision making. So, the study tries to find out the role of women in water resource management in Enderta woreda as its result may help to create a general over view about the status of women society, especially in relation to water and women in Enderta woreda.

1.3. Research Questions

The study attempts to answer the following guiding questions.

- What is the importance of women's participation in water resource management?
- What are the major factors that hinder women's participation in water resource management?
- Are there any mechanisms to improve women's participation in water resource management?
- Is there any training to change societies' attitude towards women's role in water resource management?

1.4. Objectives of the Study

The main objective of this study is to identify and understand the role of women in water resource management in the selected villages of Enderta woreda.

Specifically, the study aims at the following specific objectives.

- To identify factors that affect women's participation in water resource management.
- To show the importance of women's participation in water resource management.
- To identify methods of improving women's participation in water resource management.
- To assess the need for improvement and develop the management capacity of women.

1.5. Significance of the Study

Due to cultural influences and burden on women, their role or participation in water resource management is very much low, particularly in developing countries.

Therefore, the study is aimed at increasing awareness about the role of women in water resource management.

Moreover, it gives foundation for other researchers who are interested to study it more in detail. Finally, as this study deals with the role of women in water resource management, it draws government attention and other concerned organizations on women's participation in policy and decision making.

1.6. Scope of the Study

Currently Enderta woreda has sixty nine sub- districts (Tabias). This study mainly focused on two selected sub-districts. These are Didba and Shibta which are selected purposively by considering the activities of Relief Society of Tigray (REST) and the woreda water sector. There is a continuous activity to improve water supply, so the researcher deals on women's participation on those water related programs of the woreda.

1.7. Research Design and Methodology

The study employed both qualitative and quantitative research methods. The target population which used for this study was dwellers of the selected villages and key officials from Enderta woreda's department of water resource management. Moreover, the researcher used a descriptive study design to show the role of women in water resource management among the residents of selected villages.

1.7.1. Source of Data and Tools of Data Collection

The study used both primary and secondary data sources. The primary data was collected using questionnaire, interview, focus group discussion and observations. The secondary data were collected from published and unpublished materials which are available in the form of journals, articles, internet sources, proclamations, policies, reports and guidelines.

1.7.2. Sample Size and Sampling

Usually, the population of a study area might be too large for a researcher to attempt to survey all of its members. A small, but carefully chosen sample can be used to represent the study community. To a greater extent the sample is expected to reflect the characteristics of the population from which it is drawn. Furthermore, Enderta woreda has 69 sub-districts. Because of that, the researcher used a cluster sampling technique. First, the researcher selected two Tabia (sub-district) out of sixty nine sub-districts. Secondly, one village was selected purposively from each two Tabia based on the various activities of water resource development activities. Therefore in this study, data were collected from a total sample of 120(60 from Meremety and 60 from Shafat) and three concerned officials of water sector and project group. The target population was selected using simple random sampling.

1.7.3. Procedures of Data Collection and Analysis

Before administering the questionnaire, it was translated in to Tigrigna to make communication easier. Additionally the researcher employed two data collectors who took intensive training on how to collect it. Moreover, observation was used to triangulate the data collected by questionnaire and interview. The researcher conducted the interview, observation and document analysis. The questionnaires were distributed and collected by the enumerators in each village.

1.7.4. Data Analysis

After that, all the responses obtained from key informant interviews, the focus group discussions and the open-ended questions included in the questionnaire were analyzed qualitatively. To help showing the clear picture of the situations some of their verbatim are quoted directly. In regard to the quantitative data analysis, the generated data were expressed in terms of tables and percentages that could reflect the true nature of information collected from respondents.

1.8. Limitation of the Study

The major limitation in under taking this study was the absence of detailed and in-depth documented reports on women's activity and their achievements in the study area as well as at woreda level. Besides, though an effort was made to reveal the roles and attitude of women on currently developed water projects and their situation in general. They were not able to tell and they said that 'ask him (husband), he knows everything about me.'

1.9. Background of the Study Area

This section deals with the major physical, human, economic and water project history in Enderta Woreda.

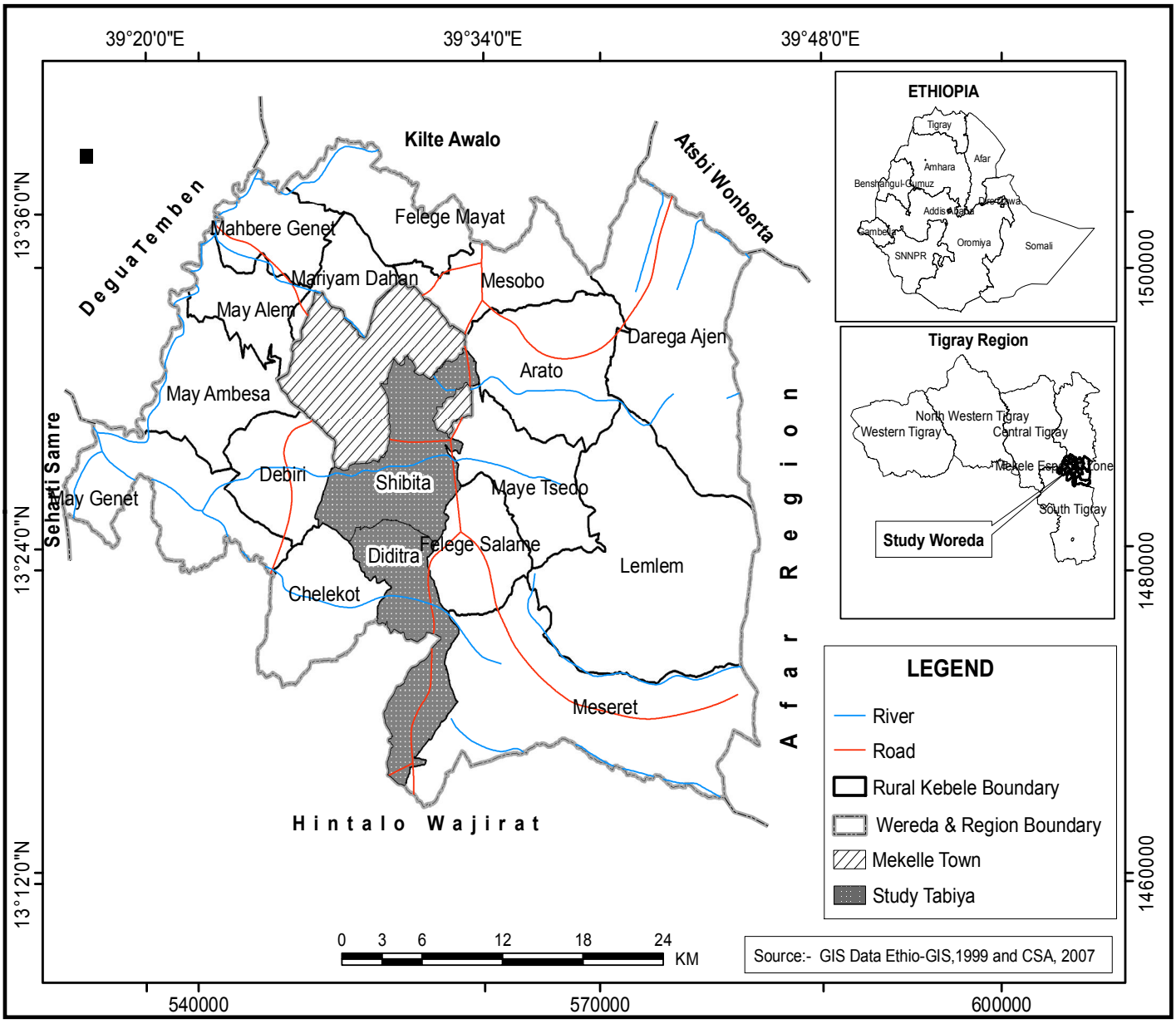

Figure 1.1: Enderta woreda and Study Tabia

1.9.1. Location

Enderta is one of the 36 woreda's in the Tigray Region of Ethiopia and is one of the drought prone and chronic food deficient woreda's in the region. It is bounded by Hintalo wajerat in the South, Samre-seharti and Degua-tembien woreda's in the West, Wukro woreda in the north Afar Region in the east. Geographically, the woreda is located between 13^0-14^0 north and at 39^0-40^0 30' east. The woreda covers a total land area of 1446.49 square kilometers.

1.9.2. Geology and Terrain situation

The land is rocky with limestone and marble resources that are currently being extracted by private investors. Land escape formation of the woreda is mostly plains and hills, with bush scrub vegetation. As a result of continuous land exploitation by manmade and natural calamities, the land is severely eroded and the soils are low in their fertility.

1.9.3. Drainage System

The Berki River, which originates in the highlands of Tigray and flows to join Giba River, a tributary of the River Tekeze, which ultimately joins the Nile, is located in the upstream of the Enderta woreda. The size of the catchement is about 410 Km^2.

1.9.4. Agro-Ecology and Climatic condition

It lies in the *woina dega* (midland) agro-ecology, characterized by dry climatic conditions and erratic annual rainfall of 450-600mm. It is known by having uni-modal rainfall pattern that covers from June to September. Small area (16%) of the woreda has bimodal rainfall pattern. the average minimum and maximum temperature is 15^0 and 27^0c respectively.

1.9.5. Land Use

The woreda has a total area of 193,309 hectares, of which the total cultivated land covers 49.03%. This indicates the fields inside the land use for 'agriculture' and 'agriculture and degradation control'. This agricultural land contains 48.48% of annual rain fed crops and 0.55% of irrigated crops. The average land holding size per household is 0.75 hectare. Residential, nurseries and recreational land use patterns cover a large portion of the woreda next to agriculture.

1.9.6. Demography

This is a moderately populated zone. The total population is estimated at 114,277 of these 57,472(50.3%) are male and 56,805(49.7%) are female in the year 2007 (Central Statistics Agency 2007). Out of the total population almost all (100%) the population is living in rural areas. Average family size is five and population density of the woreda is 79 people per square kilometer.

1.9.7. Economic Activity

Crop and Livestock production are the main economic activities in the woreda. More than 80% of the population living in the woreda is engaged in subsistence farming with land holding size less than one hectare. Agriculture is the most dominant source of food and/or income to lead their livelihoods in the woreda. The agricultural fields are fragmented over a wide range of different land forms. The farmers use animals usually oxen as the main source of power with small traditional agricultural equipment to plough their lands, where respecting of the land ploughing calendar is affected by the availability of oxen (Esser and Vagen 2002). Cattle are the most productive asset, after land, mainly owned by better-off households. Milk production increases income from butter sales.

1.9.8. Water Projects and Water Coverage

In Enderta woreda, water projects were began in the 1990s with the dam locally named as "Wedi Cheber". It was constructed by SART, an NGO in Tigray which emphasized on water and sanitation programs. Officially, water projects which focused on drinking water were started in 1998. According to the reports in the woreda about 73 large and small projects of dam, check dam, diversion, and source development were constructed in corporation of Enderta woreda water resource and Energy Bureau and REST. The water resource department has two groups; water resource group and irrigation group. Those groups have a responsibility of encouraging and mentoring water committee and irrigation committee of each village.

Concerning the water coverage, 67.84% and 54.8% of the households in Tabia Didba and Shibta, respectively, had access to safe drinking water. In general as the report in Enderta woreda indicated, 79.5% of all households in the woreda had access to safe drinking water.

1.10. Organization of the Paper

This thesis is organized in to four parts. The first part is an introductory part which includes background of the study (introduction), statement of the problem, research questions, objectives, significance, scope, limitation of the study, methodology(Source of Data and Tools of Data Collection, Sample Size and Sampling, Procedures of Data Collection and Analysis) and the background of the study area.

The rest three parts are about related literatures, results of the study and conclusions and recommendations based on the results.

CHAPTER TWO

Literature Review

2.1. General Overview on water Resource

Water resources are sources of water that are useful or potentially useful to humans. Uses of water include agricultural, industrial, household, recreational and environmental activities. According to Speidal et.al (1988), ‘’the earth is water world’’. From the outer space the oceans are visible as great swirls of blue, green and grey covering over 71 % of the surface. The blue-white of ice and snow cover another 3.5 % (Ibid). Below patches, linear streaks of clouds are lakes and rivers, ponds and streams; unseen beneath the surface are reservoirs of ground water. As its vastness, water is one of the most important natural resources because access to safe water as well as for agricultural, industrial and environmental activities is vital for survival (Tegegne Mekonnen, 2009).

Moreover, access to adequate amount of clean water is essential for maintaining good health and access to water for agriculture is essential for food production (Kulundwa and Lein, 2008). As Fasil Kebede (2009) stated ‘’irrigation is the most common means of ensuring sustainable agriculture and coping with inadequate rainfall and drought’’. In Ethiopia as well as many countries in the world, water is used for hydropower generation.

However, as defined in Tegegne Mekonnen (2009) which is from the documents of World Bank (2001), despite significant investments in water sector, the outlook on access to safe water remains grim globally. In addition to that, he explained rural Africans have the lowest level of access to clean water and sanitation when compared to other developing areas of the world as reported by UNESCO-WWAP (2003).

2.2. Perspectives on Water

The relationship between man and nature in traditional human rights concept of the western culture is that man has absolute, unquestionable right over nature (The Eye on Ethiopia and the Horn of Africa, 2003). Similarly, water is also considered as infinite resource.

Until recently, concern about water usually occurred only when it was not available to us in the amounts we wanted or when it was present in over abundance (as in floods) or when its usefulness was limited by pollution (Speidel et. al, 1988). Today there is a growing awareness on the importance of water, of the key role it plays in supporting the society and the various problems other than drought and floods involved in its use.

According to Technical Advisory Committee (TAC) of Global Water Partnership (1996), water is ''a resource under pressure''. As noted, the world's fresh water resources are under increasing pressure because of the growth in population, increased economic activity and social inequity lead to increased competition for and conflicts over the limited fresh water resource.

2.3. Definition and Concept of Water Resource Management

Eroglu (2007), in his study about water resource management in Turkey, defined water resource management as; ''the wholeness that collects all the conditions and methods related to the determination and planning of need concerned with water resources, rational water use, detailed observation, efficient protection under its framework''.

According to Eroglu (2007), in order to guarantee the supply of water in required place and at required time with sufficient and quality and to protect people and their activities from damaging effects of water resource development projects of different content and scope. As he noted, major targets of WRM of which the water resource is basic elements are;

- Determination of existing and future qualitative and quantitative characteristics of surface and ground water resources, evaluation of supply possibilities.
- Determination, planning and arrangement of community water demands.
- Formation of water balances, collection of factors that will provide continuity of these balances and development of a long term strategy for national use of water resources.
- Monitoring of water resources in order to protect them from pollution and exhaustion.
- Designation of processes in water systems and operational conditions.
- Make it possible the multipurpose utilization of water resources, determination of priorities of these purposes and re-evaluation of allocations.
- Improvement of rational water use.
- Provide sustainability of natural potential of water resources and protect them.

- Provide effective utilization of technical elements (e.g. reservoirs, treatment plants etc.) in order to protect communities from adverse effects of water resources.
- Benefits from managerial elements, economic instruments (e.g. prices, penalties etc), laws and regulations.

Other researchers also defined water resource management as ‘’a program that consists of development, processing, storage, distribution and optimum utilizing of water resources under defined water policies and regulations’’ (TAC, 1996).

2.4. Gender Issues in Water Resource Management

Gender is widely used and often misunderstood term (Momsen, 2004). Sometimes it conflicted with sex or used to refer only to women. Rathgeber (1996) in her report to IDRC noted that “donors and governments often use the term gender when addressing different needs with respect to water resources, they usually mean women”.

Obviously, women are the main carriers of water and the custodians of family hygiene in developing countries (IDRC, 1987). A study from Togo refers to women in the conjugal or family is a housewife occupied with a number of domestic tasks; the maintenance of the house, preparation of cooked meals, provisioning it with water and wood, washing clothes and dishes, raising small livestock, looking after the kitchen garden, education and care of children, and transformation of food stuffs (Ibid). In certain of these tasks women can count on the help of older children, whether boys or girls, but usually girls are more socially indicated to carry out certain tasks (preparing the fire, the ingredients for the sauce, fetching water, washing dishes, etc.). In addition to that, investigations by UNIFEM (2003) have verified that in most developing countries women are responsible for water management at the domestic and community level. Therefore, scarcity of water primarily affects the capacity of women in most rural parts. However, there is a limited access to resources and weaker ability to generate income whether in self employed activities or wage employment-constrain women’s power to influence resource allocation and investment decisions in the home, particularly in developing countries (Murutse Desta and G/Giorgis Haddis ,2006).

Sara Ahmed stated from the document of World Bank, water resources management policy (1993) 'Women who are trained to manage and maintain community water systems often perform better than men, because they are less likely to migrate, more accustomed to voluntary work and better entrusted to administer funds honestly' (Sara Ahmed, 2002).

Moreover, women in developing nations are usually in charge of securing water, food and fuel and of overseeing family health and diet. Therefore, they tend to put into immediate practice whatever they learn about nutrition and preserving the environment and natural resources (UNFPA, 2010).

Additionally, a study by the international water and sanitation center of community and water sanitation projects across 15 countries found that the projects that had full participation of women were more sustainable and effective than those that were not.

In the context of Ethiopia, patriarchal ideology and the traditional gender division of labor determine the social position of women that forces them to undertake productive, reproductive, community management roles and confine them to the traditional role of managing homes (Nigst, 2007). Thus, like in all other developing countries, women in Ethiopia play a vital role both as water supplier and water managers.

At the International Conference on water that took place in Johannesburg in (2002), the need to recognize the role of women in water policies and water management systems must be sensitive to gender issues and to insure their participation has been widely accepted. Moreover, the women's role in any sphere linked to water must be strengthened and their participation must be broadened (UNEP, 2005). Therefore, involvement of women in decision-making in relation to water resource is necessary. As Rathgeber (1996) stated, special efforts must be made to ensure women's participation at all organizational levels. However, focusing on women's roles in water and sanitation projects requires viewing and treating women as a part of total communities, rather than as a special or separate group. Gender relations could often lead to differences in opinions and interests as well as the capacity to act. More than anything else, water needs "integrated gender issues" (Ibid).

2.5. Factors that contribute to the Low Involvement of Women in Water Management

In practical terms, it is not that easy to attribute the low involvement of women in water resource management. According to Rathgeber (1996) "cultural patterns have an impact". In concordant to her, Claude (1993) stated that, women in Africa, especially those in rural areas suffer by comparison with men and with women in most other parts of the world as a result of cultural barriers interacting with low levels of economic development. A recent research in Tanzania suggested that 'women who participated in any meeting couldn't speak before men participants'. Also religious influence has its own role (Howland, 1999).

As expressed in the Bible, in the beginning God created the heavens and the earth……..So God created man in his own image ……and the rib which the Lord God had taken from the man he made in to a woman. (Eve eats the fruit of the tree of knowledge, expressly forbidden by God. In punishment they are cast out of Eden and God says to Eve), 'I will greatly multiply your pain in child bearing ……yet your desire shall be for your husband and he shall rule over you' (Genesis 2&3). As a result the society understood that women's were blocked from leadership roles by God and acceptance of women as a leader assumed disobeying for God's commandment (Jean et.al 1984).

In other side, the universal declaration of Human Rights (universal Declaration,1948) adopted by the UN proclaims that "all human beings are born free and equal in dignity and rights" yet women's freedom, dignity and equality are persistently compromised by law, custom and religious tradition in ways that men's are not, particularly in developing countries (Ibid). Mernissi (1987), as quoted by Howland describes that "Religions were developed to camouflage male dominance and package it as sacred, eternal and transcendent divine law". The reinforcement of patriarchy is the trait that Christian fundamentalism most clearly shares with the other forms of religious belief that have also been called "fundamentalist" (Howland, 1999). All Buddhism, Christianity, Hinduism, Islam and Judaism movements seek to control women and the expression of sexuality.

As noted by Howland (1999) fundamentalists argue that, men and women are by divine design "essentially" different and they aim to preserve the separation between public and private, male

and female, spheres of action and influence. However, the human rights committee, the monitory body of the ICCPR (International covenant on civil and political rights) provisions as allowing parents to ensure that their children receive a religious and moral education but that public schools are limited to teaching the general history of religion in a non discriminatory manner and only if it given "in a neutral and objective manner" because the "instruction in a particular religion or belief is inconsistent" with the ICCPR.

AS Rathgeber said also African women's capacity to have input into water resource use and management is further hampered by their lack of exposure to science and technology. To make informed choices and decisions, potential beneficiaries of water systems should have basic knowledge and understanding of the technologies involved. Women are disadvantaged because of their lack of confidence about technological matters and because of negative male attitudes toward female technical knowledge. Overall, UNESCO (1993) as cited in UNESCO (2006) revealed that in developing countries, especially in Africa, there are still historical, cultural and economic factors that have been hindering women's chances for access to and benefits from formal education especially at the tertiary level.

However, women's indigenous technical knowledge can and should form a solid basis for technology development activities, especially in water resource management sector (Howard, 2003). In some parts of the world such as China, there are more women in scientific fields. But there is still a similar disparity on their representation in policy making and in agricultural department (ICRAF, 1999).

2.6. Leadership difference between Female and Male

According to Hassan (2006), Female and male leaders did not differ in their use of an interpersonally oriented or task-oriented style on organizational studies (i.e holding leadership roles). However, women were some what gender stereotypic, using an interpersonal- oriented style in leadership studies using laboratory experiments and assessment studies. Roman (2005) in her thesis paper argues that women leaders follow participatory approach while men are more likely to use a directive command and control style. Some scholars explain women's leadership style to be more inclusive, flexible and they are more synchronic in their relationship to time, telescoping past, present and future. Man's leadership style is said to be more direct and factual

as opposed to the interpersonal style often used by women. Quoting from Hymowiz and Scheilhardt (1998), Roman has documented that recent study has found women tend to be more flexible in their leadership styles than men and engage different style and approaches (2005).

The World Bank policy research report named as "Engineering Development" depicts that "as there is more equal rights between women and men there is less corruption". It further states that where the influence of women in public life is greater the level of corruption is lower. Women in business are less likely to pay bribes to government officials, perhaps because women have higher standards of ethical behavior or greater risk a version. It is reasonable also to assume such ethics to have influence on leadership styles (2001).

Although studies show that women and men use power differently, the central emphasis should not necessarily examine the difference. Rather the major issue is that there is high disparity in the leadership positions when investigated from gender perspectives (Athukorala, 2007). According to her study, the world water council has 32 board members of whom 3 are women; the international water Quality Association has no women on board; and the steering committee of the Global water partnership includes only 2 women and 17 men. Nationally, there are very few women involved in the water sector at all levels of government.

In general, women tended to adopt a more democratic or participative style and a less autocratic or directive style than did men on all types of studies.

2.7. Importance of Women Empowerment

According to Sever (2005), women are often the primary users of water in domestic consumption, subsistence agriculture, health and sanitation. Women in many cases also take the primary role in educating children, in child and family health including sanitation and in caring for the sick. Understanding and empowering women will help to plan water interventions and policies which are based on the knowledge of how and why people make the choices they do in water use in order to meet their needs (ibid).

In addition to, advancing gender equality may be one of the best ways of saving the environment and countering the dangers of overcrowding and other adversities associated with population pressure. The voice of women is critically important for the world's future not just for women's

future, as noted by sen in Sisto (2003). However, men are often in control of budgets and planning and this may result in women's uses of water being given less importance than those of men. So as Sever (2005) noted, if women do not participate in management, they lose rights and privileges that they had before the project or programme began and may therefore in fact end up being more dependent on men.

As quoted in Aladuwake and Momsen (2010), according to Coles &Wallace (2005), the gendered nature of water use and management is a problem for effective and sustainable water resource management. Women's experience and knowledge should, therefore, be recognized and factored in to development projects aiming to manage and conserve water resources. Sustainable development requires women's full and equal participation in resource management and hence the issue of women's empowerment is of central important (Aladuwake & Momsen, 2010). In many parts of the world, the daily search for pure drinking water is becoming an ever more time – consuming task, leaving less time for household work and child care. In some cases, gender roles have become more interchangeable, as women have become empowered (Momsen, 2004).

Water may also disappear through the irreversible degradation which takes place when wetlands, flood plains and coastal ecosystems are destroyed (GWA, 2003). Deforestation, in particular in catchment areas, and the damaging of rivers are another danger, while the impact of climate change on water systems – through droughts and flooding, as well as extreme weather conditions – are becoming more and more visible. And whenever clean water is scarce, the livelihoods of the poor and women are often the first to suffer the consequences. Therefore, the participation of women in the development of water and sanitation scheme is a determinant factor for its sustainability (MOWR/FDRE: 2000); among others gives the right to full involvement of women in the planning, implementation, decision – making and training; as well as empowers them to play a leading role in self-reliance initiatives (Article 2.2.10).

2.8. Mechanisms to Empower Women

As home managers and mothers who make important decisions, women are responsible for the family's choice of water for cooking, drinking, laundry, bathing and other needs (Rathgeber, 1996). Unfortunately, planners and engineers often fail to see women's active roles in the community, as though projects are primarily male concerns.

According to IDRC (1987), to achieve women's participation, people must understand and accept women's potential contributions to the effectiveness of improved water supply and sanitation and make women aware of new information about how they can improve the quality of their lives and those of their families. Based on the concept of genuine community involvement, there must be a dialogue with community members (Circle of blue water news, 2010), so that needs and choices can be identified and women's status and roles fully understood and appreciated.

Wilder (2007), indicated that, women can be empowered through 'Effective Social change'. According to her, increase awareness and education among girls and women about human rights and personal rights, as well as to emphasize education, life skills and leadership development is an important mechanism. It also necessitates educational support to poor girls and promotes female education through role models and mentoring (ibid).

According to Faaye (2007) education is an important mechanism to empower women. As she stated, equality in education represents, in general, a package of policies which includes fair access and reasonable treatment including opportunities for underrepresented groups like women not only to enter, but to progress well in educational systems. In relation to this, Mill and Taylor noted in Tong (1998) that if society were to achieve sexual equality, gender Justice, it must provide women with same political rights and economic opportunities as well as the same education that men enjoy.

Murutse and G/Giorgis (2006), suggested that women can be empowered by "easing the difficulty that arises as the result of working longer hours than men". In this case Rathgeber (1996) stated that "water is a good starting point for discussing how women can be freed from traditional roles to participate in decision – making processes. Also as quoted in Roman (2005) "by delivering training program that dwells on the subject of gender awareness and sensitization" the participation of women in leadership can be realized. On the other hand, studies indicate a change in women's role from tradition and participate in leadership is linked with economic development and modernization. Furthermore, since it is believed that economic development leads to modernization with its diverse effects, its contributions to the improvement of women's living is undeniable. The ability of women to participate in management becomes strengthened as the result (Ibid). There is also a need for an equal opportunity legislation, affirmative action

principles, women's movement and feminist though affecting both scientific and popular interest in women leaders (Chin, 2008).

Also Kabeer(1994) in Marrakesh, sees it as crucial for women to command resources-both tangible and intangible- if they are to become more empowered. Also Bennis (1984) stated that, leadership as empowerment. According to him, for women leaders and feminist leaders, the objective of leadership includes empowering others through;

- One's stewardship of an organizations resources
- Creating the vision
- Social advocacy and change
- Promoting feminist policy and a feminist agenda (e.g. family–oriented work environments, wage gap between men and women) and
- Changing organizational cultures to create gender – equitable environments.

Consequently each position that they go through provided them with the opportunity to learn and develop essential knowledge and competencies that have been very important for their success to be in the top leadership positions (Madesen, 2007).

2.9. Women in Ethiopia

Ethiopia has a mosaic of ethnic groups having many traditional societies with distinct characteristics, over 70 languages and more than 200 dialects. In most of these cultures the patriarchal system is dominant, instituting divisions of labor by sex limiting female to that of wife, mother and house-keeper and promoting ideals and norms reinforcing these (Alasebu G.Selassie, 1988). As noted, sex based division of labor has created strong interdependence between male and female tasks. This is especially critical for rural Ethiopia women's household chores demand more time than that of men. Using conservative estimates women work 16-18 hours a day while men work less hours (Ibid).

As Wilder (2007) mentioned that, from her birth, an Ethiopian female in most families is of lower status and commands little respect relative to her brothers and male counterparts. As soon as she is able, she starts caring for younger siblings, helps in food preparation and spends long hours hauling water and fetching fire wood. In concurrent to her, gender stereotypes become more

evident soon after birth as different researchers indicated. The first question soon after birth, every visitor accustomed to ask mother is "what did you give forth?" male or female? The visitors say if it is male "hero", "you won", "yes, that is it". But if it is a female, they say "let it be", "what happen to you", "you have got your helper" etc. There are also habitual biased treatments during childhood period. For instance,

- ❖ In play
  - Boys are permitted to play outside and even the types of their plays are not supervised.
  - Girls are permitted to play with boys. If they play, they are deprived by restrictive command "don't jump".
- ❖ In moving from place to place
  - Boys are allowed to do what they want unless it is dangerous to their life they are allowed to move from place to place freely.
  - Girls are highly supervised when in case permitted they are not let alone and they are told "don't go alone".
- ❖ In eating and drinking
  - Boys are permitted and encouraged to eat and drink any more.
  - Girls are not allowed to eat more; rather they are discouraged by using a abrasive words and phrases.

    For example:- eat slowly.

    :- eat little by little.

    :- eat this, not that etc.
  - Even when drinking water, they are commanded "sit and drink".
- ❖ In well-coming to guests
  - There is no equal freedom for both sexes. That is boys have high freedom for such practices and girls are restricted for instance, permitted to present a welcome greetings to a guest where as girls are not allowed even to see the arrived guest. They are commanded "wode guada gibi).
- ❖ In talking with families at home
  - Boys are allowed and encouraged to take initiative and make suggestions.

- Girls are permitted to speak about their feelings to parents and not allowed to speak in public or to give contradicting opinions when elderly people or adults speak.

Consequently, in Ethiopia, women traditionally enjoy little independent decision making on most individual and family issues, including the option to choose whether to give birth in a health facility or seek the assistance of a trained provider (Wilder, 2007). In addition to, women are beaten at the house for any reason …… they may also be beaten if the husband comes home drunk or if he simply feels like it (World Bank, 2000). According to Wilder, women, as well as their husbands, accept the view that under some circumstances, a man is justified in beating his wife. This situation is further complicated by deep traditional social and economic patterns that place powerful constraints on the rights of women and their opportunities to direct their own lives or participate in and contribute to community and national development.

Women and children spend hours a day collecting water; time that would be better spent in education or employment. Over 45 million people in Ethiopia lack safe drinking water as Norman cited in her article.

According to some researches the need to improve Ethiopian's water sector is obvious. Previously implemented policies have been unsuccessful to improve the roles of women in water resource management (Ibid). It is now well recognized that good governance, not government, is crucial for policy success, which requires adoption of a bottom-up approach.

Norman (2010) states that, water committees must be gender-balanced, as commonly women spend hours a day collecting water, for their voice to then be silenced in decision making. Now, more than ever before, equitable water governance is required, based on notions of decentralization, user participation and demand management.

According to Momsen (2004) it should be understandable, gender equality does not necessarily mean equal numbers of men and women or girls and boys in all activities, nor does it mean treating them in the same way. It means equality of opportunity and a society in which women and men are able to lead equally fulfilling lives.

The aim of gender equality recognizes that men and women often have different needs and priorities, face different constraints and have different aspirations. Above all, the absence of gender equality means a huge loss of human potential and has costs for both men and women and

also for development (Ibid).However, in Ethiopia, particularly rural areas, the role of women in water resource is to fetch (Ebato and Koppen, 2005), and later use for food preparation, washing cloth, drinking and the like.

Currently, the participation of women in the development of water and sanitation scheme is a determinant factor for water sustainability (Nigist, 2007). The water resources management policy launched in 2000, (MOWR/FDRE:2000), gives the right to full involvement of women in the planning, implementation, decision-making and training as well as empowers them to play a leading role in self-reliance initiatives. According to the Millennium Development Goals (MDG) 'Promoting gender equality and empowering women' is an instrument of development. Moreover, women and development are unseparated (REST, 2000). However, still women participation is not ensured fully especially in rural areas of Ethiopia (Nigist, 2007

CHAPTER THREE

Data Analysis and Interpretation

This chapter deals with analysis and interpretation of the data collected through questionnaires, interview and FGD. In this section, socio-cultural, educational, and institutional factors that hindered women from participating in water resource management issues were deeply analyzed. Besides, the measures that enhance women's participation in water resource management were also presented.

3.1. Characteristics of the Household Respondents

The population which inhabited in Mekelle (Shafat) and southeastern (Meremety) zone were orthodox. Out of the total respondents 67.5% were females while the remaining were males. Regarding the age of respondents, most of them (32%) were between 21-30 years old, and 25% and 18% of all were 31-40 and 41-50 years old, respectively. As it can be seen from table 1, 62% of the respondents were married and 17% of them were divorced.

Fifty percent of the respondents had no formal schooling and only 3% of the respondents have certificate and diploma. The remaining 37% and 10% of them had primary education and completed grade 8, respectively.

Almost all the respondents were engaged in agricultural activities and 47% of all have had additional jobs, like hair dressing (kunano), selling *swa* (a drinking made of leaf of a tree called Gesho and Sorghum), daily work and trade. Selling *swa* and hair dressing are way of earning income by women-headed households. Eggs, vegetables and staple food can also be sold to earn income.

Table 1: Characteristics of Respondents

variable	Respondents	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
Sex	F	41	68	40	67	81	67.5
	M	19	32	20	33	39	32.5
Age	10-20	10	17	4	7	14	12
	21-30	28	47	10	17	38	32
	31-40	16	27	14	23	30	25
	41-50	6	10	16	27	22	18
	51-60	-	-	14	23	14	12
	>60	-	-	2	3	2	2
Marital status	Single	10	17	-	-	10	8
	Married	30	50	44	73	74	62
	Divorced	14	23	6	10	20	17
	Widowed	6	10	10	17	16	13
Educational background	No formal education	14	23	46	77	60	50
	Primary education	34	57	10	17	44	37
	Grade 8 complete	8	13	4	7	12	10
	Grade 12 complete	-	-	-	-	-	-
	Certificate and diploma	4	7	-	-	4	3
Religion	Orthodox	60	100	60	100	120	100
Occupation	Farmers	60	100	60	100	120	100
	Additional	35	58	21	35	56	47

Source: survey (2010)

- Freq - Frequency

3.2. Sources of Water

Water is an important and basic requirement for human survival, and is usually regarded as “life”. However, availability and safety of water are two important factors for a good life. Access to clean water is crucial, especially these days when we are facing the effects of climate change. In many places, especially in rural areas, the little water available is usually not clean, and is distant from village settlements. Children are the most vulnerable in such situations. Inadequate access to safe water, along with poor hygiene practices, results in sickness and even death among children, due to diarrhea and other sanitation- related diseases. As interviewees mentioned, people draw water from wells, rivers and hand pumps in their area.

As indicated in Table 2, 100% of the respondents in both study area replied that hand pump is their major source of water. However, when there is a technical problem and queue in the hand

pump they go for another source. According to the participants response in Shafat 60 (100%) draw from river, while in Meremety spring protected is the second source of water followed by hand dug well and river. These are often polluted with nitrates, bacteria and pesticides that flow from latrines, waste dumps and agriculture. As Sascha Gabizon et al (2004) stated the health effects are both long-term (thyroid and brain dysfunction) and immediate (blue-baby syndrome, diarrhea, hepatitis) and can be lethal to young children. Moreover, women have a two fold problem as a result of the unsafe water used. Illness adds to women's workloads as they are also responsible for looking after sick children.

Table 2: Basic water source of the area

Source of water	Responses	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
River	Yes	8	13	60	100	68	57
	No	52	87	-	-	52	43
Spring unprotected	Yes	2	3	-	-	2	2
	No	58	97	60	100	118	98
Spring protected	Yes	10	17	-	-	10	8
	No	50	83	60	100	110	92
Hand dug well	Yes	8	13	2	3	10	8
	No	52	87	58	97	110	92
Hand pump	Yes	60	100	60	100	120	100
	No	-	-	-	-	-	-
Taps	Yes	-	-	-	-	-	-
	No	60	100	60	100	120	100

Source: survey (2010)

3.3. Responsibility of Fetching Water

According to Sever (2005), women are the ones primarily responsible for collecting water from wells. As the respondents noted, traditionally women were the only responsible to fetch water. Whereas, it is understood from the questionnaire results that, the situation changed in recent days.

Table 3: Responsibility of water fetching

Responsible	Responses	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
Male	Yes	24	40	60	100	84	70
	No	36	60	-	-	36	30
Female	Yes	60	100	60	100	120	100
	No	-	-	-	-		

Source: survey (2010)

As shown in table 3, respondents of both study area i.e. 100% says that women are responsible for water fetching. Similarly, the respondents in Shafat reply that both women and men were responsible. As quoted in Lewis (1994), in some mountainous regions of East Africa, women spend up to 27 percent of their caloric intake in collecting water. In concordant to Lewis, Parker (2010) pointed out that "women may get up in the morning and walk many miles to collect water for their family. So, in view, women are in the first line of water fetching responsibility.

As a result, constantly carrying heavy water containers, that weigh up to 20Kg, on the head, hip or back, has severe health implications. In extreme cases curved spines and pelvic deformities can result, causing problems in childbirth.

3.4. Distance of Water Source

All over the world, women and girls assume what can be the time-consuming and dangerous duty of supplying the water needs of their households. Many walk long distances to fetch water, spending hours per day burdened under heavy containers and suffering acute physical problems, especially in drought-prone areas. The situation in the study area in relation to the distance traveled to get water source is indicated in table 4.

Table 4: Distance traveled for fetching water (in minutes)

Water source	Distance travel round trip: in minutes	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
River	≤ 10	2	3	-	-	-	-
	11-20	-	-	4	7	18	15
	21-30	6	10	18	30	32	27
	31-40	8	13	4	7	20	17
	41-50	-	-	4	7	12	10
	51-60	-	-	26	43	34	28
	> 60	-	-	4	7	4	3
Hand pump	≤ 10	6	10	4	7	10	8
	11-20	24	40	42	70	66	55
	21-30	8	13	12	20	20	17
	31-40	10	17	-	-	10	8
	41-50	10	17	-	-	10	8
	51-60	2	3	2	3	4	3
	> 60	-	-	-	-	-	-

Source: survey (2010)

As indicated in table 4, 13% of the respondents in Meremety travel 31-40 minutes and 43% in Shafat travel 51-60 minutes to draw water from river. At the same time 40% i.e. the maximum number of the respondents in Meremety and 70% in Shafat noted that, they traveled 11-20 minutes to draw water from hand pump. The hand pump construction has saved water fetching time almost by 30-60 minutes as indicated in table 4. However, a girl from Meremety says that "the hand pump is better to drink healthy and safe water, but we spent another 30-60 minutes on queue every day to draw once". As a result, girls miss other activities including education. The 2006 human development report concludes, mostly on the basis of African case studies and interviews in the course of producing the report, that there is a "straight trade-off between time spent in school and time spent collecting water" and that is much less true for boys than it is for girls (UNDP,2006).

Figure 3.1: Girls and young women on turn to draw water.

3.5. Water Use

Water is a basic human need used for drinking, hygiene, industry and agriculture. Similarly, 100% of the respondents in both of the two (Meremety and Shafat) areas said that, the fetched water is used for drinking, cooking, cleaning utensils and washing clothes. In addition, 100 and 87% of respondents in Shafat and Meremety used water for body washing, respectively. Once again, 83% in Shafat and 77% respondents in Meremety used water for livestock watering.

Table 5: Purpose of the fetched water

Purpose	Responses	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
Drinking	Yes	60	100	60	100	120	100
	No	-	-	-	-	-	-
Cooking	Yes	60	100	60	100	120	100
	No	-	-	-	-	-	-
Cleaning utensils	Yes	60	100	60	100	120	100
	No	-	-	-	-	-	-
Washing clothes	Yes	60	100	60	100	120	100
	No	-	-	-	-	-	-
Washing bodies	Yes	52	87	60	100	112	93
	No	8	13	-	-	8	7
Income generating	Yes	2	3	8	13	10	8
	No	58	97	52	87	110	92
Livestock watering	Yes	46	77	50	83	96	80
	No	14	23	10	17	24	20
Gardening	Yes	32	53	8	13	40	33
	No	28	47	52	87	80	67

Source: survey (2010)

Therefore, most activities in those study area were covered by water which draw by women as responsibility of water fetching is for women and girls.

3.6. Water Projects and Community Participation

According to Reports in Enderta woreda, water projects in Meremety village were begun in 1990s with the dam locally named as “wedi cheber”. It was constructed by SART, an NGO in Tigray, which emphasized on water and sanitation programs. The interviewee stated that, the community participation was high during water project construction. Moreover, the national water policy of Ethiopia underlined that ‘promotion of the participation of all stakeholders and

user communities' in water related activities are important. Therefore as the interviewee said, community participation is a means for successful water project construction. The analysis of Koppen et. al (2007) about water projects and management is additional on the interview result. Koppen indicated that, water projects and management reform in developing countries have tended to over look community- based water laws, which govern self-help water development and management by large proportions.

Similarly it is also evidenced, more than 50% of the respondents in Meremety and more than 90% of the respondents in Shafat have information how the water project start (table 6). According to research results, they participated from designing to implementation phase of the project.

Moreover, 67% and 100% of respondents in Meremety and Shafat ensured that their community is participated in the implementation of water project construction.

Table 6: Water projects and community participation

Items	Responses	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
Are there water projects in your area?	Yes	60	100	60	100	120	100
	No	-	-	-	-	-	-
Do you know how the water projects start?	Yes	44	73	58	97	102	85
	No	16	27	2	3	18	15
Were you consulted during preparation phase of the project?	Yes	50	83	58	97	108	90
	No	10	17	2	3	12	10
Were you asked during site selection?	Yes	32	53	58	97	90	75
	No	28	47	2	3	30	25
Is the design acceptable for you?	Yes	50	83	58	97	108	90
	No	10	17	2	3	12	10
Did your community participate in the implementation of the water project?	Yes	40	67	60	100	100	83
	No	4	7	-	-	4	3
	I don't know	16	26	-	-	16	13

Source: survey (2010)

However, some respondents opposed the project design. According to them, the hand pump is easily damageable. As the researcher observed, a hand pump in Meremety village was damaged for a year and no any effort on the side of woreda water resource and energy bureau and the local community to repair it (See figure 4.2).

Figure 3.2: The damaged hand pump which used as a toilet by the local community.

Table 7 refers the ways of community participation and how much the community participates on each of them.

Table 7: Ways of community participation

Items	Responses	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
Decision making site selection	Yes	14	23	60	100	74	62
	No	46	77	-	-	46	38
Labor contribution	Yes	32	53	54	90	86	72
	No	-	-	-	-	-	-
Cash contribution	Yes	4	7	54	90	60	50
	No	-	-	-	-	-	-
Local construction material supply	Yes	4	7	-	-	4	3
	No	-	-	-	-	-	-

Source: survey (2010)

Among the respondents, 53 and 23% of them in Meremety participated in labor contribution and in decision making for site selection, respectively. Whereas 100, 90 and 90% of respondents in Shafat participated in site selection, labor contribution and cash contribution, respectively. In general, as it can be seen the process of water project construction was participatory.

3.7. Women's Participation in Water Project

Women are the main collectors and users of water, especially in rural areas. They have to decide where to collect water, how to draw, transport and store it, how much water to draw, how many

sources of water to exploit and for what purposes (drinking, kitchen, and other domestic use). Table 8 presented the ways and degrees of women participation in water project construction of the study area.

Table 8: Ways and degrees of women's participation

Items	Responses	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
Site selection	High	8	13	60	100	68	57
	Medium	14	23	-	-	14	12
	Low	38	64	-	-	38	31
Decision making in technology choice	High	2	3	2	3	4	3
	Medium	16	27	2	3	18	15
	Low	42	70	56	44	98	82
Free labor contribution	High	26	43	56	93	82	68
	Medium	20	33	4	7	24	20
	Low	14	24	-	-	14	12
Cash contribution	High	2	3	58	97	60	50
	Medium	18	30	2	3	20	17
	Low	40	67	-	-	40	33

Source: survey (2010)

As shown in Table 8, 64, 70 and 67% of all respondents in Meremety reply that there is low participation of women in site selection, technology choice and cash contribution, respectively. The questionnaire result was more matched with analysis of Rathgeber (1996). As Rathgeber noted 'women in some cases can not make well-informed choices because they lack exposure to science and technology' and decisions about how household cash resources will be spent are often made by men.

In other way, 100, 97 and 93% of all respondents in Shafat reveals that high participation of women in site selection, free labor contribution and cash contribution. However, 82% of the respondents noted that, low participation of women in technology choice. Respondents explained that, the women's association in this kushet (village) is well organized and it made an effort to improve the well-being of women and children in their village.

The women's association chairperson indicated that, they got aid from donors (e.g. save the children) a water tanker for the elementary school on their village in addition to the public hand pump. She said 'we made our best and it would be successful some what. Obviously, water

service in school is more important for female students than boys'. Because of the absence of clean and private sanitation facilities in schools, 10 percent of school-age girls in Africa do not attend school during menstruation or drop out at puberty (GWA, 2003).

3.8. Water Committee and Management

In the past decade, water resource policy and planning has increasingly sought to integrate women in water development and management. This is because of the recognition of multiple roles of women as providers of domestic water, as care takers of family health and also managers of community water at the local level. As indicated in the policy and strategy of Ethiopia in water resource (2006), people have to travel long distances for many hours and fetch unsafe and unreliable water from rivers and other undeveloped sources. In order to solve these shortcomings sooner it takes some kinds of measures. In so doing, in every villages of Enderta woreda there is a water committee with a membership of 3 men and 3 women as the interviewee said.

The Table 9 presents the response on water committee and management and also the degree of female water committee activities.

Table 9: Water committee and management

Items	Responses	Villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
Is there a water committee in your locality	Yes	58	97	60	100	118	98
	No	2	3	-	-	2	2
Did you participate in the election of water committee?	Yes	30	50	60	100	90	75
	No	30	50	-	-	30	25
How do you rate the activities of water committee?	Good	12	20	60	100	72	60
	Fair	32	53	-	-	32	27
	Poor	6	10	-	-	6	5
	I don't know	10	17	-	-	10	8
Does the committee have female members?	Yes	46	77	60	100	106	88
	No	4	7	-	-	4	3
	I don't know	10	16	-	-	10	8
How do you compare the activities of female water committee with male water committee members?	Equal with men	16	27	60	100	76	63
	Weaker than men	38	63	-	-	38	32
	Stronger than men	4	7	-	-	4	3
	I don't know	2	3	-	-	2	2

Source: survey (2010)

Over 95% of the respondents in both study areas ensured that, there is a water committee in their locality. Also 50% of the respondents in Meremety and 100% in Shafat participated in the election process to be water committee members. In this situation, 53% of the respondents in Meremety explained the activity of water committee in their village as fair. A dweller from the same area said "there were two hand pumps before, now it remains only one. The committee members have an obligation to inform to the concerned body and solve the problem but they don't." In other way, the interviewee noted that, according to MOWR/FDRE (2002) policy, the rural communities are expected to cover the operation and maintenance costs of their system by establish a "water service Fee". However, there is a limitation to practice it. Besides, the activity of women water committee is weaker than men as indicated by 63% of the respondents.

Unlike Meremety village, in Shafat 100% of the respondents reported, there is a good activity of water committee in general and also women water committee influences equal with men as indicated by 100% of the respondents in Table 8. As mentioned, during the project, a women's association became active and discussed ways to improve the village's water problem other than the water committee.

Therefore, women's activity in water and related issues were high in Shafat than Meremety. The reason behind to become high women's participation in Shafat might be their location closer to the town. As Roman (2005) analyzed in her paper accessibility to the urban center is one factor for better women participation.

3.9. Women's Participation in Irrigation Activities

According to the water sector policy (2001), irrigation systems should promote decentralization and users based – management by taking into account of the special needs of rural women in particular. In relation to that, Table 10 identified the irrigation committee and women's activity in the committee

Table 10: Irrigation committee and women

Items	Responses	villages				Total	
		Meremety		Shafat			
		Freq.	%	Freq.	%	Freq.	%
Is there an irrigation committee in your locality?	Yes	60	100	-	-	60	50
	No	-	-	42	70	42	35
	I don't know	-	-	18	30	18	15
Do women participate in the irrigation committee?	Yes	-	-	-	-	-	-
	No	38	63	42	70	80	67
	I don't know	22	37	18	30	40	33

Source: survey (2010)

According to the researchers observation and interview results irrigation is not as widely practiced in Shafat as in the Meremety. However, existing projects were small-scale irrigation. Not surprisingly, women have been omitted from irrigation projects. This finding agrees with the Zwarteveen (1994) suggestion. According to her, irrigation settlement schemes in Africa and elsewhere have usually been based on three assumptions:

- Male heads of households control farm resources and labor.
- Improved incomes for male farmers will lead to improved quality of life for the entire household.
- Farm households are composed of families (man, woman and children).

As a result, it is men who have the greatest voice on irrigation-water committees and women who are expected to provide labor to ensure the success of their husbands' farms.

Besides the interview responses, the questionnaire result indicated that, 63% and 80% of the respondents in Meremety and Shafat respectively ensured that, women were not involved in the irrigation activities.

3.10. Barriers of Women's Participation in WRM

3.10.1.Socio-Cultural Barriers

Women's problem is deeply rooted in the imbalance between what women do and what they have. In most cultures, women must have acquired the skills necessary to do household works; like cook food, wash cloth, take care of family and the likes. As a result, the respondents (100%) in both study area replied that socialization is a major factor that contributes to have a low participation of women in water resource management. Besides, the interview result noted that the way that make women's behave in the society and acceptance is highly influenced the participation of women in external activities. Similarly, Cubile and Brown (2003) in Yania (2008), stated that, in most societies, women lack experience of decision making and management in the public area because girls, in contrast to boys, are socialized to passive roles and given little opportunity to make decisions or develop management skills outside the family context. Besides this Helgeson (2005) pointed out that, women have been socialized in to believing that they do not deserve senior positions. In concurrent the respondent noted that, the folks and proverbs in society discourage the inspiration of women in a field. For instance;

"ሰበይትያ ዝነደቀቶስ ዝብኢ አንትንቁ ይፈርስ"

A house constructed by women is collapsed when a hyena shouts.

"አንስትያ እንትበዝሓስ ቐራዕ ሓምሊ የሐርራ"

The presence of women to work together result in damage

"ሴት ብታውቅ በወንድ ያልቅ"

No matter the wiseness of a woman, the decision is to the man.

"ሴት ያመነ ጉም የዘገነ"

The trust in women is just as to hold a cloud and the like shows that how women's work invalidates by their society and demoralized them. Morever, in some parts of Ethiopia, women are excluded from ploughing and threshing crops because of the myth that women's involvement will reduce production. All these have far reaching implications on women's social space and the question of social justice and empowerment.

Table 11: Socio-cultural barriers

Barriers for women's participation	Villages												Total					
	Meremety						Shafat											
	High		Average		Low		High		Average		Low		High		Average		Low	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Socialization in the family and society	60	100	-	-	-	-	60	100	-	-	-	-	120	100	-	-	-	-
Household responsibilities	54	90	6	10	-	-	56	94	4	6	-	-	110	92	10	8	-	-
Reproductive responsibilities such as giving birth, child care and others	46	77	10	17	4	6	58	97	2	3	-	-	104	87	12	10	4	3

Source: survey (2010)

- F – frequency

In addition to socialization, 90 and 94% of the respondents in Meremety and Shafat respectively stated that, the role of women in water resource management is negatively influenced by their household responsibility. As it is understood from different interview, women's most important role in water management in the traditional context is seen within the domestic arena like that of domestic water managers. In this role they are seen as responsible for the gender-specific tasks of procuring, managing and using water for domestic purposes.

The respondents pointed out that, it is clear that in most circumstances, women are more likely than men to spend their incomes, energy and time on meeting their family's requirements. Thus, women became responsible for household strategies and are obliged to manage those household resources under their control to ensure the survival and well-being of other household members. So the highest number of respondents in both of the two study areas indicated that, it is important to go beyond family responsibility to improve their participation in water resource management.

Regarding the reproductive responsibilities, 77 and 97% of all respondents in Meremety and Shafat, respectively replied that it has high influence in decreasing their participation on water resource management. In relation to this, governments and donors usually see women's involvement in water-resource management primarily from the perspective of their roles in social reproduction. The interview result showed that, the primary concern of women is for activities which make them acceptable by society as a good women i.e the way what they socialized. As a

result, income-generating activities have been added to the projects to make them more attractive to women. In fact, 325 women received training on water and sanitation, maintenance and operation in 2009.

As understood from the above, the socio- cultural roles and activities of women are negatively influenced their external roles by consuming their time. Therefore, women should be continually trained and supported to deal with technical, social, institutional and cultural demands of water related activities.

3.10.2.Educational Barriers

Educational barriers for women's participation in management are basically related with the socio-cultural barriers for women's advancement in the public activities of the country.

According to the questionnaire results, 100% of all respondents in Shafat and 70% of respondents in Meremety noted that, low educational qualification is the major factor that has high contribution in decreasing the participation of women in water resource management.

In addition to the questionnaire results, the interviewee mentioned that, despite recent improvement of females' education, females' low educational access and success in the country is the fundamental barrier for employment and management position in water resource management. It was indicated that, even though some girls got opportunities to participate in education, their success in education still lag behind that of boys because of socio-cultural factors, particularly gender division of labor and the negative attitude of the society and the family towards girls' education. As the result of this, there is low number of women in management staff, which in turn resulted in gender inequality in the management positions of water resource and energy bureau.

Table 12: Educational barriers

Barriers of women's participation	Villages												Total					
	Meremety						Shafat											
	High		Average		Low		High		Average		Low		High		Average		Low	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Low educational qualification	42	70	10	17	8	13	60	100	-	-	-	-	102	85	10	8	8	7
Lack of knowledge about water technology	28	46	16	27	16	27	60	100	-	-	-	-	88	74	16	13	16	13

Source: survey (2010)

In other way, lack of knowledge about water technology has an impact on the role of women in water resource management. 46% of the respondents in Meremety and 100% of all respondents in Shafat indicated that, lack of knowledge on water technology is a factor that decreases women's participation in water resource management. Consequently, the results from FGD noted that, women society should introduce with new water technology by preparing seminar, training programs and the likes.

3.10.3.Institutional Barriers

Institutional barriers that influence women's participation in water resource management were as a result of socio-cultural and educational barriers.

According to the questionnaire results, 43% of the respondents in Meremety replied that patriarchal culture of the society has high impact on women's participation. While, 23 and 33% of respondents in Meremety replied that, it has an average and low impact of patriarchal culture of the office on women's participation, respectively. On the other hand, 80% of the respondents in Shafat noted that as a medium factor. Therefore, according to the questionnaire results in both of the study area, patriarchal culture of the office has a medium impact on women's participation in water resource management.

The respondents' response about the influence of recruitment criteria indicated that, 47, 23 and 30 % of respondents in Meremety responded that, the recruitment criteria has high, average and low impacts, respectively. In the case of Shafat 77% of the respondent pointed out that the recruitment criteria has low impact. Even though, the interviewee noted that, the society themselves classified as females and males work for those recruitment criteria which are prepared by institutions to compare both women and men, it is possible to conclude that, the recruitment criteria of the institution have high impact on women's participation in water resource management based on the survey study results.

Table 13: Institutional barriers

Barriers of women's participation	Villages												Total					
	Meremety						Shafat											
	High		Average		Low		High		Average		Low		High		Average		Low	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Patriarchal culture of the office	26	43	14	23	20	33	10	17	48	80	2	3	36	30	62	52	22	18
Gender discrimination during appointment	28	47	10	17	22	37	-	-	32	53	28	47	28	23	42	35	50	42
The recruitment criteria, which one set down based on the qualification and the rank of men.	28	47	14	23	18	30	2	3	12	20	46	77	30	25	26	23	64	52

Source: survey (2010)

Regarding the gender discrimination during appointment, 47% of the respondents in Meremety pointed that, it has high impact on the participation of women. Whereas 53% of respondents in Shafat rated gender discrimination as a medium factor that negatively influence the participation of women in water resource management. On the other side, 47% of the respondents in Shafat pointed out that gender discrimination during appointment have low impact. As it can be seen, the gender discrimination during appointment is a medium factor that negatively influences women's participation and basically the cause for low number of women employees in the water sector. As respondents mentioned, women are not interested to do a job which is far away from their house especially if they have children. As a result educated and trained women are placed lower ranked jobs than men who had been hired without regard to training or entry qualification.

3.10.4.Informal Network of Men, Support and Encouragement

Nawe (2004), revealed that even where there is an acceptance of equal opportunities there are implicit disadvantage, in which men had more fully developed informal networks in different occasions between colleagues and used them for their career development whereas women are excluded from where networking takes place, thus they miss a lot of what is gained through this process.

Moreover, respondents indicated that, women's multiple roles and patriarchal relationships do not give them a chance to be in the informal network of men and having opportunities to be selected for management positions. This means if women are able to be in the informal network of men, they might have the opportunities to be nominated for the managerial position.

In addition to the interview results, Table 14 presents the agreement level of respondents in relation to the impact of informal network of men and the absence of women in the network of men.

Table 14: Informal network of men and absence of encouragement

Barriers of women's participation	Villages												Total					
	Meremety						Shafat											
	High		Average		Low		High		Average		Low		High		Average		Low	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
The absence of women in the informal network of men	32	53	14	23	14	23	56	93	4	7	1	2	88	73	18	15	15	12
The absence of encouragement from the family: such as husband or parents	30	50	14	23	16	27	56	93	4	7	-	-	86	72	18	15	16	13

Source: survey study (2010)

As indicated in Table 14, 53% of the respondents in Meremety and 93% in Shafat pointed out that the absence of women in the informal network of men highly impacted the role of women in water resource management. However, the FGD participant noted that, women's have had informal network also, the reason that influence women's participation is lack of place to discuss about their problems. As the respondents pointed out, women's being passive in organizing themselves is partly due to the way how the implementation process of the management interventions is arranged. Consequently, managing water in an integrated and sustainable way can actually improve gender equity by easing access, both to water and to related services (UNDP, 2002). In many ways, formal and informal women's networks can play important and stimulating roles.

In addition to informal network, lack of support and encouragement by the husband and family was considered as additional barrier for women's participation on water management. According to the survey study, 50% of the respondents in Meremety said that the absence of support and encouragement from family has high impact on their participation in water management. Once again, 93% of the respondents in Shafat replied that the absence of support and encouragement has high impact on women's participation in water resource management.

3.10.5.Other Barriers of Women's Participation in Water Resource Management

In addition to the factors mentioned earlier, the role of women in water management can be affected by other factors such as the absence of role models and mentoring, absence of encouragement from governmental and non-governmental organizations, lack of confidence and religious burden.

Table 15: Other barriers of women's participation

Barriers of women's participation	Villages												Total					
	Meremety						Shafat											
	High		Average		Low		High		Average		Low		High		Average		Low	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
The absence of role models and mentoring	26	44	14	23	20	33	8	13	42	70	10	17	34	28	56	47	30	25
The absence of encouragement from governmental and non-governmental organizations	6	10	20	33	34	57	20	33	4	7	36	60	26	22	24	20	70	58
Religious burden	38	63	12	20	10	17	24	40	26	43	10	17	62	52	38	32	20	17
Lack of confidence	18	30	6	10	36	60	34	57	26	43	-	-	52	43	32	27	36	30

Source: survey (2010)

As it is indicated in Table 15, 44% of the respondents in Meremety noted that the absence of role models and mentoring has high impact on women's participation. On the other side, 23% of the respondents in Meremety indicated that, the absence of role models and mentoring has low impact on women's participation.

Moreover, according to the study results in Shafat, 70% of the respondents pointed out that, the absence of role models and mentoring is affected averagely. However, the interviewees mentioned that, lack of opportunity to see other women in a variety of management positions to hear how these women describe their lives and to compare themselves with women just one step further up the hierarchy have been mentioned as reasons for women not to have moved in to management positions in larger numbers. Therefore, as the research result indicated, the absence of role models and mentoring has adversely impacted on having large number and effective women participation in water resource management. As it can be seen from Table 15, 57% of the

respondents in Meremety and 60% in Shafat pointed out that, the impact of absence of support and encouragement from governmental and non-governmental organizations in women's participation is low. However, the FGD participants stated that, limitation of training which sponsored by government and lack of funding for women to participate in all water related issues were influenced women's participation. So, according to the study results, the absence of support and encouragement from governmental and non-governmental organizations has its own impact on the role of women in water resource management.

Regarding the religious impact, 63% of the respondents in Meremety pointed as a burden that has high impact on women's participation. On the other hand, 20% of the respondents noted that as a medium factor, whereas 17% of them as a factor that have low impact on women's participation in water resource management.

On the other side, the survey results in Shafat indicated that, 40 and 43% of the respondents pointed out high and moderate impact of religion on the participation of women in water resource management, respectively. In general, religion has qualified to direction of negative influence the participation of women in water resource management in both study areas.

Similarly, lack of confidence is one of the negative influential factors on women's participation. As the interviewees said, even though, women have an indigenous knowledge how to do things with water inside their house, they lack a confidence since the water technology is changed in the external activities of water related issues. In addition to the interview results, the questionnaire result indicated in table 15 reveals, 57% of respondents in Shafat noted that, lack of confidence has high impact on women's participation. Also, the remaining 43% of respondents pointed an agreement value of moderate. On the other side, 60% of the respondents in Meremety replied that, the impact of the lack of confidence on water related issue is not significant and have low impact on women's participation. On saying that, the average value of the questionnaire result tend to, lack of confidence has high impact on women's participation in water resource management.

3.11. Measures to Enhance Women's Participation in WRM

Even though the elimination of cultural barriers is challenged, 100% of all respondents in Meremety and 97% of the respondents in Shafat agreed with the item 'eliminating socio-cultural barriers' to enhance women's participation in water resource management.

In addition to the elimination of socio-cultural barriers, 93% of the respondents in both study area agreed that, changing the attitude of society is another measure to enhance women's participation. However, as the interviewees explained, changing society attitude might be challenging, because society's attitude is related with socio-cultural situations and according to Claude (1993), systemic discrimination against women in the norm and that norm will not change rapidly. As a result, the interviewees underlined that, there is a need for legal reforms to promote women's equality and to protect their interests against gender-biased cultural practices.

Similarly, 100% of the respondents in Meremety and Shafat agreed on the importance of 'increasing women's educational qualification' as a measure to enhance women's participation in management.

On the other hand, 97% of the respondents in Meremety and 100% of all respondents in Shafat noted that, giving gender sensitive training for the community could improved the participation of women in water resource management. Similarly, 90% of the respondents in Meremety and 100% of all in Shafat agreed with the item 'encouraging women to participate in management positions' as additional measure to be taken to enhance women's participation in water management. Table 16 indicated that 93% of the respondents in Meremety and Shafat pointed out that 'creating opportunities for women to observe major water committee activities-purposeful involvement of women in water commission and senate meeting' are important to enhance women's participation in water resource management. In addition to that, 100% of the respondents in both study area stated, developing women's management skills are other measures to be taken to enhance women's participation in water resource management. According to the interviewees, developing women's management skill is important even though women are visible to be active and responsible for their management roles as well as management styles. In the absence of management skill, they might be overwhelmed by men who have life long experience in relation with public roles.

Regarding the measures to be taken to enhance women's participation in water resource management, the respondents were asked to point out their degree of agreement. Their response is presented in Table 16.

Table 16: Measures to enhance women's participation in WRM and level of agreement of respondents

Measures to enhance women's participation	Degree of agreement																	
	Meremety						Shafat						Total					
	Agree		Undecided		Disagree		Agree		Undecided		Disagree		Agree		Undecided		Disagree	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Eliminating socio-cultural barriers	60	100	-	-	-	-	58	97	2	3	-	-	118	98	2	2		
Try to change the attitude of the society	56	93	2	3	2	3	56	93	4	7	-	-	112	93	6	5	2	2
Increasing women employees in water sector	56	93	4	7	-	-	60	100	-	-	-	-	116	97	4	3		
Giving gender sensitive training for the community	58	97	2	3	-	-	60	100	-	-	-	-	118	98	2	2	-	-
Increasing women's educational qualification	60	100	-	-	-	-	60	100	-	-	-	-	120	100	-	-	-	-
Sharing experiences by creating management network	60	100	-	-	-	-	58	97	2	3	-	-	118	98	2	2	-	-
Developing women's managerial skill	60	100	-	-	-	-	60	100	-	-	-	-	120	100	-	-	-	-
Creating opportunities for women to observe major water committee activities-purposeful involvement of women in the water commission and senate meeting	56	93	4	7	-	-	56	93	4	7	-	-	112	93	8	7	-	-
Training women in relation to the need for participation in management	54	90	6	10	-	-	60	100	-	-	-	-	114	95	6	5	-	-
Encouraging women to participate on managerial positions	54	90	6	10	-	-	60	100	-	-	-	-	114	95	6	5	-	-

Source: Study (2010)

N.B: F=Frequency

In addition to the above women's management style, developing women's management skills make women to contribute more for the institutions. Moreover, training on management helps them not to be challenged easily by the impacts of socio-cultural factors like patriarchal ideology of some colleagues. This finding is similar with some measures to be taken on the common wealth countries, where trainings in relation to management were given (Singh, 2002).

According to Singh (2002), in England, the Quality of woman in leadership program (QWIL) was established to enhance women's organizational awareness and leadership skills to promote their participation in positions of leadership. Similarly, Enderta woreda water resource and energy bureau is expected to facilitate situations and give training for women related to management skills and related activities.

In general, Table 16 shown that, most of the respondents strongly agree with the given items related to measures to be taken to enhance women's participation in water management. Accordingly, 93%, 100% and 90% of the respondents in Meremety pointed out that, increasing women employees in water sector, sharing experiences by creating management network and training for women in relation to the need for participation in management, respectively are measures to be taken to enhance women's participation. Also, 100%, 97% and 100% of the respondents in Shafat noted that, increasing women employees in water sector, sharing experiences by creating management network and training for women in relation to the need for participation in management, respectively are measures to be taken to enhance women's participation in water resource management.

Finally, increasing women's educational qualification and eliminating socio-cultural barriers has been given priority by the questionnaire results and interviewees, so the responsible bodies are expected to realize their achievement, which in turn help to increase the number and quality of women in the water sector and holding of management position. Increasing women's participation in education in general and addressing socio-cultural barriers are long term measures where as giving training for the existing women in the water sector to develop their management skills and encouraging women, who were not ever participate in management are some of relatively short term measures which can be taken by the responsible bodies of Enderta woreda water resource and energy bureau.

CHAPTER FOUR

Conclusions and Recommendations

4.1. Conclusions

This study tried to describe and explain the role of women in water resource management. The study has found that women and girls are often the ones who have to walk long distance and spend many hours every day fetching water which negatively impacts girls schooling and hinders the involvement of women in more productive and income generating activities. Also, women play an important role in promoting the sustainability of water resource and water projects. Experiences of the woreda water resource and Energy Bureau and REST revealed that gender has been taken as an important component for the promotion of sustainability of rural water supply and projects. This has created enabling conditions for the promotion of the participation of women and men from the inception till the implementation and monitoring of their water projects. Especially, the participation of women during the construction of their water projects was remarkable, where as it was lower than men during the planning stage.

The study has also identified that there was an inadequate link between the technical and social aspects of water projects. Women had limited sayings on site selection and technology choice in Meremety for their water supply services. They had also limited involvement during the design work of their water projects. As a result of these limitations, they traveled averagely half an hour to draw water and the hand pump was damaged in a short time; because it necessitates more energy to move up and down.

The members of the communities in the study areas and project staff members both in the village and woreda level have little confidence on women's water committee members' ability to handle key decision positions such as chair person-ship. Men generally dominated water supply and irrigation management committees in Shafat and Meremety. The divisions of work among water committee members have shown that most female committee members were willing to keep the public money, to make sure the water is clean, and to control the hand pump opening time. Even though, husbands did not want their wives to do such kind of jobs due to fear of any losses that could happen. In addition, female committee members were less encouraged by their husband as

well as their families to participate in training programs especially when the training place is outside their village.

Furthermore, women often seek employment that allows them the flexibility to spend time with their families. Their putting- family-first frequently prevents their obtaining the training and other credentials they would need to compete more effectively in the job market. Thus it is possible to say that female's end up concentrated in "women's jobs" partly because they choose to do so. But many observers (like Lott, 1987; Fagenson, 1993 and Blau and Ferber, 1992) question whether a women's choice is so free. Therefore, this study concludes that, the socio-cultural factors have an important role to block women's choice on care of their family and household activities.

Even if it takes a long time, it is generally accepted that gender roles are not static and subject to change. However, the traditional division of labor between women and men in the study areas still perpetuates inequality between the two sexes and confines women to the private sphere.

According to the research findings, women's participation in management positions mainly depends on the number of women in the office and also which made the expected proportional representation of women to be insignificant and unsatisfactory. Particularly the absence of well developed gender policy, the absence of sufficient effort to enhance the number of female staff members are institutional barriers for women's participation in management position of the water sector.

In addition to, low educational qualification, the absence of role models and mentoring are the other factors that have high negative influence on women's participation in management position.

Finally, it is pointed out that, the main measure to be taken to enhance women's participation in management is realizing the women's access and success in education and increasing the number of women in higher educational institutions, which helps to recruit more women in the office. Side by side with the above measures, redressing the socio-cultural barriers that affect women educational access and success and their involvement in management is additional measures that can be taken to enhance women's participation in management. Besides this encouraging women, who were not ever participate in management and giving training to develop management skills of women are additional measures to enhance women's participation in water resource management.

4.2. Recommendations

Based on the identified gaps in the study the following practical recommendations are forwarded to assist those responsible for gender mainstreaming in water management and for those who are striving to increase the sustainability of water resource management.

In both of the two study areas, women are generally responsible for collecting water for their families on average. They often have waited in turn to collect water, forcing many to leave home at 11 o'clock to night to reach the source and get their turn. Then, when they have collected enough water for their family, they will start the long journey back home carrying the heavy water containers. However, the societies that the researcher worked in are generally male-dominated so extra care and attention has to be taken to ensure women are equally included in the projects. As the main users of the future water points women are best placed to choose the ideal location.

Educational attainment is, without doubt, the most fundamental prerequisite for empowering women in all spheres of society, for without education of comparable quality and content to that given to boys and men, and relevant to existing knowledge and real needs, women are unable to access well-paid, formal sector jobs, advance within them, participate in and be represented in government and gain management positions. Moreover, the risk increases for society as a whole that the next generation of children will be similarly ill-prepared. So, side by side with facilitating the situations and increasing the enrolment of students in general and the female students in particular, the government should take measures to enhance the educational success of female students in primary, secondary and tertiary level.

It is worth mentioning that, institutional arrangements must be reformed, so that stakeholders are fully involved with all aspects of policy formulation and implementation. Moreover, the office should try to make its administrative system more efficient, encouraging and attractive for women to hold management positions and to contribute for their institution. For instance, it should create scholarship program for women by establishing some criteria for those in the staff membership, where as short term training for those who never involve in the institutions staff.

In addition to, because of the socio-cultural impact, women might be neutral from competition to management position and in the absence of support from the top leaders, the influence of socio-

cultural barriers and the negative attitude of some male colleagues, who are the product of the society, impedes women's holding management positions. Therefore, top leaders and colleagues should accept and believe in women's contribution for the institution and then support and encourage them to be in management positions. Moreover, it is necessary for institutions to play a more positive and constructive role to encourage women's participation.

In addition, the concerned body should develop approaches that provide them with: space, in the form of forum where women can present their experiences, learn from their peers and encounter representatives from established knowledge systems for fair and equitable exchange and learning. On the other hand, creating gender sensitivity at all levels of the government among both women and men is imperative to bring about a gender-responsive water management bylaw and planning.

The negative gender consequences of management or challenges of women are time limitations to balance personal life particularly household responsibilities and management roles and the negative attitude of colleagues towards women managers. Therefore, women with negative gender consequence should believe that they can go after what they want and that they have the ability to reach their goals in their own way. Similarly, women who are in management needs to focus on their achievement of goal rather than giving attention for the negative attitude of some individuals in the office. In order to do this, they should develop their self confidence to get access to or open for others and should be honest and active.

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Appendix- I

Addis Ababa University

School of Graduate Studies

College of Social Science

Department of Geography and Environmental Studies

Survey Questionnaire for House Hold

Dear Respondents;

This study is conducted in partial fulfillment of the requirement for the degree of Master of Arts in Geography and Environmental studies. The purpose of the structured questionnaire is to get information about role of women in water resource management. I would like you to note that the information to be obtained from you is very essential to the successful completion of this study. Since your responses will be kept confidential, please give your honest response.

Thank you in advance!

General Information

1. Name of Enumerator: _____
2. Date: _____
3. House hold location
   i. Zone: _____
   ii. Woreda: _____
   iii. Sub-woreda: _____
   iv. Village: _____
4. House hold Characteristics
   i. Age of respondent: _____
   ii. Marital status of respondent

   (Single: 1, married: 2, divorced: 3, widowed: 4) ..... ☐

5. Educational level of respondent

   (No formal education = 1, primary education= 2, grade 8 complete= 3, grade 12 complete = 4, other = 5) ..... ☐

6. Religion

   (Orthodox= 1, catholic= 2, protestant= 3, Muslim= 4, other= 5) ..... ☐

7. Occupation: _____

Instruction: Please fill the appropriate value in the given box and give short and precise answer to open ended questions.

1. Water source on the area
   - 1.1. What are the water sources on your locality?
     - 1.1.1. River (Yes = Y, No = N) ..... ☐
     - 1.1.2. Spring unprotected (Yes = Y, No = N) ..... ☐
     - 1.1.3. Spring protected (Yes = Y, No = N) ..... ☐
     - 1.1.4. Hand dug well (Yes = Y, No = N) ..... ☐
     - 1.1.5. Hand pump (Yes = Y, No = N)..... ☐
     - 1.1.6. Pipeline (Yes = Y, No = N)..... ☐
2. Responsibility of water fetching
   - 2.1. Do the adult males normally fetch water for the household?

     (Yes = Y, No = N) ..... ☐
   - 2.2. If No, why?
   - 2.3. Do adult females normally fetch water for the household?

     (Yes = Y, No = N) ..... ☐
   - 2.4. Do male children normally fetch water for the household?

     (Yes = Y, No = N) ..... ☐
   - 2.5. If No, Why?
   - 2.6. Do female children normally fetch water for the household?

     (Yes = Y, No = N) ..... ☐

3. For What purpose do you use it?

Purpose	The 1st two primary sources	
3.1. Drinking		
3.2. Cooking		
3.3. Clearing utensils		
3.4. Washing clothes		
3.5. Washing bodies		
3.6. Income generating		
3.7. Livestock Watering		
3.8. Gardening		

3.9. Other specify _____

4. Distance Travel for water fetching

4.1. How long does it take you to fetch water from particular sources?

4.1.1. River: Round trip: in minutes ..... ☐

4.1.2. Protected spring: Round trip: in minutes ..... ☐

4.1.3. Unprotected spring: Round trip: in minutes ..... ☐

4.1.4. Hand pump: Round trip: in minutes ..... ☐

4.1.5. Hand dug well: Round trip: in minutes ..... ☐

4.1.6. Pipeline: Round trip: in minutes ..... ☐

4.1.7. Other specify: _____

5. Community participation

5.1. Are there water projects in your area?

(Yes = Y, No = N) ..... ☐

5.2. If "Yes", Do you know how the water projects start?

(Yes = Y, No = N)..... ☐

5.3. If "No", why? _____

5.4. Did you asked during preparation phase of the project?

(Yes = Y, No = N) ..... ☐

5.5. If "No", why? _____

5.6. Did you asked during site selection?

(Yes = Y, No = N) ..... ☐

5.7. Did you asked during technology selection?

(Yes = Y, No = N) ..... ☐

5.8. Is the design acceptable for you?

(Yes = Y, No = N) ..... ☐

5.9. If "No", How? _____

5.10. Did your community participate in the implementation of the water project? (Yes = Y, No = N, I do not know = I) ..... ☐

5.10.1. If "Yes" what was the form of participation?

i. Decision making in site selection: (Yes = Y, No = N)..... ☐

ii. Labor contribution: (Yes = Y, No = N) ..... ☐

iii. Cash contribution: (Yes = Y, No = N) ..... ☐

iv. Local construction material supply: (Yes = Y, No = N) ..... ☐

v. Other specify _____

5.11. How do you rate women's participation in the forms of participation?

i. Site selection: (High = 1, Medium = 2, Low = 3) ..... ☐

ii. Decision making in technology choice:

(High = 1, Medium = 2, Low = 3) ..... ☐

iii. Free labor contribution: (High = 1, Medium = 2, Low = 3) .. ☐

iv. Cash contribution: (High = 1, Medium = 2, Low =3) ..... ☐

6. On water committee and management

6.1. Is there a water committee in your locality?

(Yes = Y, No = N) ..... ☐

6.2. Did you participate in the election of water committee?

(Yes = Y, No = N) ..... ☐

6.3. If "no", Why? _____

6.4. How do you rate the activities of water committee?

(Good= 1, Fair= 2, Poor= 3, I don't know= 4) ..... ☐

6.5. Does the committee have female members?

(Yes = Y, No = N, I don't know = I) ..... ☐

6.6. If "Yes" how do you compare the activities of female water committee with male water committee?

(Equal with men = 1, weaker than men = 2, stronger than men = 3, I don't know = 4) .....

.....

6.7. If the answer for the above question is 2, what do you think the reason? _____

_____

_____

7. Irrigation activities and women's participation

7.1. Is there an irrigation committee in your locality?

(Yes=Y, No=N, I don't know= I)----------

7.2. Does women's participate on the irrigation committee?

(Yes=Y, No=N, I don't know= I)----------

8. Barriers for women's participation in WRM

8.1. Different researchers mentioned various barriers; like socio-cultural, organizational, educational, political and individual/personal barriers for women's participation on management. In your opinion, how much do these barriers hinder women's participation in different managerial positions like water resource management?

Expected barriers for women's	High	Average	Low
• Reproductive responsibilities: such as giving birth, child care and others			
• Household responsibilities of women			
• Socialization in the family and in the society			
• Low educational qualification			
• Patriarchal culture of the office			
• Gender discrimination during appointment			
• The recruitment criteria, which one set down based on the qualification and the rank of men			
• The absence of women in the informal network of men			
• The absence of role models and mentoring			
• The absence of support and encouragement from governmental and non-governmental organizations			
• The absence of encouragement from the family: such as husband or parents			
• Lack of confidence			
• Religious burden			
• Lack of knowledge			

8.2. Please write as much as you can, if you have additional view, based on your observational or experience. _____

_____

9. About measures to enhance women's participation in WRM.

9.1. What is the degree to which you agree with the following statements regarding the measures to enhance women's participation in water resource management? Please rate your agreement on the following points accordingly.

Measures	Rating of measures on the level of agreement		
	Agree	Undecided	Disagree
• Eliminating the socio-cultural barriers			
• Try to change the attitude of the society			
• Increasing women employees in water sector			
• Giving gender sensitive training for the community			
• Increasing women's educational qualification			
• Sharing experiences by creating management network			
• Developing women's managerial skills			
• Creating opportunities for women to observe major water committee activities- purposeful involvement of the women in the water commission and senate meeting			
• Training women in relation to the need for participation in management			
• Encouraging women to participate in managerial positions			

9.2. If you have any helpful comments regarding measures, please write below. _____

_____

_____

Appendix-II

Focus Group Discussion Guide

- Date of Discussion: _____
- Village: _____
- Sub-woreda: _____
- Woreda: _____

Discussion Points

1. Do you think that women and men have equal decision making power in your community?
2. How do you see the participation of women in water project cycles?
   - Ways of participation
3. Women members' willingness to participate in water committee and impediment to women committee members.
4. The role of women water committee members.
5. What kinds of trainings have you received from external supporters?
   - Trainers/institutions
   - Place of training
   - Participants/trainees
   - Topic of training
6. Do you believe those trainings are strong enough that enable you to influence others?
7. Women members' participation in the training and impediments for their participation.
8. Do you believe women's involvement in the water project results positive outcome?

Appendix-III

In Depth Interview Guide with key Informants

- Date of interview: _____
- Name of person: _____
- Position: _____

1. The level of women participation during the project cycle (planning, design, implementation, operation and maintenance).
2. People's attitude towards women committee members.
3. The role of women committee members, specific problems of women committee members.
4. Specific structural factors that perpetuate in equality between men and women.
5. Have these been measures to ensure women's equal participation in the planning and ongoing management of the water project or programme?
6. The level of assistance from external supporter agencies.
7. Is the participation of women in these projects either necessary or sufficient for project success or for higher levels of access for women?

Appendix-IIII

Interview guides with concerned officials of the water sector and project staff

- Date of interview: _____
- Name of person: _____
- Position: _____

Issues to be raised during interview

1. Current policy strategies to involve women in water sector management and decision making?
2. Recognition on the importance of involving women
3. Has targeted training on water resource management and skills been provided for specific groups of women?
4. Level of women mainstreaming
    - Budgeting
    - Rewarding
    - Training/education
    - Women empowerment
    - Strategy
    - Guidelines, laws, manual etc.
    - Accountability
    - Regulation
    - Legislation
5. Numbers of women who employed in water resource management office of the woreda?
6. Institutional support to women water committee.
7. Level and form of women's participation and involvement in the project cycle.
8. The contribution of women committee members in water management.
9. Level of women's participation on water resource management activities.
10. Structural factors that affect women representation in decision-making position on water committee.
11. The benefits gained from the project for women community.

Declaration

I declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

Name: Amleset G/her

Signature: _____

Date: _____

This thesis has been submitted for examination with my approval as a university advisor.

Name: Dr. Woldeamlak Bewket

Signature: _____

Date: _____