FACTORS AFFECTING THE PARTICIPATION OF RURAL WOMEN IN WATER SUPPLY PROJECTS:

THE CASE OF HARAMAYA WOREDA, EAST HARERGE ZONE

Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Masters of Art in Environment and Development.

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JULY 2009
Addis Ababa

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

COLLEGE OF DEVELOPMENT STUDIES (CDS)

Title

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Acknowledgement

First and foremost I glorify God, the benevolent Father, for His paternal guidance and for enlightening my mind to engage in this research project. My next gratitude goes to Ato Yigremew Adal, my advisor, for his continuous assistance right from the beginning by kindly providing constructive comments that helped me bring the paper into its present form.

I would like to thank Ato Debebe Beyene, lecturer at Haramaya University, for his kind help in the recruitment of data collectors and also for introducing me to Woreda officials. I am highly indebted to Ato Elias Tezera, Woreda chief, for supplying Woreda level data.

I appreciate Ato Amanuel Gebru, Ato Minda Mamo and Ato Anteneh Girma staff members of Department of Foreign Language and Literature, for their assistance in making the paper easily understandable by commenting on my usage of the language. I am grateful to Ato Worku Tufa, who generously invested time reviewing drafts of the paper and proffering valuable comments.

As a source of inspiration and courage, Kesis Ashenafi Beyene, my husband, really deserves a great appreciation and homage. His unrelenting assistance in providing comments on the paper beginning from its infant stage deserves credit. I also would like to appreciate the patience of my sweet kids, Athenatewos and Fikir for their understanding in my busy days and for forgoing the precious time they would have otherwise enjoyed with their mother.

Last but by no measure the least, I like to thank my dearest father, life mentor and role model, Ato Tesfahun Wondim, for his support and encouragement. W/ro Almaz Teklu, my mother, deserves no less gratitude for her responsible upbringing and kind support right from my early schooling.

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List of Acronyms

UNIFEM	United Nation Fund for Women Empowerment
LDCs	Lower Developed Countries
MOFED	Ministry of Finance and Economic Development
MDG	Millennium Development Goals
UAP	Universal Access Plan
WASHCO	Water Sanitation and Hygiene Committee
WATSAN	Water and Sanitation
MOWR	Ministry of Water Resource
CSA	Central Statistical Authority
IRC	International Research Center
CIWD	Cooperatives and the Integration of Women in Development

Abstract

As primary clients of potable water for household use, rural women are believed to play a pivotal role in the management of water supply schemes. However, empirical evidence reveals that their participation is marginal, and many factors explain their poor level of participation. This study, a survey that involved 120 randomly selected households of Haromaya Wereda, is conducted to uncover the variables that affect participation of rural women in water supply projects.

A three level analysis is undertaken after coding the data making it amenable to quantitative analysis. First, cross tabulation of values of a pair of variables is examined to see the link between variables. Second, Kendall's tau_b correlation is run to assess whether or not factors are related with the independent variable. Finally and most importantly, ordinal regression is administered to see if there exists any causal relationship between level of participation (the dependent variable of the model) and household burden, awareness, cultural influence, partner's attitude, and government/project assistance. Correlation output suggests that awareness and government assistance are positively and statistical significantly correlated with the level of participation while household burden cultural influence are inversely and statistical significantly correlated and partner's attitude is found to have no significant relation with participation. The ordinal regression model outcome reinforces correlation results suggesting that household burden and cultural influence indeed have perceptible adverse impact on level of participation. On the other hand, the effect of the rest of variables is either weak or statistically not significant. Overall, this study implies that participation of rural women in water supply activities is predominantly influenced by their household burden and cultural influence.

Key words: Rural Women, participation, factors that affect participation

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Rural women's participation in the development process has been the focus of intensive debates by many international forums in the past years. Among the forums that have recognized the plight of third World's women's participation in the development process are the 1995 Nairobi Forward Looking Strategies for the Advancement of Women held in Kenya (1995), the Beijing Declaration and the United Nations Development Fund for Women (2000). According to the philosophy of these forums, each member state should promote women's economic independence, which includes the creation of employment, access to resources and credit, the eradication of the persistent and increasing burden of poverty, malnutrition, poor health and illiteracy on women. Although such declarations have been able to increase an awareness and understanding of the problems facing women and their needs, as such they have not yet resulted in significant development priorities for rural women (UNIFEM, 2000).

The impact of development on women is quite different for both urban and rural women. In fact, there is substantial evidence that rural women are mostly neglected, and consistently have lost in this process (Meer, 1998). There is also an overwhelming evidence of development policies and projects formulated bypassing the involvement of rural women in most African countries (Hunger, 2000). The majority of the population in LDCs lives in rural areas, approximately 70% being women (Cartledge, 1995).

Development, according to Olopoenia (1983) and Pradip (1984), is not an isolated activity, for it implies a progress from a lower state to a higher and preferred one. Development is a process by which people are awakened to opportunities within their reach. Development, therefore, starts with people and progresses through them (Seer, 1981) (Gwanya, 1989). This is the reason, why rural women should be involved in ongoing development initiatives. They are the most marginalized group in terms of their needs, while being the people who produce almost 80% of the food consumed in most of Africa's rural areas (Hanger, 1999).

Water supply services in Ethiopia are among the lowest in Africa. For instance, during 2006/07, only 52.46% of the total population of the country has access to water supply (MOFED, 2007). And to raise total water supply coverage to 98%, there is a need to build more than 146,000 new water schemes. Water supply services is one of the key programs included in the government's Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (MOFED, 2007). In addition, the Millennium Development Gols (MDG) for water supply and sanitation aims at reducing the existing proportion of people with unsafe water by half by 2015 (MOFED, 2004). Universal Access Plan (UAP) has been designed based on MDG and implemented to enable rapid expansion of services to all members of the community. UAP take gender issue into consideration and the importance of women's equal participation to ensure sustainable development of potable water systems.

In addition, international conferences also reveal and support the importance of women's participation in water supply. The International Conference on Water and Environment in Dublin, Ireland, in 1992 recognized the central role of women in the provision, management

and safeguarding of water. It also highlighted the special role of women in water management.

Women's responsibility to supply and manage water resource of the household is their reproductive role which refers to all of the service provided by them in ensuring medical well-being of their families, including cooking, cleaning, and child care. Access to potable water is important in helping them fulfill these tasks. Donors and governments often assume that women's primary strategic interest in water relates to their domestic roles. Consequently, by raising women's participation in the water supply projects to 50%, the government plans to increase the water coverage of rural areas by 98% and urban areas by 100% by 2012 (MOWR 2006).

However, in few studies it is clearly indicated that women especially that of the rural area are influenced by many factors. Educational level, multiple household responsibilities, lack of awareness, unwillingness of partners, lack of government or project assistance, cultural influence etc are among these factors (Elham et.al 2008) that affect their participation negativily. Therefore, this paper investigates factors that act as bottleneck to their active participation in water supply projects of the community.

1.2 STATEMENT OF THE PROBLEM

Increasing the number of people with access to safe water by 98% in rural and 100% in urban areas are the targets set under UAP. Boosting up participation of women in every facet of development endeavors is also stipulated in the MDG. Participation of women and their active participation in development projects lead to efficient use of resources. Their role is essential particularly in water resource management as they are the primary users of

it. Women are also responsible for the safekeeping and proper use of the repair tools and manuals, since it is their task to fetch water for different projects of the household. In addition, women are closely related to water projects; they are the carriers of water, the gatherers and users of water as well as the care takers of the water systems (UNICEF, 1983). Studies on household water use hypothesize that women would be willing to pay much more for such services (Alebel, 2004). So it is important to ensure active participation of women in the planning, implementation and evaluation of water projects. If women are not included in these phases of projects their sense of ownership and responsibility to maintain water resources would be small. Therefore, enhancing participation of women in water supply and sanitation management not only improves resource management but also reduces their household burden. Lesser household burden will enable them to play their role in various development endeavors.

In recognition of the significance of water to women, they have to be playing a key role in the sector, particularly at rural community level. However, because of different factors, women were not adequately involved in development projects. Any development policy that demands enhanced participation of women must therefore take into account these factors. For instance, it is expected that half of water supply, sanitation and hygiene committee (WASHCO) members will be women, the reality on the ground shows it is difficult to raise participation of women to that level. From five to ten people of the water committee women should be at least half of the members (MOWR, 2006). As members of the WATSAN committees, women are expected to be involved in the planning, implementation, monitoring and evaluation of water supply program. Hence, consideration of factors necessitates the development of strategies designed to promote involvement of women in the

planning, designing, implementation, management, and evaluation of water supply interventions (UNICEF, 1983). It is assumed that if these factor that constraint their active participations are not investigated and analyzed, they are likely to cause a continuous impediment of rural women's participation in on-going development as well as on the viability of the sustainable safe drinking water for all. This helps to increase our understanding and commitment toward empowerment of rural women by eliminating factors that constrain their increased participation in water supply projects. This study therefore attempts to explore these factors and their correlation on deterring women's participation in water supply projects.

1.4 RESEARCH OBJECTIVES

The General objective of the study is to determine factors that affect women's participation in water supply projects.

The specific objectives are:

1. Identify the gender roles in the study community.
2. Identifying the level of rural women's participation in water supply projects.
3. Determining factors that affect rural women's participation in water supply projects of the community.
4. Determine the significance of factors affect participation of rural women in water supply projects.

1.3 RESEARCH QUESTIONS

Although several questions can be raised in order to probe into the central research problem established earlier, this study will try to answer the following key questions:

1. What are the gender roles in the study community?

2. How is the level of rural women's participation in water supply projects?

3. What are the factors that limit rural women's participation in water supply projects of the community?

4. How significantly do these factors affect participation of rural women in water supply projects?

1.5 SIGNIFICANCE OF THE STUDY

The significance of this study can be justified based on three strong grounds. First, although the vitality of rural women in managing water supply projects is not debatable, a scientific explanation for their poor participation is very scarce-both locally and internationally. The results of this study are believed to enhance our understanding of the likely causes of low level of participation thereby serving as a springboard for further investigation in the field. Second, identifying factors that affect rural women's participation and the consequence on their role in water supply management enables us to determine how much women empowering work has to be done to raise their participation in water supply projects. Third, it will give a clue as to the kinds of action to be taken to alleviate these factors and consequently boost up their role in developmental projects.

1.6 SCOPE OF THE STUDY

The study considers factors that affect rural women in relation to their participation in water supply. Water supply in the study does not include water supply for municipal use, for livestock use and for industrial use. It only includes use of water for drinking and domestic purposes including cooking, cleaning utensils, washing clothes, cleaning/bathing and the like. Besides, the research mainly focuses on determining factor that affect rural women's participation in water supply and the relationship of each factor to participation.

1.7 OUTLINE OF THE STUDY

This research report is divided into five chapters. Chapter one presents the background, problem statement and the objectives of the research. Justifications for the research consist of considerations why this research is important and explanations about the scope of the research are also part of this chapter.

The second chapter presents as of literature review. Review of the literature is generated from many sources like books, journals, articles and any other sources. Detailed examination of the existing literature on the topic helps to have better understanding of the concept on water supply projects and community participation especially rural women's.

Chapter three describes and explains the methodology employed in this study. Six major purposes of this chapter are to; (1) operationally defining variables, (2) explain the nature of the population and sample, (3) describe the procedure used in designing the instrument and collecting the data, (4) summarize variables and indicators, and (5) provide an explanation of the statistical procedures used to analyze the data. In general, the chapter describes the

methodology of the research which is description about steps in scientific procedure to perform research works.

Chapter four describes the findings resulting from an analysis of data using statistical tools as stipulated in chapter three. First are the general properties of the sample, variables, and indicators based on the descriptive statistics. Second, description of associative relationship between variables, based on the results from inferential statistics. This chapter also presents discussion of the findings in answer to the research questions.

Finally, the principal conclusion and recommendations of the report are summarized in chapter five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 WHAT IS WATER SUPPLY?

Water supply refers to the supply of clean water for human as well as livestock, industrial and municipal uses (Girma, 2003). The objective of any water supply systems is threefold. In the first place, it is to supply safe water to the users, whether it constitute a family, a group of families, or Community. In addition, it is supplying water in adequate quantity and to make water readily available to the user, in order to encourage personal and household hygiene (Wagner, 1959).

It is obvious that little water will be used by people who must carry it over long distances. For example in Africa, where surface water is scarce and ground water unobtainable , housewives spend most of their time in carrying a few liters of water in cans and jars from distant rivers and springs to their homes (ibid). Under such conditions the amount of water used is the absolute minimum required for survival. It is, by necessity, rationed for drinking purpose. Little, if any, being left for maintaining the personal and household hygiene which looms so large in the epidemiology of diarrhea diseases.

2.2 COMMUNITY PARTICIPATION

Community refers to the water using community who lives around or use a water source and share the facility (International Research Center (IRC), 2001). User communities will take the lead to develop water supply facilities for their own areas. They get together, work out what they want, and apply for help to develop these facilities. Community participation refers to an active process shared by beneficiaries that influence the direction and execution of development projects rather than receive a share of project benefits. Community participation could serve as an instrument of empowerment that increase project effectiveness and sustainability. The local community has an important role to play in rural water supply program. The community, for the purpose of the water projects may be considered to comprise the local government, community leaders, religious leaders and individuals (Wagner, 1959).

Community participation could vary from being passive to self mobilization. Participation in water supply could be understood as water user community playing a significant role within the projects. The level of community participation is listed in Table 1.

TABLE 1:LEVELS OF COMMUNITY PARTICIPATION

LEVEL	TYPES OF PARTICIPATION	DEFINITION
1	Manipulative Participation	Participation is simply a pretence
2	Passive participation	People participate by being told what has been decided or has already happened. Information shared belongs only to external professionals.
3	Participation consultation	People participate by being consulted or by answering questions. No share in decision making is conceded and professionals are under no obligation to take on board people's views.
4	Participation for material incentives	People participate in return for food, cash, or other materials incentives. Local people have no stake in prolonging practices when the incentives end.
5	Functional Participation	Participation is seen by external agencies as a means to achieve project goals especially reduced costs. People may participate by forming groups to meet predetermined project objectives
6	Incentive participation	People participate in joint analysis, which leads to action plans and the formation or strengthening of local groups of institutions that determine how available resources are used to seek multiple view points.
7	Self mobilizations	People participate by taking initiatives independently of external institutions. They develop contacts with external institutions for resources and technical advice but retain control over how resources are used.

Source: (Pretty et al, 1995 in (Henok, 2007)

2.3 THE IMPORTANCE OF COMMUNITY PARTICIPATION

Sustainability is strongly influenced by the way projects are implemented. A participatory assessment with 88 various countries that manage their water supply (IRC, 2000) strongly indicated that approaches that are more gender and equity sensitive are associated with services that are better sustained and effectively used. It was found that projects functioned better over time when both women and men were offered more choice in technology, service levels, management and financing systems and when benefits as well as maintenance responsibilities were equitably shared between women and men, rich and poor. So the way a system is implemented can increase the chance of its sustainability.

2.4 GENDER ROLES OF RURAL WOMEN

Gender roles are defined as a set of perceived behavioral norms associated particularly with males or females, in a given social group or system. Gender role refers to the attitudes and behaviors that class a person's stereotypical identity, e.g. women cook and clean, men fix cars. It can be a form of division of labor by gender. Gender is one component of the gender/sex system, which refers to "The set of arrangements by which a society transforms biological sexuality into products of human activity, and in which these transformed needs are satisfied" (Wikipedia, the free encyclopedia) . In developing countries, rural women in the household have so many responsibilities. For instance, taking care of children, food preparation, fetching water, collecting fuel wood, petty trading, caring for elders and the sick, shopping of consumer items, assisting the husband in weeding, and harvesting time are among the gender roles assigned to women by the society.

2.5 WOMEN AND WATER

Water supply is central for women in Ethiopian society. They are the ones primarily seen to be responsible for household management taking care of family members (especially children and sick persons), cooking, cleaning, and washing clothes. Fetching and managing household water is the responsibility of women. They are the more disadvantaged because of water shortage. They traveled long distances to fetch water more than 3kms per day which increases their burden and spend more than five hours a day. Besides, when they fetch water women expose themselves towards violence. And girls do not go to school because they have to help their mothers in fetching water and also they could not keep their hygiene during menstruation. So, women need to be closely related to water projects, as they are the carriers of water, gatherers, and users of water as well as the care takers of the water supply system. Recognizing women's multiple roles as providers of domestic water, as guardians of family health and the managers of water at the community level, water resource planners have increasingly sought to integrate women in water development initiatives (Green, et al 1998). Therefore, projects are considered absolutely critical in addressing women's needs. To ensure this, women's active participation in the planning, implementation and evaluation of the water supply project is necessary.

Studies on household water use hypothesize that women would attach more importance to improved supplies than would men, and willing to pay much more than men (Alebel, 2004). Men are not as much concerned for water supply projects as women because they do not fetch water and think it is exclusively for women. In various places it is known that once men take over and become the guards, they fence and padlock the water points. The problem though is that after locking the water points, the guard disappears, while women line up with

their buckets to collect water early in the morning. The guards are not serving the needs of women in time (Girma, 2003).

2.6 THE ROLE OF WOMEN IN WATER SUPPLY

The roles that women play in relation to domestic water supply can be classified into four according to International Development Research Center (IDRC 1987).

1. Women as acceptors of improved water supply

Women are the primary users of any water system, whether new or traditional. Their domestic managerial role means that in food preparation, washing and bathing, women are the key mediators between the water source and the household demand. Any planned change in water availability should be based on information about their present knowledge, attitudes and practices.

The choice of water for drinking, cooking, laundry, bathing and other household functions is a result of women's careful decisions, based on what they have learned from their mothers and grandmothers, and on their observations of the costs and benefits, both social and economic, of any change of system.

2. Women as users of improved water supply

A central question confronting each new water project at the threshold of its execution is whether or not those for whom it is intended will use the new facilities. Regardless of the excellence of construction and function, new facilities will not achieve their objectives if they are not used.

3. Women as managers of water facilities

Women are usually managers of household water supplies whether it is recognized or not, they also have a strong potential role as managers of community water supplies. Women are bound more tightly to the household than their male counterparts, who must often leave the home or community in search of work. They are usually responsible for obtaining water and observing that water sources are maintained. Women thus make ideal candidates for training in tasks associated with the management and maintenance of community water supply facilities. Women, as those who already exercise considerable influence over water supplies, are in a good position to benefit from training for such tasks. In Angola, where women have been recruited as water source monitors, the breakdown rate has fallen decidedly. In Bangladesh, the women pump caretakers had higher performance records than their male counterparts. In Sri Lanka where local women have been trained to manufacture and install hand pumps as well as maintain them, there are indications of increased acceptance and hopes for continuous operation. Armed with such skills, women can plan for more accessible and more reliable water sources for their households and communities, and communities can acquire an increased sense of owning the water supply facility.

4. Women as agents of behavioral change in water supply

Women as diffusers of information about improved water supply and as agents of behavioral change must be taken into account in planning for project outcomes, both within households and community-level efforts.

In the process of behavioral change the importance of women, both those within and outside the community becomes even clearer when we consider that changing traditional behavior

depends on an understanding of the reasons why changes are beneficial, and that women are often the gatekeepers of local customs. When the necessary information for such change is on taboo subjects, who are perceived as extremely private and personal, the exchange of such information tends to occur only between individuals of the same sex who usually share other characteristics such as social status, language and beliefs.

Women themselves are aware of the time and energy spent in obtaining the family's daily water supply, time and energy which could be used in more productive and rewarding tasks. Many of them, however, are not aware of possible alternative sources of water or of how to become involved in improving existing supplies. By including women early in the project planning stages, development personnel and planners can ensure the participation of women and thus benefit from their involvement, and in turn, communities will benefit by having safe and reliable water supplies.

2.7 DETERMINING FACTORS OF WOMEN'S PARTICIPATION IN WATER SUPPLY PROJECTS

A combination of socio-cultural, psychological and economic factors is a challenge to women's involvement in water supply projects. These factors are discussed as follows.

2.7.1 BURDEN OF HOUSEHOLD RESPONSIBILITIES

Studies have shown that women have higher labor burden as opposed to men (Yeshihareg, 2007). Traditionally, women are responsible for all domestic chores i.e. cooking, feeding of children, washing, fetching water and fire wood, bathing children etc. (Melchoir-Tellier, 1981). Given this traditional role set for women, problems usually arise when women have to leave home either for short or long durations attending meetings and training workshops

on water supply projects. In a few cases, women in water committee members have been physically prevented by their husbands from participating in workshops on the grounds that nobody would perform the woman's role when she is away from home.

It is documented that women in rural Ethiopia (where 85% of population live) commonly work over 15 hours a day (National office of population, 1999). National workshop on cooperatives and the integration of women in Development held at Awassa revealed that women would find it almost impossible to join the cooperative; they go to work late and out earlier than men workers. They spend time on grinding the grains or traveling to the mill, collecting firewood, drawing water, washing clothes, preparing food that they can hardly spare time for public activities (CIWD1983).

In Tanzania, there were trainings on water supply; the trainings included practical work of constructing improved water sources. In the training female participants did not want any leading responsibility and also complained about their duties at home saying that they did not have time to take part. Most of them were late for work and when the importance of being present was explained, their answer was "Ah, I had to make tea for my man" and sometimes they told that "today you (the trainers) should cook food and bring it here since we failed to go home and cook our own" (Drangert, 1993).

From these two stories we could understand that even when women's participation is crucial, they are not active participants because of their multiple roles. Rather than consider active involvement in the management of water facilities as complementary to their working life, most women regard the activity as additional responsibility and therefore shy away from it. Even in communities where water committees are set up with participation, women's impact

on decision making is limited. Family responsibilities including the burden of water fetching, labor and other cultural issues constrain most of them from active participation. Women are pushed away from the management level as well as from the maintenance of the water points. They are seen cleaning the places but not managing it. Women are not capable of maintaining the machines because they lack the skill. On the other hand, their workload is too much; they have no time to look after the water points.

2.7.2 CULTURAL INFLUENCE

Many cultures have historically stressed the role of men as decision takers and women as domestic caretakers. In many rural communities, women take no part in the participation of water supply projects because of discrimination against women and they are often prevented from taking any effective decisions. Given the domination of men in the society arising out of the patriarchal system, the participation of women in the management of water facilities is limited. In rural societies, women are considered as being inferior to men. The situation in rural areas is such that if you are female, you do not play any role. Some women particularly the uneducated have readily accepted this position and do not therefore want to assert themselves by assuming new roles as managers of water facilities. This is because these roles are considered the preserve of men (Simpson Herbert, 1992). With this background, women tend to discourage their fellow women from active participation. It can be said that ignorance and illiteracy are perpetuating the inferior status of women and hence their reluctance to play leading roles in the water and sanitation sector. In a contrasting situation, some women have 'liberated' themselves from male dominance and plunged into active involvement in the management of water facilities. These women are very assertive and tend to override their male counterparts on the committee and other members of the society. This

has produced negative feelings and antagonism against these women. In such circumstances, the cooperation and complementary support required from the community is absent.

2.7.3 EDUCATIONAL LEVEL

World Countries are becoming increasingly aware of the importance of women in national development and the fact that education can contribute to their playing a much more meaningful role in development (Kelly, 1987), (Browne, A.W.& Barrett, H.R., 1991). There are many reasons as to why the education of women is important. Research has shown that there is a strong association between education and better life, nutrition, improved hygiene, low mortality and fertility rates, and economic development (Ibdi). Education for women in Sub-Saharan Africa has been noted to have a powerful developmental effect in light of their cardinal role of nurturing, upbringing, socialization and education of children. Women are well known for being active economically, as both producers and consumers of goods. Their capacity to serve actively in these areas can be enhanced if they are provided with adequate levels of education (Ibdi).

2.7.4 LACK OF PROJECT OR GOVERNMENT ASSISTANCE

There has been insufficient political will and sustained commitment to meeting economic needs and interests of most rural women by the local authorities and governments. While many African countries have ratified the UN agreements on this issue, there seems to be no subsequent informed policy decisions. Most governments' macroeconomic policies do not incorporate gender perspectives in their design in order to enforcing its application and implementation. As well, they often ignore the structure of households in Africa and the social relations that influence women's roles in production (Hunger, 2000). A report by

Hunger Project (Ibdi) also reveals that when women are included in official planning, they are often treated as powerless. In the foreword to the alternative framework for structural adjustment programs for socio-economic recovery and transformation, it is recognized that women play a crucial role as producer and agent of change in rural transformation, and that the negative effect on rural development is brought about by their marginalization. Even the 1994 African Common Position on Human and Social Development Forum describes women as part of the marginalized, vulnerable section of the population and they are grouped with children, youth, elderly and the disabled. No matter which rural government option is chosen, it seems that women in rural areas will always remain where they are, and ultimately will end up in a worse position (Hunger, 2000).

2.7.5 LACK OF OWN SOURCE OF INCOME

Women's lack of assets, due to the gender discriminatory property and inheritance practices in many of the African countries limit women's access and control over resources specifically land. There are significant inequalities in men's and women's access to private property resources, leading to women's much greater dependence on common property resources. For instance, the most important productive resource in rural economies, agricultural land and associated production technology, is concentrated largely in male hands (Agarwal, 1994).Where both women and men control resources, women especially in poor households are noted to spend their incomes mainly on the family's basic needs and men in greater part on personal needs (Agarwal, 1994; Mencher, 1989). Hence resources in the hands of male household heads cannot be assumed to benefit women and children in equal degree, and women's direct access to economic resources (private and communal) assumes particular importance.

2.7.6 LACK OF INFORMATION/AWARENESS

Lack of information is one of the constraints encountered in the establishment of contacts with women and in informing them directly about the program. Often women obtained their information through men. To be active participant in development projects, women's first should have the knowledge of the importance of participation in the activity and should believe that they have key role in the activity. In addition to this, they have to be aware of that without their participation development could not be achieved especially in water resource development they are the main actors of the projects because of their relation with water. As their awareness in water supply projects increases, their participation also increases. For this reason, to see any change coming to their ways, they themselves need to stand up for it (Ntomb'futhi, 1995).

2.8 OVERVIEW OF INTERNATIONAL CONFERENCES, ETHIOPIA'S WATER POLICIES AND GUIDELINES ON WOMEN'S PARTICIPATION IN WATER SUPPLY PROJECTS

The United Nation Conference on water at Mar del Plata in 1977 recommended the period 1980-1990 as the international water supply and sanitation decade. The decade put the emphasis on community involvement in rural water supply and sanitation programs. The importance of women's participation has become the leading concept for implementing water supply systems. International conference on water and environment held at Dublin 1992 set out recommendation for action at the local national and international levels based on four guiding principles. The third principle highlighted the importance of women's role in water supply projects. The recommendations of the Dublin Conference were later consolidate into chapter eighteen of agenda 21 in Rio de Janeior 1992. Agenda 21 chapter eighteen emphasized on encouragement of the local population, especially women, youth,

indigenous people and local communities in water management. (Evans, P. & Appleton,B., 1993).

The Ethiopia government has given emphasis on equal participation of women in water supply projects in accordance to the attention given by the international community to the subject. Universal access plan is designed to be implemented in 7 years (from 2005/06 to 2011/2012). In order to achieve the plan, community participation especially that of women is important as they are principal users of the water supply systems and responsible for the household water supply. The national water management policy recognizes the importance of participation of women in water resource management (MOWR, 1999). Besides, gender mainstreaming of the national water sector strategy underlines the securing of gender mainstreaming in all aspects of water resource planning, development and management. The strategy also states that research and development efforts should be made to better understand the constraints that restrict the role of women in the management of local water system and devise appropriate measures to address those constraints (MOWR, 2001). To enhance women's participation in water and sanitation projects, women's affair department of the Ministry of water resource has prepared gender mainstreaming and checking manual to be used by Woreda water bureaus (MOWR, 2006).

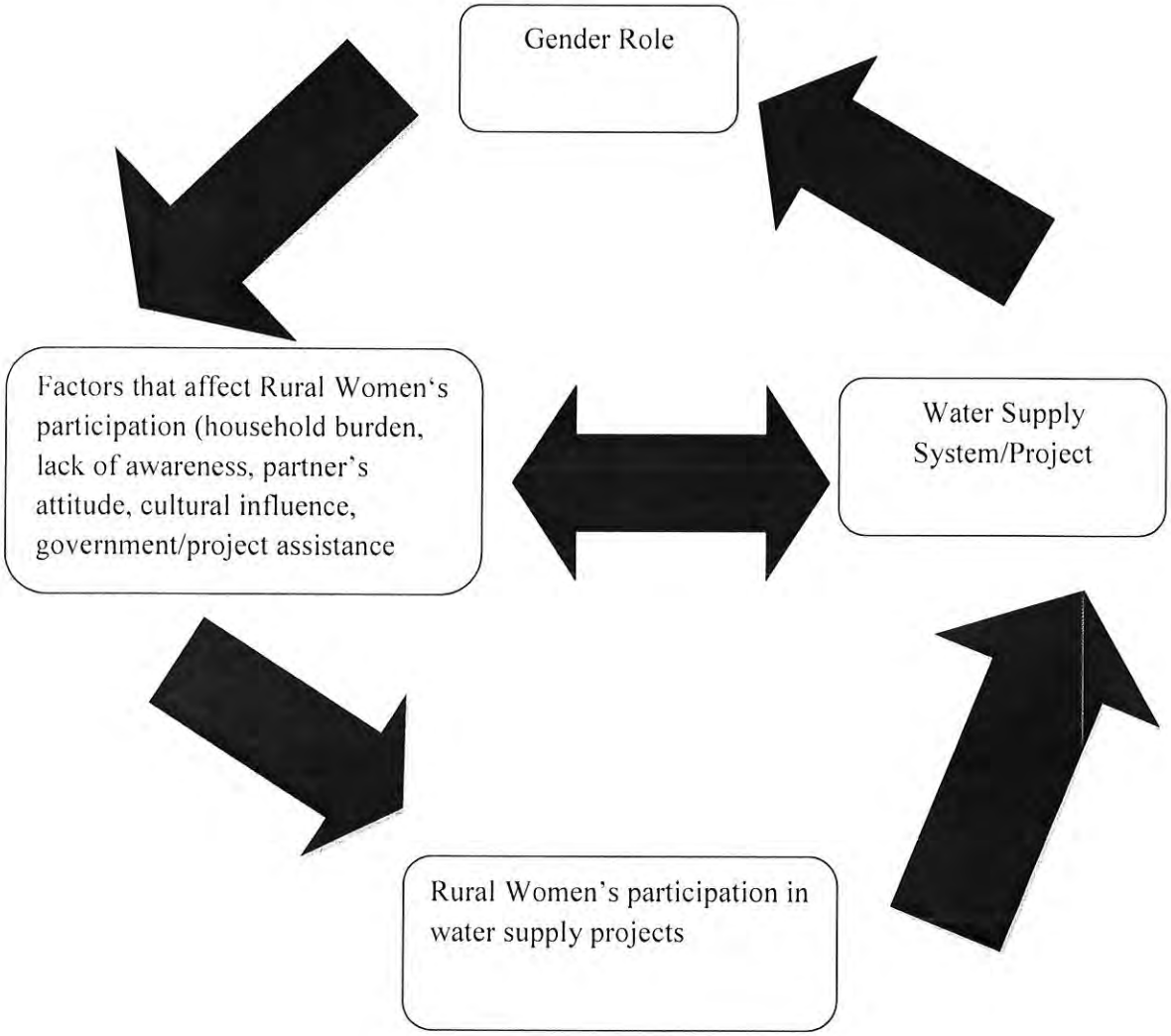
Review of literature above indicates existence of quite large body of literature on factors that affect participation of rural women and also on lower level of their participation in development projects in general. However, no study was conducted in determining the effects of these factors on the participation of rural women in water supply projects.

Therefore this study is set to fill the gap in the extant body of literature by assessing the impact of these factors on the participation of rural women in water supply projects.

2.9 CONCEPTUAL FRAMEWORK

Gender role of women and men is often prescribed by the community to which they belong. It determines division of labor between them. The effect of different factors on women is defined by their gender role understood in the community and accepted by women themselves. This in turn affects their participation in various development projects in general and water supply projects in particular. Women with the effect of these factors are less likely to actively participate in water supply projects including partaking in WASHCO. Low or no participation of women in water supply projects further exacerbates these factors. The figure in the next page exhibits the above conceptual framework.

FIGURE 1:CONCEPTUAL FRAMEWORK



CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

The research was conducted in Haramaya Woreda, East Harerge. East Hagerge has a total population of 2,739,390 of which 92% live in rural areas while the rest are urban dwellers. Forty three percent of the rural population of the Zone has access to potable water. Haramaya is one of the 16 Woredas in East Hararghe Zone and it is located 16 Km west of Harar and 39 km East of Dire Dawa. It has a total land area of 512.63Km, and constitutes 33 rural Kebeles and 4 urban Kebeles. Total population is 271,394, of which 133,018(49%) are female while the remaining 138,376 (51%) are male (Population Census Comittee, 2008). Water coverage of the Woreda is only 25.47%. The Woreda has different kinds of water schemes established by various governmental and non-governmental organizations. The Woreda is considered ideal for my research based on two grounds. First, easy access to information and my familiarity of the area. Besides, I discovered, in my preliminary assessment of study areas, that this particular Woreda offers a better logistic and facility support.

3.2 RESEARCH DESIGN

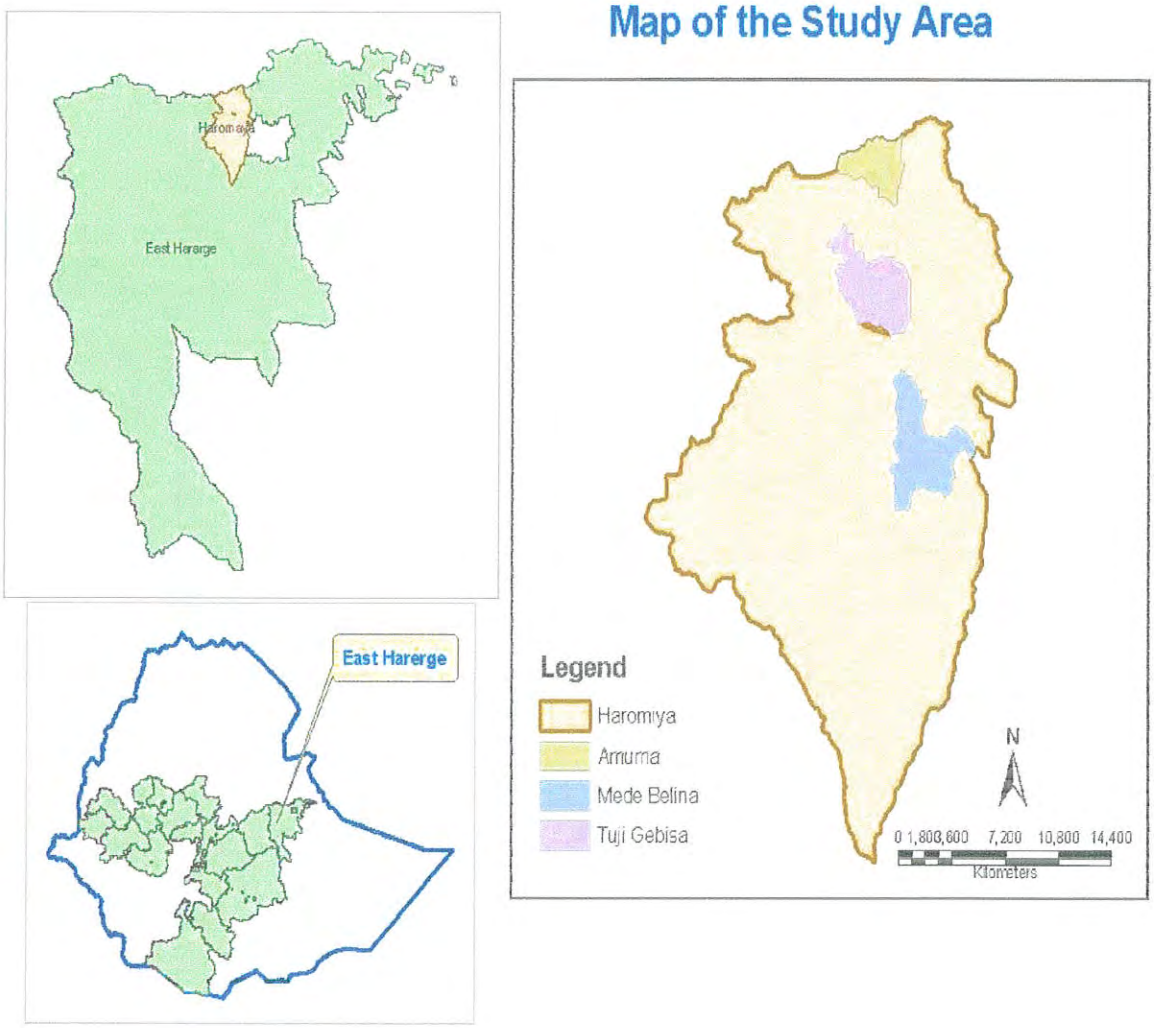
This study is a survey of rural women that aimed at identifying factors that influence their participation in water supply projects. Qualitative data are used to supplement information obtained via the survey questionnaire. The questionnaires are completed by data collection team through a door to door interview of women in the selected households.

3.3 SAMPLING PROCEDURES

3.3.1 AREA SAMPLING

Three Kebeles accounting for 10% of the total 33 Kebeles in the Woreda was selected purposively based on accessibility, availability of functional water supply project and application of water committee. Based on these, three Kebeles namely, Amuma, Medabelina and Tuji Gebissa were selected (figure 2). Villages in each Kebeles were selected purposively based on accessibility, availability and functional water supply schemes and application of water committee. Therefore, Genda Ali, Jalo, Hubeta villages were selected from three water schemes in Amuma. Similarly, Village Maya from one scheme in Meda Belina and village Shoshe and Dama from two water scheme in Tuji Gebissa were purposively selected with similar bases (see Table 2).

FIGURE 2: MAP OF THE STUDY AREA



3.3.2 RESPONDENT SAMPLING

The study involved a survey of households in Haramaya Woreda in East Harerge. A sampling frame was established based on a beneficiaries list from the Woreda Water Bureau in each water scheme. Women in the rural of the Woreda were the subjects of this study as its aim is assessing factors that affect women's participation in water supply projects.

Households in each village were stratified based on user households of the water supply scheme. Each stratum in a water scheme of each village was used as a basis of drawing sample households. Forty to twenty beneficiary houses from each stratum were selected by using simple random sampling. There are 600 beneficiaries in Amum. 200 beneficiaries in Meda Belina and 400 beneficiaries in Tuji Gebissa. Ten percent of beneficiaries from each village were taken. One hundred twenty women were in the sample survey. One woman is taken from a household. Accordingly, the number of sample respondents in each Kebele is as follows.

TABLE 2: SAMPLE OF KEBELE AND RESPONDENTS

Name of the Kebele	**Name of the village**	**No of beneficiary households**	**Sample size**
Amuma	Ali		
	Jalo	600	60
	Hubeta		
Meda Belina	Maya	200	20
Tuji Gebissa	Shoshe		
	Dama	400	40
Total		1200	120

3.4 DATA SOURCE, METHODS OF DATA COLLECTION AND TOOLS

The study used both primary and secondary data. However, quite a lot of primary data is used for the study.

3.4.1 PRIMARY SOURCE

1. Structured Questionnaire /Household Survey/

The survey questionnaire had 68 questions divided into eight sections. The first section is on general information about each subject while the next five sections are on each factor considered to have impact on their participation in water supply projects. The last section, on the other hand, is entirely devoted to capturing the extent of their participation in water supply projects (See Annex).

Pilot interview was conducted on randomly selected households to ensure clarity of questionnaire items and accordingly revision was made. The survey was administered on a door to door basis by trained enumerators. Three Enumerators were recruited from Haramaya Health Science College based on their proficiency in communicating using local language, educational background and prior experience to similar works. Training was given to enumerators on the procedure to follow while conducting the questionnaire. Enumerators were closely supervised by the researcher. Data collected by each enumerator were checked for consistency.

2. Interview

Key informants like Woreda Water Desk, staffs of the projects, Woreda Women's Affair officers and Zone Water Bureau staffs were interviewed. These key informants were

selected based on their experience and knowledge of the cultural realities of the study area. The information gathered from key informants has been used in the study to strengthen the findings obtained through household survey.

3.4.1.2. SECONDARY DATA

In any type of study, it is advisable to assess the availability of secondary data before embarking upon a primary data collection exercise since the secondary data is inexpensive in terms of time, money and manpower. So, secondary data is collected from the following sources.

- Various reports and publications of MOWR
- Different publications of Oromiya Regional Government Water Bureau
- Different Central Statistical Agency publications.
- Reports of various research scholars and consultants regarding this area of study.
-Unpublished research reports of graduate studies.

3.7 MEASUREMENT

To measure factors that affect rural women's participation in water supply projects of the community (the independent variables) and their participation level (the dependent variables) different indicators were taken.

Factors that affect rural women's participation are the independent variable and participation of women in water supply projects is the dependent variable. The dependent and

independent variables are measured by using different indicators in each variable in association of Likert scale with five rank orders.

3.8 DEFINITIONS OF VARIABLES

This study generally attempted to investigate factors that affect women's participation in water supply projects. Participation in this research refers to the involvement of rural women in the different aspects of water supply projects. Determining factors of participation such as household responsibilities, awareness, educational level, government/project assistance, partner's attitude are measured by using different indicators.

Household burden; The workload of women at home.

Awareness; Refers to public or common knowledge, understanding or consciousness about water supply projects

Partner's attitude; the perception and willingness of husbands' on women's participation in water supply projects.

Cultural influence; The effect or domination culture or community beliefs on the participation of women in water supply projects.

Participation; The process of involving women in water supply projects to encourage decision making, empowerment and ownership and getting benefits from the performance of the water supply projects.

3.9 SUMMARY OF VARIABLES AND INDICATORS

TABLE 3:SUMMARY OF VARIABLES AND INDICATORS

VARIABLES	**INDICATORS**
Age	➢ Age of respondent
Educational level	➢ Educational level of respondent
Household burden	➢ Time spend on different household projects
Awareness	➢ Exposure to know the importance of community participation in water supply projects ➢ Exposure to know the importance of women's participation in water supply projects ➢ Exposure to know the equal participation of women on water supply projects as men ➢ Exposure to know the equal representation of women's in water committee as that of men ➢ Exposure to participate in community meeting ➢ Exposure to participate in water supply projects
Partners attitude	➢ Partners encouragement to participate in water supply projects ➢ Partners willingness or promise to share household tasks in case of participation ➢ Partner's willingness to let in participating in repair and maintenance training of the scheme far from home.
Cultural influence	➢ The extent to which your culture influences you to attend meetings ➢ Extent of cultural influence to speak in public ➢ Extent of cultural influence to speak in the presence of husbands ➢ Extent of culture to impede in participating on community projects ➢ Extent of cultural influence to work together with men
Own source of income	➢ Own source of income like money, agricultural products, animal products ➢ Extent of lack of own sources of income effect on the participation of water supply projects

.....Continued

Government or project Assistance	➢ Extent of project/government motivation to involve women in water supply projects ➢ Efforts made to incorporate women's ideas and comments at a meeting ➢ Incentives given to motivate women to participate in water supply projects ➢ Extent to which women get positive responses for their request to participate in water supply projects ➢ Extent of trainings given to women on repair and maintenance of the water scheme ➢ The extent to which an attempt is made to solve women's personal problem that obstacles them to participate in water supply projects
Participation	➢ Participation in meeting about the water project ➢ Participation in site selection of the water scheme ➢ Participation in the election of WATSANCO ➢ Participation in the planning of the water supply project ➢ Participation in the designing of the water supply project ➢ Participation in the supply of labor during the construction of the water supply ➢ Participation in the supply of material during the construction of the scheme ➢ Participation in the repair and maintenance of the water scheme ➢ Participation in the record keeping of the water scheme ➢ Participation in the money management of the water scheme ➢ Participation in the fund raising projects of the project ➢ Participation in organization and management of the water supply project ➢ Participation in the decision of the water tariff

3.10 ANALYSIS

The household sample survey data were coded and entered into a computer for analysis. For analysis, Statistical Package for Social Science (SPSS) version 15.0 was employed. The data analysis made in this study can be broken down into four components. The first and the second parts are description of characteristics of the respondents, their households and other variables of interest. The descriptive analysis is followed by analysis of interrelation among the independent variables and their relation with the dependent variable. Lastly, but most importantly, magnitude and direction of a causal relationship between the independent variables and the dependent variable is investigated.

3.10.1 DESCRIPTIVE

Responses are described using measures descriptive statistics of frequencies and cross tabulations. Attention is centered on examining the responses in relation with respondents' age, marital status, family size, educational level, and whether or not they have their own income. The descriptive analysis is used as a basis for gaining deeper understanding about the relationship among the variables.

3.10.2 ANALYSIS OF CORRELATIONS

Using inferential statistics bivariate correlation of Kendall's tau-b was employed. Kendall's tau-b type of correlation is selected because it best fits with categorical measurements since the ordinal categorical measurement is used to measure the dependent and independent variables. The analysis is made to discover the correlation of factors that affect rural women's participation and their participation in water supply projects. In addition, the extent of their participation in water supply projects was determined. Correlation coefficient of factors (independent variable) and rural women participation in water supply projects (dependent variable) is determined to see the extent and direction of correlation between the two.

3.10.3 ANALYSIS OF CAUSAL RELATIONSHIP

The causal relationship between level of participation (measured in ordinal categories as "no participation", "moderate participation", and "High participation") and multiple independent variables is examined. To this end, ordinal regression model, developed by (McCullagh, 1980), is found the most appropriate. It is most suitable and practical technique to analyze the effects of multiple explanatory variables on the ordinal outcome that cannot be assumed

as continuous measure and normal distribution. Ordinal regression does not need altering an ordinal outcome as binary or dichotomous measure for logistic regression analysis, which may lead to the loss of inherent information.

In ordinal regression analysis, the two major link functions, e.g., logit and probit links are used to build specific models. This study used a logit link that is generally suitable for analyzing the ordered categorical data evenly distributed among all categories.

The essential features of the ordinal regression model may be briefly described. First, the outcome variable of interest is a grouped and ordered category that may be regrouped from an unobserved continuous latent variable (Scott, et al., 1977). Second, the ordinal regression analysis employs a link function to describe the effect of the explanatory variables on ordered categorical outcome in such a way that the assumptions of normality and constant variance are not required (McCullagh. P. and Nelder, 1989). Third, the model assumes that the relationship between the explanatory variables and the ordinal outcome is independent of the category because the regression coefficient does not depend on the categories of the outcome variable. In other words, the model assumes that the corresponding regression coefficients in the link function are equal for each cut-off point (Bender, R. and Benner, 2000).

Fitness of the ordinal regression model is tested by examining model fitting information, goodness-of-fit statistics, and Pseudo R-square. While the model fitting information allows an overall test of the model by comparing the specified model against intercept-only model, goodness-of-fit test allows comparison of predicted values of the model against observed

value. Pseudo R-square, analogous to R-square in Ordinal Least Square regression, is used to examine the extent to which variations in the level of participation, the dependent variable, are explained by a change in the independent variables. In other words, Pseudo R-square provides a test of causality by revealing whether or not most of the changes in the independent variable are caused by change in the explanatory variables.

The ordinal regression model of this study can be written as follows:

$$Y=\alpha+ß_1HHB+ ß_2PART\_ATT +ß_3CULT+ß_4AWARE+ß_5SUPPORT + \varepsilon$$

Where:

Y = the dependent variable of the model denoting rural women participation in water Supply projects

α= constant of the model

$ß_1$= the coefficient for household burden

$ß_2$= the coefficient for partner's attitude

$ß_3$= the coefficient for cultural influence

$ß_4$= the coefficient for awareness about importance of their participation

$ß_5$= the coefficient for support from government or nongovernmental projects.

ε= the error term.

The coefficients of each variable (ß1, ß2...), are examined to see whether or not they have effect on participation and also how they affect it (adversely or positively). Significance level of each coefficient is closely examined to see if the estimate is significant with the stated level of confidence interval. Moreover, the error term is assessed to see existence of the confounding variables.

TABLE 4: VARIABLES OF THE MODEL WITH THEIR CORRESPONDING ORDINAL MEASURMENT VALUES

Variables	1	2	3	4	5
Household Burden	Much burdened	Burdened	Less burdened		
Awareness	Not At all	Rarely	Moderate	Often	Very Often
Partner's Attitude	Not at all	Rarely	Sometimes	Often	Very Often
Cultural influence	Not at all	Little	Moderately	High	Very high
Government/project assistance	Not at all	Little	Sometimes	High	Very high
Participation	Not at all	Rarely	Moderate	Often	Very Often

CHAPTER FOUR

RESULTS ANALYSIS AND DISCUSSION

4.1. GENERAL CHARACTERISTICS OF THE SAMPLE

This section describes the general characteristics of the sample in terms of Head of the household, Age, Educational status, Marital status, Family size, Types of source of income, Household responsibilities in determining gender role of the community, Own source of income and Participation in water supply projects.

4.1.1 HEAD OF THE HOUSEHOLD

The study involved 120 households. Of these 85% are headed by men and 14% are headed by women. Table 5 shows the frequencies and percentage of head of the households. Ato Kebede Gudisa, a key informant, who is a natural resource expert in self help organization, which works on the water supply projects in the Woreda, said that women in female headed households have high probabilities to participate in water supply projects than women in male headed households.

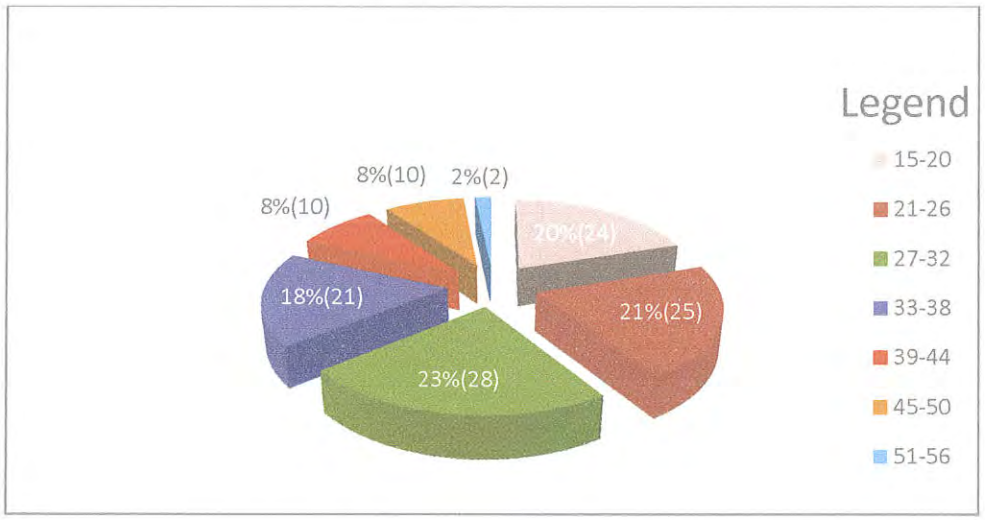
TABLE 5:HEAD OF THE HOUSEHOLDS

Head of the Households	Frequencies	Percent
Male	102	85.0
Female	17	14.2
Both	1	.8
Total	120	100.0

4.1.2 AGE OF THE RESPONDENTS

The respondents were between 15 and 56 years old. Figure 3, shows the age distribution. It shows that nearly 62% of the respondents are in the age range to 21 and 38. This shows that most of them are in active age groups.

FIGURE 3:AGE OF RESPONDENTS



Note: Number in brackets are frequencies

Source: Own Survey 2008/2009

4.1.3 MARITAL STATUS OF THE RESPONDENTS

81% of women in the surveyed households are married. Furthermore, 7% are single 3%, 7% and 3% are separated, widowed and divorced respectively. Table 6 shows the frequency and percentage of respondents' marital status.

TABLE 6:MARTIAL STATUS OF RESPONDENTS

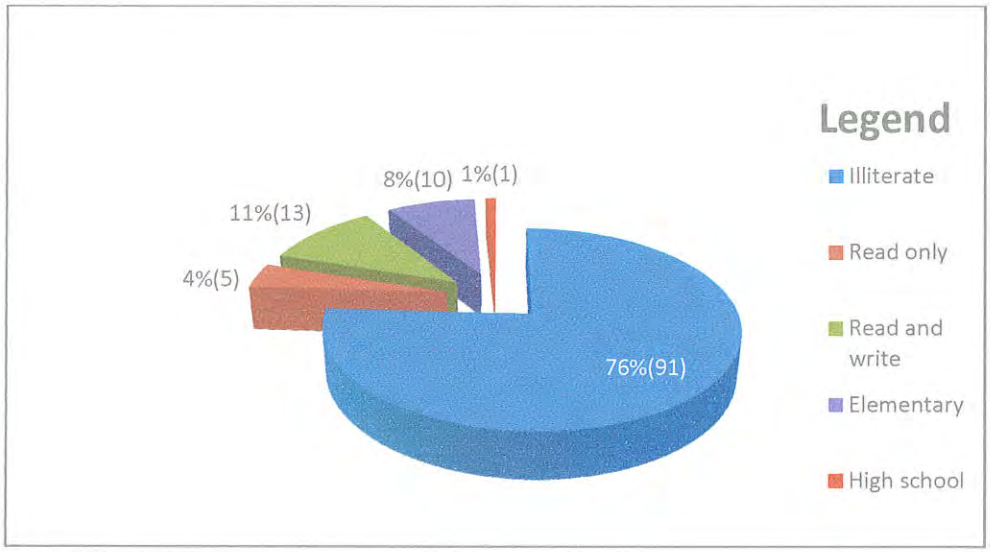
Marital Status	Frequency	Percent
Single	8	6.7
Married	97	80.8
Separated	4	3.3
Widowed	8	6.7
Divorced	3	2.5
Total	120	100.0

Source: Own Survey 2009

4.1.4 EDUCATIONAL STATUS

Educational level is an important tool, and is needed to stimulate, create, achieve and enhance active participation of rural women in development. The rate of participation of women in development initiatives is strongly influenced by their educational levels. The more a woman is educated, the greater the likelihood she would be included in the development projects (Kriefer, 1985). Women in the selected households were asked to give information on their educational level. Figure 4 provides information on educational status of the respondents'.

FIGURE 4: EDUCATIONAL LEVEL OF RESPONDENTS



Note: Number in brackets are frequencies

Source: Own Survey 2008/2009

As it is shown in figure 4 above, slightly more than three fourth (76 percent) of the women in the surveyed households reported that they are illiterate. Only 20% of the respondents could read and write.

4.1.5 FAMILY SIZE

Fifty four percent of the respondents have family size between 5 and 7. From the surveyed households 60% of the respondents have one child or more children who are below three years old.

4.1.6 INCOME SOURCE

As it is indicated in table 7 below, nearly 92% of the respondents source of income is farming.

TABLE 7: HOUSEHOLDS SOURCE OF INCOME

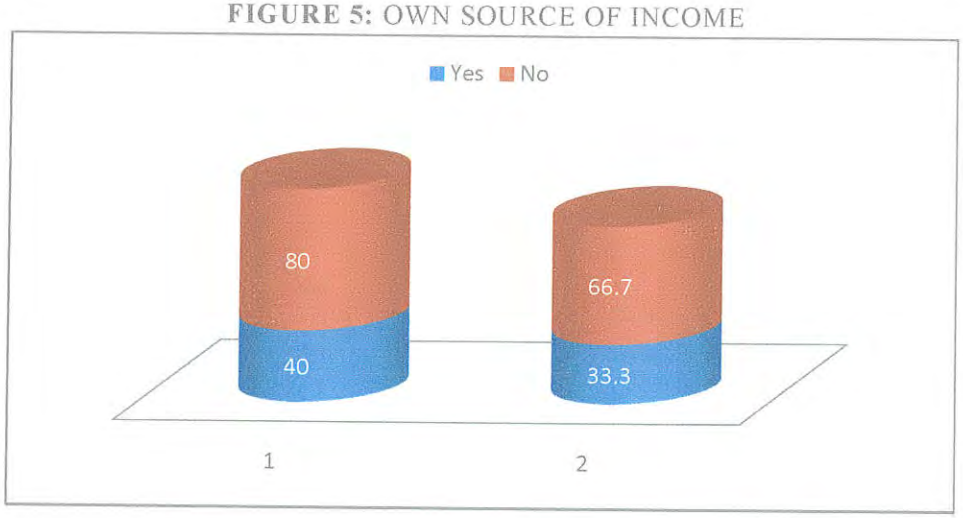
TYPES OF SOURCE OF INCOME	FREQUENCY	PERCENT
Farming	110	91.7
Trade	3	2.5
Wages/salaries	1	0.8
Farming and trade	6	5.0
Total	120	100.0

Source: Own Survey 2009

4.1.7 OWN SOURCE OF INCOME

The women in the study were also asked to give information on whether they have their own source of income or not. Figure 5, presents information on the frequencies and percentage of respondents who have their own resources and who have not. Slightly greater than two third of the respondents (67 percent) do not have their own source of income.

FIGURE 5: OWN SOURCE OF INCOME



Note: Series 1: Frequency Series 2: Percentage

Source: Own Survey 2009

4.1.8 PARTICIPATION IN WATER SUPPLY PROJECTS

As presented in table 8 below 64% of the respondents are not involved in water supply projects.

TABLE 8: PARTICIPATION IN WATER SUPPLY PROJECTS

Participation in water supply projects	Frequency	Percent
Yes	43	35.8
No	77	64.2
Total	120	100.0

Source: Own Survey 2009

Of the 36 percent of respondents who take part in water supply projects, 14 percent (see annex) participated as water committee and 86 percent participated as community member. Moreover, half of the women water committee members are participating as treasures and the rest are participating as members only. In the water committee of each water scheme (see annex) there is no equal representation of women in the committee as described in the literature part page 21. This implies that more women in the study area do not participate in water supply projects and if they participate, the majority of them participate as ordinal members and also if they participate in water committee most of them work as treasurers.

Key informants w/ro Dunia, Ato Getahun and Ato Kebede say that women's participation in the Woreda is not adequate and women could not participate equally as men due to different reasons. Even if they participate, their participation is mainly indirect, that means, they bring

food, tea and other facilities for the participant men. The majority of women in the Woreda do not participate in the water supply projects directly. The informants said that there are not equal numbers of women in the water committee. If there are women on the committee, most of them are assigned as cashier because of their honesty, a value that the community has associated with women. Furthermore, they add the point that if the Woreda women are to be participants in the meeting, the meeting should be arranged separately. If they are invited together there will be less women attendant and they could not speak loudly in front of men because of cultural influence that discourages them to attend meetings together with men and speak in the presence of men.

As age, educational level and own source of income are also taken as one of the factors that affect participation. So, it is important to see the cross tabulation of each with participation in order to see the association of participation with age and educational level.

Age and participation

Table 8, presents the cross tabulation of age and participation in the study. As shown below, those who participate are fairy equally distributed in all age categories. On the other hand, from those who do not participate, the majority are within age group of 15 to 38. Overall, it seems that age has no influence on respondent's decision to participate in water supply projects. The result is consistent with a study made in South Africa on the analysis of factors that influencing rural people's participation in sustainable management of water and land (Elham et.al. 2008).

TABLE 9: CROSS TABULATION OF AGE AND PARTICIPATION

Do you participate in water supply projects?	**age categorized**							**Total**
	15-20	**21-26**	**27-32**	**33-38**	**39-44**	**45-50**	**51-56**	
Yes	8 (19)	6 (14)	9 (20)	11 (26)	5 (12)	4 (9)	0	43 100
No	16 (20)	19 (25)	19 (25)	10 (13)	5 (6)	6 (8)	2 (3)	77 100
Total	24	25	28	21	10	10	2	120

Note: Numbers in brackets are in percent

Source: Own Survey 2009

Educational Status and participation

The cross tabulation of educational level with participation in Table 10 indicates that only 34 percent of the illiterate women and 41 percent of the literate women participate in water supply projects. It implies that the educational status and participation have association as level of education increases participation also increases.

TABLE 10: CROSS TABULATION OF EDUCATIONAL LEVEL AND PARTICIPATION

Educational status of the respondents	**Do you participate in water supply projects?**				**Total**	
	Yes		**No**			
	N	Percent	N	Percent	N	Percent
Illiterate	31	34	60	66	91	100
Read only	3	60	2	40	5	100
Read and write	5	38	8	62	13	100
Elementary	3	30	7	70	10	100
High school	1	100	0		1	100

Source: Own Survey 2008/2009

Own source of income and participation

The cross tabulation presented in the Table 11 shows the participation behavior of respondents who have their own source of income and who have not. As reported in the Table, of the 40 respondents who have their own source of income, 35 percent of them are participating in water supply projects. Surprisingly 36 percent of 80 respondents who reported that they have no own source of income participate in water supply projects.

TABLE 11:CROSS TABULATION OF HAVING OWN SOURCE OF INCOME AND PARTICIPATION

Do you have your own source of income?	**Do you participate in water supply projects?**				**Total**
	Yes		**No**		
	N	**Percent**	**N**	**Percent**	
Yes	14	35	26	65	40
No	29	36	51	64	80

Source: Own survey 2009

To see how it could happen, it is important to look into their attitude of having their own source of income and participation. As it can be seen in Table 12, equal percent of respondents (36 percent) think that having or not having of their own source of income does not affect their participation in water supply projects. But when we compare it with the total number of respondents more than half of them (56 percent) think that not having their own source of income does not affect their participation in water supply projects.

TABLE 12:RESPONDENTS ATTITUDE TOWARDS PARTICIPATION BASED ON OWN SOURCE OF INCOME

Do you think that lack of own source of income affect your participation?	**Do you participate in water supply projects?**				**Total**	
	Yes		**No**		**N**	**Percent**
	N	**Percent**	**N**	**Percent**		
Yes	19	36	34	64	53	100
No	24	36	43	64	67	100

Source: Own Survey 2009

4.1.9 GENDER ROLE IN THE COMMUNITY

The respondents were asked to classify projects by responsible person for carrying out those activities such as child bathing, child feeding, food preparation, farming etc. To determine the gender role of the community, Table 13, presents the number of respondents responsible for the listed activities. As presented in the table , activities such as child feeding, child bathing, food preparation, water fetching, firewood collection, caring for elder and the sick, shopping consumer items, washing dishes and clothes, cleaning houses, grinding grains, milling, cleaning animal wastes, animal milking and processing animal wastes for energy are among the major responsibilities of women in the community. Whereas farming activities such as cultivation, weeding, watering, soughing, applying fertilizers and land preparation for farming are done by men. Although, these farming activities are mainly done by men, women also have a share.

TABLE 13:PROJECTS AND RESPONSIBLE BODIES IN HOUSEHOLDS

Projects	**Done by Whom?**			**Total**
	Female only	**Male only**	**Both**	N
Child feeding	84 (100%)	-	-	84
Child bathing	84 (100%)		-	84
Food preparation	120 (100%)	-	-	120
Water fetching	117(97%)	-	3 (3%)	120
Collecting firewood	111 (98%)	2(2%)	-	113
Petty trade	88(92%)	5(5%)	3(3%)	96
Care for elderly and the sick	20(91%)	2(9%)	-	22
Shopping consumer items	116(97%)	3(2%)	1(1%)	120
Cultivation	1(0.8%)	109(95%)	5(4%)	115
Weeding	3(2%)	79(69%)	33(29%)	115
Watering	3(2%)	100(87%)	12(11%)	115
Sowing	1(1%)	112(97%)	2(2%)	115
Applying fertilizers	-	114(99%)	1(1%)	115
Prepare land for farming	1(1%)	104(90%)	10(9%)	115
Washing clothes	120(100%)	-	-	120
Washing dishes	120(100%)	-	-	120
Cleaning houses	120(100%)	-	-	120
Grinding grains	62(100%)	-	-	62
Milling	120(100%)	-	-	120
Cleaning animal wastes	84(95%)	4(4%)	1(1%)	89
Grazing animals	50(56%)	39(44%)	-	89
Animal Milking	74(96%)	4(4%)	-	78
Prepare animal wastes for energy	42(100%)	-	-	42

Source: Own Survey 2009

A key informant from the Woreda women's affair desk office W/ro Dunia Ali, chairwoman said that, the main responsibilities of men in the Woreda is farming and most household responsibilities like child caring, food preparation washing clothes, grinding are assigned to women. Fetching water is especially assigned to women. If she could not fetch water due to different reasons like pregnancy, other women relatives or neighbors take that responsibility but this problem partially solved because of jerry cans which attracts men's especially that of sons to fetch water.

4.2. GENERAL CHARACTERISTICS OF THE VARIABLES AND INDICATORS

This section describes the general characteristics of the variables and indicators used in this study.

4.2.1 HOUSEHOLD RESPONSIBILITIES

Time is taken as a main indicator of household burden. So different projects were taken and respondents were asked how much time on average that they spent on each activity. The sum of time spent on all activities by one respondent is taken to calculate the total time that she spends on household activities. 16 hours per day (24 hours less 8 hours of rest for all persons) is taking as a reference to measure their burden in the household. Based on these eight hours (the half of 16hrs) is taken as average time for classification. Accordingly the following classification is taken

Number	Hours	Rank order
1	>12	Extremely burdened
2	9-12	Burdened
3	< or equal 8	Not burdened

According to this classification, table 14 shows frequencies and percents of respondents in each category as follows,

TABLE 14:CLASSIFICATION OF TOTAL WORKING TIME PER DAY IN HOURS

Level	Frequency	Percent
Much burdened	67	55.8
Burdened	38	31.7
Not burdened	15	12.5
Total	120	100.0

From the above table 14, it can be seen that 88 percent of the respondents spend more than 8 hours per day in household activities. W/ro Dunia, key informant from the Woreda women's affair desk, underlines that *'household burden is one of the factors that affect women's participation in water supply projects.'*

4.2.2 AWARENESS

The awareness of the women regarding the importance of participating in water supply projects is crucial. Women may not be aware of what they are supposed to do in the meeting, ether it concerns them. They could see it as men's duty not theirs. To measure awareness of the women six indicators were taken.

To this end, respondents were asked to rank the degree of their awareness on ordinal scale of 1. not at all to 5, very high awareness. Table 15 provides information about the ranking of respondents on awareness in each indicator.

TABLE 15:FREQUENCIES OF AWARENESS INDICATORS

INDICATORS	Not at all	low	Moderate	high	Very high	Total
Exposure to the importance of community participation in water supply projects	38 (31.7)	21 (17.5)	40 (33.3)	19 (15.8)	2 (1.7)	120
Exposure to the importance of women participation in water supply projects	35 (29.2)	48 (40.0)	19 (15.8)	15 (18.3)	3 (2.5)	120
Exposure to the equal participation of women in water supply projects as men	45 (37.5)	35 (29.2)	19 (15.8)	16 (20.0)	5 (4.2)	120
Exposure to the equal representation of women in WATSANCO as that of men	52 (16.7)	28 (23.3)	31 (25.8)	7 (5.8)	2 (1.7)	120
Exposure to participate in meeting	75 (62.5)	12 (10.0)	15 (12.5)	11 (9.1)	7 (5.8)	120
Exposure to participate in water supply projects	53 (14.2)	12 (10.0)	40 (33.3)	12 (10.0)	3 (2.5)	120

Note: Numbers in brackets are percent

Nearly half of the respondents (49 percent) have below average exposure to know the importance of community participation in water supply projects. 33.3% have moderate exposure and 15.8% and 2% have high and very high exposure respectively. 70% of the respondents have below average exposure about the importance of women's participation in water supply projects. Furthermore, 16%, 18% and 3% have moderate, high and very high awareness about the importance of women's participation respectively. Furthermore, 67% have below average awareness about the equal participation of women in water supply projects. Surprisingly 43% of the respondents have no awareness on the equal representation of women's in the water committee.

Generally for purpose of analysis the sum of all indicators in the awareness variable is recategorized based on the rank order in the original data. This helps to understand the awareness level of the respondents as a whole. For the six indicators, there are five ordinal rank orders. Each indicator multiplied by the rank to get the maximum and minimum boundaries. Accordingly, the classification is as follows,

Number	Intervals	Rank order	Computation of intervals by taking the six indicators
1	$<7^0$	No awareness	^{0}6x1 (1 is rank given for no awareness level)
2	$7\text{-}12^1$	Low awareness	^{1}6x2 (2 is rank given for low awareness level)
3	$13\text{-}18^2$	Moderate awareness	^{2}6x3 (3 is rank given for moderate awareness level)
4	$19\text{-}24^3$	High awareness	^{3}6x4 (4 is rank given for high awareness level)
5	$25\text{-}30^4$	Very high awareness	^{4}6x5 (5 is rank given for very high awareness level)

Within these categories, table 16 shows the frequencies and percentage of respondents in each category. As shown in the table, from the 120 surveyed households slightly more than half of (52 percent) the respondents' awareness is less than moderate. Furthermore, 25%, 22% and 2% have moderate, high and very high level of awareness respectively.

TABLE 16:AWARENESS LEVEL OF RESPONDENTS

Levels of awareness	Frequency	Percent
No awareness	33	27.5
Low awareness	29	24.2
Moderate awareness	30	25.0
High awareness	26	21.7
Very high awareness	2	1.7
Total	120	100.0

Source: Own Survey 2009

4.2.3 PARTNER'S ATTITUDE

The Guatemala team writers said, "An important constraint for the women is the fact that they are married. The decision to participate does not depend only on the women, but rather on their husbands too". So it is important to see the attitude of their husbands towards their participation. Three indicators are taken to measure partner's attitude towards the willingness to let their wives participate in water supply projects. Table 17 shows the number of respondents and their percentage in each category. Eighty five percent of the respondents indicated that their partners do not encourage or adequately encourage them to participate in water supply projects. Ninety four percent also reported that their partners are not willing/ adequately willing to share household responsibilities in the case of their wives to take part in water supply projects. Surprisingly, 82% of respondents' partners do not allow their wives to participate in the repair and maintenance training of the water scheme far from home.

TABLE 17: FREQUENCY DISTRIBUTION OF PARTNER'S

INDICATORS	CONFIRAMTION					Total
	Not at all	Rarely	Some-times	Often	Very often	
Partners' encouragement of women to participate in water supply projects	30 28%	58 54.2%	15 14%	4 3.8%	None	107 100
Partners' willingness or promise to share household tasks in case of participation	52 48.6%	48 44.9%	7 6.5%	None	None	107 100
Partners willingness to let women in participate in repair and maintenance of the scheme far from home	40 37.3%	51 47.7%	15 14.1%	1 0.9%	None	107 100

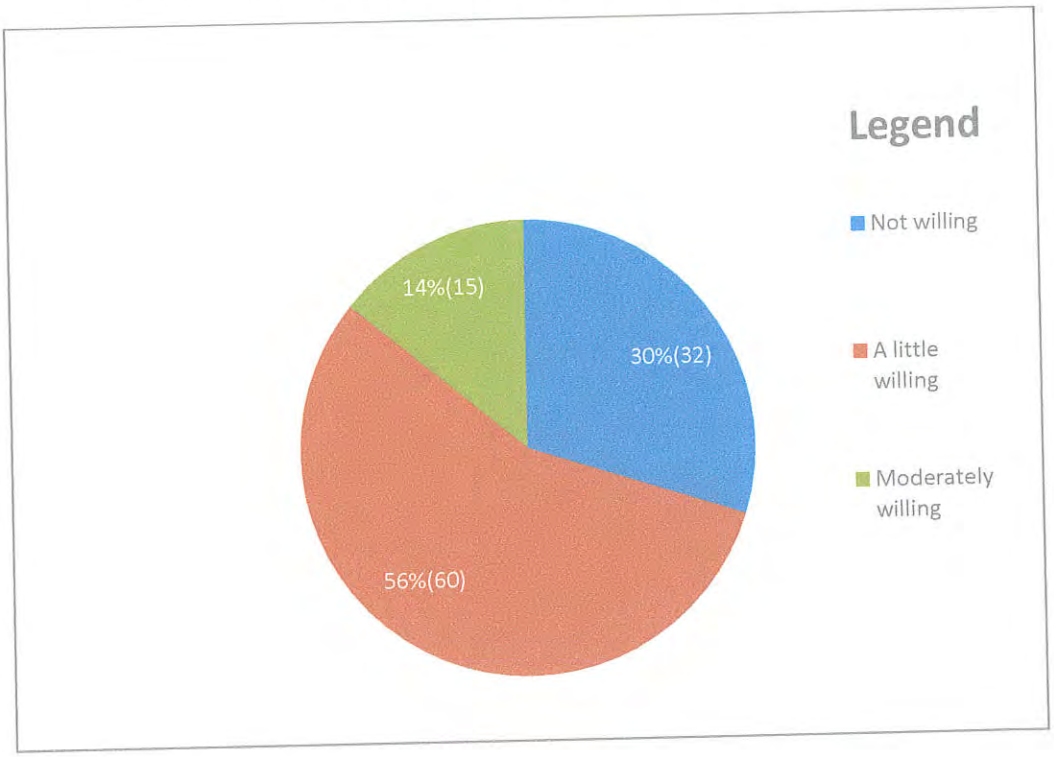
Source: Own Survey 2009

The sum recategorized based on the original ordinal rank order, to know the general characteristics of partners' attitude. The three indicators have five rank order, so the product of the three indicators with each rank order are taken as the upper boundaries in the class and the lower limits for the next new class rank order. Accordingly, the new classification is

Number	Intervals	Rank order	Computation of intervals by taking three indicators
1	$<4^0$	not willing	^{0} 3x1(1 is rank given for not willingness)
2	4-6 ^{1}	A little willing	^{1} 3x2(2 is rank given for a little willingness)
3	7-9^2	Moderately willing	^{2} 3x3(3 is rank given for moderate willingness)
4	10-12^3	Highly willing	^{3} 3x4(4 is rank given for high willingness)
5	13-15^4	Very highly willing	^{4} 3x5(5 is rank given for very high willingness)

Figure 6 represents the number and percentage of respondents in each classification. Fourteen percent of the respondents partners are moderately willingness and 56% have a little and 30% are not willing at all to let their wives participate in water supply projects. This shows that majority of respondents partners do not let their wives to participate in water supply activities.

FIGURE 6:SUM OF PARTNER'S ATTITUDE CATAGORIZED



Note: Numbers in brackets are frequencies

Source: Own Survey 2009

4.2.4 CULTURAL INFLUENCE

In many communities rural women take no part in water supply projects because of discrimination against them and they are often prevented from taking any effective decisions. Five indicators are taken to measure cultural influence. Table 18 provides information on each indicator of cultural influence in frequencies and percentage. Ordinal rank (1-5) is given from 'not at all', to 'very high'. High rank order is selected for indicators of cultural influence to attend meeting (38 percent), cultural influence to speak in public (47 percent) and the extent of culture impediment they here in participating in community

projects (36 percent). Very high rank order is given to the influence of culture to work with men (43 percent).

TABLE 18:FEREQENCIES OF CULTURAL INFLUNCE INDICATORS

INDICATORS	CONFIRAMTION					Total
	Not at all	Little	Moder -ately	high	Very high	
The extent to which your culture influence you to attend meeting	6 5.0%	11 9.2%	30 25.0%	45 37.5%	28 23.3%	120 100
Extent of cultural influence to speak in public	3 2.5%	24 20%	19 15.8%	56 46.7%	18 15.0%	120 100
Extent of cultural influence to speak in the presence of husbands	9 7.5%	6 5.0%	17 14.2%	51 42.5%	37 30.8%	120 100
Extent Culture to impede in participating in community projects	3 2.5%	12 10.0%	24 20.0%	43 35.8%	38 31.7%	120 100
Extent of cultural influence to work together with men	3 2.5%	12 10.0%	19 15.8%	35 29.2%	51 42.5%	120 100

Source: Own Survey 2009

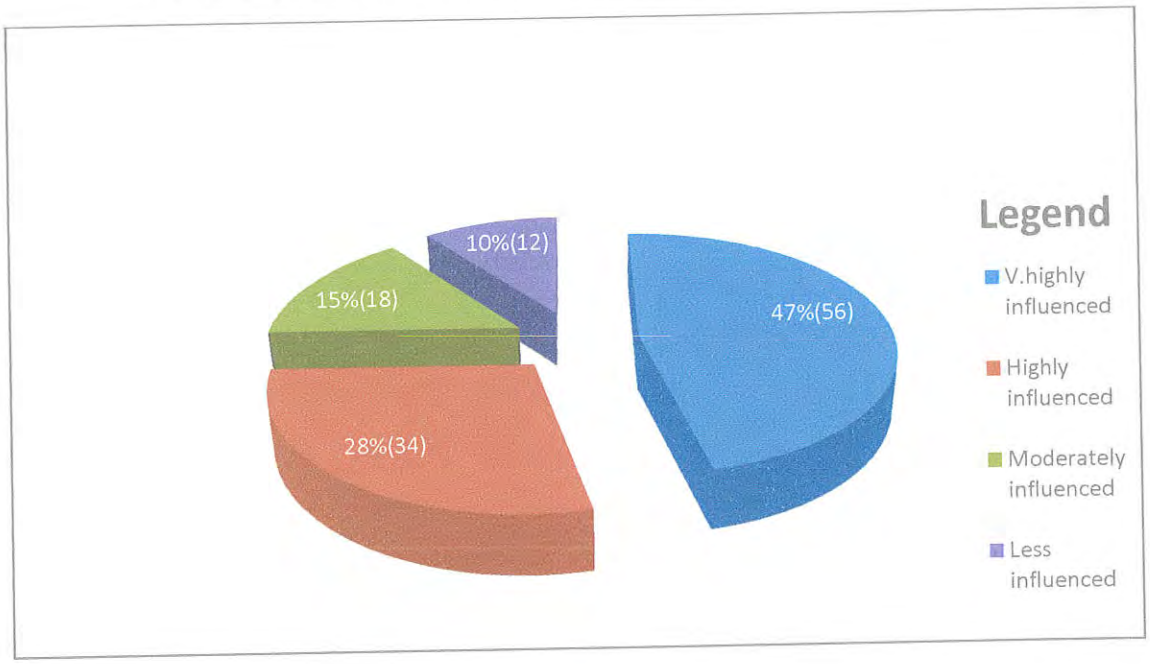
It is recatagorized on the bases of the original rank order, in order to look the general effects of cultural influence. The product of indicators with each rank order gives the upper and lower limits for the new class rank order. So the following classification is made.

Number	Intervals	Rank Order	Computation of intervals by taking the five indicators
1	21-25[0]	Very highly Influenced	[0]5x5 (5 is rank given for very highly influenced)
2	16-20[1]	Highly Influenced	[1]5x4 (4 is rank given for highly influenced)
3	11-15[2]	Moderately Influenced	[2]5x3 (3 is rank given for moderately influenced)
4	6-10 [3]	Less influenced	[3]5x2 (2 is rank given for less influenced)
5	<64 [4]	Not influenced	[4]5x1 (1 is rank given for not influenced)

Figure 7 provides information on the frequencies of total respondents in each rank of cultural influence according to the above classification.

As it is presented in the figure, slightly less than half (47 percent) of the respondents are very highly influenced by their culture. Furthermore, slightly more than one fourth (28 percent) of the respondents are highly influenced by their culture. Only 10 % of the respondents are not much influenced by the culture and 15 % of the respondents are moderately influenced.

FIGURE 7:CULTURAL INFLUENCE LEVEL OF RESPONDENTS



Note: Numbers in brackets are frequencies

Source: Own Survey 2009

Key informant from the Zone water bureau, Ato Getahun, mentioned culture as the major factor that affects women's participation in water supply projects, as it prevents them from attending meetings with men and working together with men.

4.2.5 PROJECT OR GOVERNMENT ASSISTANCE

As it is stated in Rio declaration of agenda 21 chapter 18 (1992), water development projects should be participatory approach, involving users, planners and policy makers at all levels. Six indicators are taken to measure the project or government assistance in helping the rural women to participate in water supply projects.

As presented on table 19, 54% and 56% of the respondents gave a moderate rank for indicators of extent of project/government motivation to participate women in water supply projects and effort made to incorporate women's ideas and comments at meetings respectively which are the highest frequencies in each indicator. Furthermore, 36% of respondents give moderate rank for getting positive response for requesting to participate. However, 70% of respondents said that there is no incentive for women to participate in water supply projects. In addition to this, slightly less than six seventh (84 percent) and 72% of the respondents reported that they have not got any training on repair and maintenance of the water scheme and there is no attempt made to solve their personal problems which hinders their participation in water supply projects respectively.

TABLE 19: FREQUENCIES OF PROJECT OR GOVERNMENT ASSISTANCE INDICATORS

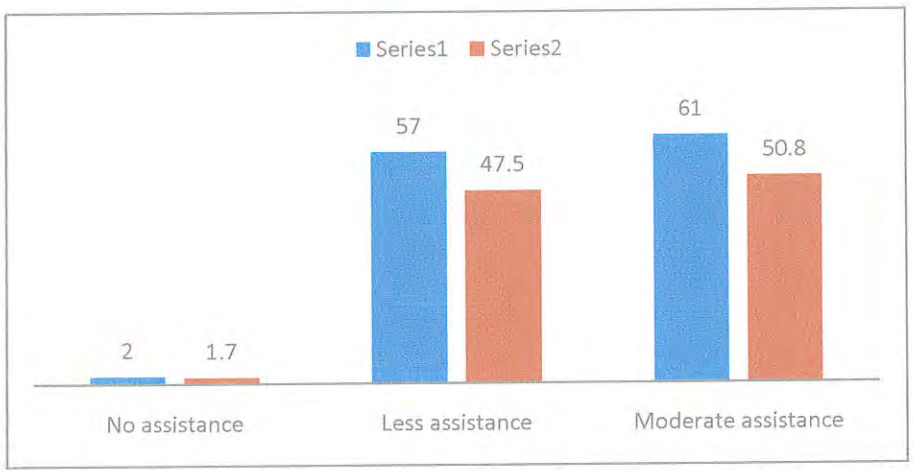
INDICATORS	CONFIRMATION					Total
	Not at all	Little	Some-times	high	Very high	
Extent of project/government motivation to participate women in water supply projects	14 11.7%	21 17.5%	65 54.2%	19 15.8%	1 0.8%	120 100
Effort made to incorporate women's idea and comment at meetings	7 5.8%	30 25.0%	67 55.8%	16 13.4%	None	120 100
Incentives given to motivate women's to participate in water supply projects	84 70.0%	8 6.7%	12 10.0%	16 13.3%	None	120 100
To what extent do you get a positive response for your request to participate	13 10.8%	27 22.5%	43 35.8%	29 24.2%	8 6.7%	120 100
Extent of trainings given to women on repair and maintenance of the water scheme	101 84.2%	19 15.8%	None	None	None	120 100
The extent to which an attempts is made to solve women's personal problem that obstacles them to participate in water supply projects	86 71.7%	34 28.3%	None	None	None	120 100

For the purpose of analysis and to know the overall project or government assistance on women participation the sum of government or project assistance indicators recategorized and ranked based on the original ordinal rank order. The upper and lower limit is determined by the product of each indicator with a respective rank order in the main question. So based on this, the following classification and rank is given

Number	Intervals	Rank order	Computation of intervals by taking the six indicators
1	$<7^0$	Not insisted	^{0}6x1 (1 is rank given for not assisted)
2	14-26^1	Less insisted	^{1}6x2 (2 is rank given for less insisted)
3	27-39 ^{2}	Moderately insisted	^{2}6x3 (3 is rank given for moderately insisted)
4	40-52^3	Highly insisted	^{3}6x4 (4 is rank given for highly insisted)
5	53-65 ^{4}	Very high insisted	^{4}6x5 (5 is rank given for very highly insisted)

Based on the above categories, as presented in figure 8, nearly half of the respondents believe that they have got moderate assistance from the project or the government.48% reported that they have got less assistance from the government. In general, half of the respondents (50 percent) have got less than average assistance from the project or government as a whole.

FIGURE 8:PROJECT OR GOVERNMENT ASSISTANCE RECATAGORIZED



Note: Series 1: frequencies Series 2: Percentage

Source: Own Survey 2009

Elias, The Woreda water office desk officer, Kebede, staff from self help water project, and Getahun, from the Zone water bureau, said that even though they make effort to increase

women's participation in water supply projects by arranging meeting with them separately, and by encouraging them to be elected in water committee etc., but the Woreda women got less assistance from the project or the Woreda or zone water bureau because of budget shortage and there is no rooms to make support that have costs such that incentives or giving sitting allowance if they are members of water committee, giving especial training on the empowerment of them.

4.2.6 PARTICIPATION

As it is known community participation in development projects is essential for sustainable development. In water supply projects the equal participation of women is important as it is their domestic responsibility to fetch and manage household water. To know women's participation in water supply projects thirteen indicators are taken with five rank order 1, no participation, to 5, very high participation.

TABLE 20: FREQUENCIES ON PARTICIPATION INDICATORS

INDICATORS	CONFIRMATION					Total
	Not at all	Rarely	Mode-rate	Often	Very often	
Participation in meeting about the water project	5 11.6%	3 7%	30 69.8%	5 11.6%	-	43
Participation in site selection of the water scheme	3 7%	23 53.5%	12 27.9%	4 9.3%	1 2.3%	43 100
Participation in the election of Water committee.	14 32.6%	16 37.2%	9 20.9%	4 9.3%	None	43 100
Participation in the planning of the water supply project	20 46.5%	15 34.9%	8 18.6%	None	None	43 100

.....Continued

Participation in the designing of the water supply project	31 72.1%	12 27.9%	None	None	None	43 100
Participation in the supply of labor during the construction of the water supply	1 2.3%	6 14%	21 48.8%	10 23.2%	5 11.6%	43 100
Participation in the supply of material during the construction of the scheme	4 9.3%	14 32.6%	17 39.5%	7 16.3%	1 2.3%	43 100
Participation in the repair and maintenance of the water scheme	16 37.2%	15 34.9%	12 27.9%	None	None	43 100
Participation in the record keeping of the water scheme	25 58.1%	6 14%	10 23.2%	2 4.7%	None	43 100
Participation in the money management of the water scheme	15 34.9%	21 48.8%	1 2.3%	3 7%	3 7%	43 100
Participation in the fund raising projects of the project	8 18.6%	6 14%	24 55.8%	5 11.6%	None	43 100
Participation in organization and management of the water supply project	15 34.9%	21 48.8%	1 2.3%	3 7%	3 7%	43 100
Participation in the decision of the water tariff	22 51.2%	8 18.6%	13 30.2%	None	None	43 100

As indicated in table 20, high weight in percentage 70% for participation in meeting about the water project, 49% participation in labor supply during construction, 40% and 56% participation in material supply during construction and participation in fund raising projects respectively is given moderate rank.

The majority of respondents have no participation in planning (47 percent), in designing (72 percent), in repair and maintenance (37 percent), in record keeping (58 percent) and in decision making about the water tariff (51 percent). Furthermore, there is very small

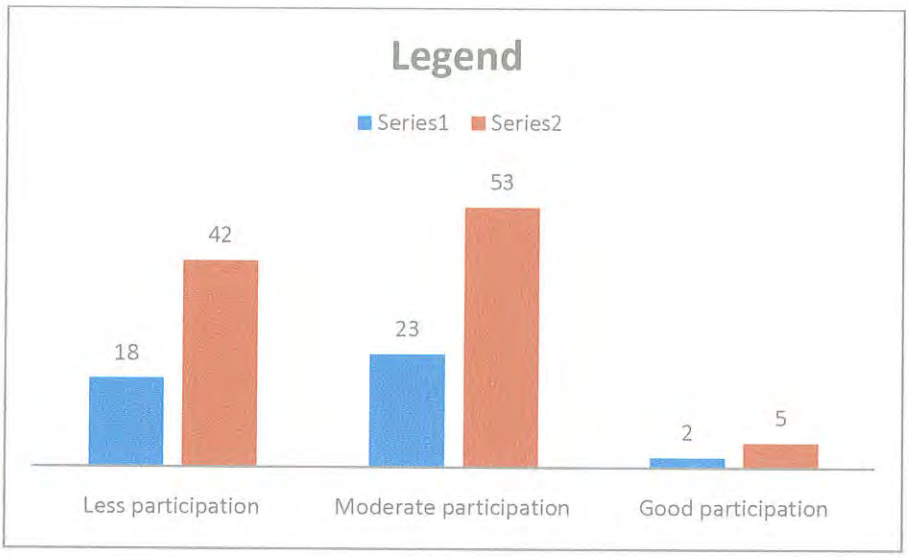
participation of most respondents in site selection (54 percent), in election of water committee (37 percent), in money management (49 percent) and organization and management (49 percent) of the water supply projects. As presented in the review literature part page ten, this implies that women's participation in water supply projects of the Woreda is passive .This means people participate by being told what has been decided or has already happened.

It is reclassified based on the product of indicators, to know the general status of women in the participation of water supply system. Each rank in the original rank order which is used to calculate the upper and lower class boundaries in the new classification. So the new category is as follows.

Number	Intervals	Rank order	Computation of intervals by taking thirteen indicators
1	$<14^{0}$	No participation	^{0}13x1(1 is rank given for no participation
2	$14\text{-}26^{1}$	Low participation	^{1}13x2(2 is rank given for less participation)
3	$27\text{-}39^{2}$	Moderate participation	^{2}13x3(3 is rank given for moderate participation)
4	$40\text{-}52^{3}$	High participation	^{3}13x4(4 is rank given for high participation)
5	$53\text{-}65^{4}$	Very high participation	^{4}13x5(5 is rank given for very high participation)

As figure 9 below shows, 53 percent of the respondents have moderate participation and 42 percent of respondents have low participation. Only 5 percent of the respondents have good participation in water supply projects.

FIGURE 9: PARTICIPATION OF RESPONDENTS



Note: Series 1: Frequencies Series 2: Percent

Source: Own Survey 2009

It will be important to look into the general relationships of respondents participation within each independent variable described above. Annex v presents the cross tabulation of each independent variable with participation in water supply projects.

As indicated in, participation in water supply increases as household burden decreases. 62 percents of respondents who participate in water supply projects have less household burden. 70 percent of respondents who have no awareness in participating in water supply projects do not participate and 100 percent of respondents, who have very high awareness, participate in water supply projects. However, 62 percent of participants who have high awareness do not participate in water supply projects. This may need further investigation. Surprisingly, women's participation does not increase as their husbands' or partners' willingness increases, so other factor like their willingness to participate in water supply

projects should be considered together with partners' attitude. Four fifth of respondents (80 percent) who are very highly influenced by the culture do not participate in water supply projects. However, 72 percent of respondents who are moderately influenced by the culture participate. Moreover, 90 percent of respondents who have no assistance from government/ project do not participate and all respondents who got moderate government/ project assistance are participating.

4.3 ANALYSIS OF ASSOCIATIVE RELATIONSHIPS AND FINDINGS

4.3.1 Household burden and level of participation

Household burden and participation have inverse relationship. If the burden increases, participation in development projects becomes less. In order to be participant in some development projects there should be time.

In this study, it was found very important to conduct a correlation analysis in order to investigate if household burden has anything to do with the level of participation of the respondents. To this end, first, respondents allocate the average time that they spend on each activity then, the average time for each activity is sum up to calculate the total time that a respondent spend on household activity. After calculating the total time (scale measurement), it recategorizes to change it to categorized measurement which helps to see respondents as general. Then, 1-3 rank is taken, namely,' *not burdened*', ' *burdened*', and '*much burdened*'. And finally, Kendall's tau_b correlation analysis has been carried out to test associative relationship between household burden and participation in water supply projects. Table 21 on the next page, presents the correlation between household burden and participation. The result of the analysis has been found to be -.269. They correlate inversely

i.e. as household burden increase, participation decrease and their correlation is statistically significant ($p<0.01$).

TABLE 21: CORRELATION OF HOUSEHOLD BURDEN AND PARTICIPATION

			Total working time in hh by the respondent per day in hours	Sum_part
Kendall's tau_b	Total working time in hh by the respondent per day in hours	Correlation Coefficient	1.000	-.269(**)
		Sig. (2-tailed)	.	.000
		N	120	120
	Sum_part	Correlation Coefficient	-.269(**)	1.000
		Sig. (2-tailed)	.000	.
		N	120	120

* Correlation is significant at the 0.01 level (2-tailed)

4.3.2 Awareness and Participation

On the review literature part page 11, community awareness on all aspect of development projects is important to enhance community participation and for the sustainability of the development projects. As community awareness increases, their participation also increases. Bivariate correlation is processed in the study to establish the relationship of awareness and participation. Table 21 presented the correlation between the two.

TABLE 22:CORRELATION OF AWARENESS AND PARTICIPATION

			Sum_part	awarness_sum
Kendall's tau_b	Sum_part	Correlation Coefficient	1.000	.197(**)
		Sig. (2-tailed)	.	.006
		N	120	120
	awarness_sum	Correlation Coefficient	.197(**)	1.000
		Sig. (2-tailed)	.006	.
		N	120	120

** Correlation is significant at the 0.01 level (2-tailed).

The correlation between awareness and participation is statistically significant ($p<0.01$) and it is positive which indicates that as awareness increase participation also increase.

4.3.3 Partner's attitude and participation

Partners' attitude is one of the factors that affect rural women's participation in water supply projects. In rural Ethiopia, women usually have no part in decision making. Even if they have crucial role in the administration of their house, they could not decide on issues concerning their household.

Correlation analysis has been done between the score of respondents rating on indicators of partner's attitude and their participation in water supply projects, to test the linkage of partner's attitude with women's participation in water supply projects, Kendall's tau b correlation analysis presented in table 23 shows that there is positive correlation but statically not significant.

TABLE 23:CORRELATION OF PARTNER'S ATTITUDE AND PARTICIPATION IN WATER SUPPLY PROJECTS

			Sum_part	Partatt_sum
Kendall's tau_b	Sum_part	Correlation Coefficient	1.000	.088
		Sig. (2-tailed)	.	.237
		N	120	120
	Partatt_sum	Correlation Coefficient	.088	1.000
		Sig. (2-tailed)	.237	.
		N	120	120

4.3.4 Cultural Influence

The discrimination of culture against women, especially in rural areas hampers women's participation in development projects. Even if women have a crucial role in water supply projects, they could not play their role effectively because of the culture. In most cultures

they are expected to be at home. The culture does not encourage them to participate in community development projects.

Kendall's tau_b correlation analysis has been run and the result as presented in table 24 below, to test the correlation of cultural influence on women's participation in water supply projects. The table shows that the correlation is negative, as cultural influence increase participation decrease and statistically significant (p>0.01).

TABLE 24:CORRELATION OF CULTURAL INFLUENCE AND PARTICIPATION

			Sum_part	Sum_culinf
Kendall's tau_b	Sum_part	Correlation Coefficient	1.000	-.306(**)
		Sig. (2-tailed)	.	.000
		N	120	120
	Sum_culinf	Correlation Coefficient	-.306(**)	1.000
		Sig. (2-tailed)	.000	.
		N	120	120

* Correlation is significant at the 0.01 level (2-tailed).

4.3.5 Project or government assistance and participation

Women should be encouraged to be participant in development projects. Development projects and government should ensure their participation in development projects through their policies, principles and procedures.

Kendall's tau_b correlation between government or project assistance and participation presented in table 25 below, shows that there is positive as government or project assistance increase, participation of women also increase and statistically significant (p>0.01) correlation between the two.

TABLE 25:CORRELATION OF GOVERNMENT ASSISTANCE AND PARTICIPATION

			Sum_part	Progov_assi_sum
Kendall's tau_b	Sum_part	Correlation Coefficient	1.000	.218(**)
		Sig. (2-tailed)	.	.003
		N	120	120
	Progov_assi_sum	Correlation Coefficient	.218(**)	1.000
		Sig. (2-tailed)	.003	.
		N	120	120

** Correlation is significant at the 0.01 level (2-tailed).

4.4 ORDINAL REGRESSION OUTPUT EXPLAINED

4.4.1 How well do the independent variables explain the change in the dependant variable?

As shown in table 26 -2Log Likelihood is large and has a very small significance level leading us to reject the null Hypothesis that the model without independent variables is as good as the model with the independent variables. In other words, it tells that the level of participation, denoted by Y, predicted by including independent variables is better than the one where only the intercept of the model α is used. The statistical evidence suggests that changes in rural women's participation in water supply projects is explained by changes in household burden, partner's attitude, cultural influence, awareness, and government/project assistance. In other words, the above independent variable explains variations among rural women's participation in water supply projects.

TABLE 26:MODEL FITTING INFORMATION

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	203.569			
Final	167.459	36.109	14	.001

Link function: Logit.

4.4.2 Does the model fit?

To what extent the observed and predicted values of the model converge? In other words, to what extent does the predicted rural women's level of participation in water supply projects coincide with the actual level of participation, given the independent variables? As indicated in Table 27, both Pearson and Deviance chi-Square statistics is large, with extraordinarily high level of significance (*0.980 and 1.000 for Pearson and Deviance respectively*). This implies that the model fits well to the reality on the ground. In other words, all the independent variables, with their associated coefficients, are good predictors of rural women's' level of participation in water supply projects.

TABLE 27:GOODNESS OF FIT

	Chi-Square	df	Sig.
Pearson	181.617	223	.980
Deviance	147.476	223	1.000

Link function: Logit.

The Pseudo R-square also confirms the previous conclusion that the model fits. However, the coefficients are not so large as to imply strong explanatory power of independent variables. As shown in Table 28 below, the Pseudo R-Squares under Cox& Snell and Nagelkerke are well above 25% while it under McFadden but still above 15%. One can deduce that the variables in the model partly explain a change in the level of participation, and that there are other confounding variables affecting level of participation. In other

words, there are variables besides household burden, partner's attitude, cultural influence, awareness, and government/project assistance that ought to be discovered that can explain the disparity in the level of participation in water supply projects among rural women.

TABLE 28:PSEUDO R_SEQUARE

Cox and Snell	.260
Nagelkerke	.305
McFadden	.158

Link function: Logit.

4.4.3 THE EFFECTS OF EACH EXPLANATORY VARIABLE ON THE DEPENDENT VARIABLE.

The coefficients of each independent variable are explained as follows

1. Household burden

The coefficient of respondents, who are very much burdened is, -.871 with significance level of .243, the singe indicates that there is a lesser likelihood for those highly burdened to participate than those who are not. Consistent with literature, this suggests that household burden is the chief factor influencing participation of women in water supply projects.

2. Awareness

Coefficient for "no awareness" is -4.273 which implies that compared with those adequately aware, women who are not aware about water supply projects in their communities are less likely to participate. However the significance level of .039 is so small that the coefficient obtained is suspected to result more by chance than its actual relation with the independent variable.

3. Partner's attitude

Rural women whose partners do not encourage them to participate in water supply projects are as likely to take part as those who do not get the same encouragement, as can be implied by a coefficient of 0.701. One can draw a conclusion from the sign of the coefficient that partners attitude has insignificant impact on women's participation in water supply projects.

4. Cultural influence

Cultural influence coefficient for women who are highly influenced by culture is -1.074, suggesting that they are very unlikely to participate as much as those who are less influenced. In addition, with a significance level of 0.158 it will be naive to conclude that there is a genuine impact of cultural influence on level of participation.

5. Project assistance

Project assistance has a coefficient of -18.110, taken at face value may indicate that there is a large impact of project/government assistance on level of participation. However, a look at the significance level, which is absolutely zero, implies that the relationship is not statistically significant and hence lead into the conclusion that project assistance has no impact on level of participation.

TABLE 29:PARAMETER ESTIMATES

		Estimate	Sig.
Threshold	[Sum_par_cat = 1]	-4.227	.022
	[Sum_par_cat = 2]	-3.260	.077
	[Sum_par_cat = 3]	.450	.776
Location	**[Cat_hhburden=1]**	**-.871**	**.243**
	[Cat_hhburden=2]	.028	.968
	[Cat_hhburden=3]	0(a)	.
	[awareness_sum_cat=1]	**-4.273**	**.039**
	[awareness_sum_cat=2]	-5.045	.014
	[awareness_sum_cat=3]	-4.255	.033
	[awareness_sum_cat=4]	-4.223	.031
	[awareness_sum_cat=5]	0(a)	.
	[Sum_culinf_cat=1]	**-1.074**	**.158**
	[Sum_culinf_cat=2]	-.272	.741
	[Sum_culinf_cat=3]	1.005	.227
	[Sum_culinf_cat=4]	0(a)	.
	[Progov_assi_sum_cat=1]	**-18.110**	.
	[Progov_assi_sum_cat=2]	-.272	.560
	[Progov_assi_sum_cat=3]	0(a)	.
	[cat_par_sum=1]	**.676**	**.473**
	[cat_par_sum=2]	.788	.272
	[cat_par_sum=3]	.496	.501
	[cat_par_sum=4]	0(a)	.

Link function: Logit.

Note: the negative sign indicate the poor participation of category one compare with the reference category. The coefficient is zero for the reference category

CHAPTER FIVE

5.1 CONCLUSIONS

Empowerment of women with the view of attaining equitable sharing of resources across gender groups has become a generally accepted principle. After realizing the role women can play in development, countries have been putting efforts towards enhancement of participation of women in development projects. Especially in developing countries, where gender inequality is the highest, enhancing active involvement of women in development projects have become among the priorities. Water supply projects are no exception. Women especially those in the rural area, as clients of water schemes, have a potential of playing a predominant role in water supply projects. However, despite having a great potential, rural women's participation in water supply projects is negligible. Reports suggest that there are quite a variety of factors affecting rural women's participation in water supply projects, and this study is conducted to discover what those factors are and their effect on participation of rural women in water supply projects. This study, a survey that involved 120 randomly selected households of Haromaya Wereda, is conducted to uncover the variables that affect participation of rural women in water supply projects.

A three level analysis is undertaken after coding the data making it amenable to quantitative analysis. First, cross tabulation of values of a pair of variables is examined to see the link between variables. Second, Kendall's tau_b correlation is run to assess whether or not factors

are related with the independent variable. Finally and most importantly, ordinal regression is administered to see if there exists any causal relationship between level of participation (the dependent variable of the model) and household burden, awareness, cultural influence, partner's attitude, and government/project assistance. Correlation output suggests that while household burden and cultural influence are inversely and statistical significantly related with participation, awareness and government assistance are positively and significantly correlated with level of participation. Although partner's attitude is positively correlated with participation the coefficient is not statistically significant. Therefore, one can infer from the correlation outcomes that more participation is associated with lesser household burden and cultural influence, and more awareness and government/project assistance. The ordinal regression outcome, in which the causal relationship is explored, reinforces Kendall's tau_b correlation results for household burden and cultural influence. It implies that household burden and cultural influence significantly deter participation. On the other hand, the coefficient for partner attitude suggests that women do not get a helping hand from their partners more likely to participate than those whose partners have a positive attitude towards participation. Overall, this study implies that participation of rural women in water supply activities is predominantly hindered by their household burden and cultural influence.

The findings of this study are important for two reasons. Firstly, it has a significant contribution to the existing body of knowledge about participation of rural women in water supply activities and the influencing factors. Except existence of anecdotal evidence, no scientific investigation has so far been made to learn what determines level of participation of rural women. Consequently, this study can be used as a spring board for future research in

the same line. Secondly, discovering household burden, own source of income and cultural influence as a major impediment to participation of rural women in water supply projects will help policy makers to focus more on strategies that can relieve their burden, promote gender equality among the society so that the potential of women in water supply activities is well recognized. Achieving increased participation of women will in turn enhance efficient management of water supply. Besides, projects designed to boost participation will also focus on ways of relieving rural women of their burden, rather than launching awareness enhancing campaigns alone.

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Annex I

QUESTIONNAIRE FILLED BY RURAL WOMEN IN HARAMAYA

Name of Enumerator_____ Date _____ 2001E.C

Section 1: Respondents: Household background Information

Kebele _____

Village _____

	RESPONSES
1. Head of the household	1. M 2. F
2. Age of the respondent	_____ In completed year
3. Educational level	1. Illiterate 2. Read only 3. Read and write 4 .Elementary 5. High school 6.Other please specify----------
4. Marital Status	1 Single. 2. Married 3. Separated 4. Widowed 5. Divorced
5. How many children do you have?	1. M _____ 2. F _____ 3. Total_____
6. What is the family size of your household?	1. M _____ 2. F _____ 3. Total_____
7. How many of your children are below 3 years old?	1.None 2. One 3.Two 4.More than 2
8. How many of your family members are above 65 years old?	1.None 2. One 3.Two 4.More than 2
9 Do your children go to school, if they are old enough to go?	1. Yes M _____ F_____ 2. No M _____ F_____

10. How many of your children do not go to school?	1.None 2. One 3.Two 4.More than 2
11. If your answer to question number 10 as regards your daughter/s is 'no' What is the reason?	1. She helps her mother at household work 2. We don't think education is so important for her 3. We didn't allow her to go because of violence against girls 4. Others, specify_____
12.Major income source of the household	1. Farming 2. Trade 3. Wages/Salaries 4. Other; please specify_____

Section 2: Household burden/Responsibilities

Please supply information on your household responsibilities based on the following projects profile on the next page.

Activity code	Activity	Who				When					Time for the projects					Total Time By rural Women 11
		MA 1	FA 2	MC 3	FC 4	Before- 6am 5	6am- 12am 6	1pm- 6pm 7	7pm- 10 pm 8	After -10 pm 9	Time allocated /day 10		Time allocated/ week		How often	
											Hrs.	Mts	Hrs.	Mts		
	Child Caring															
13	-feeding															
14	-bathing															
15	Food Preparation															
16	Fetching Water															
17	Collecting Fire Wood															
18	Petty Trading															
19	Care for Elder and the Sick															
20	Shopping Consumer Items															
	Farming															
21	-cultivation															
22	-weeding															
23	-watering															
24	-sowing															
25	-applying fertilizers															
26	-land preparation															
	Cleaning															
27	-clothes															
28	-dish															
29	-house															
30	Grinding grains															
31	Milling															
	Animal husbandry															
32	-cleaning their wastes															
33	-grazing															
34	-milking															
35	-making their wastes for energy source															
	TOTAL TIME															

MA=Male Adult FA= Female Adult MC= Male Child FC= Female Child

36. At what time do you wake up in the morning?	_____ In time
37. At what time do you go to bed at night?	_____ In time
38. Do you have social commitments?	1. Yes 2. No
39. If your answer to question 38 is yes, then please specify them. (multiple answer is possible)	1. Idir 2. Maheber 3. Iquib 4. Debo 5. Kebele Gebere maheber 6. Others ; please specify----------
40. How much time do you spend on these social commitments in a week?	_____ in hrs.

Section3. Awareness/Information

	Not at all 1	Low 2	Moderate 3	High 4	V.High 5
41. Have you ever been told about the importance of local community participation in water supply projects?					
42. Have you ever been told about the importance of local women's participation in water supply projects?					
43. Do you know that women should have as much participation in water supply projects as men?					
44. Do you know the equal representations of women in the WATSANCO?					
45. Have you ever been invited by the project to participate on meeting?					
46. Have you ever been called by the project to participate in water supply projects?					

Section 4: Partner attitude

	Not at all 1	Rarely 2	Moderate 3	High 4	V.High 5
47. Does your husband encourage you to participate in water supply projects?					
48. Does your husband promise to share some of your household task in case you like to participate?					
49. Is your husband willing that you participate in the training of water scheme maintenance?					

Section 5: Cultural Influence

	Not at all 1	Little 2	Moder-ately 3	Highly 4	V.Highly 5
50. To what extent does your culture community affects you to attend the meeting if you are invited?					
51. To what extent does your culture affect you to speak in public?					
52. Does the presence of your husband in the meeting affect you to speak in a meeting?					
53. To what extent does your culture impede you to participate in community projects?					
54. To what extent does your culture affects you to work together with men?					

Section 6: Lack of own source of income

55. Do you have your own resource, like money, agricultural products, animal products etc that could you control?	1.Yes 2.No
56. Do you think that lack of these resources affects your participation in water supply projects?	1.Yes 2. No
57. If your answer to question **56** is yes, to what extent does it affect you?	1.Little 2.Moderately 3.Strogly 4. Very strongly

Section 7: Lack of project/government assistance

	Not at all 1	Rarely 2	Moderate 3	High 4	Very High 5
58. To what extent does the project motivate you to participate actively?					
59. Is there any effort to incorporate your idea and comment at the meeting?					
60. Have you got any incentives to participate in water supply projects?					
61. Do you get positive response from the project when you request to participate in the water supply projects?					
62. Do you get any training to operate and maintain the water supply scheme?					
63. An attempt made by the project/ government to solve your personal problems that appear to be obstacles for you to participate in water supply projects?					

How do you evaluate the extent of your over all participation in water supply projects?

Participation Indicators	Not at All 1	Rarely 2	Moder -ate 3	High 4	Very High 5
71. Participation in meetings about the water project					
72. Participation in the site selection of the water Scheme					
73. Participation in the Election of the WATSANCO Members					
74. Participation in the planning of the water supply Project					
75.Participation in the designing of the water supply Project					
76.Participation in the supply of labor during the construction of the water supply project					
77. Participation in the supply of materials for the construction of the water supply project					
78. Participation in the maintenance of the water Scheme					
79. Participation in the record keeping of the water supply projects					
80. Participation in the money management of the water supply scheme					
81. Participation in the fund raising projects of the Project					
82. Participation in the organization and management of the water supply project					
83. Participation in the decision of the water tariff					

Thank you for your response

ANEXX II

Interview guide questions to Zone water bureau/Woreda Water Desk/ Woreda water supply project staffs

Date of interview_____

Name of the interviewer_____

Position _____

Kebele_____

Village_____

1. For what purpose does the community use the water?
2. How long has it been since WATSANCO / water committee started providing its services to the community?
3. What is the number of WATSNACO/ water committee members?
4. Are there females on the WATSANCO/ water committee? If there are women, what is their number and what is/ are their positions?
5. What are the criteria for being WATSAN committee members?
6. How do you evaluate the level of women's participation in water supply projects?
7. What factors do you think that affect Woreda women's participation mostly?
8. What problems do the Woreda water bureau/the project mention concerning women's participation?
9. Is there equal female attendance in the meeting about the water supply project?
10. Does the project encourage women's participation in the water supply projects?
11. Are water projects in the Woreda gender mainstreamed?
12. What efforts have been taken by the project to encourage women to participate in the water Supply projects?

Please rate the following factors that you think affect rural women's participation in water supply

No	Factors	Not at all 1	A Little 2	Moder-ately 3	Strongly 4	very strongly 5
13	Lack of information					
14	Lack of resources					
15	Cultural influence					
16	Educational level					
17	Lack of Government (project) Assistance					
18	Partner Attitude					

19. What do you suggest as a solution to enhance women's participation in water supply?

ANNEX III

Interview guide questions to Woreda women's office

Date of interview_____

Name of the interviewer_____

Position/title_____

1. What roles and responsibilities that the society assigned to women and men in your localities/woreda society?

2. How do you evaluate women's participation in water supply in your Woreda? (not at all, little, enough, good, very good).

3. What are the major problems that the Woreda's women have in participate in water supply?

Please rate the following factors in terms of the degree of their effect on rural women's

Participation in water supply

No	Factors	Not at all	Little	Some extent	Strongly	Very strongly
4	Lack of information					
5	Lack of resources					
6	Cultural influence					
7	Lack of education					
8	Lack of government (Project) assistance					
9	Others					

10. What do you recommend as a solution to increase women's participation in water supply?

ANNEX IV

Members of water committee in each village water scheme

Kebele	Village	No of water committee members			Position of Women water committee members
		Men	Women	Total	
Amuma	Genda Ali	3	2	5	Cashier
	Hubeta	6	1	7	Cashier
	Galo	5	1	6	Cashier
Medebelina	Maya	7	2	9	
Tuji Gebisa	Shoshe	8	2	10	Guard
	Dama	5		5	
Total		34	8	42	

ANNEX V

CROSS TABULATION OF PARTICIPATION AND FACTOR VARIABLES

Factors		Do you participate?			Percent		
		Yes (43)	No (77)	Total	Yes	No	Total
Household burden	Much burdened	17	50	67	25	75	100
	Burdened	17	21	38	45	55	100
	Not burdened	9	6	15	60	40	100
Awareness	No awareness	10	23	33	30	70	100
	Less awareness	6	23	29	20.7	29.3	100
	Moderate Awareness	15	15	30	50	50	100
	High awareness	10	16	26	38.5	61.5	100
	Very high awareness	2		2	100		100
Partner attitude	Not willing	8	24	32	25	75	100
	Less willing	26	34	60	43.3	56.7	100
	Moderately willing	5	10	15	33.3	66.7	100
Cultural Influence	Less influenced	6	6	12	50	50	100
	Moderately influenced	13	5	18	72.2	27.8	100
	Highly Influenced	12	22	34	35.3	64.7	100
	V. highly Influenced	11	45	56	19.6	80.4	100
Project/government Assistance	No assistance	18	2	20	90	10	100
	Less assistance	25	39	64	39	61	100
	Moderate assistance	36		36	100		100

Declaration

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

Declared by:

Tsigereda Tesfahun

Candidate

Confirmed by:

Yegremew Adal

Advisor