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**PASTORAL WOMEN PARTICIPATION IN WATER RESOURCE  
MANAGEMENT: THE CASE OF BENA-TSEAMY WOREDA,  
SOUTH OMO ZONE, ETHIOPIA**

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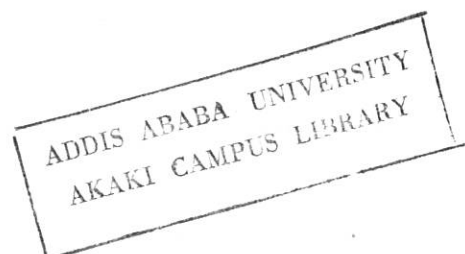
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This is to certify that the thesis prepared by Shewadinber Mekonin entitled: *pastoral Women Participation in Water Resource Management: the case of Bena Tseamy Woreda South Omo Zone*, Ethiopia and submitted in partial fulfillment of Degree of Master of Art (Environment and Development) complies with the regulations of the University and meets the standards with respect to originality and quality.

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## **ABSTRACT**

Pastoral Women Participation in Water Resource Management: Evidence from Bena Tseamy woreda, South Omo Zone, Ethiopia.

**Shewadinber Mekonin**

The title of this study is pastoral women participation in water resource management in the case of Bena Tsemay woreda, South Omo Zone, Ethiopia. The major objective of this study is assessing pastoral women participation in Water Resource Management in Bena-Tseamy woreda of South Omo Zone. To achieve this objective, the study employs both qualitative and quantitative research methods. Field data from number of selected kebeles in Bena-Tsemay woreda was collected through use of questionnaires, direct field observations, key informant interviews and focused group discussions, while, secondary data was obtained through detailed literature reviews. Quantitative and qualitative data collected were analyzed using SPSS and interpretation data analysis techniques. The result of the study shows that there are low or inactive involvements of pastoral women in both domestic and irrigation water resources managements even if, they are primary agents in securing food and water needs of pastoral household. The study also identifies different socio-cultural factors that contribute for low level of women involvement in water resource management in the study area like: cultural influence, work burden, male dominance, low social status of women, etc. Finally recommendations to wards viewing and empowering pastoral women as manager of water resources and active participants in water resource management were proposed based on the result and gap identified.

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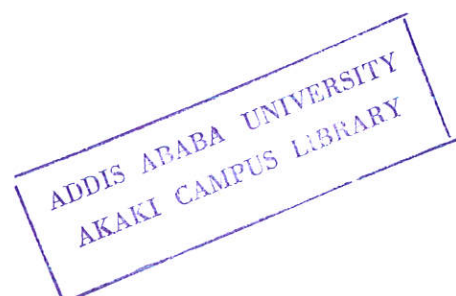
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## ACRONYMS

AWM:	Agricultural Water Management
AMU:	Arba Minch University
CSA:	Central Statistics Authority
CBO:	Community Based Organization
DDAR:	Demand Driven Action Research
DRA:	Demand Responsive Approach
ESA:	External Support Agency
FHH:	Female Headed Household
FGD:	Focused Group Discussion
GAD:	Gender and Development
GIS:	Geographical Information System
GO:	Governmental Organization
IDE:	International Development Enterprise
IRC:	International Research Center
MDG:	Millennium Development Goal
MHH:	Male Headed Household
MoFED:	Ministry of Finance and Economic Development
NGO:	Non Governmental Organization
NRM:	Natural Resource Management
PIM:	Participatory Irrigation Management



RDAO:	Rural Development and Agricultural Offices
SPSS:	Statistical Package for Social Sciences
SNNPR:	Southern Nations, Nationalities and Peoples Region
UN:	United Nation
UNDP:	United Nation Development Program
UNCED:	United Nations Conference on Environment and Development
WSAH:	Water Sanitation and Hygiene
WID:	Women in Development
WUA:	Water User Association
WMC:	Water Management Committee
WHO:	World Health Organization

## **CHAPTER ONE: Introduction**

### **1.1. Background**

Water is among the essential natural resources that sustains life and it is therefore a basic human need which human beings will not survive without. A minimum of 20 - 40 liters of water per day per person is required for drinking and basic hygiene. However, the world water resources are facing immense pressure from the growing demands from population growth, economic activity and improved standards of living (UNDP, 2008).

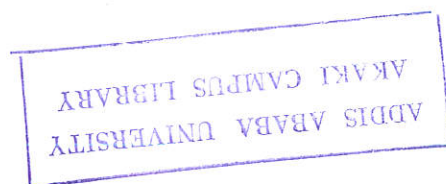
Ethiopia is known as water tower of Africa. Yet, the great majority of its population suffers from inadequate and unclean water supply, and has the lowest water supply coverage among African countries. For example, water supply coverage in Egypt, Sudan and Eritrea stands at 91-100%, 51-75% and 26-50% respectively while it is less than 25% in Ethiopia (Harvey petter and Reed, 2004: 3).

Water management is concerned with the planning, design, implementation, and maintenance of a water project to ensure that water, as a resource is efficiently and effectively used by the community. Water management involves the participatory approach of empowering communities especially women to provide, protect and safeguard their own water sources (Vijita, 1996). Well managed water project is essential for better water accessibility both for domestic and agricultural production which is necessary for achievement of the MDGs. Water is a fundamental requirement for

effective primary health care and a precondition for success in fighting poverty, hunger, child mortality, gender inequality and environmental damage (UN, 2006).

Community based system of water management evolved in the 1980's as a response to the international crisis of water scarcity and dwindling resources (Green, 1994). The system emphasizes equitable and sustainable management of water as a community resource; and involvement of women in the resource's management. Women are most often the collectors, users and managers of water in the household as well as in the agricultural system. Because of these roles, women have considerable knowledge about water resources, including quality and reliability, restrictions and acceptable storage methods and are keys to the success of water resources development schemes.

Similarly, pastoral women in the study area has substantial role in securing water need of the household both for domestic purpose and that of agricultural activities. Particularly, women found in remote kebeles of Bena-Tsemay woreda spent more of their time and energy on searching of water. They travel longer distance for searching of water from scoop well by digging sand found in temporary river beds, traditional water source like, river and undeveloped springs especially during dry season, thus they are the primary agents who face more challenge due to water related issues. Thus, this study was focused no assessing the participation of pastoral women in water resource management and identify major challenges that hinder women participation in South Omo Zone, Bena Tsemay Woreda.



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

In Ethiopia the total population that has access to water services in 2008 was around 98% for urban areas and 26% for rural areas (MoFED, 2008). This means, 74% of the rural population has no access to portable water in Ethiopia. The consequence of this poor water supply coverage is severe. It aggravates the infant mortality rate, very low economic productivity and low female enrolment ratio in school. This is more serious in the rural population that has virtually no sanitation facilities with low access to water (WSAH, 2005). This implies that, potable water scarcity is one of the most critical issues today. Even though the water crisis is observed as a general problem for the rural population of Ethiopia, pastoral communities faced more challenges as a result of their location.

Similarly in Bena Tsemay woreda, women have primary responsibility for management of household water supply, sanitation and health due to gender assigned role thus they are the primary agents who face more challenges related with water. Some of the challenges are: they are forced to move far distances for searching of water from permanent water source which is mostly unsafe which intern expose the family to different health problem, they also forced to dig sand that are found in temporally water source for searching of water following the river courses, etc...and These create a great work burden on women by consuming their time and energy that needs for involving in different productive activities.

On the other hand, they also play a substantial role in food production based on their gender assigned role while, male are responsible for managing livestock production. Thus

women spent more of their energy and time in irrigated crop production activities in the field in addition to securing water for domestic purposes and other household chores. Thus, they are the primary agents who face more challenges due to water related problems which needs area focused and context specific research to examine and investigate the root causes. Thus, this study tried to assess pastoral women participation in water resource management in both domestic and agricultural water management aspects and identify major challenges that hinder their participation in Bena-Tsemay Woreda, South Omo Zone.

### **1.3. Objectives**

#### **1.3.1. General objective:**

The general objective of the study is assessing pastoral women participation in Water Resource Management in Bena -Tseamy woreda, South Omo Zone.

#### **1.3.2. Specific objective**

- Assessing pastoral women participation in domestic water supply management,
- Examining pastoral women participation in agricultural water resource management,
- Identifying major challenges that hinder women participation in water resource management practices both for domestic and agricultural production.

### **1.4. Research Question**

- What is the level of pastoral women participation in water resource management?

- How is the participation of pastoral women in agricultural water management in relation to domestic water management?
- What are the major factors that hinder pastoral women participation in water resource management practices in the study area?

### **1.5. Significant of the Study**

Government and External Support Agency (ESA) strategies emphasize the importance of adopting a demand responsive approach to the delivery of water services. The Demand Responsive Approach (DRA) has emerged as an innovative strategy for assisting willingness of communities to improve their water resource management practices. It recognizes the existing capacity of communities to take responsibility for identifying and solving their water related problems. Women are among this responsible persons, thus assessing the participation of pastoral women in water resource management and identifying the challenges that hinder their participation can contribute considerably to any attempt intended to up-hold the household water use, women participation in water management and improve the socio-economic status of women in pastoral area.

Thus, the result of this study is helpful for planners and policy makers to provide relevant data and information regarding gender-based water resource management in the area. Accordingly, the result of this study will help for possible gender sensitive interventions to be implemented by concerned bodies in order to minimize the challenges faced women due to water related problems through improving their participation in water resources management activities.

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

This study considered only Bena-Tsema Woreda pastoral and agro pastoral group among South Omo Zone. The study focused on assessing the participation and challenges of pastoral women in water resource management in relation to water use for domestic, crop production and livestock watering in reference to their male counterparts. In any piece of research work, some occurrences of challenges are usual and this study has faced some difficulties in logistic availability, transportation problem due to poor infrastructure, time and financial shortage, language barriers and cultural influence some women respondents inactive during group discussion and household survey.

## **CHAPTER TWO: Literature Review**

### **2.1. Women and Water Resource Management**

The community involvement paradigm was officially adopted in the water sector by the international community during the 1977 World Water conference in Mar del Plata, Argentina. As Schouten and Moriarty (2003) noted the slogan of the conference was “water and sanitation for all”. In New Delhi in 1990, where the results and follow-up of the international drinking water supply and sanitation decade (1981-1990) were discussed, water resources were one of the subject areas which emerged as essential for the next generation. The importance of preserving and protecting fresh water resources were given emphasis. The conference also underlined that water supply and sanitation should not be reserved for few, but all people have the right to fulfill the basic needs (Schouten and Moriarty, 2003).

Provision of adequate and clean water for all was underlined by Mar del Plata Conference. The New Delhi document was mentioned women several times in relations to their roles in managing domestic water collection and use. This has created a favorable condition for the recognition of their involvement as a critical element in reaching the water decades targets of ‘water for all’. New approaches called Women in Development (WID) were launched by the UN system and bilateral organizations that targeted only women and sought to broaden their involvement in the planning and implementation of water supply and services (Wijk, 1998).

As results of this, women were trained as hand pump caretakers and artisans; their participation was mandated in water committees. Many projects started involving them in trench digging system, maintenance and water committees. Following the New Delhi, the Dublin (1992) and Rio de Janeiro global water conferences mentions the central role of women in the provision, management and safeguard of water.

As depicted by Waijk (1993) these conferences “call for the pivotal role of women as providers and users of water and guardians of the living environment to be reflected in institutional arrangement for the development of water resources”. Like the above mentioned conferences the Earth Summit in Rio de Janeiro (June 1992) in its Agenda 21 (strategy to provide universal coverage of sustainable water supply) explains the role of women in the same way “women should be involved in water management and training” (Wijk, 1998).

As Wijk noted it is during the Noordwijk conference (March, 1994) which was followed the Dublin and Rio conferences on water and water resources management the issue of gender started to emerge. The Noordwijk conference endorsed equitable involvement of women in decision making, management and training. The Noordwijk Action Plan (1998) stressed that water and sanitation programs need to be based on partnership and involvement of all stakeholders, (especially women, community associations, local, regional and central government, public and private sector agencies and nongovernmental organizations. From the experience of these conferences, a set of principles emerged that brought about dramatic changes to water supply and sanitation development. The economic value of water started to being recognized that calls for water has value and

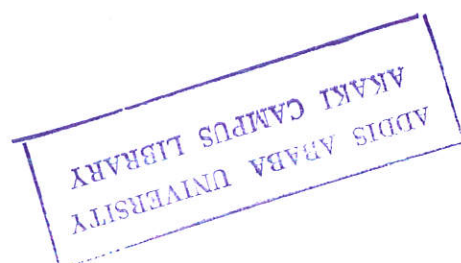
users need to pay. At the same time the water sector was learning that services should respond to demand in order to promote users willingness to pay.

As stressed by Wijik (1998), the Noodwijk conference gave insights into gender by stating “the requirement of gender disaggregated data that facilitate the involvement of women and men in the management of water resources.” The conference also recognized that the convergence of gender approach with demand responsive approach helps to promote the new idea of water as an economic good and users need to pay for it. From the above paragraphs, it can be seen that, in international forum on water resources, increasing attention is being paid to gender aspects. The attention is slowly shifting from singling out women in their predominantly domestic functions to bringing up the share of power in water planning and management between women and men.

### **2.1.1. The Transformation of Women’s Role from Passive Water Carrier to**

#### **Active Manger**

As argued by Wijik (1998), during 1950s and 1960s women were regarded as water carrier and provided with water in order to address their practical needs. In domestic water supply programs women were initially seen simply as carriers of water. Their important roles in maintenance and management were not recognized. Therefore, women were not involved as actors but rather as passive beneficiaries. While women often benefited through access to water at a closer location, women were excluded from the involvement of water development project cycles (Wijik, 1998). Women in Development (WID) approach that comes into use in the early 1960s had influenced the water sector development planners and policy makers to view women as the mere beneficiaries of the



improvements. Rogers (1998) has explained the impact of WID approach on development planners in the following way:

The assumptions of development planners made about women in society are based on thought of natural that a woman's place is in the home and she has a very specific set of tasks which are thought to be universal because they are based on the biological imperatives of sex. The most important role for women, defining their entire life, is portrayed as the bearing and bringing up of children. A man on the other hand, is seen as the natural head of the family, representative in the outside world and therefore the person with whom planners will deal.

Under the rubric of WID, women were often treated as a homogeneous group, class, ethnicity and intra-household gender differences were not taken into account. Women's situations were analyzed exclusively, and activities were developed accordingly for them. Men were seldom involved in these activities in order to understand the needs of women. As argued by Young (1993) it was after the introduction of Gender and Development Approach (GAD) in 1980s, that women began to be recognized as actors and managers of water in their own right, and it was demonstrated that involving women in planning, construction and management, brought benefits for general development, for the project, for the households and from women themselves. Bourne (1984) wrote that: "Women are recognized as local water managers in a culturally prescribed manner" This transformation from passive water carrier and grateful beneficiary to active manager and necessary participants was the product of GAD approach.

### **2.1.2 Women in Rural Water Supply Projects**

In many villages in developing countries, there are abandoned hand pumps, installed by well-intentioned government authorities that were constructed without any consultation and participation of user communities. When these system broke down no one in the village repaired them, since people felt no sense of ownership. Such water supply schemes are also viewed as government property (Bourne, 1984: 15).

Such undesired results are the outcome of improper understanding of what community is and what characteristics it has. The definition of what is meant by community must be carefully examined. Community is not simply collection of people living in certain shared geographical boundaries. However, communities are active and has a lot of dynamics and also not passive. Communities are neither homogeneous nor static entities. The past experience in the water sector shows that water engineers have brought technical solutions to communities, however, a number of rural water systems failed due to inadequate understanding of community dynamics.

Harvey petter and Reed (2004) said: “communities are made up of people with different gender; families/clans; ethnic groups; religious groups; socio-economic groups; profession; and literacy and education levels”. Similarly, Schouten and Moriarty (2003) also show that the communities are “melting pots of continuous negotiations, discussions and conflicts”. Communities are dynamic and change constantly in their power balances, wealth, size, water availability and so on. Communities are also diversified that consists of rich and poor people with different status, women and men, old and young, powerful and powerless. From these various descriptions of the characteristics of community, we

can thus deduce that community though its members are close to each other; do not necessarily have the same levels of power and control, same interest with similar obligations. Women and men have different levels of responsibility and different tasks, different attitudes to the value of water source close to home. And have different degree of influence over decisions, and have competing interest in water use for home, cattle and crops. For instance, women and men need water to drink, however, domestic water is almost invariably seen as a women's affairs while water for irrigation is often largely the responsibility of men.

Thus, as Young (1993) put it: "being men and women are differently located within the socio-economic structure, they tend to have different set of interests and needs". Similarly in the study area water for domestic purpose is considered to be women's responsibility and water for livestock and crop production is seen as the responsibility of male. Thus, this research tried to assess women involvements in both domestic and agricultural water management and identified different factors that make women involvement low.

## **2.2. Barriers to Women's Participations in WRM**

### **2.2.1. Women's Work Burden**

As indicated in the previous section, development planners, especially technical personnel in the water sector do not recognize and consider the triple roles of women and its implication in the participation of rural water supply project activities. The total workload of women in rural areas is very high, however, the works do by women are not considered as valuable works, while the work men do is used as a standard and given

high value. The traditional held belief of man as breadwinner still predominates even though it does not hold in practical value. The workload of women and its implications in any form of participation can be seen by analyzing their triple roles.

**Reproductive work:** Child bearing, rearing, reproduction tasks such as household chores, cooking, washing, cleaning, etc. for the maintenance and sustenance of the family on a day to day basis. It thus includes not only biological reproduction, which is a minor aspect of it, but also the care and maintenance.

Women's reproductive work is invisible, because it is seen as natural work. Productive work comprises income generating activities done by both women and men for production with cash or kind and includes both market production with an exchange value and subsistence home production with an actual use value and potential value. In many societies, for generation on end, women have contributed immensely to the survival of their families by engaging in many types and forms of productive work.

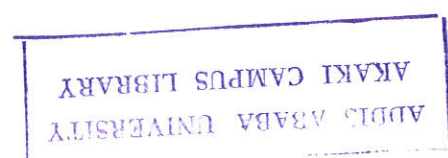
**Community managing work** comprises activities undertaken by primarily by women at the community level as an extension of their reproductive roles. This is to ensure the provision and maintenance of scarce resources of collective consumption such as water, fuel, health care, and education. It is voluntary unpaid work undertaken in the free time of women. Men who are usually paid either in wages or increases in status often undertake the community politics roles. Women's community roles may vary from caring for sick community members in the form of doing household chores and assisting in service work for the community such as road construction. These all are considered to be performed by women for free since they are assumed to have plenty of energy. When men are engaged

in any type of community work, for instance, in water committee, they are paid in the form of prestige. They tend to be moreover involved in positions of direct authority. As asserted by (Young, 1993), women's reproductive works are considered as “natural or biological and do not involve in the market, thus not valued”

Adequate understanding of women's triple roles helps to collect accurate data on women's activities and not to underestimate their productive works. Collection of data on women's activities will also help the development planners to challenge the existing stereotype on women's work. Wijk (1998) has stated, “Careful examination of women's work has a positive outcome to examine women's work load and to design appropriate schedule to ensure their participation in water projects. It is also uses an entry point for project preparation and to know who is doing what in certain community and to plan for community participation activities.

### **2.2.2. Women's Social Status**

Social norms and values provide the framework within which status and positions are ascribed. Women in most places are generally disadvantageous comparing to men in terms of status and rights. It is also widely recognized that women and men particularly in developing countries do not have equitable division in rights, domestic and public roles. In almost all cultures and economies, the “pervasive ideology of male superiority” is prevalent (Young, 1993) that hinder the participation of women in public arena. Such cultures and norms shape women's view of themselves and forced them to accept their inferiority. Another social factor that hampers the involvement of women in any planned development activities is the control and upper hand of men over political, economic,



social resources and distribution of power. For instance, in rural communities women are intimidated to speak in public meetings, especially in the presence of their husbands. The power relations between women and men within the family, community and society level is generally hierarchical and women are usually found at subordinate position than men. As argued by (Young, 1993), our identities as man and woman are socially constructed, not fixed biologically. Oakley in (Young, 1993) noted:

*“It is not easy to change and violate the masculinity and femininity characteristics of men and women, which are acquired through long term socialization started almost at birth and continue well into adulthood”.*

Women are intensively socialized to acquire feminine characteristics such as being attractive, passive, caring, submissive, dependent, shy, quite, innocence and gentle; whereas men are socialized to acquire masculine characteristics like self-reliant, competitive, aggressive, strong body and successful. Gender relations which are the product of masculine and feminine characteristics are socially constituted relations between women and men. Violation of these relations are sanctioned by norms and values held by members of a given community (Young, 1993). She further elaborated the gender relations at the community or wider society levels are characterized by order of dominance, i.e. male tends to be the superior term in relation.

Similarly, social norms and values of pastoral communities in South Omo Zone put a great pressure on pastoral women that hinder them from participating in planned development activities in the area. Deep rooted harmful traditional practices within the study area also have negative impacts on their participation in water development

projects. And all these problems are not well assessed due to several factors like, being remote area, unavailability of infrastructure and other services.

### **2.3. Women Participation in Water Resource Management**

A number of studies conducted in rural villages have tried to identify the relationship of gender issues with water resource management. For example the research conducted in Ha Tinh and Nam Dinh region of Vietnam revealed that men and women had different perceptions and interest towards improved water supply provisions. Women were found to believe that they stand to benefit from improved water supply because it gives them opportunities for washing and showering at any time, whereas the men in the villages could take a bath in the river after the day's work in the field. Because of their need for privacy, women had to wait until dusk before they could wash and shower. The new water facilities helped women in the villages to improve their personal hygiene. In Ethiopia also women and men need clean water for daily life, but for women the needs is more urgent and differ than men.

Another finding of the study was that in Ha Tinh and Nam Dinh rural communities, men normally made the final decisions related to water. Due to traditional customs men make major decisions related to the location of tap-stands, selection of caretakers, maintenance, and skilled workers. The study also indicates that, the participation of women in village level community meetings was very low due to women's workload in the home and women's own wrong perception that men had better knowledge on the topics discussed the meetings. One of the most conclusive findings of this study is in Nam Dinh and Ha Tinh the provincial and District IEC groups and the community steering committees

consisted mainly of men. The selection criteria used for community steering committee, i.e. having a leadership position within the community made it difficult to have a gender-balanced representation on the committees. Since women have a very limited access to community's leadership positions, they are unlikely represented in community committees.

This situation has similarities among rural communities of South Omo zone. For instance, the study made by Hirut (2001), reveals similar information. Most activities in rural societies including among pastoral groups are managed along gender lines. While some activities such as water collection for domestic use and grass cutting are mainly the preserve of women, few Natural Resource Management (NRM) tasks are carried out by men alone. This means that it is often women who are responsible for natural resource collection and use, and particularly where these are scarce it can result in women being overworked. Further as pastoral systems change and there is a decline of activities more often associated with men such as hunting, cattle raiding and livestock herding, pastoral men are finding themselves under worked and yet fail to take up any of the 'women's tasks'. Rather in some cases women are taking up traditional 'men's' roles. For example amongst the Hamar of Ethiopia young wives are increasingly taking on herding activities, in order to promote the self-sufficiency of nuclear families (Hirut, 2001).

### **2.3.1. Women Involvement in Agricultural Water Management:**

Agriculture water management includes irrigation and drainage, water management in rain fed agriculture, recycled water reuse, water and land conservation, and watershed management (World Bank, 2006). Women play a critical role in agriculture in the

developing world, accounting for about 70- 80 per cent of household food production in Sub-Saharan Africa, 65 per cent in Asia and 45 per cent in Latin America (World Bank, 1996). Managing land, water and livestock resources, often in the absence of men, they are not always recognized as 'farmers'. Social norms, institutional arrangements and the growing liberalization of agricultural marketing systems (Baden, 1998) have an impact on gender-based disparities.

In most developing countries, women's lack of access to land rights whether as private property (inheritance), usufruct rights on common property resources or direct purchase/lease from the market, has an impact on their livelihood strategies, food security and social status (Agarwal 1994). Independent or joint land tenure for women can provide them with access to collateral for bank loans (agricultural credit) in their own names or access to agricultural extension services and information systems which are typically targeted to men. But land reforms in several countries, while important for the poor and landless, have generally targeted male household heads, excluding women from legal tenure, which in turn, affects their claims to water for irrigation and their participation in community institutions (Deere and Leon 1998, van Koppen 1998).

### **2.3.2. Women and Access to Irrigation**

Irrigated agriculture provides some 40 percent of the world's food and consumes about 75 percent of the world's renewable freshwater resources (Agarwal, 1994). However, while most farmers depend on traditional systems of irrigation, investments in irrigation worldwide have tended to focus on large-scale projects (dams, canals) benefiting rich farmers often at the cost of small and marginal farmers who have been evicted, displaced,

or had their land expropriated ([www.fao.org/sd](http://www.fao.org/sd)). These projects coupled with intensive private-owned micro irrigation (tube-wells, bores) have led to severe environmental damage water-logging and saline intrusion and competition over the availability and quality of water for domestic purposes. Overexploitation of groundwater and growing pollution from leaching of fertilizers and pesticides compels women (and girls) to walk further to collect safe water for their domestic needs.

Irrigation planning and policies have typically ignored gender differentiated needs and priorities as they have focused on the construction and maintenance of systems, the efficient distribution of water and increased agricultural output, rather than the nature of crops grown or the impact of irrigation on labour markets or the co-existence of productive and consumptive water uses (Cleaver 1998).

For example, small women farmers in rain-fed agricultural areas in Africa use less water for nutritious crops than is used in male farming systems growing one or few crops often including 'thirsty' ones like sugar and rice. But increasingly, particularly during extended periods of drought, crop choice is also a function of other factors such as access to labour (many men migrate) and animal draught power as livestock are severely affected by water scarcity (lack of fodder and water for drinking or bathing cattle).

Recent attempts at the devolution of irrigation management to the local level, such as participatory irrigation management (PIM) policies, only target 'landowners', typically male household-heads as members of Water User Associations (WUAs) responsible for decision making on the distribution and management of water. The rural household is

perceived as a unit of congruent rather than conflicting interests and women in this model are seen to benefit indirectly as co-farmers through their husbands' rights to water.

However, while women may share similar irrigation related needs on family plots – sufficient water for growing one or more crops a year – there may be differences of opinion regarding the timing and timeliness of water delivery (Zwarteveen 1997). Women often have to balance other household tasks along with irrigation and usually find it difficult to irrigate at night, particularly if they are single women, because of social norms defining mobility and security concerns.

Female-headed households usually have to hire (male) labour to help with irrigation or depend on social networks of family and friends during the peak season. Moreover, female farmers who grow the same crops as men, and should be entitled to receive an equal amount of water, find it difficult to claim and receive their water entitlement, especially when water is scarce. Sometimes irrigation can lead to food insecurity because of the shift to cash crops, thus increasing household dependency on the market and devaluing indigenous knowledge systems.

For example, in the Gambia, traditional swamp rice farming practices and knowledge are being lost as more land is pushed into irrigated fruit and vegetable production for export purposes ([www.fao.org/gender](http://www.fao.org/gender)). Research in Malawi shows that children of cash crop cultivators are less well nourished than those of small women subsistence farmers. Irrigation also has an impact on female labour participation, albeit mixed, providing employment opportunities for women on their husband's plots (unpaid, extra work) or as agricultural laborers on land belonging to large farmers. At the same time, the

introduction of irrigation in dry-land or rain-fed areas may reduce distress migration, particularly by women, as it enables families to grow a second or third crop (Ahmed 1999). Women also use irrigation water for other purposes, such as watering cattle, washing clothes and utensils in canals or watering their kitchen plots gardens.

Gender-sensitive technology is another important, but seldom considered factor, for enhancing women's access to irrigation. In a study of peri-urban agriculture in Nairobi, a growing income-generating opportunity, many women farmers found the water pumps in use too costly and not easy to operate or manage (Hide and Kamani 2000). Women find themselves excluded from male networks, remaining at the back of queues for spare parts and repairs (Chancellor et al. 1999). In contrast, in water-rich areas of eastern India, the nonprofit organization International Development Enterprise (IDE) changed its marketing strategy based on market research to target the purchase and maintenance of treadle pumps to small and marginal women farmers (Prabhu 1999).

#### **2.4. Conceptual framework**

Woman participation was among the variables strongly associated with project effectiveness. A World Bank review of 121 rural water supply projects found that the failure to take gender differences and inequalities into account can result in failed projects (WB, 1996). Thus, equal involvement of both male and female in any development activities including water project have paramount importance to ensure project effectiveness and to attain women empowerment. Well managed water project with active involvement of male and woman has potential for change in the socio-economic aspects of the target communities particularly those of woman and the poor.

One of the social conditions that could primarily be improved as a result of having effective water resource management is improved physical accessibility of water which results in a reduction in the effort and time required to collect water. The locations of some water points are risky and dangerous to women and children. According to the research conducted by (Alemu, 2006), carrying the heavy load of water, either on the head or back, from far distant locations or sources causes various health hazards like, headaches and exhaustions. In addition to this, it inhibits them from involving in different productive activities since their time is spent for searching of water. For low-income women, the working day is excessively long. In many African countries, including Ethiopia, the collection and carrying of water and fuel wood over considerable distances can result in women having only few hours sleep a night in the dry season.

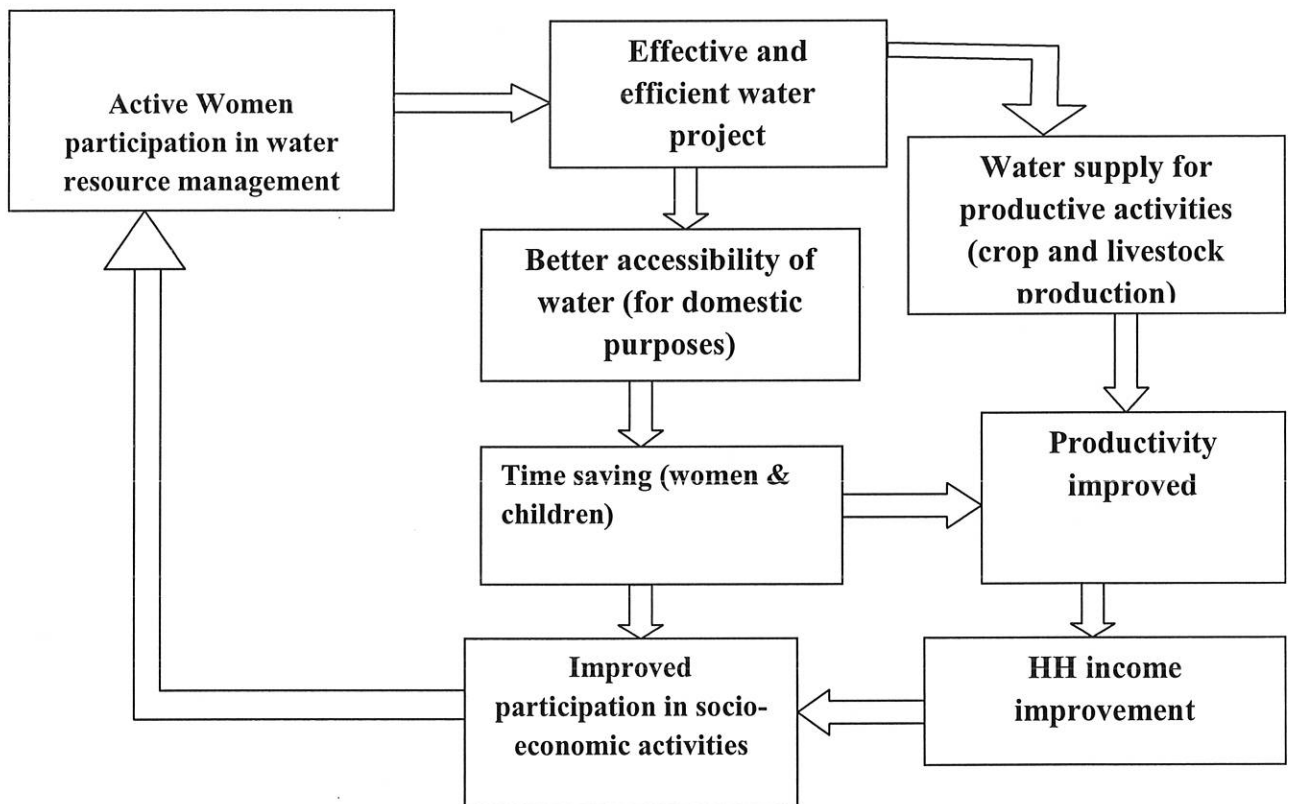
The lack of access to water supply has impacts not only on the quality of life of women, but also productivity and health. According to a survey carried out in 2001 by the Salvadoran think tank, the rural poor in particular spend a significant share of their productive time collecting water. Families without household access to water spent 4.9% of their productive time for fetching water. For the structural poor the values were much higher with 13.6% and 7.1% respectively (El Salvador-Wikipedia, the free encyclopedia, Feb, 2008).

The livelihood of the household is also greatly influenced by the accessibility of water and sanitation which is necessary in the improvement of their economic well being. That means, livelihood can be improved through provision of safe water supply and appropriate sanitation which can minimize the large amount of time and energy spent in

fetching water. The time and energy saved through provision of improved water supply can use in many economically productive activities (DFID, 2001:25, cited by Tefera, 2007).

As shown in the following diagram, IRC (2003) came up with this conceptual framework to study the impacts of community water project on the livelihood of the user community. In this frame work, well managed water project with active women participation is directly related with project effectiveness. This results in improved accessibility of water for both domestic use and productive activities. Women will also able to take part in different productive activities due to time saving. This will be resulted in productivity and income improvement which is the basic issues for women empowerment and improvement of socio-economic participation. Thus, this study will try to investigate the existing opportunities that enhance women involvement in water resource management and their level of participation in relation to male by using this conceptual framework. It also tries to identify the major factors that inhabit their participation.

**Figure 2.1: Conceptual framework**



*Adopted from IRC, 2003 with some modification*

## **CHAPTER THREE: Research Methodology**

### **3.1. Description of the Study Area**

#### **3.1.1 Location**

Bena Tsemay Woreda is one of the six pastoral woredas in South Omo Zone which is found at a distance of 703 km southwest of Addis Ababa. It has an area of approximately 254,907 ha. Its administrative structure consists of 29 rural and 2 rural town kebeles. Some kebeles are agro pastoralist while majority are belong to pure pastoralist. It is bordered with Mago National Park in the north, Konso Special Woreda in the south, Male Woreda in the east and Hamer Woreda in the west.

#### **3.1.2 Agro-Ecology and Climatic Conditions**

The area is characterized by semi-arid and arid climatic conditions, with mean annual rainfall increasing from the extreme south lower part, with 350 mm, to the upper part where it ranges to 838 mm. The rainfall is bimodal, with the long rain season from April to June and the small rains in September and October. In general, it has an erratic, variable rainfall and high ambient temperature ranging from 26-35°C (RDAO, 2011). The vegetation that covers the area is a mixture of *Acacia*, *Boswellia* and *Commiphora* woody species and short grasses type with varying density of woody vegetation (Alemayehu and Tezera, 2002).

### **3.1.3 Land Holding and Ownership Patterns**

According to Rural Development and Agricultural Office of the Woreda (RDAO, 2011) report, the average land holding size ranges from 1.5 - 3 ha. The average is about 2 ha. The total land coverage of the area is 254,907 ha. Of which, cultivated land accounts 16,355.2ha, grazing land 77,120.58 ha, shrubs 72,265 ha, forest land 4,119.59 ha, cultivable land 21,914.2 ha, lands which not suitable for cultivation due to its stoniness and mountainous 30,170ha and 2,961.32 ha is resident area.

Information obtained from the discussions held with different pastoral, agro-pastoral, and woreda agricultural office expert indicated that some 20 - 30 years back, the land was almost all owned communally. Currently, however, pastoralists owned small plots of cropland, rangeland and enclosure nearby their cropland and around their homestead. The rest of the vast rangeland is still owned communally, which is mainly used for grazing purposes.

### **3.1.4 Topography**

The altitude of South Omo Zone ranges from 360 -3500 meters above sea level (m.a.s.l) with different agro-climatic zones that include Dega (0.5%), Weyna-Dega (5.1%), Kolla (60%) and Bereha (34.4%). The study site is categorized under Kolla and Bereha agro climatic zones with average altitude ranges from 528-1645 m.a.s.l. Out of the total kebeles of the woreda, 15 kebeles are found at the altitude greater than 1,300 m.a.s.l.; whereas the remaining kebeles at the altitude between 500-977m.a.s.l. (RDAO, 2011).

### **3.1.5 Soil Type and Character**

Major soil types in the area includes; fluvi, chronic chambi, eutinic, litho, and eutic soil With PH ranges from 5.5- 6.7 and different soil textures like, salty, sandy, loam, clay and sandy clay which is mainly potential for natural plants with limited agriculture. This is because, loam and sandy loam are mostly developed at low land of the woreda in moisture scant areas, ranged topography, low rainfall and if they are subjected to prolonged rainfall they become acidic and associated with non soluble minerals. On other part of the woreda soil forming process are limited and steeple slops, low rainfall and majority of the soils are sandy which result in low agricultural practice in the area.

### **3.1.6. Population and Ethnic Group**

According to CSA (2007) the total population of South Omo Zone is estimated to be 573,435; of which female constitutes 286,828 (50.02%). The total population of the study woreda is estimated to be 52,968 (26,778 male and 26,196 female); of which female constitutes 49.5%. According to Rural Development and Agricultural Office of the woreda (RDAO, 2011) report, different ethnic group are living in the area like Bene(48.6%), Tsemay(36%), Biraile(2%) and others(13.4%). About 96.4% of the woreda population is living in rural area while the remaining 3.6% in rural urban area (RDAO, 2011).

### **3.1.7. Economy**

The major economic activities of the people in the woreda are livestock herding, crop production, petty trade, handcrafts, etc. The condition of livestock herding and crop

production depends on the agro-climatic zones of the area. The economy of those households residing above 1300 m.a.s.l. was agro-pastoral groups practicing a mixed farming. . The primary stock raised there is cattle and supplementary flocks of sheep, goats and some packed animals like donkey.

Households who are living in between 500-900 m.a.s.l engaged in livestock herding due to unfavorable climatic condition for crop production. Like agro-pastoralists, the primary stock raised in pastoralists group is cattle supplemented with flocks of sheep, goats and some packed animals like donkey.

Erratic rainfall constrains the use of arid and semi-arid lowlands for regular and reliable cropping. Rainfall in the study area is both uncertain and limited as compared to cultivating highland areas. It is such a pattern that exposes pastoralists and agro-pastoralists to famine and drought. However, they practiced crop cultivation like maize and sorghum for HH consumption purpose following the drop of rain and kebeles near to Witho and Kako River also practices irrigated crop cultivation by using water from these sources.

### **3.1.8. Water Resources**

There are both temporary and permanent water sources used by pastoralist and agro-pastoralist groups. Major permanent water sources found in the area include: rivers, springs, bore holes, hand and wind pumps. With regard to rivers the woreda has two permanent rivers namely, River Kako and Witho which is the tributary to Omo Gibe River Basin. Kako River is cross the kebeles found in semi-arid parts of the study area. There is also one spring within this semi-arid part of the study area in which the

communities are use the spring for different purposes. Communities in Yirga kebele are potential beneficiaries of the spring and Kako River for domestic, crop and livestock watering.

The other major river in the area is Witho River which crosses the arid or pastoralist parts of the area. Besides the permanent water sources there are numerous temporary water sources in the area these includes Ponds, Scoop Wells, Floods, Temporary Rivers and Roof Catchments. All of these are used by both pastoralist and agro pastoralist groups during wet season and at the beginning of dry season; because, these sources will became non functional during dry season due to underground water shortage and lack of rainfall in the area.

**Table 3.1: Major Water Sources and Their Status in the Study Area**

Si. No.	Water sources	Quantity available	Location	Status	
				Functional	Non functional
1	Permanent Rivers	2	Cross within the woreda		
2	Springs	4		3	1
3	Bore holes	3	Kako, key affer and luka kebeles	3	
4	Roof catchment	16	School compound	10	6 need maintenance
5	Wind pump	2	Withokebele	1	1
6	Hand dug well	57	All kebeles	34	23
7	Pond	10	-	6	4

**Source: Bena Tsemay woreda water offices, 2012.**

## **3.2. Research Methodology**

### **3.2.1. Sampling Techniques and Sample Size**

In South Omo Zone, there are eight woredas; of which six of them are pastoralists and agro-pastoralists and the rest two run agricultural way of life. Most pastoral woredas are found in remote and inaccessible areas –of which Benna- Tsemay was selected as a study district purposively due to relative accessibility in terms of infrastructure transportation culture and living style. In this woreda, there are 31 kebeles with some of them have potential for surface irrigation by using permanent river crossing the area, some have potential of flood irrigation and some of them use spring to irrigate their farm lands. Based on these accessibility of the water both for irrigation and domestic use one kebele (Yirga) from surface irrigation user using Kako River and spring water, one kebele (Witho) from modern irrigation user by using Witho River, one from flood irrigation user (luka) and one from non user's kebele(kako) were selected purposively. Kebele selection was set by discussing with different stockholders from Woreda Water Sector, Woreda Rural Development and Agricultural Office experts particularly irrigation and Woreda Gender Offices experts.

The total numbers of households in four selected kebele administrations were 2,170. Thus, 10% of 2,170 household heads is 217 but only 200 household heads were considered as sample respondents to conduct household survey only 10 % of the total population is determined as a sample depending on the availability of resources to conduct the survey. And these 200 households were drawn from four selected kebeles through making fresh list of households in each kebele and then, the list was stratified

into female-headed and male-headed households. And finally, with male-headed households the sample respondents were selected randomly from each kebeles using probability proportion to sample size. However, with regard to female-headed households' purposive sampling technique were used to draw the sample respondents. This was due to the small number of female-headed households in identified kebeles. The main target of the study as it is reflected in its title was female headed households. But male headed households were considered as control or reference point. Finally, a total 100 FHH and 100 MHH were selected from all sample kebeles. Three focus group discussions and key informant interview were also conducted with expert's elders and other individuals and a total of 12 key informants were interviewed for qualitative data collection Table 3.2. Show the Summary of household survey and qualitative sample size.

**Table3.2: Summary of Household Survey and Qualitative Sample Size**

Woreda	kebeles	Total HHs	House hold survey		qualitative sample size (Key informant interview and focus group discussion)	
			Sample HH head		Experts	Appointees
			Male household head	Female household head		
Bena Tsemay	Witho	713	30 MHH	30 FHH	7	3(woreda experts)
	Luka	351	15 MHH	15 FHH	-	-
	Kako	703	30 MHH	30 FHH	-	-
	Yirga	403	25 MHH	25 FHH	-	-

**Source: Field Survey, 2012**

### **3.2.2 Sources of Data**

Both primary and secondary data sources were employed in this study. The primary sources were first-hand information gathered through household survey, interviews, focus group discussions and direct field observations. The secondary sources were also obtained from both published and unpublished materials which include different books, magazines, and previous research findings, reports from different sectors (GOs and NGOs), etc. to supplement the primary data.

### **3.2.3 Tools and Methods of Data Collection**

Both qualitative and quantitative methods of data collection were used in the study, so as different instruments were applied to collect the data. These methods give the chance to obtain a deeper understanding of people's experience, opinions, knowledge, beliefs, needs, constraints and traditions. Moreover, they helped to obtain a detail understanding of the existing realities of the households (Degefa, 2005). Interviews, focus group discussions, narrative life history, and direct field observations were used to collect the qualitative data; whereas household survey (questionnaire) was used to gather quantitative data.

#### **3.2.3.1 Key Informant Interview**

It is often used as a method of generating data for understanding people's knowledge, experiences, opinions, beliefs, needs, perceptions, and constraints. It can be categorized as structured, semi-structured or unstructured in their settings (Robson, 1993). The research employed key informant interview to assess level of women participation in

Water Resource Management (WRM), and to identify the major challenges that hinder women participation. Semi-structure interview or interview guideline was organized for key informants like experts, appointee, households, and other concerned bodies mainly in the context of the study.

To this end; twelve key informants, of whom four of them were elders one from each sample kebeles, five experts, and three key informants (appointees) from the rural development and agricultural offices, water resource offices and women and children affairs of the woreda were interviewed. In all cases, the selection of the individuals was made purposively. To this end, interview guidelines were administered.

Triangulations were used to make the data more credible and valid, cross checking information from different concerned bodies. To triangulate the information that collected from different directions, I interviewed different individuals using the interview guidelines Interviewees included under this particular study were experts from government offices, administrators, and well known individuals from the site kebeles.

#### **3.2.3.2 Focus Group Discussion**

Focus group discussion is making group interaction, which enables the participants to get a chance to discuss each other's idea and share their information in relation with the intended objectives (Woldie, 2007). By employing this method, I explored the issues, which are not handled through individual interviews. To identify the issues not attended through individual interview, I organized FGDs in all four sample kebeles. Each group consisted of 8 individuals mainly pastoralists (MHH and FHH). The discussions were used to extract information on the study subjects and to get insights from community

members who are directly or indirectly involved in the water resource managements and also to use the idea rose during discussion for cross checking the results found from household survey and key informant interview. The questions for discussion were prepared by the researcher focusing on some general backgrounds of the households, water resource management practices (including water sources, uses for home consumption, livestock watering and crop production) women participation in water resources managements and challenges inhibit their involvement. Accordingly, 2 FDG were conducted in each pastoral and agro-pastoral group of which one FDG is conducted with women group.

### **3.2.3.3 Observation**

Observation has a vital role in providing firsthand information and enables in-depth opinions into the issue under investigation if it is critically observed and recorded (Degefa, 2005). Therefore, I employed observation to identify the living, housing, type of work, and other conditions of the households, sources of water in the area and their status, their water utilization and management practices in their surroundings.

### **3.2.3.4 Household Survey**

Structured questionnaire survey was administered for sample households at place of origin (Yirga, Kako Luqa and Witho kebeles) to gather quantitative data to supplement the qualitative data.

Before the actual conduct of the survey, preparatory activities were carried out. Among the preparations, structured questionnaires were prepared and then pre-test of the



questionnaires was done before the actual survey was undertaken with the non-sample respondents. While conducting the field survey, seven enumerators were recruited based on their ability to speak the local language, well exposure to the area, culture, and their ability to conduct survey and one guider and language interpreter were recruited in order to assist the overall data collection processes. They were trained on methods of data collection technique and contents of the interview schedule.

The questionnaire survey tried to address the general backgrounds of the household head, which includes demographic and socio-economic features of household heads, water sources, uses, water management practices, women participation in domestic and agricultural water resource managements and the challenge they face in relation to their participation. Therefore, all information concerning about these issues is obtained from sample households

#### **3.2.4 Methods of Data Analysis**

Data collected through the assigned instruments will not be valued, unless it will be coded, stored, transcribed, interpreted, and analyzed (Woldie, 2007). Qualitative data collected from primary sources by using interviews, focus group discussions, field observation and household survey questionnaires on water sources, management practices, level of women participation and challenges of women to take part in water resource managements in the area were interpreted grouped and summarized by using qualitative methods. Quantitative data which were collected using HH survey was analyzed using descriptive statistics: like percentage, average, tabulation, charts. The SPSS version 16 soft ware program was also used for data analysis. Finally, by using the two data analysis methods the researcher reached to conclude the study.

## **CHAPTER FOUR: Results and Discussion**

### **4.1. Demographic and Socio-Economic Characteristics of the Respondents**

This section provides a general overview of the respondents' background and how it affects water use, collection, allocation and gender relations in water resource management in pastoral households in the Bena -Tsemay districts of South Omo Zone. In order to evaluate the determinants of water use and demand in the households and the extent to which women get involved in domestic water supply and small scale irrigation water resource management, the following variables are used; sex, age, educational status, marital status, household size, livelihood of the respondents and source of income. Understanding of these issues will help policy makers to see which areas are critical for enhancing women empowerment.

#### **4.1.1. Age, Sex and Family Size**

Table 4.1 shows the respondents characteristics in terms of age, sex and family size. Accordingly, about 61.5% of respondents were in the age group of 25-34 while 28 % of them were in between 35-50 years. The average family size in the study area was 8.5 per HHs with a range of 1-16. This is lower than what was reported for the Borena pastoralists which is 13.5 per HH (Alemayehu 1998); in the case of Uganda pastoralists it is 14.5 per HH. On the other hand, the researched areas family size is higher than what was reported for Kereyu pastoralists which is 6.17 per HH (Abule 2003). With regard to sex of the respondent 50% of the respondents were male while the remaining 50% were female respondents.

**Table 4.1: Age, Sex and Family Size of the Respondents in the study area**

Respondents Back Ground		Frequency	Percentage
Age category	15-24	8	4.0
	25-34	123	61.5
	35-50	56	28.0
	>50	13	6.5
	<b>Total</b>	<b>200</b>	<b>100.0</b>
Sex	Male	100	50.0
	Female	100	50.0
	<b>Total</b>	<b>200</b>	<b>100.0</b>
Family size	0-5	80	40.0
	5-10	111	55.5
	Above 10	9	4.5
	<b>Total</b>	<b>200</b>	<b>100.0</b>

Source: Field Survey, 2012

#### 4.1.2. Educational and Marital Status of the Respondent

##### Educational Status

The educational level of the community in the study area is very low. As shown in Table 4.2, 72% of the respondents were illiterates while, the remaining 28% were only able to read and write. In the study area the chance of attending school depend on family size because they are expected to help their family with labor. Furthermore, even if the family size is big enough to give a chance for some children to go to school it is not the right of the family members to decide on the issue rather the elders of the villages decide the number of children who is supposed to attend school from each family or household. The elders decide on the fate of the children to go to school based on the labor requirement of each family. If there is an adequate amount of labor for the family, the extra sons will be allowed to go to school otherwise, they will not be given permission. In all the pastoral

groups, unfortunately females are not allowed to go to school at all (focus group discussion with elders from luka kebele).

The reason behind not allowing female to go to school is that, within all pastoral communities' females are considered as a major income sources for the family. That means, during marriage as a gift the families of the bride will receive 30-50 cattle's from the groom. Therefore, if they send female to school they fear that she will become aware of the traditional harmful practice then she will be out of the control of the family; as a result, the family will miss all the benefits they gain through marriage. To make the matter even worst, the intensity of this problem is more manifested in poor pastoralist areas and in areas with less access to educational facilities due to mobile way of life.

### **Marital Status**

With regard to the marital status of the respondents 48 %of the respondents were married (Table 4.2). The dominant type of marriage is monogamy and yet polygamy is also quite common among respondents. Out of 48% of married respondents 75% of them were monogamy while 25% of the respondents were polygamy. The married woman will be considered as a wife- that means woman was considered as wife until her first son/daughter gets married. Based on their culture, this kind of woman is locally known as **“Gechwo”** and after that these women will not get any kind of respect from the community and her family (personal communication with the woreda women affairs expert).

**Table 4.2: Educational and Marital Status of the Respondents in the Study Area**

Respondents back ground		Frequency	Percentage
Educational status	Illiterate	144	72
	Literate(Read and Write )	56	28
	<b>Total</b>	<b>200</b>	<b>100.0</b>
Marital status	Married	96	48.0
	Widowed	43	21.5
	Divorced	57	28.5
	Single	4	2.0
	<b>Total</b>	<b>200</b>	<b>100.0</b>

**Source: Field Survey, 2012**

#### **4.1.3. Livelihood and Income Sources**

##### **Livelihood**

Based on the survey result in the study area, 56% of the total sample HHs runs agro-pastoralist ways of life while 23% of them earn their living from off farm activities (Figure 4.1(A)), The major off/ nonfarm activities practiced in the area includes: hand craft like local jewelry, artifacts and trading local drinks which is locally known as “cheqa” is mainly produced and sold by female headed households. While local jewelry artifacts are mainly practiced by male which is the main income generation mechanism since South Omo Zone especially Hamer and Benna are tourist areas.

The respondents are mainly dependent up on pastoral and agro- pastoral activity combine with some off farm activities. HHs who live in arid parts of the woreda are pure pastoralists; 60% and above of the HHs income came from livestock and livestock products. Since the climate of the area unfavorable for farming activity the community mostly pastoralists; however, try to produced maize and sorghum in some place only for

consumption purposes by using water from perennial rivers and flood coming from highland areas.

The remaining HHs that resides in semi arid area are engaged in agro-pastoralist way of life. These agro-pastoralist groups derive their living from livestock rearing supplemented with crop production by using flood from high land areas and by using surface irrigation diverted from Kako River.

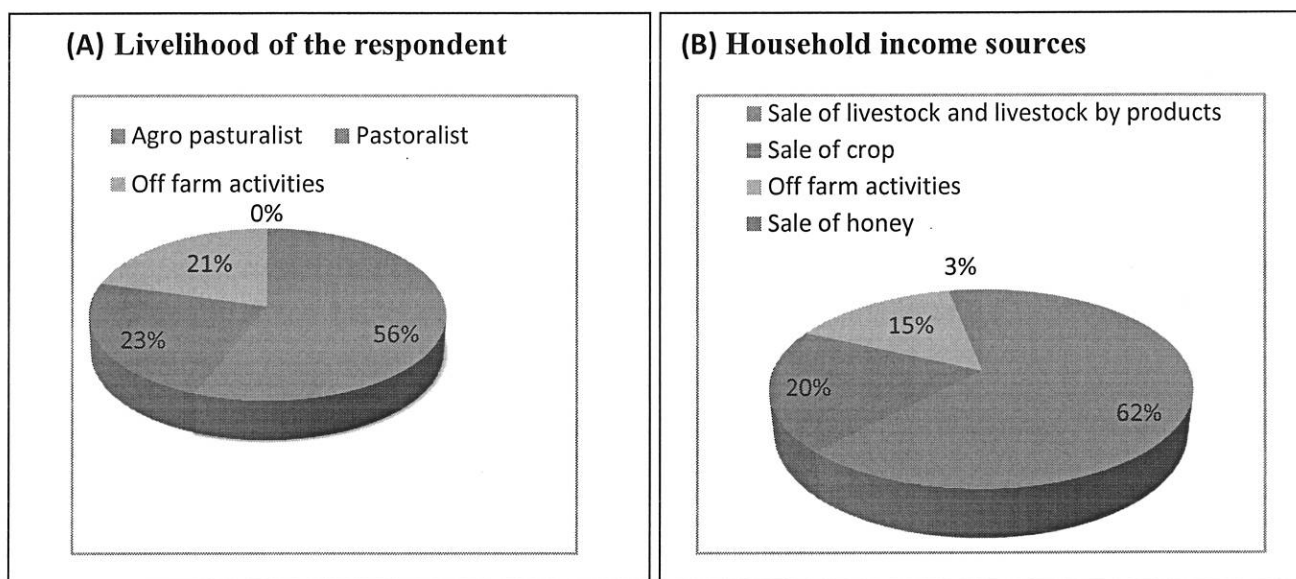
### **Income Sources**

The main income source of all pastoral and agro pastoral groups in the area is derived from the sale of livestock and livestock products (Figure 4.1(A)) followed by the sale of crops and income earned from off farm activities. Similarly, the dependence on livestock and livestock byproducts as the main sources of income is well documented in other pastoral area of Ethiopia (Alemayehu 1998; Abule 2003) and east African countries (Ndikumana et al 2000). As per discussion made with pastoral groups in Bena Tsemay district milk is not soled but they earn their income from milk products like butter. Because in Bena Tsemay culture milk and blood are uses as the main food item especially for children. Unlike that of other rural parts of Ethiopia, males are responsible for selling butter in the study area because they own and manage the livestock. On the other hand, women do not have the right to own the livestock. Therefore, they mostly earn their income from sale of local drinks (cheqa). Even after the death of her husbands all the resources especially cattle will be handed over to her brother in law or her son.

As per the result of the survey in the study area, 62% of sample HHs earn their income from the sale of livestock and livestock by products, 20% from crop products 15% from

off farm activities and 3% from sale of honey. The study conducted in Bena Tsemay district by Teref et.al (2003) show that the first income sources of the these communities were livestock and livestock by products which is similar to the results of this study but the second level income sources was honey production. The reason for this variation is that the pastoralist and agro-pastoralists recently started producing crops not only for consumption but also for income sources due to the fact that the climatic condition of the area is no longer suitable for cattle rearing. The following figure shows the percentage of livelihood of the respondents and their source of income.

**Figure 4.1: Livelihood and Income Source of the Respondent**



#### 4.1.4. Number and Type of Livestock Owned by the Household

Livestock are the main assets of the pastoralists in the study area upon which their livelihood depends. It is used as a source of food (milk, meat, and blood), social functions, as a means of saving, income source, and risk minimization. The number of cattle they own decides the status of individuals in the community. All the sampled

households of the different pastoral groups wished to have a large number of cattle to get a higher status in the society. In addition, bride payment is one of the traditions in which cattle play the major role. Even though plowing with oxen is a recently introduced technique to the area, most of the pastoralists involved in crop production use oxen as a source of power.

Accordingly, livestock's like: sheep, goat, cattle and donkey are found predominantly in the area where as camels and horses are also found in small quantities. According, to data from Woreda Rural Development and Agricultural Office the total number of livestock in the area up to 2003 are: 82,402 sheep, 261,574 goat, 212,667 cattle, 21,223 donkey, 123 camels and 8 horses (RDAO, 2012).

#### **4.2. Pastoral Resource Management in Bena-Tseamy woreda**

There is a traditional management rooted in the community on how to find and decide upon the key resources (water and pasture). Within this social network different groups of the community have different responsibilities and tasks. As the interviews made with key informants the elders have the power in decision making and conflict resolutions, the migration pattern of livestock, the status of the key resources and where to find them are being discussed by the elders during evening hours around the homesteads and by the time they meet to drink local drink called "cheqa".

A group of young men between 15-35 years of age have the responsibility of monitoring the landscape and they also assist the evening meeting of the elders. Wealthy men can affect decisions on the key resources. The elders (council of elders) manage and decide how the water and the use of water points are also retracted during dry seasons. During

the period of water scarcity more wells can be created. This is the time when the pastoralists rely on key resources. They migrate to key resources areas that have been left to rest during the wet season. Some places with key resources are being fenced in order to preserve them from animals (Data from focused group discussion).

The key resources are used during the dry periods and when the rain starts the pastoralists migrate to the peripheral areas with more temporary resources areas so the key resources do not get exhausted. During the wet season, when water and pasture is more abundant, the livestock is moved to other areas in order to allow the water and the pastures of the key resources to regenerate. Some places with key resources are being fenced in order to preserve them for next drought period. Trees are not to be cut because they are important shade zones for animals, awaiting water and prevent evaporation (Data from focused group discussion).

During the rainy season pastoralists rely on temporary water sources accumulated in the area like ponds. And this is a time when water and pasture are become more abundant, thus the livestock is moved from key resources areas in order to allow them to regenerate. Unlike pastoralists of kenya who were highly mobile in the search water since there are almost no permanent water sources in the area pastoralists who live in Bena-Tsemay woreda run partially settled ways of life that means men move with cattle during dry season to permanent rivers while children and wife stay at home managing other activities.

The communication between community members on where to find and how to manage the key resources is based on kinship and social relationships. This implies that cooperation on the key resources is the basis for surviving in the pastoral dry land. By

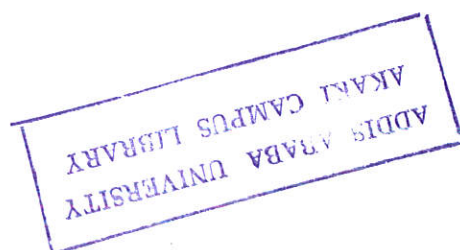
commonly decisions regarding restrictions on and protection of key resources areas secure water and pasture for the dry season. This show that migration this is one of the strategies were pastoralists used to manage their key resources.

### **4.3. Pastoral Women Participation in Domestic WRM in the Study Area**

#### **4.3.1. Water Source in the Study Area**

Based on direct observation conducted within sample kebeles, in the study area there are both temporary and permanent water sources used by pastoralist and agro-pastoralist groups. Major permanent water sources found in the area include: rivers, springs, bore holes, hand and wind pumps. With regard to rivers the woreda has two permanent rivers namely, River Kako and Witho which are the tributaries to Omo Gibe River Basin. Kako River is across the kebeles found in semi-arid parts of the study area. Among these kebeles only one kebele (Yirga) uses this river for crop production purpose in addition to watering livestock and home consumption, while the remaining kebele uses it only for watering livestock and home consumption. This is because their topography is not suitable to use the water for their farms by using surface irrigation and there is lack of irrigation facilities like motor pump. There is also one spring within this semi-arid part of the study area in which the communities use the spring for different purposes. Communities in Yirga kebele are potential beneficiaries of spring and Kako River for domestic, crop production and livestock watering.

The other major water source in the area is Witho River which crosses the arid or pastoralist parts of the area. Enchate and Duma kebeles are kebeles that potentially use this river. Besides the community there are two investors who invested on a total of 6,390ha of land to cultivate cotton by using water from the same river. Similarly, the



canal water established by the investors is also used as an additional water source for the pastoralists to produce cotton, watering livestock, home consumption and crop production.

Besides the permanent water sources there are numerous temporary water sources in the area. These includes Ponds, Scoop Wells, Floods, and Temporary Rivers All of these are used by both pastoralist and agro pastoralist groups mainly during wet season and at the beginning of dry season; because, these sources will became non functional during dry season due to underground water shortage and lack of rainfall in the area.

Searching and following water sources for livestock and home consumption is one of the major occupation for pastoralists and one of the key determinants of pastoral way of life. According to the survey result, all the water sources in the study area are used for both crop production and livestock watering including home consumption. Accordingly, 37.5% and 22.5% of the respondents in the study area said their potable water sources are river, and spring respectively. While 19.5% get from hand and wind pumps. Table 4.3, shown detailed information about potable water sources in the area. Group discussion made with pastoral and agro-pastoral households in Luqa and Yirga kebles confirm that the water source for crop productions, livestock watering and home consumption are the same. This is due to erratic rainfall and critical water shortage problems in the area.

**Table 4.3: Potable Water Sources in the study Area**

<b>Si. No.</b>	<b>Source of potable water</b>	<b>Frequency</b>	<b>Percent</b>
1	River	75	37.5
2	Spring	8	4.0
3	Wind pump	9	4.5
4	Hand pump	18	9.0
5	Bore hole	6	3.0
6	River and spring	45	22.5
7	Wind and hand pump	39	19.5
<b>Total</b>		<b>200</b>	<b>100</b>

**Source: Field Survey, 2012**

As shown in table 4.4, majority of the respondents collect potable water from rivers and springs. And they justify the reason for depending on these water sources as: lack of other choices, distance between the water source and their residences is short and the adequacy of the water in terms of quantity. Accordingly, 75 HHs (43%) and 51HHs (45.5%) of the respondent uses water from the rivers and springs respectively. Out of 75 HHs, 66 HHs use these water sources due to lack of other choices, 5HHs said, due to short distance, 4 HHs use the water its adequacy and none of them stated that they use the water source because of its quality. On the other hand, out of 51 HHs who uses springs, 24 of them justify the distance is relatively short to their home, 4 HH is due to lack of other choice, and only 1 HH said they uses it because of its best quality.

**Table 4.4: Main Source of Potable Water \* Reason for Use from Particular****Source.**

Si. No.	Which is the Main Source of Your Potable Water	Reason for Use From Particular Source				Total
		Short distance	Lack of other choice	Adequate quantity available	Best quality for the purpose	
1	River	5	66	4	0	75
2	Spring	24	18	8	1	51
3	Wind pump	24	4	0	1	29
4	Hand pump	11	3	2	1	17
5	Bore holes	7	0	0	0	7
6	Wind and hand pump	15	0	1	5	21
<b>Total</b>		<b>86</b>	<b>91</b>	<b>15</b>	<b>8</b>	<b>200</b>

**Source: Field Survey, 2012****4.3.2. Water Sources of the Area during Dry and Wet Seasons**

75 % of the respondents said water source of the area is changed with seasonal variability. Accordingly, out of 75% of the respondents 30% of them collect their potable water from scoop well (water extracted from sandy water saturated areas following the course of river beds), 26% from permanent rivers (River Witho and Kako) and the remaining 19% of the respondents collect from spring. On the other hand, the remaining 25% of total researched population answered as there is no change in their water source with seasonal variability. But, within the same source the amount of water decreases with seasonal variability.

In all the pastoral and agro pastoral groups, there was no problem of water in the wet season as they can use water from all sources around their settlements such as permanent and temporary rivers, ponds, hand dug shallow wells, wind pumps, deep boreholes and

surface water available on the range lands. Key informants from woreda water supply experts explain that water source of the communities is highly affected by seasonal variations, especially during the dry season's temporary water sources dry up and the water table from boreholes and wind pumps will also get so low.

Based on seasonal variability of water sources the distance women and children traveled to collect water are also changed. The survey result reveal that 48% of the respondents get water by moving a distance which takes a total of 3 hr on a walk by carrying water at their back. Based on pastoralists assumption this is around 10-20 km away from their residence. These respondents are those who live in remote areas and who have no other water sources in their area, thus they are forced to move to River Kako and River Witho. 36.5% of the respondents travel up to 1hr. on a walk to fetch water. These were pastoral groups who collect water from bore holes, hand and wind pumps near to their homestead that is why the distance become smaller than those who collect from permanent river.

On the other hand 8% of the respondents were getting water by moving a maximum of 2hr to collect water and the remaining 7.5% were getting water by moving more than 4 hr which is estimated to be 20 -30 km to Main River found in the area. Generally, all pastoralists who use permanent rivers as their water sources travel more than 10 km to River Witho and River Kako. This distance woman traveled to collect water decreased during wet seasons as they get water around their residences.

In the study area the frequency of watering of animals is also dependent on season like the case with the Borana, Afar and the Somalia pastoralists in the dry season, those herders, particularly owning cattle, graze their animals for two consecutive days and

move their animals on the third day to the watering points. In the wet season, however, because of the availability of water everywhere animals drink water depending on their need.

**Table4.5: Distance of Water Points from the Residence**

Si. No.	Walking Time for one trip	Frequency	Percent
1	30 min.	73	36.5
2	1 hr.	16	8.0
3	1hr and30 min.	96	48.0
4	2hr.	15	7.5
<b>Total</b>		<b>200</b>	<b>100.0</b>

**Source: Field Survey, 2012**

### 4.3.3. Water Quality and Water Treatment

#### Water Quality

In pastoral and agro-pastoral communities of the study area, water sources for watering their livestock, bathing, and domestic purposes are the same, as a result, their water source is highly contaminated with animal residues, wastes due to bathing and washing their close. Similarly survey result shows that 63% of the respondents mentioned that the water they used has no quality which exposes the HHs in general and women and children in particular to health problems in which the burden is failed on the shoulder of women as they were the primary caretakers, create additional expenses on the family for medication in addition to creating work burden for treating this unsafe water.

#### Water Treatment

Treatment of water improves water quality which will in turn improve human health by reducing the prevalence of water borne related diseases (WHO 2003). However, it was



found that in the studied area not all households treat water before use. This is because lack of awareness about water treatments, lack of treatment methods and critical water shortage that force the communities to use the water they get as it is rather than focusing on their quality. However, some of them are treating the water they use through using different traditional water treatment. Like boiling and treating water by using plant roots found in the area that traditionally the communities use it for treating water. The plant is locally known as “*Quaser*”.

As discussion made with women’s group the procedure to purify water by using the root of this plant is that, first put water in wider container then, bring the root and string the water with it for some times and leave it until the residue will precipitate. After the residue precipitated the next step is filtering the water to other containers. This is pure water prepared for drinking purpose according to their perception. All this is performed by women this clearly show women’s domestic water management mechanisms.

#### **4.3.4. Water Use in the Household**

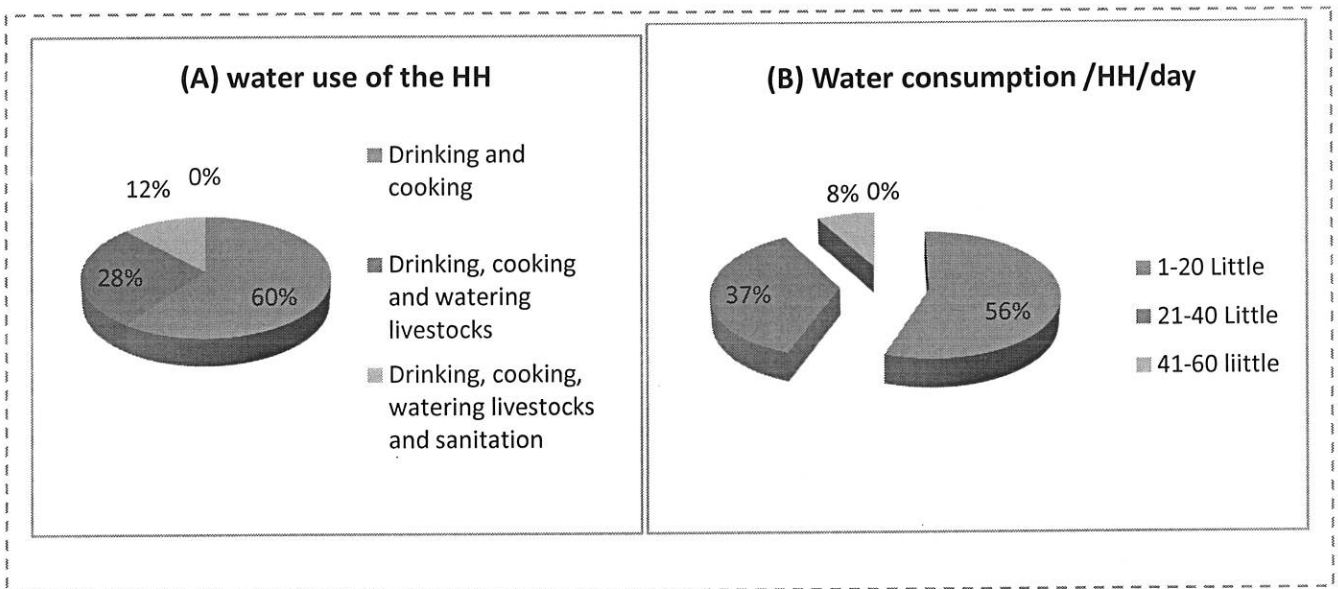
Dry land pastoralists and agro pastoralists are highly dependent on key resources of the area. These key resources are water sources and associated pasture mainly used for dry season for livestock watering at the first level and that of home consumption. Accordingly, the main use of water in the study area is for drinking, cooking and watering livestock with some sanitation purposes.

As shown in figure 4.2 (A), survey result reveal that, 60% of the respondents answered as they use water for drinking and cooking, 28% of them use the water for all livestock

watering, cooking and drinking; while the remaining 12% of them use the water for sanitation purposes in addition to drinking cooking and livestock watering.

The average water use in Bena-Tsemay district is 40 litter/day/households ranging from 20-60 litter /day/households. But only 8% of the respondents use 60 litter of water per day, while the majority uses 20 litter/day/household (See figure 4.2 (B)). However, water use varies per household depend on the household family size and priorities of activities. According to the respondents, it is very difficult to collect more water due to the fact that there is a shortage of water and facilities like wind pump, hand pump, water point and etc...in addition the distance of permanent water sources (river and springs) is too far from the community to be able to fetch enough amount of water.

**Figure 4.2: Water Use and Water Consumption of the HHs**



#### 4.3.5. Domestic Water Resource Management in the Study Area

As discussed in the above (section 4.2) pastoral key resources are managed by social organizations in which different groups of the community have different responsibilities and tasks in deep rooted traditional way. However, some of water points like; hand pumps and wind pumps that are used for domestic purposes have managed through water management committee that are organized by woreda water offices during the establishments of water points and most of them is not well functioning at this time due to several reasons like: most of the member was leave the area, lack of refreshment training, lack of follow up, etc.

On the other hand, as discussed in the above section majority of the respondents collect domestic water from traditional sources (Rivers and Springs) while, 37% of total researched population collect potable water from hand pumps, public taps, water points, bore holes and wind pumps which need maintenance from time to time by using money collected from water users or other sources. However, only 5% of the respondents who collect potable water from these sources pay the required water fee which is 1 birr for 20 little of water. These are those peoples who live near the rural town and collect water from water venders.

**Table 4.6: Domestic Water Management Committee in the Area**

Si. No.	Is There any Domestic Water Management Committee in Your Area?	Frequency	Percent
1	No	134	66
2	Yes	66	34
<b>Total</b>		<b>200</b>	<b>100.0</b>

Source: Field Survey, 2012

#### **4.3.6. Women Participation in Domestic Water Resources Management**

Women not only do most of the work in water collection, but also take most of the management decisions regarding water use at home. They decide which water source to use for various purposes, how much water to use, and how to transport and store. The complexity of water use pattern was illustrated by the investigation carried out in each kebeles of the study area. Focused group discussion with women's decision-making patterns on use of water revealed that water collected from hand and wind pump is used for drinking since it is assumed to be clean and has good taste. Children are not supposed to use this water for any other purpose. Water obtained from river, scoop well, borehole and undeveloped spring is threatened locally by boiling and string with root of trees before using it for drinking purposes.

Untreated water from unsafe water sources is reserved for watering plants and cattle. In such a way women manage the domestic recycling use of water. Women also decide the economic use of water. Domestic water that is collected from developed sources also used for local drink (cheqa) making. However, household survey result in table 4.7 show that, out of 100 samples female respondents only 9 of them were answered as they are participant in domestic water management committee. On the other hand, out of 100 male respondents 44 of them were answered as they are participant in water management committee. This clearly shows that pastoral women participation in domestic water management committee is very low compare to male participants.

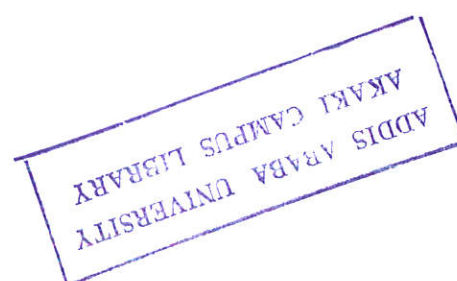
The respondents also put as there is different criteria to be a member of domestic water management committee. These include: Education, influential persons and one who must be elected by the communities, etc. but, pastoral women are disadvantaged in terms of all this issue as previously discussed educational status of pastoral women is low, they have low social status in the communities this is because social status is measured with the total number of livestock owned and women have no right to own livestock. Thus; they are not able to participate in domestic water management committee.

On the other hand interview with key informant from water sector show that, there are seven domestic water management committee members and out of these two of them are women; however, these women are not actively involved especially in relation with decision makings, participation in meetings and community discussion in issues related to water rather they simply involve as member without express their ideas. Water supply expert express women participation in domestic water management committee by saying they are inactive participants. That mean, even when they involved, they have no right to express their idea in any meetings and they have no power to influence decision making process.

**Table 4.7: Sex \* Participation in Domestic WMC Cross Tabulation**

Si No.	Sex	Are you participating in domestic water resources management committee?		Total
		yes	No	
1	Female	9	91	100
2	Male	44	56	100
<b>Total</b>		<b>53</b>	<b>147</b>	<b>200</b>

Source: Field Survey, 2012



#### **4.3.7. Responsibility and Frequency of Collecting Water**

As shown in figure 4.8, pastoral women and children are the main group responsible for searching, collecting and allocating water which is used for home consumption. Although, men sometimes do help their wives when they are sick and or when the nearest water sources in the village is broken down or not functional. However, for widowers and those who separated from their wives/husbands, children bear the greatest burden. Specially, girls have the main responsibility within these type of families to fetch water from nearest water sources while boys have a responsibility to watering livestock's and helping girls in collecting water from rivers during water shortage in the nearest sources.

As shown in table 4.8. 63% of the respondent reported that as women has the responsibility of collecting and allocating water for HH consumption, while who said children accounts for 33.5% and only 3.5% of them said male have the responsibility of collecting and allocating water used for HH consumption. This implies that, within pastoral communities the responsibility of searching and collecting water is failed under the shoulder of women and children. The frequency of collecting water is highly depends on the season due to the fact that water availability in the area varies based on the season. Accordingly, they collect water twice per day during wet season while they collect only one time during dry season. Even during dry season they are not allowed to collect water more than one jericane per day since the water table from hand pump, wind pump and borehole will decrease. On the other hand the communities who collect water from rivers and springs collect water more than two times per day based on their needs.

**Table 4.8: Responsibility of Collecting and Allocating Domestic Water.**

Si. No.	Responsible Person	Frequency	Percentage
1	Men	7	3.5
2	Women	126	63
3	Children	67	33.5
<b>Total</b>		<b>200</b>	<b>100.0</b>

**Source: Field Survey, 2012**



**Figure 4.3 : Women and Children While Fetching Water.**

#### **4.4. Women participation in Irrigation Water Resource Management in the Study Area**

##### **4.4.1. Irrigation Practices of the Respondents**

Communities in the study area run mainly pastoralist and agro pastoralist way of life due to erratic and limited rain fall to engage in shifting cultivation as that of highland areas. However, they produce small amount of sorghum and maize only for home consumption following the rain drops. Some pastoralists live near permanent river are engaged in small scale irrigation by using water from the rivers to produce cereal and vegetable.

As shown in table 4.9, the household survey revealed that, about 111 (68 female and 43 male) which is about 55.5% of the respondents are engaged in irrigated crop production activities. This result shows that women are more involved in crop production activities than that of male. On the other hand, the remaining 89 (32 female and 57 male) which is about 44.5% of the respondents are not involved in crop production activities. This result shows that pastoral women are more involved in crop production practices than that of male. Respondents who are not involved in crop production mention different reasons for not being involved in the irrigation scheme. Out of 44.5% who are not involved in irrigation scheme 63% of them said due to lack of irrigation facilities like water, and water pump, 10.6% said due to lack of awareness, 12.6% lack of human power and the rest said lack of farm lands.

Out of the 55.5% of the household involved in irrigation scheme 58% of them are engaged in cereal productions like; maize and sorghum. 17% of them produce oil crops like sesame which is introduced by Woreda Rural Development and Agricultural Offices, 13.5% pulses mainly soybean and 4.5% of them are engaged in vegetable production. As discussions made with key informants (elders) all cereals (maize and sorghum) are produced in small amounts only for home consumption while the remaining crops (oil crop, pulses and vegetation) produced for income generation purposes. As per discussion the major agricultural tools they are using for plowing their farm land are ox-drawn plow supplemented with using digging tools like iron and wooden hoe.

The elders also explain that some 10-20 years back they used only digging tools since they produced crop by waiting rain drops. Because using this implement will conserve

water lose due to evaporation. Elders also elaborate using only digging tools consume more time and energy thus, now they started plowing by oxen in order to save their time and energy. They also start irrigating their field by using water from permanent sources in the area.

However, there are some communities who still use digging tools like stick diggings mainly communities who live in areas with critical shortage of water and live far from permanent water sources use rain water and flood diversion to their crop fields with major aim of moisture conservation. Different investors were also started producing cotton by using water from Witho River. They also support local communities through providing canal water to irrigate their field, for the home consumption and also for their livestock watering specially during dry season. And this help pastoral woman to save the time spent on walking to Witho Rivers.

**Table 4.9: Sex \* Participation in Irrigated Crop Production Activities. Cross Tabulation**

Si No.	Sex	Are you engage in irrigated crop production?		Total
		yes	No	
1	Female	68	32	100
2	Male	43	57	100
<b>Total</b>		<b>111</b>	<b>89</b>	<b>200</b>

**Source: Field Survey, 2012**



Figure 4.4, Women While Preparing Bed and Sowing Seed

#### **4.4.2. Irrigation Water Resources Management in the Study Area**

There are three major sources of water that are used for irrigation this includes; permanent rivers (Kako and Witho Rivers), springs and flood. Similarly, household survey show that out of the 55.5% of the household involved in irrigated crop production 48.6% use river water, 35.2% use flood water which comes from highland areas by diverting it to their fields and the rest 16.2% of them use spring water. All these households have their own water management systems.

Based on the survey result out of 55.5% households who involve in irrigated crop production, 64% is manage their water sources through establishing water user association, 22.5% through CBO, while 5.5% and 8% of them manage through Kebele administration and woreda rural development and agricultural office. Discussion with committee member confirms that there are different functions that are handled though management committees in order to use the available water resources efficiently. Their main functions include mobilizing the community to prepare and cleaning canals, conflict resolution, managing proper distribution of water for all, etc.

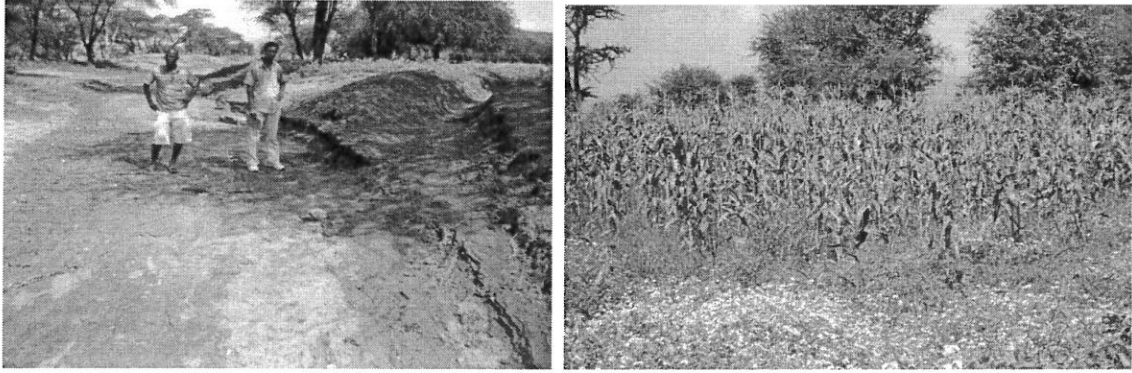


Figure 4.5, One of Flood Diversion and Maize Cultivation Using Flood Water Practiced by pastoralists in luka kebele

#### **4.4.3. Women Participation in Small Scale Irrigation WRM**

As shown in the previous discussion, pastoral women have paramount role in irrigated crop production activities in the study area. They engage in land preparation, planting, weeding and harvesting while male are responsible for herding livestock. Men also help their women while preparing canal for irrigation purposes. Even if much of their energy lost on field activities, their role regarding decision making process and managements aspects are very low or negligible. As shown in table 4.10 household survey result out of 100 participated female headed household in the study only 15 of them were answered as they are participant in irrigation water resource management processes. While that of 52 male out of 100 male headed household are involved in irrigation water management activities. This clearly shows that women participation in irrigation water resource management activities is very low in relation with male headed households.

Key informant interview made with woreda agricultural experts also confirm that, women are highly involved in field activities of crop production than their male counter parts, she said all the responsibilities of crop production including

household chores are failed under the shoulder of pastoral women while male are responsible for managing livestock and engaging in different community management activities and sometimes they help women in preparing canal and land preparation that are used for irrigation purposes.

**Table 4.10: Sex \* Participation in Irrigation WMC Cross Tabulation**

Si No.	Sex	Are you participating in irrigation water resources management?		Total
		yes	No	
1	Female	15	85	100
2	Male	52	48	100
<b>Total</b>		<b>67</b>	<b>133</b>	<b>200</b>

Source: Field Survey, 2012

#### 4.5. Challenges That Hinder Women Participation in WRM

Even if pastoral women spent majority of their time and energy in searching, collecting domestic water to fulfill housed hold water needs and also exert their time and energy in engaging in field activities to secure food needs of the household, their participation in both domestic and irrigation water resource management is very low.

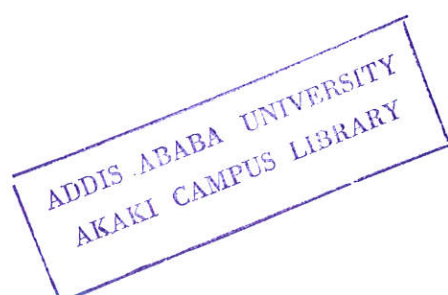
Respondents put different factors for the poor participation of women in water resource managements. As shown in Table 4.11, 43.2% of the respondents mentioned cultural influences like; wrong perception and negative attitudes toward women participation by communities as a major factor that hinder women participation where as 28.8% of them said burden of HH chores which include: all the reproductive activities in the household like searching and fetching of water and fire wood, food preparation, caring elders and children, managing sick and milking cows, in addition to field work and other activities while the rest answered lack of awareness about equal participation of women and men.

Interview with irrigation and water supply experts also agreed with these ideas. They explain that different challenges make pastoral women not actively participate in water resources managements. The first and major one is cultural and traditional beliefs that give lower position to women within pastoral communities. For instance, in Bena Tsemay culture women are not allowed to involve in social issues like meetings and discussions or they are not allowed to rise any idea on meetings or discussions this is because of wrong perception toward women, lack of awareness about equal participation of women and men in water resource managements, lack of confidence by woman itself, male dominance etc.

**Table 4.11: Challenges that Hinder Women Participation in WRM**

<b>Si. No.</b>	<b>Challenges Affecting Women Participation in WMC.</b>	<b>Frequency</b>	<b>Percent</b>
1	Burdon of household chores	38	28.8
2	Cultural influence	57	43.2
3	Lack of awareness	18	13.5
4	Both burden of household chores and cultural influence	19	14.5
<b>Total</b>		<b>200</b>	<b>100.0</b>

**Source: Field Survey, 2012**



## **CHAPTER FIVE: Conclusion and Recommendation**

### **5.1. Conclusion**

Pastoral communities in Bena Tseamy woreda are mainly managed their key resources through social organizations that mean there is a traditional management system rooted in the community to find and decide upon the key resources. Among these social organization water management committee and water user associations are some of social organizations developed by communities and woreda water and agricultural experts to manage domestic and irrigation water resources.

Within this social organization decision making and conflict resolutions, the migration pattern of livestock, and the status of the key resources are being discussed by the elders while young men will monitor the landscape and they also assist the meeting of the elders. On the other hand, pastoral women are involved in both productive and reproductive activities like fetching and securing domestic water needs of the household, they also have substantial role in securing household food needs. However, these entire roles were not given any recognition from the community.

That means women participation in both domestic and irrigation water resource management is very low in relation with male participant or involve as a member without expressing their feelings, ideas and they will not involvement in decision making process. Different socio-cultural factors contribute for the disadvantaged position of women in water resource managements in the study area. These includes; male dominance, lack of awareness about gender equality, wrong perception towards women, cultural and traditionally bounded way of life in pastoral communities, burden of household chores,

lack of confidence due to cultural influence, etc. in addition to these, remoteness of the area, poor infrastructures, lack of facilities, and other challenges de motivate different NGO who work on gender equality, women empowerment, harmful traditional practices, etc not to work within this community. Even governmental offices are not achieving their planned activities due to lack of infrastructures.

## **5.2. Recommendations**

Based on the identified gaps by the study the following practical recommendations are forwarded to assist those responsible bodies to work on pastoral women empowerment and their level of participation in water resources management program in pastoral area

- In the area there are numerous temporary rivers with huge amount of sand. The sand has the capacity to hold and give water to the communities as potable water sources (chirosh) during dry season. Therefore, governmental and nongovernmental bodies who are engaged in water development project in the pastoral area should give emphasis to sand dam construction in collaboration with the local communities.
- Training programs targeting both men and women in general and women in particular are essential in order to help women develop confidence, involve, take the lead and manage water resources in the area, and also to improve the awareness level and change the negative attitudes of men toward women in involving them in water resource managements.

- Culture and traditional beliefs are major factors hindering women from participating in community management roles. Thus governmental and nongovernmental organizations and concerned bodies should perform more to reduce these factors through raising the awareness level of the community about the importance of involving women; they should also perform more on introducing time and energy saving technologies so as to save the time women spent on doing household chores in traditional way.
- It is essential to conduct intensive and extensive community mobilization before project implementation so as to create a sense of awareness, ownership and to respect the traditional skills and knowledge of women to ensure the sustainability of water sources in the area.
- Government should give greater emphasis toward infrastructure development in the area so that nongovernmental organizations and local governmental offices can be motivated to work with local communities.

## Reference

- Abule E 2003 Rangeland evaluation in relation to pastoralist perceptions in the Middle Awash Valley of Ethiopia. A PhD thesis Presented to the University of the Free State, Bloemfontein, South Africa. 297p.
- Agarwal, Anil (1994), Making Water Management Everybody's Business: Water Harvesting and Rural Development in India
- Alemayehu M (1998), The Borana and the 1991-92 droughts: A Rangeland and Livestock Resource Study, Institute for sustainable development, French Catholic committee against hunger and for development. Addis Ababa, Ethiopia.
- Alemayehu M and Tezera G (2002), Socio-economic of pastoral Community in Bena-Tsemay and Hamer Woredas of South Omo Zone, Southern Nations and Nationalities peoples Regional State. Addis Abeba, Ethiopia.
- Alemu kebede (2006), the role of gender in the provision of rural water supply and sanitation services the case of achefer and yilmana densa communities of amhara region
- Baden, Sally. (1998). Practical Strategies for Involving Women as well as Men in Water Supply and Sanitation Activities, Report prepared for gender office (Sida).No.11.

- Biseswar, Indra (2005). Gender Basics. a hand out given in the Course of Gender Issues in Ethiopia, Institute of Gender Studies, Addis Ababa University. August 2005.
- Bourne, Peter. (1984), Water and Sanitation Economic and Sociological Perspectives. Academic Press Inc. Orlando, Florida.
- Chancellor, F., Hasnip, N., and O'Neill, D. (1999) Gender-sensitive Irrigation Design, Part 1, OD 143, HR Wallingford, Ltd, OX10 8BA, UK (Study 3)
- Central Statistical Authority (2007), Population and Housing Census. Federal Democratic Republic of Ethiopia, Addis Ababa.
- Degefa Tolossa, D. (2005): Rural livelihoods, Poverty and Food Insecurity in Ethiopia. A Case Study at Erenssa and Garbi Communities in Oromiya Zone, Amhara National Regional State. Department of Geography, Faculty of Social Sciences and Technology Management Norwegian University of Science and Technology, NTNU, Trondheim.
- Fernando Vijita (1996), Energy, and Environment Technology Source books: Water Supply, International Technology Publications Ltd, in association with the UNIFEM and IRC, London.
- Green Cathy (1994), Water Resources Management: A Macro Level Analysis from a Gender Perspective
- Harvey, Peter and Reed Bob. (2004). Rural Water Supply in Africa: Building Blocks for Hand pump Sustainability. WEDC, Loughborug University, UK.
- Hide, J., Kamani, J. (2000) Informal Irrigation in the Periurban Zone of Nairobi, Kenya; OD/TN 98, HR Wallingford, OX10 8BA, UK. (Study 1)

- Hirut Yibabe. (2001) "Gender Relation and the Status of Women in Hamer Tsemay-Benna Pastoral Communities of South Omo", pp. 158-65. In Pastoralism in South Omo: Towards an Integrated Development. Proceedings of the Workshop held in Jinka (South Omo), October 11-15 2001. Addis Ababa: EPaRDA.
- IRC (2005): "From system to service: scaling up community management" Report of the conference, 12 - 13 December 2001, The Hague, The Netherlands, Report, Unpublished document, IRC International Water and Sanitation Centre, Delft, The Netherlands.
- MoFED (2008): Ethiopian progress towards achieving the millennium development goal, 2008.
- Narayan, D., The Contribution of People's Participation: Evidence from 121 Rural Water Supply Projects, The World Bank, Washington, D.C., 1995.
- NEK- Internal Consultancy. (2000). "A Review and Assessment of the Status of Women in Rural Water Development Project." Addis Ababa, Ethiopia.
- Ndikumana J, Stuth J W, Kamadi R, Kamadi S, Ossiya R, Marambii and Hamlett P 2000: Coping mechanisms and their efficacy in disaster-prone pastoral systems of the greater horn of Africa: effects of the 1995-97 droughts and the 1997-98 El-nino and the responses of pastoralists and livestock. 106p.
- Robson, C., 1993. Real world research: a resource for social scientists and practitioner researcher.

Rogers, Barbara. (1998). *The Domestication of Women: Discrimination in Developing Societies*. London: Kogan

Schouten, Ton and Moriarty Patrick. (2003). *Community Water, Community Management from System to Service in Rural Areas*. Published by ITDG, UK.

Tefra Admasu, Ebro Abule\* and Zewedu Tessema (2007), *Livestock-rangeland management practices and community perceptions towards rangeland degradation in South Omo zone of Southern Ethiopia*

UNDP, (2008): *Economics in sustainable water management, training manual and facilitator guide*.

UN, (2006): *United Nations Millennium Development Goals Report*. New York, USA.

WSAH (2005): "Financing water, sanitation and hygiene in Ethiopia: Making every drop count *Water, Sanitation and Hygiene for all*" (WSAH), Tearfund 2005

Water Partner International (2006): "Water facts",

<http://www.water.org/crisis/waterfacts.htm>

Water for life, (2005-2015). *A policy brief on Gender Water and Sanitation*.

WHO (2005): *Health in Water Resources Development*"; 2005; World Health Organization Fact Sheet

[http://www.who.int/docstore/water\\_sanitation\\_health.htm](http://www.who.int/docstore/water_sanitation_health.htm)

- Wijk- Sijbesma, Christine Van. (1998). Gender in Water Resources Management, Water Supply and Sanitation. International Water and Sanitation Center. The Hague, the Netherlands.
- Woreda Rural Development and Agriculture Office (2011/12). Socioeconomic Profile of Bena Tsemay Woreda: Office Record. Bena Tsemay woreda.
- World Bank (1996). Toolkit on Gender in Agriculture, Washington DC: World Bank Gender Analysis, Poverty and Social Policy Department ([www.worldbank.org](http://www.worldbank.org)).
- Woldie Asfaw (2007). Seasonal Migration and Rural Livelihoods: The Case of Bahir Dar Town and Three Rural Kebeles in Amhara Region, Addis Ababa University, School of Graduate Studies.
- World Bank, (2006). Reengaging in Agricultural Water Management: Challenges and Options, Series Directions in Development. Washington, DC: World Bank
- Young, Kate (1993). Planning Development with Women: Making a World Difference. Published in the USA
- Zwarteveen, M.Z. 1994. Gender issues, water issues: a gender perspective to irrigation management, International Irrigation Management Institute, Colombo, Sri Lanka, Working Paper 32.

**Appendix 1: Questionnaire for the respondents**  
**Addis Ababa University**

**College Development Studies**

**Department Of Environment and Development**

**Pastoral Women participation in Water Resource Management: Evidence from  
South Omo Zone, Ethiopia”**

**INSTRUCTION FOR RESPONDENTS**

**Dear Sir/Madam**

I am undertaking a research entitled by pastoral women participation in Water resource management: evidence Bena Tseamy Woreda South Omo Zone, Ethiopia. Knowing the contribution of pastoral women in water resource management in reference with male counterparts at grass root level and identifying the challenges that hinder women participation will have a paramount importance for the development, for the clients, for the government, NGO's, and others. More over the result of this study will be used as additional reference for those who want to conduct detailed research and who want to implement gender sensitive water related project in the area.

Your honest and genuine answers to the provided questions will help us for better understanding of the problem. The quality of the result of this research is based on the accuracy of the information you provided. Eventually, I promise you, the information you will provide is going to be reported and communicated in aggregate and utmost care will be taken for its confidentiality.

## INSTRUCTION FOR ENUMERATORS

1. Make brief introduction for each respondent before starting to ask question
2. Please ask each question clearly and patiently until the respondent understand and get your question
3. Fill the interview schedule according to the answer they provided only don't put your own.

- Name of enumerator \_\_\_\_\_ Sign. \_\_\_\_\_
- Serial Number \_\_\_\_\_ Zone \_\_\_\_\_
- Woreda \_\_\_\_\_ Kebele. \_\_\_\_\_
- Date \_\_\_\_\_

### **PART I: Demographic and Socio-Economic Information of the Respondents**

#### 1.1. Sex,

1=Female                      2=Male

#### 1.2. Age,

1= 15-24,                      2= 25-34,                      3=35-50,                      4=above 50

#### 1.3. Type of household head,

1= Female-Headed                      2 = Male-Headed

#### 1.4. Education level,

1 = Illiterate                      2 = read and write                      3 = grade 1-8,  
4 = grade 9-12,                      5 = grade 12 and above

1.5. Marital status

1 = Married    2 = Divorced/ Separated    3= Widowed    4=Others

1.6. If married

1=Monogamy                  2=Polygamy

1.7. Do you have children?

1= Yes,                          2= No

1.8. If yes, specify the number of children you have?

1= One Male and One Female                  2=Two Male and Two Female

3=Two Female and three Male                  4=other

1.9. How many members are there in your household?

1= Two                  2= Three                  3= Four                  5= other

1.10. Do you send all your children to school?

1=Yes,                          2= No

1.11. If yes, which school do you send them?

1= Formal                          2=Non formal

1.12. If no, who is left from school

1=Girl, Why?\_\_\_\_\_

2= Boy, Why?\_\_\_\_\_

1.13. What is your major means of earning livelihood?

1= Crop production

2=Cattle rearing

3= Trading

4= Crop production and cattle rearing

5 =Hand craft

6=other please specify-----

1.14. What are your main sources of income?

1= Sale of crop

2=Sale of livestock products and by products

4= other please specify-----

**PART II: Water Source, Use and Management for Domestic Purpose in the Area.**

2.1. What are the water sources in your locality?

1=River

2= spring unprotected

3= Spring Protected

4=Hand dug well

5= Hand pump

6= Other

2.2. Which is the main source of your potable water

1=Developed spring

2=Hand pump

3= Public Tap

4= undeveloped spring

5=River,

6= Other please specify-----

2.3. Reason for use from particular source:

1= Short distance,

2= No payment, thus I save money

3= Because of the source is reliable

4= Best quality for the purpose

5= Adequate quantity available

2.4. Is your water source is changed with the seasons?

1= Yes

2= No.

2.5. If yes, where do you go to collect water used in your household?

A) During dry season,

B) during wet season,

1= -----

1= -----

2= -----

2= -----

3= -----

3= -----

2.6. How far is the water source from your residence?

1= 30 minute walks

2= 1hr and30 minute walk

3= 2hr walks

4=other please specify-----

2.7. Do you need new water source?

1. Yes

2. No

2.8. Who is responsible for collecting and allocating use of water in your household?

1= Husband

2= Wife

3= Children

2.9. Do you pay for the water you collect?

1= Yes

2=No

If yes please specify how much birr/lit. ....

2.10. Do you have to take a lot of time queuing to collect water?

1= Yes

2= No

If yes, please specify how much time .....

2.11. How do you see about the water quality from your source? -----

2.12. Does the quality of the water from the source affect the use of water in your household?

a) Yes

b) No

c) If yes, please specify how .....

2.13. Do you use any particular treatment for your drinking water?

1= Yes

2= No

If yes how? -----

2.14. For what purpose do you allocate water from your home source?

1=Drinking

2= Cooking

3= washing)

4. Bathing



5. Not interested

6. Other, specify\_\_\_\_\_

3.9. Have you been given special encouragement to participate in water related issues?

1. Yes

2.No

3.10. If your answer for Q3.9. is yes, please explain. \_\_\_\_\_

---

### **PART IV: Water Use for Crop production**

4.1. Do you have farm plots?

1=yes,

0= No

4.2. If yes, what are the major crops grown on your farm?

1----- 2-----

3----- 4-----

4.3. What are the implements used for agricultural tasks?

1= Digging sticks    2=Wooden hoe

3=Iron hoe          4=Ox drawn ploughs

5=other specify-----

4.4. What are the reasons behind using these implements?

1----- 2-----

2----- 4-----

4.5. Do you use any irrigation?

1= Yes,

2= No

4.6. If your answer for Q 4.5. is No, what reason would you attach for not using

irrigation system?

1= lack of irrigation system

2= lack of irrigation facility

3=Lack of human labor

4=other please specify-----

4.7.If yes, for Q 4.5. Name the source of water for irrigation system.

1= pond,

2= spring,

3= river,

4= fold,

5=other

4.8.If your answer is yes for Q 4.5. How is the water sources managed?

1= Through Water committee

2= through community based organization

3= Kebele administration

4= Woreda agricultural office

5= other please specify-----

4.9. If your answer for Q 4.8 is through water committee, what are the functions of management committee?

1, -----

2, -----

3, -----

4.10. Are women involved in the irrigation water management committee?

1= Yes

2= No

4.11. If yes what roles do they play in managing irrigation water resource?

1, -----

2, -----

3, -----

4.12. If no, what reason would you attached for not involving in the management committee? 1, -----

2, -----

3, -----

4.13. Are women involved in irrigated crop production?

1= Yes

2= No.

4.14. If your answer for Q4.13 is yes, list the major crop produce?

1-----

2-----

3-----

4-----

4.15. If your answer for Q 5.13 is no, what are factor that hinder their participation?

1= Lack of land plot

2= lack of irrigation facility

3= have no water access for irrigation equal to man

4=Lack of human labor

5= culture reason

6=other please specify

### **PART V: Water Uses For Livestock Production**

5.1. Do you have livestock?

1=yes,

2= No

5.2. If yes, write the number of livestock you have

1. Oxen/Bulls =-----

2. Cows=-----

3. Calves=-----

4. Heifers-----

5. Goats-----

6. Chicken -----

7. Horse-----

8. Donkey-----

9. Camel-----

10. Sheep -----

5.3. What is the source of water for your livestock?

1= Rive

2= Developed spring

3=Public Tap

4=undeveloped spring

5= other please specify-----

5.4. How far is the water source used for livestock from your residence?

1.  $\leq$  30 minute walks

2. = 30 minute-2hrs walk

3.  $\geq$  2hr walks

5.5. Who is responsible for watering livestock in your household?

1= Husband

2= Wife

3=Daughter

4= Son

5.6. What is the frequency of watering live stock per day?

1. Once a day

2. Two times a day

3. Other specify-----

5.7. Any additional idea?-----

-----  
-----

***Thank you for your ideas and time!***

## **Appendix 2: Chalkiest for Key Informant Interview for Government Officials**

### **Section 1: Respondents Identification**

Institution.....

Name of respondent.....

Sex.....

Date of interview.....

### **Section 2: Water Resources and the Area**

2.1. How do you describe the area in terms water availability and supply?

Probe: there is - Enough water

- Water shortage

2.2. Do seasonal variations affect water availability in the area?

Probe: -During dry season

-Wet season

2.3. Which groups and /or gender are affected the most?

Probe: -Elders/gangsters/children's male or women

- Why and how

2.4. What do you do to help the water users cope up with the challenge?

Probe: develop more water source

### **Section 3: Water use and techniques**

3.1. What is the water used for in the area?

Probe: - Domestic e.g.

- Commercial e.g.

- Others please specify

3.2. How do you explain water availability to meet the demand?

3.3. What water facilities are used by the households or communities in the area?

3.4. How do you explain water coverage in terms of facilities?

3.5. Approximately how many households share the same water supply facility?

Please give number?

3.6. Who is responsible for the construction of the water supply and irrigation facilities?

Probe: government, communities, etc

3.7. What type of facilities do you advocate to be developed and why?

### **Section 4: Management and Maintenance**

4.1. How is the water source managed? (Both for irrigation and water supply)\_\_\_\_\_

Probe: -WC            - Kebele Administration            - CBO

4.2. What are the main functions of the management committee?

4.3. Are women involved in the management committee and other water related issues?

Probe: If no what are the reason? \_\_\_\_\_

If yes what roles do women play in the management and maintenance of the source?

4.5. Is there any difference in terms of improvements recognized by involving women in the management and maintenance of the source?

4.6. How do their husbands feel about having women in the maintenance of the water source?

1.15 How do you address the maintenance costs?

1.16 Are there any challenges you have faced with the maintenance of the water source?

Probe: Frequency

Problems

1.17 In your opinion what problems affecting in order to improved in the management of the water source?

*Thank you so much for your time and ideas.*

### **Appendix 3: Check List for Focus Group Discussion**

1. What are your water source for domestic use, livestock and crop production?
2. Is the water available enough to meet the demand?
3. How is the water source managed?
4. Is there any management committee?
5. If yes, what are the main functions of the management committee?
6. Are women involved in the water related issues?(participation)

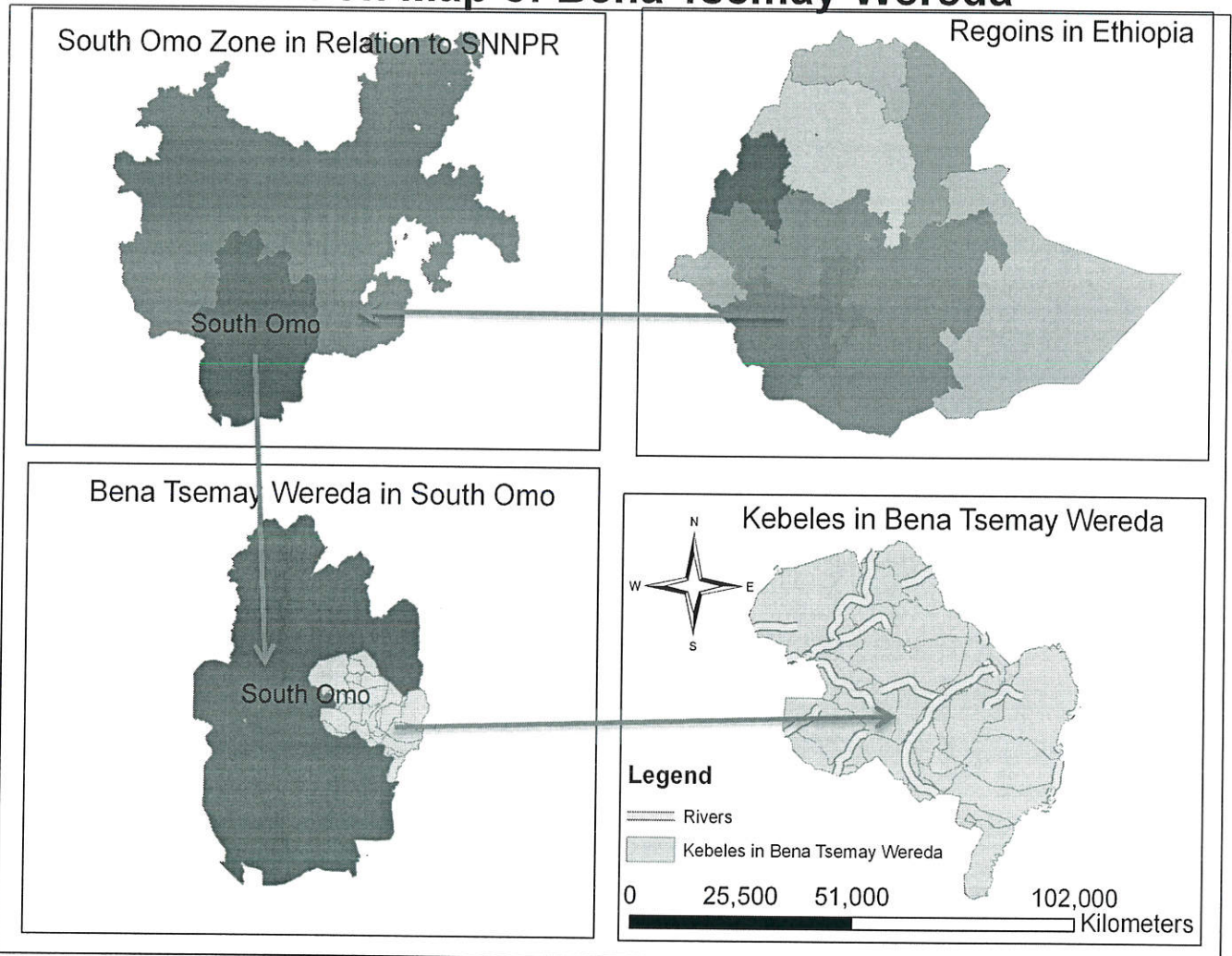
Probe: Workshop, Training, Mgt committee, etc...

7. What roles do women play in the water related issues and maintenance of the source?
8. What are the major challenges for low participation of women in water resource management?
9. How do you think women participation being improved?

## Appendix 4: Location Map of the Study Area

Figure 4.6: Location Map of the Study Area

### Location Map of Bena Tsemay Wereda



Source: (Ethio-GIS and CSA data 2011)

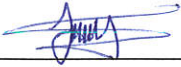


## DECLARATION

I declare that this thesis is my original work and 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:

Shewadinber Mekonin




---

Candidate

June 1, 2012

Confirmed by:

Dr. Feyera Senbeta



Advisor

June 1, 2012