ADDIS ABABA UIVERSITY SCHOOL OF GRADUATE STUDIES

Community Based Local Economic Development: The Case of Awra Small Scale Irrigation Project, Awra Woreda Afar National Regional State

Institute Of Regional and Local Development Studies (RLDS)

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Addis Ababa

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Community-Based Local Economic Development: The Case of Awra Small-Scale Irrigation Project Awra Woreda, Afar National Regional State

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

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ACRONOMY

FAO	Food and Agriculture Organization of the united Nation
CoSAERAR	Commission for Sustainable Agriculture and Environmental Rehabilitation in Amhara Region
DA	Development Agent
NERDU	Northeast Range Land Development Unit
NGO	Non- Governmental Organizations
LDC	Less Developing Countries
MWR	Ministry of Water Resource Development
SSI	Small-Scale Irrigation
WPARDO	Woreda Pastoralist Agriculture and Rural Development Office

ABSTRACT

The research attempts to deal with problems associated with institutional arrangements and capacities at different administrative hierarchy and sector development bureaus in Zone 4 Awra Woreda in Afar National Regional State, in initiation, planning, design, construction, operation and maintenance of community based small-scale irrigation project.

This study aimed at investigating the nature, mechanism and prospects of community based local economic development with a focus on small-scale irrigation project in selected case study area in pastoral Afar. The specific objectives of the study were: To identify and explain the role of the different actors in small-sale irrigation project, to determine what supporting services arrangement were put in place to help the pastoralist engage in irrigated farming activities ,to determine how clan based land tenure and resources use systems do affect irrigation farming practices and scheme development and to asses the contribution of the irrigation scheme to improving the food security of the households in the study area.

The study pursued qualitative and quantitative approach to achieve the study's objectives. Different but complementary data collection techniques such as document review, group discussions key informants interview and sample survey were used for data collection. The Data were analyzed using SPSS by entering pre- and post-coded data from the household survey questionnaires. These data were analyzed using tabulation and cross-tabulation with frequency and percentage value.

The study reveals that encouraging efforts were being made by the NGO and government at regional and Woreda level to enhance participatory approach in the course of the development of the study scheme. Nevertheless, the participatory approach pursued was not based on institutional framework for the initiation, planning, implementation and operation and management activities of small-scale irrigation activities. The study reveals that the local communities were not adequately involved in decision making at the different stage of the project management cycles. The prevailing clan based land tenure and resources use systems may negatively affected the irrigation activities and become threat for continuity of irrigation farming activities unless corrective measures are taken with the active participation of members of the different sub clans in the study area. Despite the minimal involvement of the local community, it is revealed that the project has contributed for improving the food security of the irrigators.

CHAPTER ONE
INTRODUCTION

1.1. Background

The pastoral areas of Ethiopia are supporting to a very great extent pastoralists who comprise around 12% of the national population. They inhabit the low-lying area generally below 1500m elevation (Ali, 1992), which often correspond to the range land receiving an average rainfall below 700mm. The areas they utilize constitute 61% of the total land mass (UNDP/RRC, 1983 cited in Ali, 1992; Mohamed, 2004).

The pastoral nomadic sector raises a relatively large partition of the national herd. It account for about 42% of the total livestock population of the country. It is estimated that 27 million cattle, 24 million sheep, 18 million goats and 1 million camels are found in pastoral areas (Hogg, 1997; Solomon, 1999).

Livestock and livestock products are the main pillar of the livelihood of the pastoralists. Pastoralists also derive their livelihood from crop production mainly of cereals using rainfall and traditional irrigation agriculture (Assefa, 1995; Mohamed, 2004). However, erratic rainfall condition, recurrent drought and famine coupled with inappropriate development policies have negatively impacted the livelihood security and local development of the pastoral areas of Ethiopia. Recurrent drought is a major concern in pastoral areas. It reduces forage supply and causes herd mortality and result in food insecurity and poverty. Study by (Mohamed, 2001) discloses that average livestock holding per household decreased by 37% in the pastoral areas of *Borna* mainly due to drought. It is known that the environmental factor, that is, the nature of rainfall plays a major role in determining the economic base and food security of the pastoral societies, and level of agricultural production, and hence the level of the agricultural GDP of the country(Dejene and Yilma, 2000.). Appropriate intervention, therefore, is essential by

introducing water harvesting mechanism and efficient irrigation system to be used in dry months in pastoral areas of the country. In line with this, the current government of Ethiopian has been attempting to promote development in the pastoral areas. It appreciates the pastoral mode of production and incorporates the needs of holistic approach to the development of the pastoral area, and recommends sustainable settlement using irrigation (SDPRP, 2002).

The central government has supported the development of irrigation schemes that have potential to irrigate 2000 hectare in *Gode* area of Somali region and another scheme that would irrigate 27,000 hectare was under construction in west *Gode* of the same region (Mohamed 2004). It also returned about 15,000 hectare of land to the Afar pastoralists in 1991, and proposed to sedentarize the Afar pastoralists using irrigation development (Muhammad, 2004; Yohanes, 2004). Nevertheless, according to Mohamed (2004), the irrigation schemes have not revealed satisfactory results and Ethiopian pastoralists have not been fully integrated into irrigated farming.

It is known that micro earthen dam and small scale river diversion irrigation projects constitute an important component of local economic development mediated through community based or participatory development approach. The Afar National Regional state has been developing a number of small-scale irrigation schemes with the view of improving the livelihood of the pastoralist and gradually brings voluntary settlement production around irrigation scheme since 2001. In this regard, the state government rehabilitated pump irrigation systems, which was used for seed multiplication site for *Tendaho* state farm in 1980s and 1990s, and handed it over to 100 pastoral irrigators organized into water users association to irrigate 37 hectare. It had also carried out *Henele* small-scale irrigation project and *Alelesubula* small-scale irrigation project in *Dalifagi and EWA woreda* respectively. The *Helene* small-scale irrigation project has the potential of irrigating 100 hectare while the *Ewa* has 160 hectare. The two schemes were expected to benefits a total of 820 household heads (SSD, 2006). The state has also

planned to construct a total of 6 small scale irrigation schemes in 2007-2016 that could irrigate 897 hectare of land (MoWR, 2002).

Nevertheless, more often, emphasis is given on technical aspects of the irrigation schemes such as design and construction of dam, canal, spillways and etc. and less emphasis on institutional aspects such as land tenure, market, pastoral resource use and management system as well as local participation at all stages of the irrigation project management cycle.

The state government often collaborates with NGOs (local and international) to mobilize resource and implement development projects in the region. There are about 18 NGOs in A far region. They engaged in different development activities such as relief and rehabilitation, irrigation development, animal heath provision, education and water supply. Of the total NGOs in the region, about 11 percent are involved in the provision of water and irrigation-based development. Some of the NGOs, like Support for Sustainable Development (SSD) and The Lutheran World Federation Ethiopia, have been trying to make a difference in their target areas through the promotion of integrated community development activities based on community based irrigation projects. This will need effective partnership between the community, the NGOS and the government in order that their efforts yield tangible results and sustains the benefits obtained from the development intervention in their target areas.

1.2 Problem statement

It is a bare fact that agriculture is the mainstay of Ethiopian economy. The sector has been experiencing chronic crises since the late 1960s'. Increase in population, variability of rainfall and absence of appropriate institutional arrangement; locally relevant tenure system, empowerment, coordination and control failure, contributed to sustained food shortage in the country. A lot remains to be done to mitigate household vulnerabilities to the vagaries of nature. So, what interventions should be done to change the situations

particularly over the more mobile and less controllable pastoral communities of Ethiopia were frequently asked question. In line with this, intervention through irrigation projects has been taken as one option by different actors; central and local governments, civil society organization and NGOs since the imperial period.

Irrigation-based development interventions in pastoral areas by the previous two governments and the current ones of Ethiopia, however, have many problems. These can partly be explained by lack of appropriate institutional arrangement to coordinate, control and intervene locally acceptable irrigation based local development projects. Curbing these problems, in the context of decentralized governance and globalization, requires, the arrangement of appropriate institutions that help forge genuine partnership among different stakeholders to initiate, plan, design and implement locally acceptable and sustainable development projects/ programs. Cognizant of this, the Afar National Regional State has been implementing small-scale irrigation in partnership with NGOs, pastoral communities and other development actors to promote community development and settler farming. Small-scale river diversion irrigation project in *Awra woreda* in *Afar* National Regional State, which was implemented by Support for Sustainable Development (National NGO) in partnership with the regional state and *Awra wored government,* is the subject of this research. Thus, this research attempts to deal with problems associated with institutional arrangements and capacities at different administrative hierarchy and sector development bureaus in Zone 4 *Awra Woreda* in *Afar* National Regional State, in the initiation, planning, design, constructing, operation and maintenance of community based small-scale irrigation project. The challenges and opportunities experienced in working with multiple local development actors are the issues that the research raises while dealing with community-based local economic development project, small-scale irrigation project in the study area. The study will also examine the contribution of small-scale irrigation project to improve food security at household levels.

The study addresses the problem stated by trying to answer the following research questions:

1. What are the roles of each of the actors involved in the project and how are their plans and action coordinated?
2. How are the planning, construction, operation and maintenance activities of the project coordinated among different actors?
3. How are the irrigation schemes affected by the herds and the clan based land tenure system
4. What institutional arrangement is in place to enhance ownership of the schemes by the community and sustain the operation of the scheme

1.3 Research objectives

The purpose of this research is to investigate the nature, mechanism and prospects of community based local economic development with a focus on small-scale irrigation project in selected case study area in pastoral Afar. The specific objectives of the study are:

1. To identify and explain the role of the different actors in small-sale irrigation project activities in the study area
2. To determine institutional/organizational arrangements put in place to foster small-scale irrigation farming practice in the study area
3. To describe how clan based land tenure system affects small-scale irrigation scheme in the study area
4. To asses the contribution of the project to the food security of the households in the study area

1.4. Justification for the study

Pastoralists in east Africa have undergone continual change in their political, social and economic activities since the colonial period. These changes have been detrimental to sustain the pastoral mode of production, enhance their livelihood security and bring local economic development. The variability of rainfall coupled with the centrist approach for development is the major reasons for the vulnerability of the pastoral communities to drought and a threat for their livelihood security. The pastoral communities of Ethiopia in general and the Afar in particular had been victims of centrally prescribed development policies and intervention since the imperial period up to 1991(Ayalew, 2001;Getachew, 2001).

Over recent years, following the devastating drought of the 1970s' and 1980s', the outlook on pastoral areas development has changed. Because, the occurrence of these droughts revealed, in dramatic and unprecedented ways, how vulnerable the pastoral communities across dry-lands of Africa had become (Helland, 2001). The main purpose of this change is to restore the capacity of the pastoral societies to feed themselves (Muhereza, 1995; Helland, 2001). Development projects have become much more concerned with issues like local food security and local self-reliance rather than addressing and manipulating the factors of production in the pastoral enterprise. Great emphasis is attached to fostering popular participation and strengthening local institutions. Local communities are to an increasing extent expected to be responsible for their own welfare.

The current government of Ethiopia has given due consideration for the pastoral areas development in the country. It has designed pastoral areas policies and development strategies. It established the pastoralist affairs standing parliamentary committee that could influence the policies for the pastoral area development. According to SDPRP (2002), the government emphasizes the importance of pursuing holistic approach for achieving sustainable development in the pastoral areas in the countries. This document

requires that all development actors work hand-in-hand with all sphere of development. Small-scale irrigation project will provide to see how actors work in partnership in line with SDPRP (2002) as well as the challenge pertaining to community based development. The research attempts to generate useful information on local level opportunity and challenge encountered by the development actors in addressing the problem of poverty through small-scale irrigation project. The information generated by this study can be used for formulating long-run policy strategy paper to the extent that institutional arrangement of small scale irrigation projects in pastoral areas are concerned.

1.5 Research methods

1.5.1 Method of data collection

Both primary and secondary data types were gathered and used for this study. The primary data used for the study are the responses to structured questionnaires/interview by the sampled respondents, data generated through group discussions, key informants' interviews and data obtained from documents related to the study scheme. The secondary data types included information from formal sources. Documents from formal organization like *Woreda* Pastoralist, Agriculture and Rural development Office, Support for Sustainable Development Project Management Offices and *Kebele* administrations in the study area were assessed for the general and background information for the study area. Different literatures; published studies, unpublished thesis and dissertation dealing with pastoral area development, irrigation, agricultural extensions, land tenure issues, water rights, local economic development etc. relevant to the study theme were gathered from Addis Ababa University's libraries, Forum for Social Studies, World Bank library and other sources.

The research used different but complementary research techniques to collect the required data from the different sources. The techniques were group discussions,

interview with key informants, household survey, personal observation and document investigation.

Group Discussions

The researcher conducted two group discussions with members of the community in the four *kebeles* covered by the study. The discussion groups were irrigator and non-irrigator households. Each group comprised 24 members (i.e. six household per *kebeles* for each group were included in the discussion groups).Two of the members in the irrigator discussion group were female household heads that came from *Hida kebele* as the other *kebeles* did not have women irrigators. All of the members in the non-irrigator discussion group were male household head.

Besides, other similar group discussions were conducted at different level. The first discussion was conducted with groups comprised 12 members. The members of the group came from each *kebele* (i.e. each *kebele* were represented by its sub clan leader and two elders). The elders were identified based on their knowledgeable about local resources use arrangements before and after the introduction of the study scheme in the area and their involvement in the different stage of the project cycle of the study scheme.

The second focus group discussion was conducted with members of the *kebele* administrative body. Three members from each *kebele* administrative body who are chairman, peace and stability head and secretary were identified and included in the discussion group.

The third group discussions were made with members from *Woreda* Pastoralist Agriculture and Rural Development Office and *Woreda* Administration Council. Six members from WPARDO and three members from the *Woreda* Administration Council were represented in the discussion group. The *woreda* administrator, head of social affairs of the *Woreda* and one Cadre had represented the *woreda* council in the discussion group while head of WPARDO, the natural resource conservation section head,

cooperative section head, plant science expert, animal science expert and general agriculturalist were members of the discussion group that represented the WPARDO. The fourth focus group discussion was made with staff of the project implementing NGO at the study area.

Key informant interviews

These interviews were conducted with professional from the project implementing NGO (included Irrigation Agronomist, extension worker, soil and water conservation engineer and construction engineer) as well as one senior management member of the organization). In addition, the *DA at Hida kebele*, two sub clan leader, two elders, and one woman irrigator were contacted for the interview. WPARDO head and staff members (one general agriculturalist and one natural conservation expert) were used as key informants from the WPARDO.

Observation

The researcher observed the irrigation activities, the physical structure of the scheme (to see whether there was broken structure , ask why they were broken and had not yet been maintained), the interaction of irrigators with the DA, the project staff, the cultivated and uncultivated land etc. during the field work for the study. The observation was guided by carefully prepared observation indicators. All observations (objects and processes) were consistently recorded and incorporated in the research results.

1.5.2. Household survey

The sample household survey was included in the research method of this study to collect information that reveals households' irrigation activities performance, differences in food security situation of between irrigator and non-irrigator households, feelings of the population to the land allocation and distribution etc. variables prepared based on the research question and objectives. The subsequent subsection discusses the sample design, sampling method and procedures used to undertake the household survey for this study.

1.5.2.1. Sample design and sampling

The survey covered the population in the four rural *kebeles* in *Awra woreda* of Afar National regional state. The total population of the survey was 1,420 household head (irrigators and non-irrigators household heads). The population covered by the survey is shown in table 1.

Table 1. Household size distribution by *kebele*.

Description	*Kebele*				
	Hida	Lekuma	Leykora	Aliberi Mesgid	Total
Households N0.	405	275	284	456	1,420

Sources: Records of each *kebeles* administrations

The research used purposive, stratified, probability proportional to size followed by simple random sampling design to select the household heads for the study. Purposive sampling was used to select the rural *kebeles* that would be covered by the study. The *kebeles* were selected based on the information that they are direct beneficiaries of the scheme for the study. Having done this, the lists of the total population (the household heads) of the survey were stratified into irrigator and non-irrigator household heads based on the information obtained from the project implementing NGO and the *kebele* administration. Accordingly, 496 and 924 household heads were listed in the irrigator and non-irrigator stratum respectively. For each stratum, the household heads to be included in the sample were determined based on the intention of the research to have a stratified sample of n=142 from the total population of (N=1420). Furthermore, it was assumed to allocate the sample proportionally across strata so that the sampling fraction (the fraction of units selected into the sample (of size n) from among all the N elements in the frame population) of 0.1 was used in each stratum. Based on this, 50 and 92 household heads were determined to be the sample size for irrigator and non-irrigator stratum respectively. Simple random sampling using lottery method was applied to draw the samples from

each stratum independently. Table 2 shows the results of sample design and sampling pursued for the study.

Table 2. Proportionate stratified random sample results from household heads population stratified into two strata

Stratum	Households in the frame	Proportion of population	Stratum sample size	Stratum sampling fraction
Irrigators	496	0.349	50	0.1
Non-irrigator	924	0.651	92	0.1
Total	1,420	1.000	142	0.1

Source; Kebele administration and researcher's calculation

The procedures pursued to determine the sample size for each stratum are summarized below:

- Obtaining lists of the survey population;
- Determining the sample size. Done based on the intention of the researcher to include 10% of the survey population (1,420 households) in the four *kebeles* into the samples. Hence the intended sample size was 142;
- Determined the proportion of the sample to the survey population;
- Calculating the proportion of the household in each *kebele* to the total survey population;
- Stratifying the households into irrigator and non-irrigators;
- Determining the size of the samples from each stratum in each *kebeles* based on their proportion to population. Based on this, 50 households from stratum of irrigator and 92 households from non-irrigators households were drawn using simple random sampling. The numbers of households drawn from each stratum at each of the *kebele* is shown on the table 3.

Table 3. The distribution of households by *kebeles,* stratum and the sample size for each stratum.

		Strata of the households		**Proportion of households in the stratum**		**Sample size of stratum**		**Stratum sampling fraction**	
Lists of *kebeles*	Households Size	IR	NIR	IR	NIR	IR	NIR	IR	NIR
Hida	405	246	159	0.17	0.11	25	15.9	0.1	0.1
Lekuma	275	80	195	0.06	0.14	8	19.5	0.1	0.1
Ley kora	284	90	194	0.06	0.14	9	19.4	0.1	0.1
Aliberi	456	80	376	0.06	0.26	8	37.6	0.1	0.1
Total	**1,420**	**496**	**924**	**0.35**	**0.65**	**49.6**	**92.4**	**0.1**	**0.1**

IR=irrigators; NIR=non-irrigators

1.5.4. Data collection instrument

Semi-structured questionnaire with sufficient room for probing, a detail interview guide with complete lists of topics to be covered and structured interview survey questionnaire were used as instruments of data collection. The semi-structured interview was used for key informant interview and focus group discussions while the structured interview was for household interview. For the purpose of conducting group discussion and individual interview with the local communities' members, interpreters were recruited on the basis of the command of Amharic and local language (*Afarigna*), knowledge of the local people and their way of life. In like manners for purpose of collecting household survey data, eight enumerators on the basis of command of English language were recruited and eight interpreters were assigned to each enumerator. Both the enumerators and interpreters were trained how to carry out their job by the researchers.

1.6 Data analysis

The data were analyzed in terms of the study objectives already designed and the findings were considered at each methodological level first. The findings from household interview were mostly seen in relation with the focus group discussion, key informant interviews and group discussions' results.

Qualitative description and descriptive statistics were used for the analysis of the data. Both pre-coded and post coded data were entered into desktop computer. Statistical package for social scientists (SPSS) was used to analysis the household survey data. Tabulation and cross-tabulation of variables with percentage values and chi-square test statistic were used for the analysis of the survey data. Whereas, data collected through semi structured interview were analyzed by rearranging and summarizing each interview's results into main points that were raised in accordance with specified outline and writing narrative and descriptive reports incorporating the points.

1.7 Limitation of the study

The research revealed the events, experience and lesson that were pertinent to the study scheme in the study area. Hence, it has methodological limitation to make inference to the whole pastoral community in the study area or to the pastoral Afar. Some of the data generated through the household survey, for instance livestock holding, increase in household meals a day and frequency of engagements in irrigated farming in a year, are subject to certain degrees of biases depending on the willingness of the interviewees and ability to recall the past. Nevertheless, it is the conviction of the researcher that the study serves as stepping stone for further detail study in the future and as an input for decision makers and planners involved in small-scale irrigation scheme development in pastoral Afar.

CHAPTER TWO
REVIEW OF RELATED LITERTURE

2.1 Overview of trends in pastoral area development approach

Development projects in pastoral setting in eastern Africa at first saw the integration of pastoralism into the national economy as a major goal, on the assumption that the pastoral economy contained surplus which could be used for various national purposes, such as boosting foreign exchange earnings or providing inputs to other parts of the national economy(Helland, 2001). According this Author, the first phase the development history in pastoral society saw the introduction of innovation and presumed improvement like veterinary services, water development , rangeland management , genetic upgrading and improvement through cross-breeding , and supplementary feeding and fattening schemes. Most of this has been to little or no avail. The expected effects and benefits have more often than not failed to materialize. Neither the national economy nor the local community have benefited from these massive investments (Helland, 2001) These were because the formulation of the pastoral area development policies, the planning and implementation strategies of the policies were influenced by the development theories (the modernization theories) of the 1950's and 1970's (Getachew, 2000; Devalk, 1990). These theories were very much macro-economically and macro-regionally oriented. Both macro-economical and macro regional planning theories reflected a form of intellectual centralism and assume that decentralization of benefits would occur by 'trickledown' through socio economic group and 'spreading' over space.

One of the pastoralist areas where the above development policies were massively executed is Afar-now called Afar National Regional State. Several studies on the Afar pastoralists of Ethiopia have revealed that the policies promoted by the previous government of Ethiopia have resulted in a decrease in dry season pasture and dislocation

of many thousands of pastoralists from their home base. The schemes have negatively affected the welfare of the pastoralists that they were supposed to benefit (Getachew, 2000). The prevailing policies in the then periods were biased towards developing large scale irrigated and mechanized farming and crop cultivation against the less controllable, more mobile pastoral group. This state of affairs have brought about change in resource use pattern and intense competition for resource among different pastoral groups and between the pastoral group and the cultivars as well as an increase in inter ethnic tensions and deterioration of the ecology in the region (Ayalew,2001; Getachew,2000). Hence, the development intervention in the pastoral Afar, let alone achieving the intended objectives, they did not even able to create appropriate crop production and management skills among the pastoralists (Getachew, 2000).

Over recent years, however, emphasis on pastoral areas development has increasingly taken the attention of government officials, researchers and development practitioner because of its never-ending crises. This crisis manifested, on one hand, by recurrent drought/recurrent famine condition and increased pastoral mobility which has led to conflicts over the ever diminishing resource and on the other, violence now defines social relations between different pastoral group and between pastoralists and other resource users, cultivators with whom they have to compete for resources Muhereza (1995). This became evident after the devastating drought in the 1970's and 1980's, which in dramatic and unprecedented ways revealed how vulnerable the pastoral communities across dry lands of Africa had become (Helland, 2001). In the aftermath of the experience of the 1970s and 1980's, the outlook on pastoral development has changed. The main purpose of this development is to restore the capacity of the pastoral societies *to* feed them. Rather than addressing and manipulating the factors of production in the pastoral enterprise, with a view to increasing production and herd-off-take, development projects have become much more concerned with issues like local food security and local self-reliance. Great emphasis is attached to fostering popular participation and strengthening local institutions. This particular concern often takes on an aspect of restructuring the

organizational capacities undermined or denied by previous administrative system. Local communities are to an increasing extent expected to be responsible for their own welfare.

2.2 Government policy and strategies for pastoral area development

Since the early 1990s, following the downfall of the *dergue*[1] regime, some positive changes have taken place towards pastoral communities in Ethiopia. Various measures have been taken to include the pastoralists in the designing development policies and strategies. The 1995 constitution of the FDRE makes various provisions in the interest of pastoralists. Some of these provisions as contained in the 1995 constitution of FDRE are:

> Article 40: Ethiopian pastoralists have the right to free land for grazing as well as the right not to be displaced from their own land.
> Article 41: pastoralists have the right to receive fair prices for their products that would lead to improvements in their conditions of live which should be the objectives that guide the state in the formulation of economic, social and development policies (FDRE,1995:).

These provisions for pastoralism have contributed to the inclusions of pastoral development policies as part and parcel of the broad national development policies and strategy of the government. The pastoral area development policies and strategies appear in different documents of the national development policies and strategies of the current government. Some of these documents are Rural Development Policies and strategies (2001), Sustainable development and Poverty Reduction Program(2002), The Five –Year (2000-2004) Development Plan and Ministry of Federal Affairs (2002).These policies and strategies as contained in the different national development policies and strategies document indicate the fact that the long term objective of the policies is to sedentarize the pastoralists on a voluntary base through the introduction of irrigated crop and pasture

[1] The dergue regime was a military administration which came to power after the overthrow of Emperor Hile Selasse in 1974. Dergue ruled the country for 17 years until it was in turn overthrown by Ethiopian People revolutionary Democratic Front (EPRD) in may 19941.

production. SDPRP (2002) gives more emphasis on supporting sedentary agricultural livelihood:

- Sedentarization of mobile pastoralists on a voluntary basis consolidation and stabilization of those who are already settled or semi-settled through improved water supply, pasture and social services.
- Careful selection of viable river courses for future sedentarization based on irrigation and linkage of these places through roads and other communication lines.
- Provisions of mobile social services including health and education holistically for those that continues to be mobile (SDPRP, 2002:71-73).

The short and medium term objectives of the pastoral area development policies emphasize more on the mobility of pastoralists since they gain their livelihood from traditional livestock keeping based on mobility (RDPS, 2002). The first priority, in this regard, is to ensure water supply in different selected pastoral areas as well as undertaking range land management and conservation activities based on traditional management system. The strategy also pointed out that a wide range of activities should be undertaken in cooperation with the pastoral clan leaders, elders, elected representative and communities. Different people and policy analyst, however, forwarded their critics on the long term objectives of the government strategies on pastoralist (Helderam, 2004). They claim that sedentarization of pastoralists through irrigated crop and pasture production along the major river course is not appropriate strategy to bring about sustainable change in the livelihood of pastoral communities and their local development. The main basis of their argument is the fact that land adjacent to the major line of the river course is the dry seasons grazing area for different clans in pastoral areas. Hence changing the dry seasons grazing area to farm land would lead to conflicts among clans because it is against the pastoral resource use and management systems (Helderman, 2004).

This line of argument, however, is based on the partial view of the socio-politico and economic contexts that govern the change in resource use and production mode in which the pastoral communities have been passing. History has shown that the pastoral

communities across dry lands of Africa changed their resources use pattern, management system and livelihood activities (engaged in irrigated/rain-fed agriculture at one time and livestock herding at an other times in history) in response to changes to external factors such as climatic factors that brought drought and famine, socio-political changes that brought about property right changes and war and inter-and inra-ethnic conflicts (Niemeijer, 1996). In the nineteenth century, the II Chamus communities of Lake Baringo in Kenya were using a complex irrigation system initially intended for subsistence purposes. It was gradually adapted to cater for the growing of local market for agricultural produces as the Swahili caravans that crossed the area increasingly used the Baringo region as important sources of provisions (Anderson, 1989 cited in Niemeijer, 1996). Nevertheless, the II Chamus abandoned irrigation system due to the external factors that constrained the fruitfulness of the systems and they finally turned to the culturally preferred raising of stock (Niemeijer, 1996).

Similarly, changes have been occurring in pastoral setting of Ethiopian Afar from pastoralism to agro-pastoralism to agriculture. For instance, the Afar of *Wahdes* in the north eastern Ethiopia have started settled crop cultivation along with a mix of pastoral mode of production as a response to the recurrent famine and drought that hurt the area and to diversify their survival strategy Assefa (1995). Therefore, sedentarization of pastoralists through irrigation based farming *per se* is not contradictory to the pastoralists coping mechanism and livelihood diversification within the dynamic natural and social environment. Hence, it is rather the degree of consideration give to the implication of the highly changing scenarios in pastoral setting, which can reveal the relationships between different systems of resource use, during planning designing and implementing irrigation projects in pastoral areas that most constrained on the sustainability of development schemes in pastoral areas.

2.3 Institutions and organization for irrigation management

The terms "Institutions" and "organization" are often used interchangeably. However, some writers maintain some difference between the two concepts. For instance, Movik (1999 citing Uphoff, 1986) writes, "An organization comprises structures of rules, norms and behavior that exist over time, because they are valued as well as useful".

Hayami and Ruttan (1985) define institutions as the rules of society or organizations that facilitate coordination among people by helping them form expectations, which each person can reasonably hold in dealing with others. According to Pejovich (1995), institutions are legal, administrative and customary arrangements for repeated human interactions. Others provide a broader definition to the term "institutions" and maintain that institutions comprise not only the arrangement of rules, norms and customs but also the organizations providing these arrangements. Nabli and Nugent (1989a), for example, say that formal organizations such as labor unions and employers' organizations are institutions because they provide sets of rules governing the relationship both among their members and between members and non-members. Clague(1997) further maintains that broadly defined, institutions can be organizations or sets of rules within organizations However, an adhoc group that forms itself to achieve a single short-term objective and then dissolves is not an institution (Merrey, 1997). From this, it may be observed that an organization is not necessarily an institution, and visa versa. An organization is taken, as an institution when it provides social constraints that shape the choice set of actors in a form of legal, administrative or customary arrangements that exist over time for they are valued as well as useful. Thus, the term "institution" refers to both such organizations and the sets of rules governing the social relationships.

Strong local level development organization comprising both governmental organizations and non-governmental organizations, cooperatives, credit and saving groups, community-based organizations, and self-help groups are critical generally in local level social

development (Alila, 1998 in Tegegn and Assfaw, 2002). "The role of organizations becomes even more crucial when government services and market resources are not accessible to all members of the community" (Tegegn and Asfaw, 2002: 26). In such cases, the community must have its own organizations which are capable of initiating their own projects to replace or supplement the services delivered by the government and market, and provide the resources and services needed in the community. There is a growing body of evidence that such organizations are productive. For instance, among the different World Bank projects, the success of the *Muda* irrigation project in Malaysia was attributed to the grass-roots institutional development which carefully and patiently established the water users' organization while the negative rate of return in the HIVINI agricultural development project in Benin was mainly caused by the disintegration of the network of cooperatives that had been designed as the institutional support project promoted activities (Cernea, 1987). The World Bank Study of 25 completed agricultural projects reported by the same author found out that local grass-roots organization to be prime factor contributing to the long term sustainability of project benefits, while their absence was identified as an important cause of unsustainability (Uphoff, 1991). Furthermore, Greenhill (1995), in a study of Brazilian Coffee, demonstrates that institutions improve efficiency by reducing uncertainty in exchange arrangements.

Where irrigation water serves more than a single person, patterns of social interaction govern the use of those facilities (Coward, 1991). Realizing that irrigation water is a community property and therefore needs communal management can become the impetus for farmers to organize (Pradhan, 1992); and community management of irrigation often involves the formation of organization of formal user groups known as Water Users Associations or WUAs (Gyasi, 2003). Most of the new initiatives for forming WUA's and management strategies do not evolve from the traditional systems. Instead the structure of WUA's is; largely imposed by government agencies and the donor community. The long run sustainability of these institutions often remains questionable. In general, it seems desirable to use existing local organizations. If the existing organizations are insufficient or inadequate for the purpose, careful analysis should lead

to the design of facilitating the establishment of new organizations congruent with local culture (Cernea, 1991).

Institutions for governing irrigation usually have some basic features in common. Meinzen-Dick and Cernea (1994) stated that the common features found in many successful institutions for water management have those of: role specialization, i.e. the members of the management committee having clear duties and responsibilities that pertain only to their position; accountability- the organization is accountable to its members and federations if there are any. The organization design must provide specific means to fulfill the four functions of any irrigation organization: non-routine construction and rehabilitation; water allocation and proper disposal of unused water; routine maintenance and management of conflicts (Freeman and Lowdermilk, 1991).

As a formal institution, the WUA's will have organization charter, which must be defined and accepted by the users of the irrigation before operation begins. According to (Freeman and Lowdermilk, 1991), it is always disastrous to proceed with the physical technology to get the water flowing with only vague notions about what joint agreements should be devised for rehabilitation, allocation, maintenance, and conflict resolution. The reason for this is that when water flows, some farmers are in better initial positions than others to take advantage of the resource. They quickly employ their good fortune to consolidate disproportionate advantages, and then oppose later attempts to reform the situation usually with success because of their hold on critical resources. The same authors add that the social organization of an irrigation system must provide for a local council or water court capable of adjudicating the interests of members and managers. This judicial council must interpret and apply organizational rules in specific cases of conflict and then pass on its interpretations to organizational executives for implementation. Members of the council should be from the local community; and access to the council must be cheap, quick and easy (Freeman and Lowdermilk, 1991).

Water users' associations are usually responsible for matters related with water allocation, water distribution, maintenance, and conflict management. However, these are not the only issues to be managed in irrigation. Matters like those with input and output marketing conditions are decisive for success. Thus, a further strengthening of water users' associations so that they can accomplish the management of such issues, or else, establishment of independent cooperatives is critical.

2.4. Community-based irrigation, resource use and property rights

The natural resources specifically relevant to this study are water and land. Several authors in the field have explained that access to and control over these resources is determined by socio-cultural and economic factors (Demsetz, 1967; Dessalegn, 1999). Because these resources are used for different purpose, for instance, land for farming and communal grazing; and water for irrigation, fishery, domestic consumption etc., the multiple use of such resources would results in conflict of interest and the unsustainable utilization of the resources unless institutions governing the proper use of the resources are not strong at different levels ((Bakker et al., 1999).

Water resource can play a significant role in improving food security and household income. The extent to which water resources will contribute to sustainable livelihoods will depend on availability, the nature of rights of access, the system of management and the technology with which the resources are exploited. Moreover, the specific relationship between livelihoods and water resources will determine the nature of the stakeholders and their interest in the resources (Dessalegn, 1999; Darout, 2004).

Hardin's (1968) concept of "Tragedy of the commons," in which rational beings seek to maximize their own benefit at the cost of the community," remains the dominant paradigm of overexploitation of common property resources as a consequence of common ownership. Common or collective ownership, in this context, implies a lack of well-defined property rights of the co-users (Singh and Ballabh, 1996).

According to Yeraswork (2000: 18-21), there are four major types of property rights regime:

1. Absolute private Property Rights regime-

   Under this regime, the rights of the owner are to a great extent specified, completely exclusive, transferable and enforceable ..... The owner can by and large put to use his asset in any way he chooses while more or less completely excluding all others.

2. Modern Associational or Collective Rights regime-

   An association, whether professional, religious, local communal, etc, entails distributed rights and rights on multiple levels:

   i. The rights of the group or the association as a whole to exclude nonmembers and other collective agents from access to group property,
   ii. The rights of individual members to obtain allotments and /or use of association commonage.

   In the case of allotment, the individual has the right to exclude even other members from his/her allotment while at the same time enjoying the right, like the others, of access to the commonage.

3. Customary communal property rights regime-

   This regime is based on inalienable .... Rights shared by members of a social group usually a decent group that are normally defined and enforced by custom, wit a local authority exercising administrative rights.

4. Public property rights regime-

   Here, the state or local government is the primary agent, a type of guardian; certain rights of control are concentrated in a "public representative" or the state...

In the past, there reigned a deep-rooted pessimism about preserving common property resources other than through centralized state control or privatization (Hardin, 1968 cited in Movik, 1999). The property rights School (PRS) economists strongly argued in this line. They said that it was unlikely that collective owners of a common property resource could reach an agreement that would lead to optimal long-trim use, Hence, they concluded that the most efficient way for dealing with the problem of externalities is internalization through the creation of exclusive private ownership rights (Demsetz, 1967; Johnson, 1972 cited in Yeraswork, 2000).

However, recent years have emphasized the merits of community-based management, thus constituting something of a reversal of the previous thinking. Currently, local control in irrigation and water management schemes is widely held as being the preferable strategy in contrast to state control or privatization to avoid the tragedy and externalities portrayed by Hardin and PRS economists (Blair, 1996). The ardent opposition on the 'tragedy' concept focuses upon Hardin's and the PRS economists' failure to distinguish between open-access and common property regimes. The opposing school of thought maintains that common property regimes are not synonymous with open–access in which the resource is nobody's property. Thus, the counter argument to the "Tragedy" parable holds that

1. The common property regime denotes exclusivity of rights for a bounded group which it exercises over a well delineated object, to the exclusion of all outsiders save or its invitee; and
2. The bounded group has a social mechanism for regulating the utilization of the commons and for sanctioning its regulations (Yeraswork, 2000:51).

It is commonly argued that individual actors are tempted to overexploit commonage when they are uncertain regarding each other's actions in terms of utilizing it. Thus, adoption of cooperation becomes a necessity. This calls for institutionalized control strategies or social controls that emerge in or are devised by groups to prevent or resolve collective action problems (Burns, et. al. 1985). There is a common argument that collective action is possible when the problems of free riding and lack of trust are resolved through the advent or enforceable rules or institutions.

2.5 Community-based irrigation, decentralization and participatory development

Decentralization is a democratic reform which seeks to transfer political, administrative, financial, and planning authorities from the national to sub-national levels. The objective of decentralization, among other things, is to empower local authorities, enhance accountability and efficiency, and promote popular participation (Tegegne and Asfaw, 2002). There are several arguments favoring participation. The first major argument is that participation will serve a range of general development objectives such as efficiency, equity, capacity-building, and sustainability. It is conceived as one of the most important approaches for realizing self-reliant, sustainable development and social justice. Most studies on participation have shown how participation could achieve one or the other development objectives. In addition to these utilitarian objectives, participation is seen as part and parcel of "good governance" or is considered as one dimension of good governance (Tegegn and Asfaw, 2002).

Activities like operation and maintenance of an irrigation system requires commitment, coordination and collective action on the part of the user group (Tang, 1992; Gyasi, 2003). These tasks, as part of local-level development program, can be promoted by the efforts of the formal and informal institutions at the local level and popular participation at the grassroots level, within a broader frame of decentralization that strengthens and empowers these institutions (Tegegne and Asfaw, 2002).

A comparative impact study on participatory and non-participatory irrigation systems in Philippines indicated that in the participatory systems, substantial benefits were reaped from the small investment in institutional activities, including more functional physical structures, greater increases in rice yields, larger increases in dry season irrigated areas, and stronger irrigators associations (Bagadion and Korten, 1991).

Thirteen out of twenty-five World Bank financed projects were found to be non-sustainable (according to a re-evaluation). Among the primary reasons for their non-sustainability were factors of a socio cultural nature, mainly the lack of farmer organizations and participation, neglect during project formulation and implementation (Cernea, 1991). Such examples confirm with economic facts that financially induced growth interventions stand a high risk of being less effective than well planned ones, or of failing altogether, if they neglect to build up the socio-cultural structures like popular participation for development.

2.5.1 People centered participatory planning

In participatory development planning, people are conceived not as recipient of but as a knowing subjects capable of achieving a deepening awareness of the sociological reality, which shapes their life and their capacity to transform that reality (Gran, 1983 in Degene and Yilma, 2005). Project should be conceived as a means for promoting self-development rather than as means for transferring technical skills alone. Hence, empowerment has become a central concept conveying a fuller meaning of people's participation (Yeraswork, 2000; Dejene and Yilma, 2003). This is because empowerment creates conditions for self-reliance and sustainable development.

People's participation in local–level planning can be conceived as a sociological process whose success depends on the human rather than the technical and financial strength of a project. A mere technical transfer of a project may perpetuate a state of dependence, apathy and indifference on the part of rural community. Three types of 'participation' can be distinguished, namely mobilization, decentralized decision-making and empowerment.

Mobilization refers to the situation where people are involved not as co-planners but as sources of labor or as suppliers of other resources. The labor campaigns of the 1980s Ethiopia can be cited as example of mobilization.

Decentralized decision-making alone may not convey the full meaning of people's participation. This is because decentralization of powers alone is not enough; it is important to know who exercises those powers. It is possible that power may be delegated to a small segment of the society, and yet the majority of the people can be marginalized.

Empowerment, on the other hand, conveys a fuller meaning of people's participation. Empowerment creates conditions for self-reliance and sustainable in the process of identification, implementation, monitoring and evaluation of viable and replicable development projects like SSI projects. Participation should not be taken as a means towards the implementation of projects but also as an end in itself as noted by (Devalk and Wekwete, 1990). 'Participation' in matters concerning own development is also a fundamental right, and therefore an end in itself *perse'*.

Why is people's participation? It provides the following desirable factors: (1) effective utilization of local resources, (2) sharing of experience, and (3) selection of location-specific and appropriate technologies through the learning process. What is appropriate to a specific community could be identified largely through persistent experimentation. The learning process is at the center-piece of people's participation.

Following FAO (1990), the tangible benefits of participatory development can be summarized as follows: (1) increased food production, (2) higher net family incomes, (3) increased employment, (4) higher rates of saving, (5) acquisition of new skills, (6) creation of low cost facilities, (7) building of rural community infrastructure at low costs, and (8) strengthening of rural institution.

Ideally, a participatory development project has, at least, the following eight characteristics: i) A significant percentage of the specified group must participate at all phases of the project cycle.ii) There must be clearly defined mechanisms for enhancing people's participation in project design, implementation, monitoring and evaluation. iii)

There must be policy environment and institutional arrangements conducive to participatory planning, which does not take place in a political and organization vacuum. IV) Technological and organizational components of the project must be culturally feasible. V) The project design must attain some reasonable standard of ecological soundness. VI) The project must show the potential for self-reliance; researcher and field workers should serve a catalytic function, not a welfare function, which promotes further dependency. VII) Mechanisms should be provided to make the project sustainable and replicable. Projects should not die when funding stops. VII) The learning process, rather than the technical transfer of blueprints should be encouraged at every phase of the project cycle.

2.5.2 Development partnership

The fundamental objective of partnership for development is to ensure better development prospects, by taking greater account of the needs and priorities expressed by the population. It focuses, on the one hand, in brining together and ensuring collaboration at different intervention levels of the potential economic and social actors, and on the other, it concerns itself with the active participation of direct beneficiaries in decision-making at the different stages of actions that concern them (Hertogs, 1999:2). The milestone for successful development programs is participation. It is imperative to create enabling environments whereby various development actors discuss, dialogue, identify, design, implement, monitor and evaluate programs. This condition will create strong sense of ownership of the programs that, in turn, is critical in attaining the objective of improvement in the livelihood of the community (OECD), 1997 a, b UNDP, 1999a)

2.5.3 Partnership between development actors

Development actors realize their objective of local economic development by forging effective partnership among themselves. Here, 'partnership' is defined as an arrangement in which actors work together to find solutions and achieve defined goals. Partnership involves willingness to learn from each other, sharing experiences and pooling resources. Partnership can be forged between various development actors, such as government, communities, the private sector, civil society organizations, donors, and so on. In this study, however, we focus on partnership between regional/local government, NGOs, and communities. Relationship between actors can be viewed either as one of harmony or as conflicting (or contradictory) arrangement. The assumption of harmonious relationship between government, civil society organization, and communities can be described by the presence of complementary relationship of the triad (Dejene, 2005; Harrison, 2001). Government provides policies, regulatory frameworks, and public goods to enhance local development. Civil society organizations (say, NGOs) mobilize financial resources, build capacity, and undertake policy advocacy works. NGOs are said to have pioneered and promoted programs and policies, which are subsequently taken on board by governments. Communities, on their part, complement the activities of the other two actors through effective participation at different stages of project development, including feasibility study, project design, implementation, and monitoring and evaluation. In particular, they identify their felt needs, share their knowledge of the local system with other actors, and contribute their labor when the need arises. On the other hand, the relationship between the triad can be viewed as one of mutual mistrust and suspicion rather than one of harmony. Governments often feel that it is unreasonable and may be undesirable for public policy to be shaped by the whims and experiments of NGOs. Moreover, governments accuse NGOs for lack of accountability, transparency, and mismanagements of funds (Bull and Dunn, 1996 Cited in Dejene, 2005). On the other hand, NGOs complain about lack of conducive legal framework, bureaucratic hurdles, and non-

cooperation on the part of government officials, inadequate physical and institutional infrastructure, and ineffective implementation of decentralization and liberalization policies (UN\ECA, 1999; Ball & Dunn, 1966: Edwards and Hume, 1992). Of the triad, communities have received little attention as potential partners in the development process. Local governments have a long way to go to recognize the untapped potentials in promoting grassroots level program. NGOs, on the other hand, have gained considerable experience in working hand-in-with communities (Dejene, 2002). Effective partnership between the triad can be built through dialogue, exchange of in formation, openness and clear definition of boundaries of interest and activities of partners, and through improved appreciation of democratic values and procedures. It is in this way that effective communication can be achieved (Dejene, 2005). Partnership does not take place in a vacuum. Its global context should be considered. The globalization process creates both opportunities for and threats to local development. Opportunities to be exploited including (but not limited to): Market liberalization, decentralization of the decision-making process, increased flows of information, relatively favorable markets for some exports of least developed countries (LDCs), measures taken to cancel debit of some LDCs (such as Ethiopia), increased flows of aid through NGOs and so on. Possible threats include (but not limited to): the decline in official development assistance, non-responsiveness of foreign direct investment to policy reforms in Africa, the fall in the world prices of primary commodities (such as coffee), rising trends in the worlds price of crude oil, the widening income gap between rich and poor countries and the exodus of Africa scientists and professionals to the west. Participatory development can be affected by external and structural factors. For example, Ethiopia, unlike Asian countries, lacks a tradition of administering irrigation schemes. Existing property right regimes may not be well equipped to solve problems associated with the distribution and utilization of irrigated land (Dejene, 2005; Dessaleng, 1999). Low river yields in drought years may reduce the size of irrigated land. With unreliable water supply, irrigation efforts could be risky venture. Market, property rights and other institutional issues may determine the extent to which irrigation schemes can be effectively utilized.

CHAPTER THREE
THE STUDY AREA

3.1 Awra irrigation project

Awra irrigation project is found in Zone-4 administrative zone of *Afar* National Regional State, in *Awra Woreda* at *Hida Kebele.* The project area lies within Hida *kebele.* It is located at Latitude $11^0$55'50" N and Longitude of $39^0$58'37E (SSD, 2003). The altitude of the area is 840 above sea level; situated at northwest part of the region 200km away from Mille town, which is 520km north east of Addis Ababa along the Addis Ababa Djibouti road. The *Woreda Awra* lies on fertile plain land in the central portion of the Awash basis Figure 1 display the location of the *Woreda* and the *kebeles* covered in this study

The *Awra* Irrigation system is designed to serve the segments of *Lekuma, Hida, Aliber Mesgid* and *Leykora Kebeles'/sub-clan's territories* in *Awra Woreda.* These *kebeles* are located at 10 to 30 km west of *Awra Woreda* town.

Rainfall

The mean annual precipitation of the study area is less than 600mm. May/June is the driest seasons of the year, *Hagay.* The main rainy season-*Karima*, which accounts for above 60% of the total rainfall, occurs from July to September. This is followed by the best grazing season which is from September to November. There is minor rainy season called *Sugum.* It appears during March to April. *Gilal* is less sever dry season with relatively cool temperature (November to March).The irregularity of rainfall distribution within a growing season and the variability of the onset of the rain season are the main constraints for the regeneration of grazing resources, the production of pasture and dry land crops in the area (Yohanes 2003).

3.2. Command area history

The command area is the gross area of land that includes the farm road, irrigation canal, land covered by soil conservation structure, trees around the canals and the net irrigated land of the Awra Small-Scale Irrigation Project. It was an endless expanse of gently sloping fields dotted with numerous bushes common in semi-arid range land. The bushes used to provide browse for camels and goats. When the rain is good, the land regenerates pasture quickly, and it was a vital wet season grazing fro the home herds.

The command area was used for grazing, rain fed agriculture and irrigation farming under different ownership of the land since the imperial period. In the 1950's and early 1960's, the land was used for rain fed crop production by the local lords. The North East Rangeland Development Unit (NERDU)[2] was making use of the land for rangeland development activities in the 1970s and 1980s. Parts of NERDU's intervention in *Awra* project area included the building of a small weir across the *Awra* River for irrigated food and fodder production. Nevertheless, the scheme failed mainly due to the collapse of security in the area which entailed evacuation of the NERDU's staff. The weir was torn away from its foundation by torrential flood (Yohanes, 2003). For nearly two decades after NERDU, the area fell into a buffer area in the conflict triangle between the government forces of *Dergue*, the Tigray People's Liberation Front (TPLF) and the Eritrean People Liberation Front (EPLF). NERDU left the area in 1986 due to insecurity. Since this period, the command area was used for communal grazing.

With the introduction of *Awra* small-scale river diversion irrigation project in 2003, a change in use and ownership of the land in the command area was occurred. The

[2] North-east Rangeland Development Unit (NERDU), Headquartered in *Weldi*a North Wello, is part of the Third Livestock Development Program (TLDP) which also included Southern Rangelands Development Unit (SORDU) and Jijiga Rangeland Development Unit (JIRDU proposed by Livestock and Meat Board(LMB) in 1974. NERDU gave a great emphasis on rehabilitation of drought-stricken pastoralists. This rehabilitation included irrigation schemes as an alternative life-style for those who had lost access to dry-season grazing because of irrigated cultivation of cash crops along the Awash River (LMB, 1974b).

command area was put for irrigated farming with individual ownership of the land. This was possible by distributing the command area first to four *kebeles,* and second by allocating the size of irrigable to selected individual households in each *kebele*.

3.3 Population characteristics

According to the population and housing census carried out in Afar in July 1996, the population of the region was 1,106,383 of which 625,839 were males and 479,544 were females. Ninety two percent of the region's total population lives in rural area, while the rest 7.8% in urban centers. According to the same sources, *Awra Woreda* has a total population of 18,306 of which 154 settled in urban area and the remaining in rural area. Out of the total population of the *Woreda* 8, 308 are female and 9, 998 are males.

The average household size of the sampled households, covered in this study, is 10 while the figure for the entire region of the Afar, according to the 1996 census, is 5.7 for urban and 6 persons for rural area. Table 4 shows the distribution of the population by sex and number of households in the study *woreda.*

Table 4 Population size by sex in the study *Woreda*

	Both sex	Male	Female	No household
	18,306	9,998	8,308	3,234

Source; Population and Housing Census of Ethiopia (CSA, 1996)

3.3.1 Age and sex structure of the population

The age and sex distribution of the population obtained by the survey is shown in table 5.

Table 5. Distribution of the population by age and sex for the sampled household heads

	Male		Female		Total	
Age group	N	%	N	%	N	%
0-4	113	13.7	82	14.7	195	14.1
5-9'	132	16.0	84	15.1	216	15.6
10-14	92	11.1	64	11.5	156	11.3
15-19	79	9.6	58	10.4	137	9.9
20-24	95	11.5	36	6.5	131	9.5
25-29	62	7.5	58	10.4	120	8.7
30-34	64	7.7	63	11.3	127	9.2
35-39	28	3.4	23	4.1	51	3.7
40-44	44	5.3	21	3.8	65	4.7
45-49	16	1.9	12	2.2	28	2.0
50-54	26	3.1	16	2.9	42	3.0
55-59	14	1.7	7	1.3	21	1.5
60-64	28	3.4	14	2.5	42	3.0
65+	33	4.0	20	3.6	53	3.8
Total	826	100	558	100	1384	100

Sources: Household Survey, 2007

As can be seen from the table 5, 41% of the population was below the age of fifteen, 55% were between the ages of 15-64. The total population age 65 and above were 3.8%. Fifty one percent of the population in the sampled households were age 19 and below. This revealed that the age composition of the surveyed population is dominated by young age of 0-19 years. Nevertheless, the population age ten years and above accounted for 70.3 % of the population in the sampled households which means that on average a sampled households could have 6.7 active labor forces.

3.3.2. Mobility and settlement patterns in the study area

The usual pastoralists movements is a long journey to the east before the onset of the main rainy season (*karima)*, and to the north and northwest to the territories of Amhara region such as *Sanka ,Bati and Hara* as well as to the flood plain land at the down stream of Awra irrigation scheme in the east.

The Afar covered in the study area live in the clustered of village locally known as *bura* scattered all over the area at different distances in each of the subclan's territories. The closest *bura* are less than 500 meters apart, but some are as far as three kilometers within the subclan territories/*kebeles*. The average cluster of village in each *kebeles* rages from 5-10 with 25 households in each village on average.

3.4 Social characteristics

Patrilineal descents play an important role in the social organization of the Afar in the study area. Every Afar belongs to a specific clan through his/her father's line. All clan are endogamous patrilineal clans. The social organizations of the traditional pastoral afar are responsible, among other things, for the allocation of human and animal resources to the various natural endowment areas. The pastoral Afar lives in defined clan lands. The lands are divided into a number of tribal/ clan territories demarcated by boundaries which follows natural features such as rivers, hills, rocks and bare lands. Nevertheless, the social organization/institutions of the pastoral Afar have maintained uniformity despite the variation in distances between and among the different tribe/clans.

Kinship: kinship is the basis of the social organization among the Afar pastoralists. The social relation of Afar pastoralists is based on genealogical reckoning, trailing ancestors through father's or mother's line of decent or both. Kinship system attains a high level of organization among the pastoralists in terms of lineage ands kinship structure. Hence, the kinship relationship of tribe, clan, sub clan, lineage/family must be recognized and

accounted for in every decisions and issues that concerns resources shared by more than one group among the Afar (Yasin, 2004).

Tribe: it is the largest kinship group recognized by its members. Each tribe is independent and considers its leaders to be of equal importance with other clan leaders, regardless of the size of tribe. The tribal chief (*Makabantu*-named *balabat* during the imperial periods) is expected to maintain peace although his personal influence is limited. A council of elders must make all the decision by majority vote (Yasin, 2004).

Clan and sub clan: the clan (*Kedo)* that makes up a tribe is the most political and social unit in terms of cooperation and belongings. Members of a clan recognize a common ancestor. Like the tribal leaders, the clan leaders do not have authority to decide and make agreements o behalf of their clan members. They mostly convene the councils that decide by consensus (Yohanes, 2003, Yasin, 2004). In the study area , elders and official revealed that there are around 27 sub clans that belonged to *Hado Ashento* clan but it was not possible to exactly know how many clan were there since different people gives different name that overlap with the sub clan name the already gave (Yasin,2004).

Lineage/ family: there are two types of family called B*ura* and *Dahla* in the study area. The *Bura* is a nuclear family. This name is also used to name a cluster of village in the study area. The second one is extended family structure that comprise a man, his wife (wives), children, wives relatives and possibly of married sons, their children and wife. In case of a man having more than one wife, the wives usually set up their own houses close to each others. A girl remains part of her father's lineage upon marriage but her children will not unless she is married to someone of her clan (Yohanes, 2003, Yasin, 2004).

3.5 Livelihood activities

The *Afar* economic is basically a livestock economy based on multi-species pastoralism, and includes cattle, camel, goat, sheep and Donkey. Livestock production activities used to play, almost exclusively, a fundamental role in livelihood of the pastoral communities in the study area. According to the discussion made with elders, the population in the study areas used to live, until recently, almost entirely on livestock rearing activities. They used to obtain as much as 70-80 % of the food requirements from livestock and livestock products. Nevertheless, they lost most of the livestock during the 1970s and 80s droughts. Since then, recurrent droughts, animal disease, and other environmental restriction have tremendously curtailed their livestock wealth; and many families have been unable to survive solely on animal and their products. Currently, there are people that engage in pastoralism, agro-pastoralism, trading and combination of these activities. Table 6 shows major occupation of the sampled households of the study.

Table 6. Major occupation of the sampled household

Occupation		Frequency	Valid Percent	Cumulative Percent
	Pastoralism	62	43.7	43.7
	Farming	3	2.1	45.8
	Trade	1	.7	46.5
	Pastoralism and farming	30	21.1	67.6
	Pastoralism and trade	46	32.4	100.0
	Total	142	100.0	

Source; Household survey, 2007

According to the results of the household survey shown in table 6, out of the 142 sampled households (both irrigators and non- irrigators) 21 % of them are engaged in crop and livestock production activities, 32% in livestock production and trading activities, 43 % only in livestock production activities. This indicates that most of the survey populations

are mainly engaged in pastoralism followed by pastoralism and trading activities for their livelihood activities.

3.5.1. Livestock production activities

Livestock production is the main pillar of the livelihood of the pastoral Afar in the study area. Like other pastoralist in eastern Africa, multi-species pastoralism is the main form of livestock production activities of the population in the study area. According to A. Dixon and *et al* (1989), livestock production in dry land area varies greatly in type of animals, products, organizational structure, land tenure and stocking intensity. The population of this study keeps different mixes of animals that include cattle, camels, goat, sheep and donkey to fulfill households' consumption requirements and meet financial needs. The number of livestock population by type in the study *Woreda* is shown in table 7.

Table 7 Livestock population by type in *Awra Woreda**

Cattle	GOAT	Sheep	Camel	Mule	Donkey
36,893	12,297	24,066	16,418	104	150

Source: *Awra* Pastoralist, Agriculture and Rural Development Office (WPARD)

These mixes of animal production activities play a fundamental role in the livelihood of households in the study area. They provide food (milk and meat from cattle, sheep and goat and camels, butter and yoghurt from cattle; draught power (from camel and donkey used as back animals, and oxen for ploughing) and leather goods. Besides, livestock are sources of prestige and main forms of wealth accumulation. Hence, all types of species are very important for a household to meet different economic and social requirements. Shortage of adequate vet services, livestock extension services, improved forage availability have contributed for the low level of production and productivity of the livestock sector in the study area. Each household unit requires a minimum number of animals to derive its livelihood, so animal and human populations are strongly linked.

The number of animals in the area is very large although checked by recurrent droughts. But the number of animal per person is low; therefore, production per person is low.

Livestock ownership and size per household: Literatures have revealed that in traditional Afar livestock are individually owned by men, women and children. Every Afar start to build up his or her herd at birth when a new born child is given *Hududta* (Naval string) stock one female animal of each species. Boys get more animals than girls, as the latter often have to do without camel and cattle (Helland 1980 in Ali 1992; Yohanes 2004). This ownership arrangement was found still existing in the study area.

Household Livestock size: The sampled households hold mixes of livestock species. The herd structure of the livestock in a household is dominated by cows. The type of livestock the sampled household holds is shown on the Table 8.

Table 8 Livestock size of sampled households

Livestock type	Total Head	Average
Oxen	147.0	1.0
Cows	1031.0	7.3
Bulls	193.0	1.4
Heifers	413.0	2.9
Goat	1869.0	13.2
Sheep	945.0	6.7
Donkey	131.0	.9
Camels	988.0	7.0

Source: Household Survey, 2007

The survey result indicated that irrigation farming beneficiary household owned on average one ox, seven cows, seven camels and one donkey. This indicates that the number of oxen per households is very low that it may hamper irrigated land preparation by irrigator households.

3.5.2. Crop production activities

Various socio-economic, political and environmental (i.e. presences of potential resources-water and cultivable land) factors were supposed to bring the possibilities of starting crop production particularly irrigation-based production in the Afar regions. The development policy and strategies of the 1960s and 1970s, which focused on large scale irrigation and settlements schemes, establishment of state farms and the availability of the potential resources for agricultural production in the region, are, among others, the major contextual factors that introduced crop production/farming activities in the region. In *Awra,* farming practices is also a recent phenomenon. Various factors contributed for the commencement of crop production though most of the pastoralists in the study area have not yet adequately engaged in farming activities. According to the local elders, crop production was commenced by the local elites[3] in partnership with the land lords of Amhara ethnic in *Raya and Kobo* Administrative province in north *Wollo* of the then period. The relationship between the elites of the two ethnic groups enabled the employments of skilled peasants and tenants from the above mention provinces for undertaking crop production activities. The local elites engagement in crop production was not to diversify their livelihood strategies but as a means of wealth accumulation. The crop production in the period was supported by mechanized farming and skilled farmers' labor from the *Raya and kobo* province.

In the 1970s, the intervention of the World Bank financed project, the North East Range Land Development Unit (NERDU), was also the factors that helped the introduction of crop production using irrigation in *Awra* though NERDU abandoned the area in 1982 for security reasons. One of NERDU's interventions was irrigation based fodder and food crop production using *Awra* River. The involvements of the pastoral community in the crop production activities was limited to hired labor supply for weeding , loading and

[3] The local elite composed of family members of the tribal/clan leaders who were called *balabat/or chikashum* during imperial period

unloading of farm inputs and produce and guarding activities for NERDU managed cropping practices.

The 1975 land proclamation was also one of the historical factors that helped the practices of crop production in the area, in this time, by the pastoral communities. Following the land proclamation of the 1975, land distribution was carried out in the study area. According to the information obtained from the local elders[4], all households obtained 1-2 hectare of cultivable land during the land distribution. Besides, the government officials promised the community to render every possible supports in order that the community would be able to cultivate the land distributed to them. But , the promise were never fulfilled and no meaningful supports were provided to individual pastoral households whom the land was allocated to, rather the official urged the establishment of cooperative farming. The technical, material and other supports were provided to the cooperative not to individual pastoralists. According to the elders, the involvement of the local pastoral community in the production activities of the cooperatives was very minimal, for the farming activities were carried out using tractors and hired labor. The pastoralists were not able to build their farming skill in the process of production. The cooperatives distribute farm produces to the members at the end of harvest though the pastoralists did not engage in the actual production process. They consider this share as their rights for being the pastoralist in the area. The cooperative continued functioning until the insurgency of "JEBEHAT", EPLF fighters damaged heap of harvested crops of the cooperatives, caused deaths of human and livestock, and created insecurity in the area in 1985.

In brief, the chapter showed that the largest segment of the population in the study area derives their livelihood from solely from livestock rearing, some of them from livestock and trading activities, while a few engaged in crop production along with livestock population in study area. The population still maintains the customary institutions that

[4] Ato Ali Mirah, subclan leader of Lekora *kebele*, Hanefere Ali and Alawis Ahimed selected eldere from Leykora *Kebeles*; Ato Kelifa Ahimed, Subclan leader of Ashento *Kebele*; Ato Ebelene Mehamed and Ayida Eregele selected leders from Ashento *Kebele* ; discussion made at Ashento *Kebele* on April 7,2007

govern the local resource use and management system albeit the changes in official land tenure regime in the country since the imperial period. The chapter also pointed out that the population had experienced development intervention, irrigated crop and fodder production, by NERDU and cooperative based crop production, on the currently irrigated land of the study scheme, during the dergue regime. Nevertheless, the intervention did not brought about a lasting benefit to the pastoralists mainly because they were not participatory. The next chapter and its subsequent sub section discuss the analysis and interpretation of the facts gathered form the field and other relevant sources.

CHAPTER FOURE
4. DEVELOPMENT ACTORS AND ROLES

4.1. Local development actors and their roles

The research identified several actors that have been involved in specific interventions in the local development efforts in the study area. Such entities are regional and local government organization, NGOs and Private investors (engaged in flour mill service provision) and the local community, irrigators and non-irrigators members of the pastoral Afar, in the study area. Nevertheless, not all actors were equally relevant in the roles they have in the development of *Awra* small-scale irrigation (SSI). Thus, the research identified *Awra Woreda* Pastoralist Agriculture and Rural development Office (WPARDO), *Woreda* Administration, *Kebele* Administration, Pastoralist Development Coordination Bureau (PDCB), Support for Sustainable Development (SSD), Sustainable Land Use Forum(SLUF) and the local community as the main actors that have been involved, though at different degree, in *Awra* small-scale irrigation project management cycle of initiation, planning , design, construction, operation and maintenance. SSD, SLUF, and the government organizations are considered major organizational development actors in the development of the study project.

According to the separate group discussions made with the staff of SSD and WPARDO, irrigators and non-irrigators, the community covered by the study had been involved in the *Awra* small-scale irrigation project management cycle differently. The discussion groups' members revealed that the community was involved in the initiation of the project idea, allocation of irrigated land to households, distribution of the command area to the four irrigated farming beneficiary pastoral *kebeles*, supplying unskilled labor for construction purpose and in administering irrigation water use.

On the other hand, the NGOs, Support for Sustainable Development and Sustainable Land Use Forum, were found to be the only sources of funding in the case study small-scale irrigation project. SSD undertook feasibility study, designed the project, undertook construction of the scheme, provided extension support services to the irrigators and involved in technical advices to the government organizations in the establishment of the water users' association. SSD also applied integrated agricultural development approach in the promotion of SSI in the study area.

The role of SLUF was limited to providing funds and capacity building to SSD's *Awra* irrigation project staff, conducting advocacy work and involving in joint evaluation of project activities. The Local government's development organizations, Pastoralist, Agriculture and Rural Development office and the regional level government organization, were involved in facilitation for access to irrigable land, partially involved in provision of technical advice for water users association, initiation of the project ideas, facilitated the implementation of the project activities and involved in joint evaluations of the project activities on quarterly and bi-annual basis.

It was found out that the actors differed in their knowledge of the pastoral resources use system, the pastoral area development policy of the nation and the regional state and in their financial and human resources capacity. The study revealed that these differences among actors, particularly of the organizational development actors, brought about lack of effective coordination of their actions and difficulty to have consistent community based irrigation development approach that help the allocation of clearly specified tasks and responsibilities to each of the actors that were involved in the development of the irrigation scheme of this study. The implication of this is that discrepancy in knowledge of the pastoral resources use systems and resources among actors constrain the formation of active partnership between or among actors in the development small-scale irrigation scheme in the pastoral area. Such differences are found to have implication on how to coordinate their action among themselves and developing mechanism that should be put in place to avoid problems that would emerge with the irrigation projects in regard to

forms of resources use and ownership. The subsequent section of the thesis discusses the roles of the actors in the different stage of the project cycle, how they were able to involve in the processes of the scheme development, and the mechanisms employed to coordinate the plan and action of the actors in the development of the study scheme.

4.1.1. Initiation and planning of the scheme

The information obtained from the local elders[5] and records of the project related document indicated that there were irrigation production practices using modern river diversion structure to divert water from the *Awra* River in the late1960s and early 1970s. The elders disclosed that the North East Rangeland Development Unit (NERDU) constructed small weir on *Awra* River for irrigated fodder and food crop production as part of its pastoral area development intervention in the 1960s. The weir was constructed in the same location where the weir for the study scheme was constructed by SSD. NERDU used to irrigate 90 hectare. After the first harvest, the scheme failed to function due to the collapse of security, which entailed evacuation of NERDU's staff .in 1978(Yohanese, 2004). Eventually, the weir, constructed by NERDU, was torn away by torrential flood, a fate that might have been avoided by timely maintenance (Yohanese, 2004).

After this event, the pastoral community at *Hida kebele* had been trying to mobilize their resources to divert the river for irrigation production. However, because of the lack of supporting organizational actors in the area and internal coordination problems, the community was not able to develop the schemes until SSD came to the area in 2003. Therefore, initially, the initiating efforts for the development of the project were noted on the local community particularly of the *Hida kebele/Ashento* subclan members in the study area. The discussion made with senior and middle level mangers of the *Woreda* Pastoralist Agriculture and Rural Development Office (WPARDO) and the *woreda* administration indicated that the community including the *kebele* administration along with the WPARDO requested the regional government to develop irrigation scheme on Awra River before 2003. It was based on this request submitted to the regional government by the WPARDO that SSD came to the study area to undertake the

[5] Ato Ali Mirah, subclan leader of Lekora *kebele*, Hanefere Ali and Alawis Ahimed selected eldere from Leykora *Kebeles*; Ato Kelifa Ahimed, Subclan leader of Ashento *Kebele*; Ato Ebelene Mehamed and Ayida Eregele selected leders from Ashento *Kebele* ; discussion made at Ashento *Kebele* on April 7,2007

development of SSI in collaboration with the community and *woreda* government organization in the study area.

Nevertheless, the discussion conducted with the irrigators and non-irrigators in the four *kebeles* indicated that most of the community members except the elders and *kebele* administration leaders perceived that it was SSD that initiated the project. The analysis of the household survey's results supports the findings from the group discussion made with irrigators and non-irrigators. It confirmed that a great numbers of the sampled respondents perceived that SSD had initiated the project. Table 9 shows the responses of the sampled households regarding who initiated the scheme.

Table 9 Responses of sampled households regarding who initiated the scheme

Who initiated the scheme		Response	Percent
	Community	21	14.8
	SSD	48	33.8
	Government	19	13.4
	Community, SSD and Government	31	21.8
	Do not know	23	16.2
	Total	142	100.0

Source: Household survey, 2007

As can be observed from table 10, 48(33.8%), out of 142 sampled respondents, said that SSD initiated the project while 21(14.8%) of the respondents said that the Community initiated the project. It also shows that 19(13.4%) of the respondent said it was government that had initiated the project and 31(21.8%) responded that the community to gather with the government and SSD had initiated the scheme. The rest 23 (16.2%) said that they did not know who initiated the project.

Further analysis of the responses on table 10 revealed that almost all of the respondents who said the community initiated the project, and community to gather with government and SSD were respondents from *Hida kebele/Ashento subclan* members. Those respondents in the category of SSD initiated the project and the government initiated the project were largely from the other three *kebele*s. This variation in the responses of the household may indicate that the greater proportion of the community's members in the different *kebele*s might not have been involved in the initiation of the project. It may be the local elders and *kebele* administration that requested the regional state for the development of the scheme.

4.1.2 Project planning processes

SSD coordinated the subsequent planning processes of baseline survey, feasibility study and design of the scheme, based on the agreement made between SSD and the regional government in early 2003. The SSD was the sole actors that provided the financial and human resources in terms of skilled and professional manpower required for these processes. The roles of the government organizations, *Woreda* Pastoralist Agriculture and Rural Development Office (WPARDO) and the Pastoral Development Coordination Bureau (PDCB), were limited to providing administrative supports for legal or formal entry of SSD to the area, facilitating establishment of linkage between SSD and the community through the *kebele* administration and subclan leaders, and the collection of the required information for the project planning, feasibility study and design.

It was found out that the local community was involved in the planning and study activities. According to the discussion made with irrigators and non-irrigators, the community members were participating in providing information and guiding the technical staff of the SSD to the river course and catchments area. The discussion groups' members said that SSD's staff conducted discussion with the local community. Local elders, subclan leaders, *kebele* administration and the local government representative were present during the discussions. They revealed that the discussion centered on the

willingness of the community for the development of the scheme, the problems of food security, rainfall occurrences and flood hazards and its frequency. The discussions also indicated that there was no objection to the development of the schemes by the majority of the community members during project initiation and subsequent planning processes. Nevertheless, there was no evidence of the involvement of the community in feasibility studies. The feasibility studies for *Awra* small-scale irrigation project was confined to the technical (hydrology and engineering) aspects. There were no socio-economic and institutional feasibility studies conducted for the project (content analysis of feasibility study report for *Awra* small-scale irrigation project prepared by SSD in 2003). Thus, the lack of involvement of the community in the feasibility study may be attributed to failure of conducting feasibility study on the socio-economic and institutional issues by the SSD and the concerned government organization.

In addition, the research found out that the community and WPARDO had not identified any of the project activities components contained in the officially signed project planning document. It was SSD that planned the activities on behalf on the community, based on the information collected in the planning process. The separate group discussion made with the community, the professional employees of the WPARDO and the Awra *woreda* administration indicated that no specific tasks and responsibilities were clearly allocated to the main local development actors (the community, government organization and SSD) at the stage of the project. In this regard, (OECD, 1996:16 cited in Harrison, 2001) argued that acceptance of partnership model with greater clarity of roles of different partners, actors, is the most positive changes that help achieve self reliance development. In a true partnership local actors should progressively take the lead, while external partners back their efforts to assume greater responsibility for their overall development. Nevertheless, the field reality in the study scheme revealed that the implementing NGO shouldered the responsibilities for the coordination of irrigation activities and preparation of annual action plan on behalf of the local community and the local government organization.

The analysis of the household survey data confirmed that most of the sampled household (both irrigators and non irrigators) in the four beneficiary *kebeles* were participated in the planning process of the project. Table 11 shows the responses of the sampled household regarding the stage of the project cycle they participated at.

Table 10. Stage of the project cycle which the sample Respondents were participated at

Responses	Project Beneficiaries			
	Irrigators		Non-irrigators	
	stage of the project Participated at		Stage of the project Participated at	
	N	%	N	%
1. at planning	*12*	*24.0%*	*9*	*9.8%*
2. at the design	*2*	*4.0%*		
3. at implementation	*13*	*26.0%*	*4*	*4.3%*
4. Operation and maintenance	*3*	*6.0%*		
5. at planning, Implementation operation and maintenance	*2*	*4.0%*	*1*	*1.1%*
6. At planning and Implementation	*11*	*22.0%*	*78*	*84.8%*
7. at 1, 2,3 and 4 above	*7*	*14.0%*		
Total	*50*	*100.0%*	*92*	*100.0%*

Source; Household Survey, 2007

As shown in table 11, most of the sampled respondent said that they had participated at the planning and implementation stage of the project cycle. 11(22%) out of the 50 sampled irrigators said that they had participated at the planning and implementation stage of the project while 78(84.8%) out of the 92 sampled non-irrigators said that they had participated only at the planning and implementation stages of the project. According to table 11, it was only 7(14%) of the sampled irrigators who responded that they had participated at planning, design, implementation and operation and maintenance stage of the project. This indicates that most of the sampled respondents were participated at the planning and implementation of the scheme. The participation in the design of the scheme was very insignificant. It was only 4% and 1% of the sampled irrigators and non-irrigators respectively that said they had participated in the design stage of the project. The implication of this is that the local development actors, particularly the community,

were not actively involved in the development of the study scheme; participation is used as a means to undertake the project studies and implementation activities but not as empowering the community to actively decide on their local development affairs.

There was no appropriate institutional framework for involving the pastoralists in project initiation and planning processes including detail feasibility studies and design. They are regarded as "recipients" of the project and took only a limited role of information providers and receiver. They provided basic information on the locality, river courses, flow direction, food security situation, flood hazards and rainfall occurrences. Decisions were made by the government (regional and local government) bureaucrats and their employees as well as SSD.

There was no institutionalized participatory planning approach and structure put in place that help ensure the active involvement of the pastoralists at the grassroots level in the planning processes following the commencements of decentralized governance system in the country. The lack of capacity in terms of human resources, to guide irrigation development project planning at the regional and *woreda* level government, has created problems to establish effective partnership and ensure the active participation of the community in the development of the study scheme.

4.1.3 *Awra* Small-Scale irrigation scheme design

The overall design of the scheme (head work and system design) was carried out by Support for Sustainable Development (SSD). SSD used its resources, both technical and financial and consultants, for the design of the scheme. Nevertheless, with a greater emphasis on the technical aspects of the scheme, the designer obviously circumvented the inclusion of the socio-economical and institutional aspects in the system design of *Awra* SSI. No effort was made to involve the pastoralists in deciding on the how the operation and maintenance activities of the scheme would be carried out at the stage of the project. Thus, the existing social capital, the customary institutions that govern the pastoral

resources use and management systems, was not integrated with the new resources use and management system that emerged with the introduction of the irrigation scheme. The results of the group discussions made with the community, irrigators and non-irrigators, pointed out that the community was not clearly aware of its roles in the operation of the irrigation system and of how the maintenance of the scheme would be carried out at the stage of the project.

It was found out that the systems design lacked appropriate operation and maintenance manual, cropping pattern and cropping intensity which is well-recognized by the community and government partner organization. This resulted in inefficient utilization of the scheme and conflicts over land ownership, and forms of use after the completion of the construction of the scheme. In this regard, Ounivchit and Satoh (2002) asserted that irrigation system design must be conducive to the majority of the users and it must be clear at the design stage how the system will be operated. The boundary of the entire system and its sub-system must be demarcated for common understanding. Location of water control and division of water control responsibilities must be agreed before the construction.

The discussion made with the staff of the Awra *woreda* Pastoralists Agriculture and Rural Development Office (WPARDO) including the head of the office indicated that they did not know about how the operation and maintenances activities of the system were designed at the design stage, and even later when the construction phase of the scheme was completed. The head of the office said, "It is the responsibility of SSD to ensure the well-functioning of the scheme before it hands over the project to the local community and the government organization." The discussion also revealed that lack of professional employees that could provide technical advices to the WPARDO and the *woreda* council on the appropriateness of the scheme design for the local condition was the factor that prevented the WPARDO from actively involving in the design of the study scheme. Thus, the lack of capacity in the government organizations has restrained the active involvement of the organization in controlling and correcting the design work of

the scheme in order to ensure that the scheme is conducive to community and the local resources use and management systems.

There were no institutional set up that help reflect on the design of the irrigation scheme by involving the concerned actors to jointly decide, before the commencement of the construction work, .on the appropriateness of the design to the local context The responsible government organizations only receive what is submitted to them by the implementing NGO and approve the implementation of the project. They are not wary of the implication of the scheme on their recurrent budget and on the sustainability of the scheme utilization when the supports form the NGO/SSD stops. This may imply that the local government organization and the community will be unable to operate the scheme effectively when the support from SSD stops.

4.1.4 Construction

By the mid 2003, SSD had opened its project coordination office within the vicinity of local community at *Hida kebele.* The construction of Awra small-scale irrigation scheme started in May 2003. SSD financed and implemented the construction activities of the scheme. It assigned construction and conservation engineers, surveyors, foremen, project coordinators and supporting staff to undertake the construction. This means that the coordination of the construction activities was mainly carried out by SSD using its organizational structure for controlling the performance of its staff and the relationship of the staff with the other local development actors.

It was assumed that the community would contribute ten percent of the project cost based on the oral promise made by the members of the local community that participated in discussion meetings during the planning stage. This was indicated in project planning document as "project cost expected from community's contribution." The community; however, did not contribute for the project either in kind or cash. This is an indication of the lack of mechanisms to ensure that meaningful commitments are obtained form the

community to contribute resources for the scheme development prior to the construction stage of the project.

The results of the discussion made with the project staff of SSD indicated that it was not possible to get adequate unskilled labor for the construction from the community members for some months since the start of the construction. Most of the pastoralists were not willing to engage in construction work as they considered it very difficult and consume their energy. In addition, it was revealed that free food distribution was the commonly practiced both by government and NGO in the area. The community claimed free food distribution without participating in the construction work. This had led to temporary conflicts between SSD's project staff and the local community, which in turn, slowed the pace of implementation of the project. in order to alleviate this problems SSD conducted series of discussion meeting and awareness raising session with the community to make the community members understand the purpose of the grain resource of the project and the importance of the community involvement in the construction work to solve the problem that led to conflicts between the community and the project staff. It also involved some proportion of unskilled laborers from farmers in north W*ollo* area in combination with the local laborer that are willing to work in food for work payment so that members of the pastoral community could learn construction work from the farmers. As the community members understood that the purpose of the food grain is not for free food distribution, and saw the benefits obtained from food for work activities by those engaged in the construction work, several members of the pastoralists from the four subclan appeared to participate in the construction work on food for work basis. As a result, agreement was made between the community and SSD indicating that individual would get food grain based on the number of days an individual participated in the construction activities and payments of food grain is made fortnightly. Based on this, specific tasks and responsibility were allocated to the community. The community became responsible for the coordination of unskilled labor supply and the management of the food grain that would arrive at store in project site. For this purpose a committee comprising members of sub clan leaders, elders and *kebele* administration from the four

pastoral *kebeles* was formed by the community. The committee was responsible to coordinate the supply of labor, control the labor makeshift on a fortnight bases, resolve conflicts that arose during food-for-work payments. However, it was noted that the motive behind establishing the local committee by the community was that every sub clans' members and the *kebele* administration wanted their members to benefits from the food for work activities on equal basis. In this regard, FAO indicated that local communities and individual within the community will participate in community development activities and take collective action when the benefits are quick, visible, when they accrue only to those who participate, and when they are felt to be proportionate to the contributions (FAO, 1997:5). This means that inadequate consideration of the social organization as well as failure to ensure the commitment of the community to make contribution for the project before the start of the construction will give rise to reluctance of the community to participate, in an organized and responsible group, in the subsequent stage of the project management cycle of construction, operation and maintenance.

The roles of the government organizations, WPARDO and PDCB, during the construction were limited to evaluating the performance of the construction activities based on the annual plan submitted to them as well as providing administrative supports that help SSD to get cements and other construction material from government agency. The *woreda* administration along with the *kebele* administration were involved in maintaining peace and orders and taking corrective measures when attempts were made by some deviant members of the local community to rob the food grain from the project store.

4.1.5 Operation and maintenance

The mechanisms of carrying out the operation and maintenance activities and the main actor in charge of coordinating the activities had changed over time following the construction completion. Initially, SSD was the main responsible actor for the coordination of the operation and maintenance activities. This is in accordance with the project agreement signed between SSD and the regional government. It is stated in the agreement that SSD would be responsible for providing, trainings, education and technical support to the selected irrigators from the among the community members for two consecutive years following the completion of the construction (Content analysis of Awra Small-scale irrigation project planning document prepared by SSD,2003).

However, the separate group discussion made with project staff, members of the *kebele* administrations, the *Woreda* Pastoralist Agriculture and Rural Development Office staff indicated that it was not easy for SSD to help the commencement of the irrigation farming activities immediately upon the completion of the construction. This was because problems of ownership and use of the command area emerged as the community raised questions concerning who would be irrigators, which subclans'/*kebele* members be embraced in irrigators group as well as how would the land be farmed (in cooperative or individually etc.). Solving these problems required series of discussion between the pastoralists in the study area and the regional and local government as well as the involvement of senior political officials at regional and *woreda* level. These had delayed the commencement of the irrigation farming practices until the *woreda* and regional government solved the problems deciding the distribution of the land in the command area to four sub clan/ or *kebeles*.

It was found out that SSD's Awra small-scale irrigation project employees were responsible for the day to day management of the operation and maintenance activities of the scheme. SSD was the main and the lead local actor for the coordination of the operation and maintenance activities until October 2006. It assigned irrigation

agronomist, extension worker, and conservation and construction engineers at the project coordination office at *Hida kebele.* The staff has duties to motivate the irrigators to start irrigated farming, train on efficient water use, survey maintenance need and coordinate the extension supports. Nevertheless, no government organization and its structure at local level were involved in the preparation of cropping plan and water distribution activities.

According to the key informant (Irrigation agronomist of SSD's staff), the selected irrigators from the four subclans were new for irrigated farming activities since they did not have previous experience in managing small-scale irrigation scheme. He also added that the local level organization for the operation and management of the scheme was not clearly envisaged at the earlier stage of the project period; and when the construction phase of the project completed, there was no organized community group that was ready to undertake the operation and management of the scheme with the support of SSD. It was because of this that SSD bore the responsibilities for shouldering the operation and management of the scheme so that the irrigators could learn how to manage the scheme by working with SSD and gradually took over the responsibilities within the project period. He also added that during this period the numbers of selected irrigators that actually started irrigated farming were so few that problems of water use among irrigators were not frequently surfaced up.

Later on when relatively more and more selected irrigators started farming conflicts over water use, maintenance and land use emerged. This gave rise to initiating the formation of community based group responsible for the operation and management of irrigation system. According to the group discussions made with the SSD's project coordination office and the WPARDO, the need to form the *Awra* small-scale irrigation users' association arose from the problems SSD encountered during the operation of the scheme as relatively more and more irrigators started engaging in irrigation farming in the course of the project.

It was SSD who took the initiative to facilitate the formation of the association. It facilitated the involvement of the community (irrigators in the four *kebeles*), the WPARDO, *Woreda* administration and *kebele* administration. Series of discussion and consultative meetings were conducted on the importance of the formation of the association, the formulation of the association bylaws and the organizational set up of the association since July 10,1998E.C. Finally the association was formed and officially started carrying out its responsibilities as of October, 2006. From October 2006 on, the operation and maintenance of the scheme was managed by newly established local organization known as *Awra* Small-Scale irrigation Users' Association.

Organizational set up of the association: The Association has 500 members from the four sub clan irrigation beneficiary *kebeles* (Hida, *Leykor, .Lekuma and Aliberi Mesgid*). The general assembly that is the decision making body of the association convenes at least three times a year and must be attended at least by 50% of the members(the *Awra* water users association organizational bylaws, Amharic, October 28, 1998 E.C).

The executive body of the association comprised 14 elected elders from each of the four *kebeles* and approved by the general assembly. These members were represented on equal proportion from the four *kebeles,* that is, each of the four *kebele* elected three elders to be represented in the executive body of the association. But two women members were included in the executive body based on their active involvement in the irrigation activities and the recommendation of SSD and the *kebele* administrations. The executive body is structured to have two committees: Water distribution, and control and mediator committees. There is also president, vice president, committee chair men which considers representation across the beneficiary *kebeles* for their election. There are 36 block leaders who are responsible for water allocation and canal maintenance in their respective block (one block contains 5-7 hectare or 12-25 irrigators). Each of the committees should work in unity and in close collaboration with block leaders. The activities of the water distribution committees and the block leaders were supervised by the project control and mediator committee of the executive body. The responsibilities of the water committees

were water distribution, resources mobilization for maintenance, conflict management while water allocation was being carried out by the project's extension workers (the *Awra* water users association organizational bylaws, Amharic, October 28, 1998 E.C).

Formulation of the rules of the association: Rule for operation and water management was formulated by SSD in collaboration with the WPARDO and *woreda* administration council, the community and *kebele* administration as part of the processes of the *Awra* Irrigation Users' Association formation[6]. The rules contained in the organizational charter of the association clearly spelt out the roles and responsibilities of the association, the leaders of the association and its members. It also describes the relationship between the members and the leaders of the association. Nevertheless, it did not indicate the relationship of the association with *kebele* administration and the customary institutions that govern resources use and management in the area. The rules are written and documented only at SSD, the *Woreda* Pastoralists Agriculture and Rural Development Office and the executive body of the *Awra* small-scale irrigation users' association. But the irrigators were orally told the rules, they don't have the document. They run the operation simply as a commonly understood convention, recall punishment rate as the specific cases occur although the water users' association does have organizational charter. That means that the formulated rules as contained in the organizational charter of the users association are not well-understood by the users. The household survey result confirms this too. The household interview results show that the majority of the respondents do not know what exactly the rules for controlling water distribution breaches say. The responses are summarized in table 11.

[6] Group discussion made with project staff of SSD at *Awra*, the WPARDO staff members, head of the office, food security expert, cooperative section head, Arid agriculture expert, by the researcher April 2007

Table 11 Users Knowledge of the content of the rule for controlling water distribution breach

Responses	N	%
There is punishment in money Ranging from 10-400 birr	16	32.0%
Water should not be wasted; it should be used properly	11	22.0%
Water should be distributed in turns	7	14.0%
Water should be allocated according to crop type	8	16.0%
No response	8	16.0%
Total	50	100.0%

Source: Household Survey, 2007

The following arrangement can be extracted from the results of interviews with water committee members, users' responses in the household interview

1. Every users has the right to use to their allocated land for irrigation
2. Every user should use water properly to avoid waste.
3. Water should be distributed in turns following spatial sequence of plots
4. Water distribution should be controlled by water distribution committee and irrigation block leaders in each irrigation block
5. Every irrigator should participate in the canal clearing and maintenance activities on major and communal secondary canal
6. Conflicts should be managed by the water committee; if the conflicts are beyond the capability of the committee, they should be referred to the control and mediator committee and the *kebele* administration
7. Irrigators should properly water their plots and timely weed their farm.
8. Every user should take care that his/her livestock so that livestock should not cause damage in the irrigation system.
9. Users who do not respect the above arrangement should be punished according to the following arrangements.
    - 400 Birr for those who let their camel to irrigated crop area
    - 200 birr for those who violates irrigation water turn and divert water to the field by breaking the systems structure

- 100 Birr for those who did not let other irrigators to have used their water turns, once they used the time allowed for their turns.
- Those who watered their livestock on irrigation canal would be fined : 10 Birr for cattle, 20 birr for camel, and ten Birr for small remunant
- 100 Birr for those who did not irrigate their water and weeds their farm due to negligence.

It was found out that the water distribution committee refers conflicts management cases beyond its capability to the control and mediator committee and *kebele* administration. Nevertheless, it was revealed that it was difficult to enforce the rules as formulated particularly when the convicts are non-irrigators. This was due to the fact that the control and mediator committee, part of the executive body of the association, are not considered neutral in the eyes of the non-irrigators "criminal" ,and the *kebele* administration is not cognizant of the rules contained in the organizational charter of the association. Fortunately, conflicts hardly escalated to the extent of leading inter-sub clan conflicts thanks to kinship relation, culture and respects to power and reasons that has prevailed in the pastoral communities in the study area. The implication of this is that the project design that did not consider the clan based resources use and management system and the existing social organization, while forming the association and the formulating the rules for the operation and maintenances of the irrigation system, will lead to ineffective utilization of the scheme when more powerful sub clan members and other local elites gradually inclined to have disproportionate share of the benefits of the scheme. Therefore, the local and regional government should be wary of the future implication of this state of affairs on the inter-sub clan cohesiveness, pressure of the administrative routine and on the sustainable settlements of the pastoral communities along the major river line using small-scale irrigation scheme.

4.1.5.1. Water allocation and distribution

Water distribution to the different irrigation blocks and plots was decided by SSD's Awra project staff employees, Agronomist and Extension workers. They are responsible for preparing water distribution plan every year. The plan was mainly based on the number of irrigators that had shown commitment to start irrigated farming by participating in the project annual plan of action and preparing their irrigable land. According to the key informant[7], the staff determined the number of irrigable plots expected to be cultivated based on the information obtained in the annual action planning meetings with the irrigators and decided the distribution plan accordingly. However, no detail water distribution and farming schedule were available indicating the frequencies of water distribution, start and ends of irrigation seasons as well as the magnitude of water required for different crops. The annually prepared water distribution plan was not usually communicated and discussed with the irrigators. With no forum for irrigators and staff to discuss on water distribution matter, irrigators that were not embraced in the annual action plan, but may have started farming lately, could not negotiate with irrigators that were embraced in the plan and started farming earlier in an irrigation seasons. This had been putting SSD's staff in confrontation with the late starters in every irrigation seasons in a year.

The results of the group discussions made with irrigators confirmed that late starter of irrigation farming often created problems on water use when they forcefully tried to irrigate without discussing with the staff of SSD and irrigators that already cultivated their plots in an irrigation seasons. They indicated that irrigators who usually started cultivating their plots lately are pastoralist who do not have adequate labor and are not able to hire labor for farming activities. This group of irrigators did not appear during the annual planning meeting as they are occupied in herding activities.

[7] Ato Nemrude,Irrigation Agronomist ; Ato Belachew, Extension worker; and Ellisa, general agriculturalist of SSD Project coordination staff, Interview made by the researcher, April 2007 in the study area.

With the formation of Awra Small-Scale Irrigation Users' Association, rules governing the operation and maintenance of the scheme were given to the association members and the leaders. The water distribution committee of the executive body of the association was responsible for equitable distribution of water among irrigators, control the water distribution and manage conflicts by working with the block leaders closely on matter related to water distribution. Nevertheless, there were no water application frequencies and magnitudes for different crops which are recognized as rules for irrigation water use by the actors, SSD and the community, even if the association was formed. According to the discussion made with the members of the executive committee of the association and SSD's project staff, water distribution had been undertaken following spatial sequence of irrigation blocks and plots after the formation of the association. However, there was no mutually accepted procedure indicating whether priority is for the tail-enders or head-enders. As a result, the problems on water use between the late starters and early starter of irrigated farming in an irrigation seasons were still taking place. It was also found out that some irrigators at the middle reach and lower reach of the main canal were not able to get irrigation water as some irrigators in the upper reach and middle reach commit water distribution breach. The association leaders were not able to enforce the rules. Most of the members of the executive body of the association were usually not available on their duties as they may be engaged in herding activities like other pastoralists in the area. They were not able to entertain when complaints on water distribution breach occurred. Besides, some parts of the canal were usually filled with silts and broken. As a result, flow of water is blocked; and irrigators below the broken canal did not get water even during their turns since canals were usually not maintained timely.

The analysis of the household survey's data showed that many of the sampled irrigators did not know the crop water requirement rate for different crops. Table 12 presents the analysis of the data obtained from the household survey.

Table 12. Knowledge of crop water requirement rate by the sampled irrigators

Responses		N	Percent
	Yes	8	16.0
	No	32	64.0
	No response	10	20.0
	Total	50	100.0

Source: Household Survey, 2007

As indicated in the table 13, out of the fifty sampled irrigators 8(16%) said that they knew crop water requirement rate given by project's extension workers, 34(64%) of the sampled irrigators responded that they did not know the crop water requirement rate and the rest 10(20%) did not responded to the questions. This means that the irrigators do not have knowledge of the crop water requirement for their irrigation practices. This may be due to the fact that irrigators were not actively involved in the project design and formulation of rules for the operation of the schemes or the project implementing NGO and the partner government organization may not have put in place appropriate irrigation extension support to help the irrigators know the crop water requirement to the different crops that they would produce using irrigation.

Regarding the magnitude of water allocation to different crops, the key informant[8] expressed that crop water requirement rate for a different crop type was not set since the cropping pattern and other agronomic feasibility studies were not carried out during the study period of the project. As a result, he said the staff decided water allocation to different types of crops based on their knowledge of the type of crop sown. Irrigators apply water based on the advice and close supervision of SSD's staff (irrigation agronomist and extension workers) for fulfilling crop water requirement. The interview made with the project's extension workers revealed that users always tried to over-irrigate their plots assuming that more water would give more yields despite the advice of the project workers that more water would bring about salinity of irrigated field and

[8] Ato Nemrude, Irrigation Agronomist of SSD at Awra Project office, interviewed in April,2007

reduction of crop yields.

Lack of enforcing the rules as contained in the organizational charter of the association was also observed as factors that encourage breaches like over-irrigation. This emanated from the fact that most of the block leaders did not appear on their duty regularly to entertain complaints on water use turns. Like other pastoralists in the study are they went with their herds and camel in quest of pasture to further away places. This has created loophole that allow some irrigator commit breaches and over-irrigate their land. Furthermore, a number of irrigators did not regularly cover their plot with crop in most of the irrigation season in a year, and this gave opportunity for those irrigators that covered their land to have more time to water without any complaints and over-irrigate their fields. The discussion made with the water distribution committee members of the irrigation users' association indicated that the members of the executive body of the association are not familiar with the crop water requirement rate, in terms of the time period required for a crop type. They indicted that the water distribution committee and block leaders, who are responsible for water allocation in their respective block, usually undertook the water allocation with the advice of the project's workers, irrigation agronomist and extension workers of SSD, on matters related to fulfilling the crop water requirement rate. This implies that water allocation based on the crop water requirement rate is not the routine activities of the association. Hence the association is not self-reliant in managing the water allocation based on the crop water requirement rate.

Secondary canal structure usually silt up and hinders the flows of water to different blocks through water division boxes, so some plots may need extra time to clean the canal and get water. The location of the individual plots within the command area in relation to the canal is also sources of difference for water distribution turns among the currently irrigating pastoral households in the study area. Another reason that has affected the equitable distribution of water was the decreased in volume of the river discharge during dry seasons (May-June) as well as in February-April. In this period of the year irrigation water became so scarce that irrigators at head-ends of the canal failed

to get sufficient amounts of water for their crops. The household's survey's results showed that a great number of the sampled irrigator households held the view that water is not shared fairly among users. Table 13 shows the responses of the sampled households regarding their feeling about the fairness of water share.

Table 13 Users Feeling about The Fairness of Water Share

	N	%
Fair	*21*	*42.0%*
Unfair	*23*	*46.0%*
No response	*6*	*12.0%*
Total	*50*	*100.0%*

Source: Household survey, 2007

The table 14 shows that 42% of sampled irrigators felt that water share was fair, 46% felt that it is unfair, while 12% did not expressed their feelings. The 46% users who felt water share was unfair gave illegal uses of waters by some power full irrigator households during dry season time as a reason for the unfairness. In addition, these respondents said that they are among users who get less water because they were powerless.

4.1.5.2. Maintenance of the scheme

SSD was the sole actor responsible for the coordination of the maintenance operation of the irrigation system until the formation of the *Awra* small-scale irrigation user's association in October 2006. According to the group discussion conducted with the SSD's project coordination staff and the WPARDO, SSD was carrying out both minor and major maintenance activity, silt clearing from the main and secondary canal, weeding the banks as well as special maintenance required on the control gate and division boxes. SSD was also the one that provided the resources, financial, material and technical human resources, for the maintenances activities until the period of data collection for

this research. The role of the local community in the maintenance activities was limited to daily labor provision on food-for-work payment for the maintenance work, usually initiated by SSD. This was because there was no organized community group that could bear responsibilities for coordinating the maintenance activities by working with SSD except the local project committee organized during the construction period. At interview, the key informant (the construction engineer of SSD) indicated that great shortage of the required local labor from the irrigators for the maintenance activities during the initial period of the irrigation farming activities was one of the reasons why SSD was bound to use food-for-work for the involving the community in the maintenance work. He said that, at this period, most of the irrigators did not start irrigated farming practices and they were not available in the locality when the need for the maintenance work was recognized by SSD. As a result, SSD used to involve both irrigators and non irrigators in the maintenance work using food for work payment as incentive to attract more local labor.

On the other hand, the research found out that there was no detail schedule for the maintenance activities prepared by the project and discussed with the irrigators as well as specific tasks and responsibilities, with clear agreements negotiated with them, were not given to the them, even upon the completion of the construction work. The discussion conducted with SSD's project staff members indicated that SSD initiate the maintenance work when its project employees saw the need for the maintenance of the scheme in any of the month in a particular year.

With the formation of *Awra* small-scale irrigation users' association in October 2006; however, allocation of tasks and responsibilities to the irrigators were made. Tasks and responsibilities allocated to them were clearly spelt out indicating the types of the tasks, how the association/or the irrigators carries out the tasks, the responsibilities of the executive body of the association and the members. These are contained in the charter of the association and documented at SSD, WPARDO and in the executive body of the association. The discussion made with members of the executive body of the association

confirmed that the members were cognizant of the responsibilities of the association and the tasks that the association should accomplish. Nevertheless, the discussion group members revealed that the executive body encountered problems in coordinating the maintenance activities. They said that every member was not equally committed to participating in the maintenance activities. The variation in distance of the settlement area of members from the irrigation farm, presences of members who did not start irrigation farming or who did not regularly engage in irrigated farming, and lack of incentives such as the curtailment of food for work payment after the formation of the association, were mentioned as reasons for the problems of coordinating and mobilizing the irrigators for the maintenance activities by the association leaders. On the contrary, irrigators indicated that the irrigators were not well-cognizant of their roles and responsibilities for the maintenance of the irrigation structure. They disclosed that because of the curtailment of food for work with the formation of the association they were not able to involve in both the main and the secondary canal clearing activities as they used to do before the formation of the association. They pointed out that the maintenance activities required large labor force and energy that they could not engage without payment to maintain the structure. As a result, they added that canal structures were not regularly desilted and maintained after the formation of the association. The researcher observed silted-up secondary canals, stone filled division boxes and miss-located wooden control gate, which stayed not maintained for more than a month, at different places along the secondary canal structure. According to the key informant interview and the group discussions made with the members of the executive body of the association, the structure was not maintained since irrigators and block leaders in that particular block did not start farming activities or block leaders and most of irrigators may have gone to distant area with their herds in search of pasture for their livestock or for other livelihood activities. This may indicate that unless further attempts made to make the community clearly aware of their specific roles and responsibility in the maintenance work of the scheme, farming operation, actively involves in the formulation of the rules and regulation of the users' association, the scheme structure would not be effectively utilized and the sustainable function of the scheme structure will be in question. Therefore, the local

government organization and SSD should try to develop mechanisms to support maintenance work of the scheme until significant members of the community start irrigation farming, rather than fully relying on the pastoralist's labors when damage and heavy silt-up of canal occurs.

The perception of the users towards the ownership of the scheme is also one of the problems that make the users not committed to maintenance activities. The key informant[9], revealed SSD used to pay the community for their participation in the construction activities, during the construction period, and when heavy damage occurred on the irrigation structure due to unprecedented flood that this practice gave rise to many of the local community members to feel that the scheme belonged to SSD and think as if it were the sole responsibilities of SSD to maintain the structure of the scheme. This feeling has been surfacing up even the after the establishment of the water users' association. The case of Eblene[10], who is one of the elders in *Hida kebele* and irrigator, needs worth considering here. He said,

> Most of the community members are running after their short term benefits while we are offered a big resource, pointing at the irrigation structure, by SSD to enable us to have sufficient food and teach our children. SSD has contributed a lot for our community. It enabled us to restock some of our livestock asset lost in 2002-2003 droughts by allowing us to involve in food for work activities. Nevertheless, most of the community's members always demand grain payment for their participation even for small maintenance work like secondary canal clearing, weeding the bank in the main system. I usually hear this being talked among the community members since I am within them. The leader of the water users' association is lame to take serious action on those users who do not want to participate on the maintenance activities. They are only taking their salary from SSD without doing any meaning full job. There are complaints from the communities (both the currently selected irrigators and non-irrigators) on the formation of the association and the distribution of the benefits from the irrigation system. Youths, recognized elders, local spiritual leader (*'Kalicha'*) were not involved in the processes of the formation of the association and election of the leaders of the association. It was the *kebele* administrations members and some elders, who are agent of the *Woreda* administration and paid regular salary by the government that manipulated the election of the leaders and covered the affairs, which the communities think need resolution before the formation of the association, when they are trying to raise them. I am in fear how the scheme functions when SSD leaves our area because there is disagreement among us on the water committee and the land tenure issue.

The results of the household survey disclosed the fact that most of the sampled irrigators

[9] Irrigation Agronomist of SSD at Awra irrigation project, interviewed by the researcher, April 2007
[10] Ato Ebelene Mohamed, one of the elders of the Ashento subclan, interviewed by the researcher at the project site, April, 2007.

perceived that the structure belonged to SSD or the government. Table 15 presents the findings of the survey.

Table 14 Ownership of the structure as perceived by users

Responses		Percent
The government's	13	26.0
The community's	7	14.0
The government's and the community's	6	12.0
SSD	24	48.0

Source: Household survey, 2007

As Table 15 shows, only 14 % of the respondents perceived that the structure belongs to the community, 12% of the respondents felt that the structure belongs to the community and the government, 26% responded that the structure belongs to the government, and 48 % of the respondents considered the scheme belong to the SSD. This might causes differential commitment among users toward maintenance of the scheme structure after the formation of the association. Experience in other irrigations scheme has indicated this. Huber and Urban(1997) have disclosed that attempts made in 1990s in Haiti, to transfer the operation and maintenance responsibilities of St. Rapael irrigation scheme, which was under state management before 1990s, to the users resulted in inefficient utilization of the scheme due to lack of commitment for regular maintenance of the scheme under the new management system, users' managed system tried in 1990s, for the users perceived that they are not owners of the scheme, considered the state the beneficiaries and themselves as the supplier of labor to the government. This was because the users had most taken part in the scheme as paid workers before the 1990s (Huber and Urban, 1997). Differential commitment was also observable from users' responses concerning the frequencies of their participation, and the part of the scheme where they have participated in maintenance in comparison with the situation before the formation of the *Awra* small-scale irrigation users' association and after. Table 15 and 16 depicts the results of the household responses.

Table 15 Frequencies of users' participation in the structure maintenance before and after the formation of the users' association

Responses	Before the formation of the users' association		After the formation of the users' association	
	N	%	N	%
1-3 times a year	11	22.0%	20	40.0%
4-6 times a year	31	62.0%	9	18.0%
7-10 times a year	7	14.0%		
no response	1	2.0%	21	42.0%

Source: Household survey, 2007

As Table 15 shows, frequencies of user's in the structure maintenances changed greatly in the two situations. Thirty one respondents, sixty two percent, out of the 50 sampled irrigator households, said that they used to participate 4-6 times in the maintenance of the structure before the formation of the users' association but after the formation of the association it was only nine respondents, 18% of sampled irrigators, said that they have participated 4-6 times in a year in the maintenance of the scheme structure. The number of respondents who said they had participated 1-3 a year also showed variation in the two situations. Before the formation of the association, 22% of the sampled respondents revealed that they had participated 1-3 times a year, while after the formation of the association twenty respondents, 40% of the sampled irrigators, responded that they had participated 1-3 times a year. The no response categories were higher 21(42%) in the situation after the formation of the association. Complimentary to Table 15, Table 16 shows the responses of the sampled irrigators in regard to the question to which part of the scheme that users had participated in the maintenance activities.

Table 16 Parts of the scheme structure users have participated in maintenance activities before and after the formation of the association

Responses	Before the formation of users' association		After the formation of the users' association	
	N	%	N	%
On my own plot and on canal leading to my irrigation block	5	10.0%	3	6.0%
On main canal	6	12.0%	20	40.0%
At any point of damage on the structure	36	72.0%	5	10.0%
No response	3	6.0%	22	44.0%

Source: Household survey, 2007

It can be observed from table 16 that thirty six respondents, 72 % out of the 50 sampled irrigators, said that they had participated at any point of damage before the formation of the association, but it was only five respondents, 10% of the sampled respondents that said they had participated at any point of damage after the formation of the association. The part of the scheme at which the larger number of the respondents participated after the formation of the association is the main canal. Twenty respondents, 40% of the respondent, said that they had participated in the maintenance work on the main canal after the formation of the association. This may indicate that the level of commitment of the users to the maintenance work has decreased with the formation of the association. The reasons might be the decrease in the food for work payment incentives that they used to get before the formation of the association from SSD in which they were highly beneficial.

The researcher identified that there was no organization in local the government structure that was put in place or envisaged to provide technical support to the local community regarding the maintenance of the irrigation structure upon the culmination of the project period. The only government organization at the local level that is somehow in charge of

farming activities was the *Awra woreda* Pastoralist Agriculture and Rural Development Office (WAPRDO). The discussion made with the head of WPARDO indicated that the office did not have technical and managerial capacity to lead the coordination of the operation and maintenance activities of the *Awra* small-scale irrigation scheme. It was not ready to takeover the project from SSD unless the regional government assigned adequate budget and professional employees. The data obtained from the office vindicated what was revealed during the discussion. The data indicates that the offices do not have technical employees with diploma or university degree on water works, conservation engineering/agricultural engineering or agronomist, agricultural extensions with management experience in irrigation sector. The implications of these are that the local government will not be able to bear responsibilities for ensuring the continuity of the function of the irrigation scheme with the level of capacity it had when this study was conducted.

4.2 Organization and supporting services

The path to irrigated agriculture is very difficult and long even to farmers who are accustomed to rain-fed farming activities through their life, let alone to pastoralists, who pursue animal rearing all their lives with a little cropping activities. A significant factor affecting irrigation project performance is accessibility of the rural poor to information, capital and agricultural inputs (FAO, 1992 in Darut, 2004). Thus, provision of supporting services like agricultural extension (training, education and technical supports), saving and credits is a key to success in irrigation project. Nevertheless, the question how such supporting services provision is coordinated needs worth considering seeing the continuity of the supporting services provisions to bring success in irrigation project and ensure the sustainability of the achieved results of the project.

In this section, irrigated farming practices of the community of irrigators in the study area are seen from the following perspectives:

1. The availability of regular supporting services specifically farm input supply and irrigation extension services to the local community.
2. The decision of the irrigators to undertake irrigated farming practices or utterly engage in irrigated farming practices

The first perspective will show us what types of service are being delivered to the irrigators, how and who delivers these services. This enables us to grasp the type of institutional arrangement prevailing in providing the types of support identified and the mechanism employed to provide the services as well as the prospects for the continuity of the provision of the services. The second perspective will indicate who benefits from the irrigation farming, who missed the opportunity and what underlying factors were contributing for the differences in the benefits sharing among the irrigators.

Types of Support Services: Irrigators were being provided with different extension support services such as skill training on irrigated farming, soil and water conservation techniques, improved crop varieties (cereals and vegetables), improved forage species and payment for draught oxen rent. It was found out that it was SSD that was providing the irrigation extension supports to the irrigators. The group discussion conducted with the irrigators showed that SSD was the sole actors that they knew that had been providing them farm inputs and other extension supports though not all irrigators received such supports from SSD. According to the discussion, the irrigators' contact with SSD is regular and accompanied by visits to irrigated plots and advices based on field observation by the extension workers of SSD. They pointed out that they did not receive agricultural inputs like DAP and Urea, either from SSD or local government (WPARDO). They also added that pests and weeds were affecting their vegetable and cereal crops in different times of the irrigation seasons in a year resulting in a great loss in their crop yield.

The key informant, SSD's irrigation agronomist, noted the importance of the fertilizers for increasing the production and productivity of the irrigable land but it was not possible for SSD to provide such inputs to the irrigators. It is costly, requires close supervision of

the application, training provisions on how and when to apply fertilizers and more staff at project level to coordinate such activities. But SSD can not afford to hire more staff on regular employment basis due to budget shortage. He also confirmed what the irrigators raised concerning the pests and weeds. He described that different types of pests and weeds were affecting the amount of yield of irrigated crop in different seasons of irrigation production. SSD's staff identified the pests and the weeds, the types of crops they affect, and the seasons in which they most affect the level of yields of the crops based on field experience or trails. He added that the finding of the experiment on the effects of the pests on crop yield loss and their relation with irrigated cropping practices was documented and communicated to the concerned government organization at regional and local level. But its was merely taken as regular reports; and no formal discussion meeting was held on the findings to indicate the way forward to develop appropriate support services arrangements that help the irrigators get regular extension support on irrigation production

Coordination of the support provisions: SSD was the lead and sole actor in planning and delivery of the extension support to the irrigators on annual basis. It has assigned two staff, irrigation agronomist and general agriculturalist, at the community level. These staff members of SSD are responsible for coordinating the plan and provisions of the services at the community and local government organization level. The pastoralist liaison officer, employee of SSD, helped the transfer of information about the training schedule to the irrigators who are settled further away from the project and those were occupied in herding activities at distant places by using the traditional information channel-*Dagu.*

At interview, the same key informant mentioned earlier, stated that the duties of SSD's staff at the project level, among others, were to prepare annual action plan and implement it upon approval of the plan submitted to the regional state. He confirmed that the preparation of the annual plan was carried out based on the assessments of the crop seeds need of the irrigators. The irrigators decided the types of crops they required during the

need assessment, which is usually carried out in December. Based on this, the types of crop seeds and the quantity required would be included in the annual plan of action for the project. Nevertheless, the local government organization did not involve in the preparation of annual plan of action. This had limited the coverage of irrigators that would receive adequate support for undertaking irrigation activities. The WPARDO reported that there had not been a practice of joint action plan preparation between the two actors with a clearly set roles and responsibilities for providing supports to the irrigators. The office said that lack of adequate staff capacity, budget, and coordination skills at the local government organization (WPARDO) had restrained the active involvement of the organization in coordinating the delivery of supporting services to the irrigators in collaboration with the NGO/SSD.

The research observed that the coordination of plans and action among the local organizational development actors (SSD, AWPARDO and concerned regional bureau) was not effective. There was not any regular joint forum, well-recognized by the organizational actors that help the preparation of joint annual action plan regarding the provision of supporting services to the local community. It was found out that the only joint plan recognized by the SSD and AWPARDO was the performance evaluation of the study scheme on quarterly and annual basis. This emanated from lack of workable institutional arrangement for coordinating the action of the different local actors in improving the livelihood of the pastoralist using irrigation farming.

Mechanisms of delivering the services: it was found out that the exchange of support services (provision of farm inputs such as varieties of vegetable and cereal crop seeds and rental supports for oxen) between the irrigators and SSD is characterized by the condition that irrigators should prove their commitment to engaging in irrigation practices by demonstrating their efforts in the preparation of plots and participating in annual action. The extension workers of SSD checked the efforts of the irrigations and delivered the required inputs to irrigators. It was revealed that irrigators made no payment for the inputs delivered to them. This may be an indication of the fact that SSD was not able to provide fertilizers input to the irrigators though there was a need. This implies that the

institutional arrangement governing the relationship in the exchange of such services between the irrigators and SSD is very close to charity system since the *quid pro quo* expected from the irrigator to get the services is only revealing his/her commitment to engaging in irrigation practices in a particular year.

Coverage of the service supports: It was found out that the irrigators that had been provided with farm inputs (varieties of improved vegetable and cereal crop seeds) were very low. The coverage of the extension support service, measured in terms of the proportion of irrigators who obtained farm inputs in the different irrigation seasons. Indicated that the project was not able to reach at least 50% of the irrigators to have used the inputs and engaged in irrigation farming. The table 18 indicates the types of crops seed supplied, the irrigable land cultivated in Ha and the number of irrigators that obtained the farm inputs from SSD in different irrigation seasons of Nov 2005 to April 2007).

Table 1

Table 17 Varieties of crop seeds provided , hectare cultivated and number of irrigators reached

Crop types	Nov 2005-Feb2006				March 2006-Jun2006			July 2006-oct2006			Jan2007-April 2007		
	Varieties	Yield Qt	HA	irriga tor	Yield Qt	HA	irriga tor	Yield in Qt	HA	irriga tor	Yield Qt	Ha	irriga tors
Maize	BH541,G1, Bh542	3516.5	59.0	148.0	385.0	12.0	31.0	990.0	16.0	49.0	2612	87.1	218
Sorghum	Teshale,Abela	91.0	10.0	25.0	0.0	0.0	0.0	378.0	6.0	15.0	0.0	0.0	0.0
Onion	Bombay red	67.0	5.0	13.0	8.0	0.2	1.0	16.0	0.8	2.0	12	4.0	10.0
Tomato	Marglobe	28.0	1.0	3.0	0.0	0.0	0.0	9.0	0.2	1.0	75	1.3	3.0
Green pepper	Mareko funa	30.0	3.0	8.0	6.0	0.6	2.0	50.0	5.0	12.5	40	4.0	10.0
Cauliflower	Copenhagen	25.0	0.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	12	0.2	1.0
Cesame	Cessame	9.0	2.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	Total		80.3	203.0		12.8	34.0	0.0	30.0	75.0		96.5	242.0
Coverage				40.6 %			6.8%			15.0 %			48.4 %
Cropining[11] intensity	**0.4**				**26.15**								

Source: SSD's *Awra* project office and own analysis

[11] It is calculated based on the assumption that irrigation farming practice did not start upon the completion of the construction of the scheme from jaunary to September, so the cropping intensity of the irrigation seasons from January 2005 to February 2006 is calculated as total area covered*number of times the land was covered in a year divided by 200.

As indicated in Table 17, SSD was able to reach 203(46.6 %) , 34(6.8%) and 242(48.4%) out of the total 500 irrigators in Nov2005-Feb2006, March 2006-June 2006 , and January 2007-April 2007 irrigation seasons respectively. The land irrigated in each of the irrigation season was 80.3ha, 12.8ha and 96.5ha respectively.

The key informant, irrigation agronomist of SSD, revealed that, at the initial irrigation season, it was SSD that covered all the expenses of the land preparation and other activities with the labor involvements of irrigators who were willing to participate in irrigation farming on their allocated land. According to the key informant, SSD covered these expenses based on the assumption that irrigators, having seen the benefits of the first irrigation season's results, would start the land preparation by themselves in the next irrigation seasons and ask SSD for seeds and other technical support. Nevertheless, as table 18 indicates, it was only 34(6.8%) of the total irrigators that appeared to ask seeds in the next irrigation seasons. The reasons for this were lack of oxen, shortage of labor, and skill in farming activities in the irrigator household that hindered them to prepare their land and ask the seed from SSD. Based on these problems of the irrigators, SSD discussed with the irrigators and made arrangement to provide oxen rental cost for those who showed their commitment to practice farming by participating in annual action plan preparation and showing their efforts to engage in land preparation before the provision of the seeds. That was why the number of irrigators that were provided with the inputs in the last two irrigation seasons shown in table 17 increased compared to the second irrigation season in the table. This may implies that the number of irrigators who are currently practicing irrigation may decrease, if the support of the SSD ceased, unless regular education and inputs provisions mechanisms are put in place.

It was also found out that the SSD does not have ample resources to cover all the cost of delivering extension support services to reach most of the irrigators. This is because it requires considerable amount of money to initiative the local community to fully practice irrigated farming through conducting repetitive awareness raising campaign, education and incentives in the form of supplying farm inputs on free basis to all 500 irrigator

households. Thus, SSD revealed that it is difficult for it to reach all irrigators and enable them effectively engaged in irrigated farming activities within the course of the project period. The lack of adequate budget and functional institutional arrangements that enhance effective collaboration among the local actors limited the number of irrigators that have enjoyed extension support services and engaged in irrigated farming activities at least once in a particular cropping year since the start of irrigation farming in 2005.

The implication of this is that it is not possible to provide the required farm inputs supply to most of the irrigators by the sole supports of project implementing actor-SSD. The continuity of the supports that were being provided is in questions, for there was no joint agreement among the organizational development actors on the mechanisms of delivering the supports on regular basis in the future.

Furtherer analysis of the data in Table 17 indicated that level of utilization of the irrigation potential is very low as measured in terms of the cropping intensity achieved. If we measure the cropping intensity, and make educated guess on the benefits forgone by not utilizing the uncultivated irrigated land for grazing purpose, the result will shed light on the under utilization of the potential of the scheme. For simplicity, assume that average holding of irrigated land in the command area is 0.4ha (the holding ranges from 0.33 to 0.5 hectare), on average, irrigator engaged in irrigated farming only once in a year (based on the household survey data see table 19). It was indicated above that the total number of irrigators who engaged in irrigated farming until the time data were collected for this research was 217(SSD, 2007). Based on this, it can be obtained that only 86.8 hectare out of the 200 hectare of irrigable land planned to be irrigated was covered by crop at least in 2007, which implies that around 114 hectare was left fallow and the cropping intensity is below 50%. This means that the irrigation scheme of this study did not able to make the pastoralists to produce more than once in a year on average since the start of the operation activities of the scheme. In this regard, World Bank report has revealed irrigation sector has experienced difficulty in delivering its services in an efficient, sustainable and ecologically sound basis since the views of planners has so far

been fixed almost exclusively on the creation of infrastructure stock and not on the effectiveness and efficiency of the intended support provisions (World Bank, 1994). Therefore, mechanisms to efficiently provide supporting services for the utilization of irrigation infrastructure should be worked out and incorporated in irrigation project planning with clearly set roles for actors along with the envisaged institutional arrangement for governing the mechanisms for the exchanges of the supporting services between irrigators and support providers.

In regard to the second perspective mentioned at the beginning of this section, lack of adequate experiences and skills in cropping activities, shortage of oxen, labor shortage, distance of settlement, financial capital, availabilities of seed and farm equipments, and attitudes of the households were the main factors affecting the decision of the selected irrigators to practices irrigated farming activities or not to engage in irrigated farming. With regard to irrigators that did not regularly practice irrigation faming and those who have not yet started since the time irrigation plots allocated to them, the discussion made with irrigators and elders indicated the above factors as the main reasons that restrained them from practicing irrigation farming even if they got supports on land preparation and seed provision from SSD. The members of the discussion group explicated that irrigation farming practice is very labor demanding. Works after land preparation need close supervision of the farm to water timely, to cultivate and protect the field from livestock interference. All these require adequate labor and farm equipments. But they said they did not have the farm equipments to undertake farm activities even if they were supported with rental payment for oxen use for land preparation by SSD. They disclosed that labor force in their households is not adequate to perform both livestock rearing and irrigation activities. Most members of the household were children. The limited active labor forces available in the household were usually allocated to livestock rearing. Besides, they said shortage of financial capital constrained them to engage in irrigation practice by hiring labor (usually *Amhara* farmers from Hara area in north *Wollo*) or giving up their land to share croppers (usually *Amhara* farmers in Hara area in North *Wollo*). This was because they added that this arrangement of utilizing the irrigable land require 12 Birr a day

besides provision of daily consumption and accommodation for the hired labor and to the share cropper in the area. It was also revealed that the share croppers are available only to those members of the local community who have relation with farmers in north *Wollo* area either through marriage or through other long time acquaintances. As a consequence, they were not able to regularly practice irrigation practice.

Irrigators who regularly practiced irrigation farming were those who can afford to hire labor and those who have relatively adequate labor in their households. The cross tabulation of the frequencies of cultivating the land in a year with use of hired labor in irrigation farming activities of the sampled irrigators households will give better information on who benefits and who do not from the irrigated farming. Table 18 presents the information from the household survey on the frequency of engaging in irrigation farming by the sampled household.

Table 18 Cross tabualtion of Irrigators regularly use hired labor and the number of times an irrigator covered land with crop a year

			The number of times an irrigator covered its land with crop a year				
			0	1	2	3	Total
Irrigators regularly use hired labor	Yes	N	0	2	14	7	23
		% within Irrigators regularly use hired labor	.0%	8.7%	60.9%	30.4%	100.0%
		% within The number of times an irrigator covered its land with crop a year	.0%	15.4%	93.3%	87.5%	46.0%
		% of Total	.0%	4.0%	28.0%	14.0%	46.0%
	No	N	0	11	1	1	13
		% within Irrigators regularly use hired labor	.0%	84.6%	7.7%	7.7%	100.0%
		% within The number of times an irrigator covered its land with crop a year	.0%	84.6%	6.7%	12.5%	26.0%
		% of Total	.0%	22.0%	2.0%	2.0%	26.0%
	I did not start farming	N	14	0	0	0	14
		% within Irrigators regularly use hired labor	100.0%	.0%	.0%	.0%	100.0%
		% within The number of times an irrigator covered its land with crop a year	100.0%	.0%	.0%	.0%	28.0%
		% of Total	28.0%	.0%	.0%	.0%	28.0%
Total		N	14	13	15	8	50
		% within Irrigators regularly use hired labor	28.0%	26.0%	30.0%	16.0%	100.0%
		% within The number of times an irrigator covered its land with crop a year	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	28.0%	26.0%	30.0%	16.0%	100.0%

Source; Household survey, 2007

As table 18 shows, 14(93.3 %) of the 15 sampled households that cultivated their land twice a year were those irrigators who regularly used hired labor in their farming activities while it was only one irrigator who said he covered his land twice a year without using hired labor. The table also indicates that most of the irrigators that said they covered their land only once in a year were those irrigators that could not afford to use hired labor regularly (i.e. 11(84.6%) out of the 13 sampled irrigators in this category were those who engaged in irrigation farming once in a year but who did not use hired labor regularly in their farming activities), while 2(15.4%) were those who used hired labor in their farming activities but covered their land only once in a year. It can also be seen from the table that out of the 23 irrigators who covered their land at least twice in a year 21(91.3%) of them said that they regularly used hired labor, while it was only 2(7.7%) who cultivated their land at least twice in a year without the use of hired labor. Therefore, it is a pastoral irrigators household who can afford to use hired labor that cultivate their allocated irrigable land more than once in a year, while those who do so only once in a year were those irrigators who can not afford to use hired labor.

Regarding the (28%) sampled irrigator's household who did not start irrigation practices, they said that they did not want to engage in farming activities despite irrigable land was given to them. The implication of this is that adequate farming skill provision, education and credits supports are very important for increasing the number of household who will engage in irrigated farming activities regularly.

Concerning devoting much area of land to certain crop types , irrigators identified that maize, sorghum, onion fodder crops as their highly priority crop in that order of importance. Their responses as their first ranked crops were 20 for maize, 10 for sorghum, 2 for onion and 4 for fodder crop. Their responses as their second ranked crops were 9 for maize, 22 for sorghum, 3 for onion and 2 for fodder. Their response as their third ranked crops were 2 for maize, 5 for sorghum, 12 for onion and 17 for fodder crop.

The reasons for devoting much area of land for such crop types in their order of importance given by the 36 sampled irrigators are shown in the table 19

Table 19. Reasons of Users for Devoting Much Area of Their Irrigable land for Their High Ranked Crops

Responses		
	N	%
Household consumption requirement	9	25.0%
Contribution for livestock feed	6	16.7%
Require less labor	11	30.6%
Seeds are easily avaiable	7	19.4%
Resistant to pests	3	8.3%
Total	36	100.0%

Source: Household survey; 2007

The result of the household survey , as indicated in table 19, showed that 25% of the respondents said that their reasons for devoting much of their irrigable land for their higher ranked crops was to fulfill their household consumption requirements, 30.6% of the respondents indicated that their reason for devoting much area of land to their higher ranked crops was that the crops requires less labor, 19.4% of the respondents said that their reason was that the crops seeds were easily available , 16.7% of the sampled respondent said that crops contributed for their livestock feed while the rest three percent revealed that the crops were resistant to pest that was why they devoted much area of their land for such crops. The implication of this is those crops types that requires less labor for its production and help ensure household consumption requirement are preferred highly by irrigators in the study scheme. Therefore, the extension support should focused on providing easily available seed technology that does not consume the households labor in the production of the crops.

CHAPTER FIVE
LAND USE AND OWNERSHIP

5.1 Land Tenure and Resources Use

Traditionally land belongs to a clan/communal and the main forms of land use is grazing in pastoral Afar. Clan land often comprises strategic resources such as grazing areas and water points. Each clan has well-established local institutions where the decisions power regarding land and other natural resources rests on the village council comprising the clan leader, elders, the *feima* and local wise-men(Getachew, 2001; Bekele,2005).

The communal ownership at lineage, *Dahla,* and clan, *Kedo* level, is the main forms of tenure well recognized by the pastoralists in the study area. This traditional land tenure arrangements stresses mobility, efficiency of resource use, sharing and cooperation that enabled them cope the vagaries of nature. Nevertheless, the officially recognized land tenure forms have changed in the country since the imperial period resulting in different impacts on the pastoralists' resource use arrangements making the state exclusive owners of the land on behalf of the public. The currently prevailing constitution of Ethiopia, for instance, recognizes the pastoral land as specified in article 40: "Ethiopian pastoralists have the right to free land for grazing and cultivation as well as the rights not to be displaced from their own lands. The implementation shall be specified by law." (FDRE, 1994:98). Nevertheless, in the present government land ownership is a constitutional issue in Ethiopia. Constitutionally land is owned by the government in the name of the public through out the country. Farmers are given use rights. These rights include the right to contract out, inherit and transfer. But land sale and purchase is not allowed, as the land owner is the government, not individual. This has contributed for the change in the traditional resource use and management system that have had strong recognition of the pastoral communities of different clans/sub clans in the study area.

5.2 Change in land tenure and forms of use in the command area

It was found out that the land in the perimeter of the irrigable area of the study scheme had passed through different ownership and use forms since the imperial period. The focus group discussions made with groups comprising the sub clan leaders and elders indicated that the land belonged traditionally to the community at *Hida kebele*, the *Ashento* sub clan. The land was used for grazing and crop production. They said that the crop production was mainly carried out by the local elites' (*Balabat*) family members in partnership with the *Amhara* land lords in north *Wollo* provinces during the imperial period. But the largest portion of the land was used for communal grazing. Different subclans used it for grazing based on customary resources use arrangement recognized among the pastoralists in the study area, but the ownership lies under the *HadoAshento* clan/sub clan.

It was revealed that the Northeast Range lands Development Unit(NERDU) also used 90-100 hectare of the land in the command area for irrigated food crops and fodder production for some times in the late 1970s and early 1980s. They pointed out that NERDU obtained access to the land based on the discussion made with the clan leader and elders which convinced the community that NERDU's intervention was for the benefits of the community. After NERDU left the area because of the collapse of security, the land was being used by the pastoralists largely for grazing under the ownership of the *Ashento* sub clan though some members of the *Ashento* sub clan used crop production on some parts of the land using rainfall.

Following the 1975 land proclamation in the country, land distribution was carried out by the government administrative machinery including the pastoral association's executive body. According to the same discussion group mentioned above, during this period, every household in the study areas obtained cultivable land the size of which ranged from 2-3 hectare depending on the availability of cultivable land, the household size and the

number of the population in the *kebele*. They added that part of the land in the command area was reserved for dry season grazing and, hence, was not distributed for individual household use.

After some years, following the land distribution by the Dergue, the pastoral community at *Hida kebeles* was urged to be members of producer cooperative, *Hida* pastoralist Association Producer cooperative. The cooperative was established by the dictation of the formers *Raya Kobo Awaraja* administrative body and the agriculture development bureau. The cooperative practiced rain-fed agriculture. It used to produce mainly maize, sorghum and oil crop using tractors and laborer from Raya Kobo administrative province of the period. The discussion group members revealed that the involvement of the pastoral community in the production of the crops and other affairs of the cooperative were very minimal. But the cooperative used to provide them sufficient amount of grain produces of the cooperative for all pastoralists registered as members annually. The cooperative continued functioning until the insurgency by the *JEBEHAT* and Eritrean People Liberation Front(EPLF) fighters created insecurity , damaged heap of harvested produce of the cooperative and caused death and casualties on the people and livestock in 1982. After this event , it was revealed that both the cooperative land including the command area of *Awra* irrigation project fall under the ownership of *Ashanti* clan/sub clan and used for grazing and crop production by members of this subclan. There were around six clans/sub clans that used to have access to the grazing resources in the command area and water from *Awra* River before the introduction of the *Awra* irrigation intervention. The sub clans reside at different *kebeles* in *Awra Woreda*.

Table 20 shows the name of the clans and their location as well as their distance from the command area of *Awra* Irrigation project.

Table 20 Name of subclans, *kebeles* and their settlement distance from the irrigation scheme

Name of *Kebele*	Clan/subclans Name	Settlement from the scheme(KM)
Hida	Ashento	2
Leykuma	Me'andeta	15
Leykora	Amejisiret, Awelito	17
Aliberi Mesgid	Ashento	6
Derayiti	Haser kiyadaamo	20
Harsi Merdera	Haser	25

Source: Group discussion with local elders, April, 2007

It can be observed from the table 20 that around six subclans were used to have access to the irrigable area of the study scheme before the development of *Awra* Small-Scale Irrigation scheme. The shortest settlement distance of the subclan from the scheme is two kilometers, while the longest is greater that 25 km. This may have created problems to address the equity issues during irrigable land distribution. With the introduction of *Awra* small-scale irrigation project, the land in the command area was distributed and allocated to selected *kebeles* and households respectively. As a result, individual ownership of the land against the traditional clan/sub clan ownership of the land in the command area emerged with the introduction of the *Awra* small-scale irrigation in the study area. It was revealed that the last two pastoral *kebeles* /sub clans shown in table 21 were not included in the distribution of irrigated land because of the administrative decision of the regional and local government. The land distribution and allocation processes and their effects on the utilization of the potential of the scheme and implications on the sustainable use of the scheme are discussed in the following subsequent sub sections.

5.2.1 Land distribution and allocation

With the introduction of the *Awra* small scale irrigation project, the command area was distributed and allocated to the four *kebeles* and individual household in the *kebeles* respectively. According to the results of the discussion made with *Awra Woreda* Pastoralist Agriculture and Rural Development Office and the *Awra* project coordination office, the distribution of the irrigable area to the four pastoral *kebele*/sub clan territories was done based on the decision of the regional government. The regional government decided that the four *kebeles* such as *Hida, Lekuma, Leykora* and *Aliberi Mesgid* to be included in the Irrigated farming beneficiaries *kebeles*. Of this *kebeles Leykora* was not considered during the planning and designing stage of the project. In addition to these, the state government and the *woreda* government organization (WPARDO and *woreda* administration) predetermined the maximum size of land to be distributed to each of the above mentioned *kebele*. Accordingly, 80, 40, 40, and 40, hectare irrigable land distributed to *Hida, Lekuma, and Leykora and Aliberi mesgid* respectively. The state left the decision to select individual irrigators and determine the size of land to be allocated to the selected irrigators in each of the four *kebeles* to the *kebele* administrations, the *Woreda* government and the community. Table 21 depicts *kebeles* and the size of land distributed to each *Kebeles*

Table 21. Size of irrigable land and proportion of household with irrigable land by *kebele*/sub clans

Description	Name of *Kebeles*				
	Lekuma	Lekora	Alibari	Hida	Total
Land	40	40	40	80	200
Irrigable	0.5	0.5	0.5	0.33	
Households	262	269	447	391	1369
Household	80	80	80	246	486
% of	46.2	44.9	27.1	61.9	35.5

Source; *Awra* Irrigation water users' associations' charter, 1999 Amharic

It was found out that there was no clearly spelt out criteria that indicate on what base the land distribution decision was made by the regional and *Woreda* government organization. Nevertheless, this discussion made with the WPARDO and the *Woreda* administration indicated that the decision was based on the consideration of the technical, equity and management issues as well as the interest of the regional government to bring more pastoralists to the irrigation practices. According to the *Woreda* Pastoralist Agriculture and Rural Development office, the issues are summarized as follows:

- The command area could not be utilized effectively by *Hida kebele population (i.e.* the *Ashenot* sub clan that claims the ownership of the land) alone and the other two *kebeles* (*Leykuma* and *Aliberi Mesgid*) considered at the planning and design stage of the project.
- The *Ashento* sub clan was the traditional owner of the land and had better crop farming skill than the other sub clans so 80 hectare was allocated to it while the other sub clans got 40 hectare each.
- It assumed that the land developed for irrigation is the public property. Hence it is the public authority that should decide and guide the land distribution to different *kebeles*/sub clans.
- The other sub clans who used the command area before the project was excluded from the land distribution due to the fact that they are located at further distance from the scheme approximately 25-30km. They could not involve effectively in the operation and management of the scheme and utilize the land efficiently.

The decision of the state and the *Woreda* government organization was passed to the *kebele* administrations of the four *kebeles* indicated in table 22.so that they could select irrigator and determine the size of land that each household should get using the available total land size distributed to each of the *kebeles* by the decisions of the government body. The *kebele* administrators, clan leaders and elders were given responsibilities for selecting households that would be irrigator and determine the size of land to be allocated to the selected household from their respective *Kebeles.*

The group discussion made with local elders from the four *kebeles* confirmed that the *kebele* administrators, clan/sub clan leaders and elders in each of *kebeles* discussed the decision of the government and developed their own criteria for the selection of irrigator

household; determine the size of the irrigable land to be allocated to individual household at their respective *kebele*. The community members in each of the *kebeles* were involved in the discussion on the land 'distribution' decisions of the government and the land 'allocation' and criteria for the selection of irrigators from among the community members in each of the *kebeles.* The criteria used by the elders, clan/sub clan leaders and *kebele* administrations in each of the *kebele*s were more or less similar except that the size of land that allocated to selected irrigators was different in *Hida kebele* from the other three *kebeles*. The criteria were:

- Extended family relationship (the Dala) was used to determine the numbers of selected irrigators from each *kebeles*. If the a household head has wives, co-wives, married sons, daughters etc. of more than three relatives in the *Dala*, only three household get selected to have irrigable land from the kinship members.
- Married men and women who do not have children were excluded from the allocation of the irrigable land.
- Each *kebele*/sub clans' leader, elders and *kebele* administration decide the size of the land to be allocated to selected household head for irrigation based on the above criteria
- The vicinity of the *kebele* to the irrigation scheme was considered essential to determine which *kebele*'s household should get the land at the head, the middle and tail of the river diversion weir. Accordingly the *kebeles* very close to the scheme has to get the land at the head of the weir, the next near has to get the land at the middle and the rest has to get the far down part of the land in the command area.

Accordingly, *Hida Kebele* allocated 1 hectare to three individual household while the other *kebele* allocated 1 hectare to two household. The size of the land allocated to the household is greater than the nationally set 0.25 ha for a household (MURS, 1999).

The implementation of the land distribution to the selected *kebeles*/sub-clans as well as the allocation of the size of land to selected irrigators was not an easy task. It involved intense discussion with the different sub clans and community members. It was revealed that it took three to five months to implement the land 'distribution' decision of the government and 'allocation' of the size of land to individual irrigator in the selected *kebeles* after the completion of the construction work. There was opposition to the land

'distribution' decision of the government from the *Ashento* subclan. The opposition was not because the sub clan did not want the land for irrigation purpose but it emanated from the facts that the village grazing land for home herds of the *Ashento* sub clan was being given to the other sub clan members without ensuring whether the land is enough for all households in the sub clan.

According to the discussion made with elders and sub clan leaders[12] , at initial stage of the planning period it was only three *kebeles* (*Hida, Lekuma And Aliberi Mesgid*) that were considered to be involved in irrigation practices, but upon the completion of the construction, the *kebele* administration and the *Woreda* government announced the inclusion of additional one *kebeles*/sub clan territories without discussing with them. The inclusion of the *Ley kora kebele* at the latter stage decreased the amount of land that *Hida kebele* would have gotten by 20%. Had it not been for the inclusion of *Ley kora kebele,* the Ashanti clan could have obtained 50% of the land in the command area. This would made 303 household, out of the 391 household in the *kebele*, have irrigable land.

The conflict was emanated from the differences of interest that the government and *Ashento* sub clan have in the irrigable land ownership and uses. The government wanted more and more households from the different sub clan in the study area to be embraced in irrigation farming activities considering the equity, technical capacity and clan based land ownership government responsibilities and public property of the land, which in fact ignored the lineage-Dalla based village level communal grazing ownership/ property rights in the area. The land distribution decisions of the government based on these considerations led to the curtailments of the number household head, in the *Ashento* sub clan, that would get irrigable land. Nevertheless, the *Ashento* sub clan yielded to the decisions of the government officials after series of discussion with the *woreda*

[12] Ato Ali Mirah, subclan leader of Lekora *kebele*, Hanefere Ali and Alawis Ahimed selected eldere from Leykora *Kebeles*;Ato Kelifa Ahimed, Subclan leader of Ashento *Kebele*; Ato Ebelene Mehamed and Ayida Eregele selected leaders from Ashento *Kebele*; discussion made at Ashento *Kebele* on 5 April 7,2007

Administration and WPARDO officials which promised them that the members of the clan would get irrigable land from the potential cultivable land found at the extreme down of the lower reach irrigable land, i.e. out side of the command area of the scheme.

The key informant interviewee, however, indicated that getting additional irrigable land more and above the planned 200 hectare for *Awra* small scale irrigation project is technically impossible as the maximum hectare could be irrigated by the river discharge rate is 200 hectare so the promise made by the government official would not be fulfilled unless administrative measure are taken to reallocate the irrigable land to households in *kebeles* where the allocated size of land was so large that selected irrigator households could not use the land effectively under the current level of their farming skill, extension support, household labor availability and prevailing mode of livestock production and resource utilization in the study area.

It was reported that none of the conflicts had led to disruption of the operation of the scheme at least until the period during which the data for the research were collected. Threats for complete disruption of the operation of the scheme, however, were observed unless solutions will be found out with the active participation of the people in the land ownership and use related to the command area of the scheme.

Regarding the irrigable land 'allocation', the allocation processes were well recognized by the community, but complaints were reported during the data collection time for this research. The complaints were from both the irrigator and non- irrigators of the local community members. The group discussions made with the local community revealed that they had participated in the development of criteria for the selection of irrigators. The criteria were developed based on the consensus of the community members. But discussion group's members said that the determination of the size of land to be allocated for selected irrigators was decided by the *kebele* administration and few elders. They also revealed that the opinion of the community members, the local wise-men and youth were

not taken into account while determining the size of land to be allocated for selected irrigators in each of the four *kebeles*. As a result, they said most members of the pastoralist in each of the four *kebele* did not get irrigable land. They also added that the land allocation committee favored some communities members to get irrigable while excluding the others for mere reasons that they did not marry or do not have children. They said a household with large family size had got equal size of land compared to a household with small household size since the criteria did not take into account the household size.

The secondary data obtained also confirm the view of the community, as can be seen from the table 21, the size of the land allocated to selected irrigator households was not similar. It did not take into account the size of households and population in each of the *kebeles*. *Hida Kebele* with the total household of 391 allocated 0.33 hectare to selected irrigator in its *kebele* and reach 246 households to have irrigable land, while *Lekuma, Lekora and Aliberi Mesgid kebeles* which have 262 and 269 households respectively allocated 0.5 hectare to selected irrigator and reached 80 households in their respective *kebeles* to have irrigable land. The presence of this variation had given rise to the local communities across each of the *Kebeles* to complain on the criteria used for the selection of irrigators in their respective *kebele*.

The household survey's analysis indicated that most of the sampled households (both irrigators and non-irrigators) felt that the land allocation was not fair. The feeling of the sampled households to the fairness of irrigation land allocation is depicted in table 22

Table 22 Feeling of the Sampled respondents whether the lanc allocation was fair

Responses	Project Beneficiaries			
	Irrigators		Non-irrigators	
	Think land allocation was fair		Think land allocation was fair	
	N	%	N	%
Yes	29	58.0%	3	3.3%
No	21	42.0%	89	96.7%

Source; Household survey, 2007

It can be observed from table 22 that out of 50 sampled irrigators 58% responded they felt that the land allocation was fair while 21(42%) of them said that it was not fair. Similarly, out the 92 non irrigators sampled household heads 89(96.7%) of them said that the land allocation was not fair while only 3(9.4%) of them said that it was fair. This can indicate that there is somehow common feeling on the unfairness of irrigation land allocation among the local communities (both irrigators and non irrigators) in the study areas.

The discussion made with the community, irrigators and non-irrigators, in the four *kebele,* confirmed that the community's members in each of the four sub clan area or *kebeles* felt that the land allocation processes were unfair. They said that both irrigators and non-irrigators in their respective *kebeles* opposed the way the land allocation criteria were implemented. The reasons given by both the irrigators and non-irrigators for the opposition to the implementation of the criteria were similar though their motives were very different. The reasons were: I) land allocation committee members favored some household heads to be included in the land allocation though the criteria excluded them. Most of these favored household heads were close relatives to one or more of the committee members in their respective sub clan area/ *kebele*, ii) The size of irrigable land allocated to selected irrigators did not consider the family size of the selected irrigators-selected irrigators with large family size got equal size of irrigable land as the irrigators with smaller family size.

The motive of the irrigators for their complaints was irrigators with large household size to get large size of land relative to selected irrigators who are with small household size. The motives of the non-irrigators was that the land allocation criteria to be rectified so that they could get irrigable land. The non-irrigators said that the size of irrigable land allocated to selected irrigator was so large that it excluded them from the land allocation.

It was fond out that one hectare of land was given to three individual at *Hida kebele* and to two individuals in the other *kebeles, which means* 0.33, 0.5 hectare per head was allocated for *Hida* and the other three *kebeles* respectively. However, no delineation of the individual irrigable plots was done; hence selected irrigators had felt sense of insecurity of individual ownership of land. The sampled respondents gave various reasons for why they felt that land allocation was not fair. Table 23 shows the reasons sampled household gave for their feeling that the land allocation was not fair.

Table 23 Reasons why land allocation were not fair

Responses	Project Beneficiaries			
	Irrigators		Non-irrigators	
	Reasons land allocation were unfair		Reasons land allocation were unfair	
	N	%	N	%
There was nepotism	7	33.3%	40	44.9%
All household heads' of the *kebele* did not get land	2	9.5%	18	20.2%
The land was allocated not to individual	2	9.5%	4	4.5%
It did not consider house hold size	10	47.6%	27	30.3%
Total	21	100.0%	89	100.0%

Source; Household survey for the research, 2007

As table 23 indicates, out of 21 sampled irrigators who said that land allocation was not fair 7(33%) indicated that the presence of nepotisms in the land allocation processes was the reason for their feeling that the land allocation was not fair, 2(9.5%) said they felt

unfairness of the land allocation because all household heads did not get irrigable land, 2(9.5%) said that the irrigable land was not allocated to individual irrigators but it was given to two or three household head and this made the feel the unfairness of the land allocation and the rest 10(47.6%) of the sampled irrigators who said land allocation was not fair revealed that the lack of consideration of household size in the allocation of land was the reasons why they felt the unfairness of the land allocation

On the other hand, out of 89 sampled non irrigators household who said that land allocation was not fair 40(44.9%) indicated there was nepotisms in the land allocation processes as a reason for being felt the unfairness of the land allocation, 18(20.2%) said they felt unfairness of the land allocation to selected irrigators because all household heads did not get irrigable land, 4(4.5%) said that the irrigable land was not allocated to individual irrigators but it was given to two or three household head as a reason for feeling that the land allocation was unfair and the rest 27(30.3%) of the sampled non irrigators who said land allocation was not fair revealed that the lack of consideration of household size in the allocation of land was the reason why they felt the unfairness of the land allocation processes. Due to these reasons and some others which were widely communicated among the local community members through their traditional information channel, *Dagu,* selected irrigator households may feel that the irrigable land they hold will not stay long with them. The analysis of the gathered data around tenure security uncovered that irrigation land use/ownership title had not yet been given to the irrigator households in the study area until the data collection time for this research. The responses of these sampled household to the question under whose title is the irrigation land you are cultivating is depicted on the table 24.

Table 24 Title of Irrigation land ownership

Responses		Frequency	Valid Percent
	Myself	2	4.0
	My spouse	2	4.0
	No title is given sofar	46	92.0
	Total	50	100.0

Source; Household survey, 2007

The household survey's results shown in table 25 disclosed that out of 50 sampled irrigation beneficiary households 46 households (92%) said that land use/ownership title was not provided to selected irrigator households though they were utilizing the allocated one hectare of irrigable land in group of size two households or three while 4% of these sampled households said that the irrigable land was under their title; the other 4% of the sample household said that the land was under the title of their spouse.

The results of the group discussions made also supported the finding of the household survey. The group discussions made with irrigators households pointed out that land title was not given to the selected irrigators but what was done was that one hectare of irrigable land was given to three or two individual depending on the decisions of the land allocation committee in each of the *kebeles.* The question asked whether irrigator household feel the land would stay under their under use through out their life indicated the result depicted on the table 25

Table 25 User's feelings whether land would stay under their title throughout their lives

Responses		Frequency	Valid Percent
	Yes	31	62.0
	No	19	38.0
	Total	50	100.0

Sources; Household Survey, 2007

The data in the above table indicate that 62% of the respondents felt that the land would stay under their use/title through out their life though there was no insurance guaranteed through use certificate/ individual land titling. But 38% of them were suspicious of their life long use rights of their land. The variation in feelings of the respondents to the life long use rights of the irrigable land may results in a difference in concerns of users toward caring for the productivity of their land. A further inquiry during the household survey produced the results shown on table 26

Table 26 the Relation of life long land use guarantee to users' efforts in improving their land fertility

Responses(a)		Frequency	Percent
	It motivates me improve land fertility and conserve soil	3	6.0
	It assures me of the land is mine and must take care of it	3	6.0
	Both of the Above	5	10.0
	It does not brought any difference on my efforts	39	78.0
	Total	50	100.0

Source; Household survey, 2007

As depicted in Table 26, 39 out of 50 respondents said that the presence / or absence of life long land use guarantee did not have any relation with their efforts to improve their land productivity, 10% of them said that this feeling of them motivates them improve the land fertility and conserve soil as well as assures them that the land is their and take care of it. Six percent (6%) of the respondent said that it only motivates them improve the land fertility and conserve soil, and the other 6% responded that it only assures them of the land is their and should take every care of it. This results shows that life long land use guarantee did not have any strong impact on the efforts of the users to improve their land fertility because the largest percent of sampled households responded that they were indifferent to improve the productivity of land and care for it; whether the land is under their title or not.

CHAPTER SIX
THE PROJECT AND HOUSEHOLD FOOD SECURITY

6.1 The project contribution to household food security

The chapter and its subsection discuss the contribution of the small-scale irrigation scheme of this study to food security of the households covered by the research. The main focuses of the research in this regard was on the supply side of food security. It was found out that the project enabled irrigator households to have adequate annual food supply from own production 'with the project' compared to the 'without' project situation

6.1.1. Food supply

The availability of food/ or supply at household level and local market was found improving with the introduction of the irritation scheme in the study area. The improvement was both in terms of quantity and varieties; types of food crops produced. According to the group discussion made with irrigators and key informants interview[13] made, irrigators were able to produce vegetable crops such as green pepper, onion, tomatoes and cauliflower both for household consumption and local market with the introduction of the irrigation. They also added that among the different crop varieties introduced to the area maize and sorghum varieties were the major ones that contributed for the availability of sufficient and surplus amount of food supply for the households' annual requirement from own production.

The household Survey's results indicated that a good number of sampled irrigator households enjoyed sufficient and surplus food supply from own production "with" the

[13] Irrigation Agronomist and extension worker of SSD, interviewed by the researcher at the project area in April,2007

project condition while those of sampled non-irrigators household did not enjoy even sufficient food supply from own production. The table 29 shows the cross tabulation of sampled households with households with sufficient and surplus food supply form own production for annual food requirement of the households.

Table 27 cross tabulation of sampled households with household with sufficient and surplus food supply from own production for annual households food requirement

			Household with sufficient and surplus food supply from own production for annual Household food requirement		
			Not sufficient	Sufficient and surplus	Total
Project Beneficiaries	Irrigator households	**Count**	**26**	**24**	**50**
		% within Project Beneficiaries	52.0%	48.0%	100.0%
		% within Household with sufficient and surplus food supply from own production for annual household food requirement	23.0%	82.8%	35.2%
	Non Irrigator households	**Count**	**87**	**5**	**92**
		% within Project Beneficiaries	94.6%	5.4%	100.0%
		% within Household with sufficient and surplus food supply from own production for annual household food requirement	77.0%	17.2%	64.8%
Total		**Count**	**113**	**29**	**142**
		% within Project Beneficiaries	79.6%	20.4%	100.0%
		% within Household with sufficient and surplus food supply from own production for annual household food requirement	100.0%	100.0%	100.0%

Sources: Household survey, 2007

As can be seen from Table 27, 48% of irrigators households responded that they were able to have adequate household food supply from own production while it was only

5.4% of non -irrigator households who said that they were able to have adequate household food supply from own production. Out of the total 29 sampled respondents who said they did have sufficient and surplus annual food supply from own production 24(82.8%) of them are irrigator households while it was only 5(17.2%) of the non-irrigator household who had adequate and surplus food from own production. The difference in annual food supply for a household from own production between the two group was because irrigators households were able to engage in crop production activities at least once in a year while non irrigators household were not able to engage in crop production activities more than once. This was because non irrigators did not get reliable water source in the very arid climate where they are living, while irrigator households were able to harvest double or triple because of their access to irrigation facilities due to the project. As a result, sampled irrigators households, 24 out of the 50, irrigator household were found to have sufficient and surplus food availability as compared to the non irrigator households.

It was also found out that there were changes in the volume of cereal production per annum in aggregate for the irrigator households when compared to before and after project intervention.

Table 28 Volume of cereal production per annum in the sampled Irrigator households in the study area before and after the project

	Before The Project in Quintal	After the Project in Quintal	Difference	Percentage Change
Maize	350	540.00	190.00	54.30
Sorghum	250	432.00	182.00	72.80
Total	**600**	**972.00**	**372.00**	**62.00**

Source: Household Survey, 2007

Such increase in the amount of cereal production by sampled irrigator households was because of the possibility growing maize and sorghum twice in a year that is intensification of the cropping practices by irrigator households. This was possible

because of the availability of irrigation facility in the area, the provision of improved crop varieties and trainings on farm skills and demonstration of vegetable seed preparation and production to the pastoral communities in the study area.

The implication of this is that pastoralist and agro-pastoralist irrigator households can increase their agricultural production provided they would get access to appropriate technology and irrigation water. The comparison of the irrigator households "with" the project and "without" project situation confirmed that there were differences in having marketed surplus in the two situations. the analysis of the household survey data revealed the following differences , as shown in table 35, between these two groups of irrigators(irrigators "without" the project and irrigators" with" the project).

Table 29 Irrigator households with marketed surplus "without" the Project

	"Without" The Project	"With" The Project	Sample Size
Irrigator Households With Marketed Surplus	14.0	26.0	50.0
Percentage of Irrigators With Marketed Surplus	28	52	

Source: Household Survey, 2007

As depicted in Table 28, there is a change in the numbers of irrigator households with marketed surplus in the two conditions mentioned above. The number of irrigator households with marketed surplus increased from 28%, in the "without" project condition, to 52% "with" project condition. The analysis of the household survey data also revealed that households with marketed surplus were found out to be those who intensified (Double and triple cropping) their irrigated farming activities. Of those 26 irrigator households who responded that they had had marketed surplus, 88.5% (i.e. 23

out of 26) were those who said they engaged in irrigated farming at least twice a year (look at table 19).

With the diversification of crop and improvement in milk products, the access of irrigator households and women members in the household to food was improved with the irrigation project in the study area.; particularly women who are culturally responsible for food preparation and milking of domestic herds in pastoral Afar were able to have secure access to vegetable and milk products. In the study area, particularly at *Hida Kebele* almost all of the sampled women households were responded that they had had complete control on vegetable products produced using irrigation crops. Because it was women members who were highly involved in the production of crop using irrigation at *Hida kebele* while male members of the household usually engaged in herding and other earning activities during dry seasons.

> Asha Buko, irrigator household at *Hida kebele* said that with the project she was able to gradually improve her mixes crop varieties she had been producing. She said that she engaged in irrigation activities at least two times a year since 2005. during this period she said that she used to produced vegetable crop particularly onion and green pepper in one of the production season of the year while it produced cereals crops in the other seasons of production in a years. As a result she was able to diversify her income sources and increase her cash income and was able to buy other food items from the local market such as food oils and wheat.

CHAPTER SEVEN

7. SUMMARY, CONCLUSIONS AND RECOMENDATIONS

7.1 Summary

The study has identified that *Awra* Woreda Pastoralist Agriculture and Rural Development offices, the Woreda Administration, regional, Support for Sustainable Development and the pastoral community in the study area are the local development actors that were involved in the development of the study scheme. It was found out that the actors differed in their knowledge of the pastoral resources use system, the current pastoral area development policy, financial and human resources capacity. these differences among actors, particularly of the organizational development actors, brought about lack of effective coordination of their actions as well as difficulty to have consistent community based irrigation development approach that help enhance the active participation of the community in the course of the scheme development.

The government organizational actors, the regional and woreda government organization, did not have institutional framework for initiation, planning, design, construction, operation and maintenance of small-scale irrigation scheme that actively involve relevant actors in the development of irrigation scheme in the pastoral areas of the state. Besides, there were lack of participatory planning structure, institutionalized grassroots planning approach and shortage of capacity at regional and *woreda* level government organization to promote community based local development.

However, the research revealed that the scheme was developed based on the need of the community. Initially, the community was noted for the initiation of the study though in

the sequel the *woreda* government and the regional state organization were involved in the scheme initiation.

The subsequent stage of the project management cycle of planning, design construction, operation and maintenance was coordinated solely by Support Sustainable Development, National NGO. It was the sole organization that financed and coordinated the planning, design, construction, operation and maintenance of the study scheme as well as provision of extension support services.

The roles of the government organization were limited to facilitating for SSD to undertake the relevant studies for the development of the scheme and implement the project. Community had been involved in the different stages of the project management cycle of planning, designing, construction, operation and maintenance differently. But its roles were limited to information provisions to the study team of SSD during the planning stage, labor supply during the construction, participating in the allocation of irrigated land to households, distribution of the command area to the four irrigated farming beneficiary pastoral *kebeles*, in administering irrigation water use and maintenance of the scheme. There was no evidence indicating the active involvement of the community and government partner organizations in the feasibility and detail design study of the scheme.

There were no specific and clearly spelt out tasks and responsibilities allocated to the community at the initial stage of the project concerning the operating and maintenance of the scheme at design stage of the project. The community was not organized into irrigation user's association at the stage of the project and formulated the rules for the operation and maintenance of the scheme. In addition, the changes in local resources use and management that came up with the introduction of the *Awra* small-scale irrigation scheme were not properly communicated with the local community during the planning and design stage of the scheme.

The formation of the *Awra* small-scale irrigation users' association in October 2006 was not equally accepted by members of the local since it excluded those who did not get irrigable land. As a result, the community was complaining on the way the association formed. They suggested the users of the scheme should be organized in the form of cooperative that comprise all households as members so that the benefits from the clan land would be equitably distributed.

There were no water distribution and maintenance schedules well recognized by the irrigators, SSD and the WPARDO indicating the responsibilities of the organization and the irrigators in these activities. As results conflicts over the maintenance activities of the scheme and water distribution were prevalent in the scheme after the formation of the water users association in October 2006. There existed frequent attempts of water distribution breaches. This include over-irrigation of the plots by irrigators who think more water would give more yields, violating water distribution turns by some powerful irrigators and diverting water to ones field by breaking the scheme's structure. The executive body of the association is responsible for water distribution, resource mobilization, maintenances of the scheme structure, conflict management. Nevertheless, the association was not in a position to enforce the rules of the association as contained in the organizational charter of association. Besides, community's perception of the scheme ownership and weak enforcement of collective action rules have created lower level of commitment to structure maintenance by the community. Thus, the greater share of responsibilities for the coordination of the irrigation activities and empowerment of the community were shouldered by SSD even after the formation of the water users association.

The study also suggested that shortage of labor, trained oxen, financial capital and farming skills in irrigator households were the main factors, *interalia,* that determine the level of frequency of engagement in irrigated farming by the irrigator households in the study area. It was only those who have had social net work with the *Amhara* farmers in

north *Wollo* area and can afford to hire labor of the *Amharic* farmers that could regularly undertake irrigation activities.

On the other hand, absence of joint action planning and coordination, mutual adjustment of activities between SSD and government organization in the provision of extension support services to the irrigators have brought about low coverage of the support services and ineffective utilization of the scheme potential. Inadequate budget allocation to the WPARDO , lack of skilled manpower in the area of irrigation development, crop husbandry, facilitation of community based planning and extension service delivery have restrained the WPARDO from actively involving in the development of the study scheme e delivery of extension support services

The decisions on irrigable land distribution to the four *kebeles* did not take into account lineage land ownership which is customarily accepted by the community in the study area and was not participatory. This has resulted in oppositions to the decision of the government by the *Ashento* sub clan. The resentments to the decision are still apparent though it seems that the community yielded to the decision. Nevertheless, there is latent opposition by the *Ashento* sub clan members which is manifested in the form of irrigable crop damages and canal structure breakage. There are still unmanaged conflicts over the land use of the command area among irrigators and non-irrigators. The conflict was due to the unfairness of the size of irrigable land allocated to selected irrigators as well as the claims of the *Ashento* sub clan (customary owner of the command area).

Several conflicts have been surfacing up after the land allocation and affected the performance of the scheme. The majors are conflicts between the irrigators and SSD and WPARDO over the maintenance of the main and secondary canal , between irrigators and non irrigators over use of the land(for grazing and irrigation), conflicts between the *Woreda* government and the community over the allocation of the size of irrigable land to selected irrigators, conflicts between the irrigators and the leaders of the association over

the weak enforcement of the association rules by the formers and conflicts among the users themselves over water use and crop damage .

7.2. Conclusion

The study has suggested that considerable efforts were made by the governments (regional and *Woreda* governments) and NGO (Support for Sustainable Development) to encourage participatory planning, implementation, operation and maintenance of small-scale irrigation scheme in the study area. the communities (clans/or sub clans) were involved in initiation of the project, providing unskilled labor for construction, controlling wheat grain resources(the project inputs for construction), facilitating access to irrigable land and administering irrigation water uses through irrigation water users' association. However, the type of participation identified may be considered one of mobilization and decentralized decision making rather than one of empowerment. Genuine dialogue was lacking in the processes of the development of the irrigation scheme of this study because:

i. There are no clearly defined and effective institutional set-up/or frameworks for fostering people's participation in the initiations, planning, feasibility studies, design implementation, operation and maintenance of small-scale irrigation scheme in the pastoral and /or agro-pastoral settings in the study area.
ii. local knowledge (indigenous knowledge of the local community in local resources use and management) were not effectively and appropriately utilized the development of the small-scale irrigation scheme
iii. there are no appropriate organizational /or institutional arrangement for community based planning and agricultural extension service delivery

iv. there was no effective mechanisms for sharing experiences among local actors

v. the sustainability and replicablility of the scheme have remained doubtful and the scheme will get collapsed when outside supports stops

Local development efforts are still being hampered by structural, institutional and policy constraints. Communication efforts, among local development actors, are far from being effective. Information flows have remained inadequate. The flows of the information were limited to providing regularly quarterly and annual progress report on the project performance by SSD to concerned government organization at regional and *Woreda* level with no regular forum for discussing on policy and institutional issues in regard to the SSI project. Project related information such as annual evaluation/review and regular monitoring reports are not communicated to the local community. They community is not facilitated to reflect on the evaluation reports and their action.

Despite lack of active involvement of the community in all affairs of the *Awra* small-scale irrigation development, the study's results reveal that the largest segment of the pastoralist in the study area accept the development of the irrigation scheme in their area. It also revealed that the project has resulted in improvement in household's food security by enabling irrigators diversify their livelihood activities, intensify cropping activities and to have access to different food varieties. According to the study's results, the food security situation of the irrigator households is significantly improved with the 'with' the project condition compared to the 'without' project condition. The food security situation of the irrigators is largely better than the non-irrigators 'with' the project condition.

7.2 Recommendation

It is broadly believed and accepted principle that the local community's active participation in the different stages of small-scale irrigation project cycle is indispensable. It is recommended that modern small-scale irrigation scheme development in the pastoral/agro-pastoral area should be initiated and implemented based on well designed institutional framework for participatory irrigation scheme development. The framework should be designed to ensure the following conditions are considered and met at different stage of the SSI project management cycles: (1) Irrigation management is viewed as a spiral cycle. (2) A framework is established for qualified people to initiate a project at the agreement of those concerned. (3) Irrigation system design is agreeable to users and it is clear at the stage how the system will be operated. (4) Meaningful commitments are obtained from users prior to the construction stage to assure that the system utilization will be most effective, if not efficient. (5). legal user's organization must be formed at the project initiation stage and serves as an effective forum for discussion, decision-making and punishment. (6) The relationships between the irrigation staff and users are not hierarchical, and irrigation staff should be accountable to users Ounvichit and Satoh(2002) . Furthermore, the research recommends the following:

- At project initiation stage and before the start of construction, identification of the actual numbers of irrigators from among the pastoralists (members of different sub clans) should be made with the active participation of the pastoralists. In between the two stages, the pastoralists ought to be aware of and clearly understand the anticipated changes in local resource-land use and ownership that will emerge with the introduction of irrigation scheme in their area. Facilitating for the pastoralists to develop criteria for the selection of the would be irrigators from their respective sub clans and for the allocation of the size of irrigable land

to selected irrigators in such a way that the fairness of the criteria are felt by the largest percent of the peoples and ensure the effective, if not the efficient utilization of the scheme.

- Concerned governmental (regional and *Woreda*) organization and NGO should ensure that meaningful commitments are obtained, prior to the construction stage, from selected irrigators to assure that the system utilization will be effective. The formats of commitments may be financial contributions, deposit of fund for future construction, and labor and/or material contribution. This should be made with clear agreements negotiated with the irrigators indicating the amount of contribution, how the commitments be realized, the rewards and the punishments lest the irrigators fail to meet what is expected in accordance with the agreement reached.

- At the project initiation stage, community irrigation development committee should be established and the committee should be assisted to gradually transform itself into water users association in the course of the operation and maintenance stage of the scheme. It is the conviction of the researchers that this will help create conducive environment for active involvement of the community and a sense of ownership of the scheme. It will also help the development of SSI scheme at lower costs in the pastoral area where there have not been prior experiences of implementation of community based SSI in partnership with the community.

- Established, within the *Woreda* PARDO, a department responsible for promoting and coordinating plan and activities of relevant development actors. The body should deal with matter related to SSI scheme, water use, agricultural extensions support services. Adequate human resources that have professional back ground and experiences in irrigation work, irrigation agronomy, and agricultural extension and community development be assigned for the department on

relatively permanent basis. Activities based recurrent budget and incentives for the staff of the department be assigned in sufficient amount, and this be considered part of the local development inputs by the political body responsible for the allocation of such budget at regional and *Woreda* level.

- The mechanisms, currently in place, for maintenances works of the structure should be redesigned with meaningful participation of the irrigators for contriving proper mechanism for maintenance works. The design should include the delineation of the responsibilities of the irrigators for what kinds of maintenance and on which parts of the structure as well as the sources of the resources for the maintenances and schedule for the frequencies of maintenance work in a year.

- SSD and concerned government organization should undertake additional catchments treatment work in the upstream area of the scheme and adequate protective structure on the river bank that help decrease the volume of silts and gravel that the flood deposit on the canals and irrigable land.

- Detail water distribution plan and irrigation farming schedule that take into account the pastoralists/ agro-pastoralists seasonal movement pattern should be prepared with the active participation of the pastoralists annually. This will help decrease the problems of water use between late and early starter of irrigation farming activities in an irrigation seasons which have led to conflicts among irrigators.

- Improvement in the rules of the water users association should be made. Irrigators should be assisted to know the major rules of the association that government the operation and maintenance of the scheme so that irrigators will be able to use the scheme in accordance with the rules of the association thereby enhancing the rules enforcements. Besides, attempts should be made to aware the *kebele*

administration, the customary institutions and the non-irrigators on the changes in the local resources use rules that emerged with the introduction of the scheme and the formation of the users associations. This will help effective rules enforcement by the local organization.

- The extension support services delivery should be done based on the needs of the irrigators. The annual plan for the types of extension support ought to be schedule for the period that enable most of the irrigators have the opportunity to get the supports.
- Concerned government body should timely rectify the size of irrigable land allocated to selected irrigators with the active participation of the community's members in each of the *kebeles*. The allocated irrigable land per selected irrigators is very large even compared to the 0.25ha of irrigable land per household suggested by MWR.
- Irrigable land distribution to different sub clan members should take into account the traditional property right regime that prevail in the pastoral area such as clan ownership and lineage (Dalla) ownership of village grazing land along with the constitutionally recognized public ownership of land.
- The WPARDO and other concerned government organizations should be proactive to involve in the provision of extension support services to the irrigators in collaboration of SSD rather than waiting until the supports of the SSD stops and they take over the scheme. This will help reach significant numbers of irrigators obtained irrigation support services and adequately involve in irrigating farming practices thereby enhancing the level of utilization of the potential of the scheme by the irrigators.

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APPENDICES

Appendix A. Questionnaires for Household Survey

Date———————— Enumerator ————————

Part-I. Household's Back Ground Information

1. Name of Interviewee ————————————
   - 1.1. Region ————————————
   - 1.2. *Woreda* ————————————
   - 1.3. *Kebele* : 1=Hida☐ 2=Lekuma☐ 3=Ley kora☐ 4=Aliberimesgid☐ /1/
   - 1.4. Sex: 1=Male ☐ 2= Female ☐ /2/
   - 1.5. Ethnicity ————, Clan's name ————, Religion———/3/
   - 1.6. Marital Status: 1=Married ☐ 2=Single ☐ 3= Divorced ☐ 4=Widowed ☐ 5=Never married 6= other specify ———————— /4/
   - 1.7. Position of the interviewee in the household? 1= Head of household ☐ 2=member of household ☐ /5/
   - 1.8. Household size: Total Household Size———— /6/

		Age grope(years)					
Sex	0-7	8 – 14	15- 20	21 –30	31 – 45	46 –65	>65
M							
F							
Total							

Part-II. Settlement and Sociological Information

2.1. Do communities in your area permanently settled? 1=Yes☐ 2=No☐ /7/
2.2. If yes, when did you settle permanently in this area? Since ———E.C /8/
2.3. What is the basis of settlement in your locality? 1= cluster of village on Kinship basis☐ 2=cluster of village on non kinship basis☐ 3=other specify ———————— /9/
2.4. How many villages are there in your settlement area?——— /10/
2.5. How many people reside in one village on average? ———— /11/
2.6. How far is your settlement from the irrigation area? ———— /12/
2.7. Does each village have it own religious shrines in your locality? 1=Yes☐ 2=No☐ /13/
2.8. Are there traditional mutual help organizations in your area? 1=Yes ☐ 2=No☐ /14/
2.9. If yes, the types of such organization————————————
————————————
2.10. What are the activities performed through the traditional organization?
1=livestock herding☐ water management☐, 3=grazing resource management☐,4=crop production☐, 5=other specify ———————— /16/

Part-III. Household Resources and Livelihood

3.1. What is the major occupation of the household? 1= Pastoralism ☐ 2= Farming ☐ 3=Trade ☐ 4= Pastoralism and farming 5= pastoralism and trade ☐ 6= other specify———— /17/

3.2. If the livelihood depends on farming /18/

3.2.1. Size of land owned————(use hectare)

3. .3.2. Cultivated area total ————

Rain-fed ———

Irrigated———

3.3.3. Lists of crop cultivated 1= Maize☐ 2= Sorghum☐ 3= wheat☐ 4=Teff ☐ 5=sesame ☐ 6= Onion/shallot☐ 7=Tomato☐ 8=Pepper☐ 9=cauliflower☐ /19/

3.4. Does the family have the required skill in farming? 1= Yes ☐ 2=No ☐ /20/

3.5. Is farm land shortage a problem for the household? 1= Yes ☐ 2= No☐ /21/

3.6. Do you have livestock? 1=Yes☐ 2= No ☐ /22/

3.7. If yes, indicate the type and number of livestock you have /23/

Types of livestock	Number of livestock owned	
Oxen		
Cows		
Bulls		
Hiefer		
Total Cattle		
Sheep		
Goats		
Small remunat Total		
Horse		
Mules		
Donkeys		
Camels		
Equines total		

3.8. What are the sources of your animal feed? 1=communal grazing ☐ 2=Own grazing land☐ 3=crop residue☐ 4=cut and carry of grass or fodder plant☐ 5= 1&2☐ 6=1&3☐ 7=1&4☐ /24/

3.9. Is shortage of animal feed a problem for the household? 1=yes☐ 2=No☐

3.10. If yes, what do you do to cope with the problem? 1=limit the number of livestock☐ 2=Purchase fodder form other sources☐ 3= Migrate to other areas with herds 4= other specify ———— /25

3.11. Does the irrigation project bring about an increase in fodder availability to the household? 1=yes☐ 2=No☐ /26/

3.12 Do you crop all your irrigable land in both wet and dry seasons using irrigation? 1=Yes ☐ 2= No ☐ /27//

3.13. If no to Q 3.12, what are the reasons? 1= Labor shortage ☐ 2= Lack of seed ☐ 3= water shortage ☐ Fallowing my land ☐ 5= other specify ————

3.14. If yes to Q3.12, do you have adequate household labor forces? 1=Yes ☐ 2= No ☐ /28/

3.15. If no to Q3.14, how do you get the required labor? 1=from relatives in village☐ 2=from hired labor ☐ 3=other specify ————/29/

3.16. From where do the hired the labor comes from? 1=From the local community☐ 2= From Amhara region ☐ 3= other specify———— /30/

3.17. How has the price of the labor become since the project? 1=Highly increasing ☐ 2=increasing some how ☐ 3=increasing a little☐ 4= no increasing ☐ /31/

3.18. Does your herd size changed 'With' the project? 1= Yes ☐ 2= No ☐ /32/

3.19. What are the reasons for the change?_____
_____
_____/33/

Part-IV. The Role of the Direct Stakeholders in the Development of the Study Scheme

A. Initiation and Planning Processes of the Scheme

4.1. Who initiated the irrigation scheme in your areas? 1=The community☐, 2= NGO ☐, 3=Local Government☐, 4= 1 &2☐, 5= 1&3☐, 6= 1,2 and 3☐ /36/

4.2. If the community did not initiate the irrigation scheme, how did you know that irrigation project was going to be introduced in your area? 1=From local administrations during community meeting ☐, 2= From clan leader ☐,3= From NGO through planning meeting ☐, 4=From the regional radio program=4, 5= other specify _____ _____ /37/

4.3. What was your feeling about the project then? 1=Happy , 2=Not Happy ☐, 3= Indifferent☐ /38/

4.4. If you weren't happy, what were the reasons? 1=I felt that irrigation would stop rainfall ☐,2= I felt that Irrigation affect my herds negatively☐, 3= I felt that the community would lose their lands to outsiders☐ ,4=I did not want to engage in farming ☐. 5= Other specify _____
_____/39/

4.5. Did you get the chance to participate in the project? 1= yes ☐, 2=No ☐_____/40/

4.6. If yes, at what stage of the project did you participate? 1=At the pre-planning stage ☐, 2=At the design stage ☐, 3= during implementation ☐, 4=In the operation and management stage ☐, 5= In all of the above stage ☐ /41/

4.7. How was your level of participation? 1=Strongly involved in revealing the need and concerns of the community ☐, 2= actively involved in determining the design of the irrigation scheme ☐, 3=as informant at the planning stage ☐,4=simply attending meeting about the irrigation project with the government and NGO's people ☐, 5= other specify _____ /42/

4.8. What contribution have you made for the project? ☐ Labor during construction=1,Material provision=2, ☐ money =3 , ☐ other specify _____
_____ /43/

4.9. What are the changes in your livelihood activities with the project? 1= Engaged in irrigated and rain-fed farming ☐ 2= Engaged in irrigated fodder production ☐ 3= Started cut and carry feeding method ☐ 4=Started vegetable production and selling ☐ 5= other specify _____
_____ /44/

B Operation and Management of the Irrigation Scheme

4.10 is/are there practice in which livestock walk about in the irrigation area Or the scheme structure? 1= Yes☐ 2=No☐ /45/

4.11If yes, in what cases? 1=For drinking water☐, 2=For grazing during fallow periods ☐, 3=For feeding on crop residue after harvest☐, 4=Uncontrolled livestock feeding on irrigated crops ☐, 5=Others/ specify _____ /46/

4.12If yes to Q. No.1, what damages do they cause in the scheme? 1=They eat up the irrigated crops☐ ,2= They damage irrigation canals☐, 3=They cause soil compaction☐, 4=Others/specify_____
_____ /47/

4.13Have you ever participated in maintenance of the irrigation scheme? ☐ Yes = 1, ☐ No = 2 /48/

4.14If no, why not? _____/49/

4.15If yes, how many times in a year do you participate approximately? _____ /50/

4.16 If yes to Q4, is it on your own plot or on the whole scheme? 1=On my own plot☐, 2=On the canals ☐, 3= At any point of damage in the scheme☐, 4= Any combination of the above_____
_____ /51/

4.17 How frequently does the structure get damaged? About _____ times in a year. /52/

4.18 What is/are the main cause/s of structure damage in your scheme? List down in order of importance./53/

1. _____
2. _____
3. _____
4. _____
5. _____

C. Water Allocation

4.19 Do you use water for supplementary irrigation (During the wet season)? 1=Yes☐, 2=No ☐ /54/

4.20 If no, why not? _____ /55/

4.21 If yes, is the water availability in the diverted river is sufficient for both wet season and dry season irrigation? 1=Yes ☐ 2=No☐ /56/

4.22 If no to Q4.21, what were the reasons? 1=Upstream population use the river water in dry seasons☐, 2=I do not engaged in farming in wet seasons because I keep livestock in wet seasons grazing area☐,3=other specify_____ /57

4.23 Do you feel you share equal water with every user in the scheme? 1=Yes☐, 2=No☐ /58/

4.24 If no, what do you think is the reason for the inequality=Clan difference☐, 2=Gender☐, 3=Political Power ☐, 4=Religion☐, 5=Crop Type☐, 6= others/specify /59/

4.25 If there is inequality, which groups of people get more? 1= male household head☐, 2=members of strong clan ☐, 3= households who have irrigated land near the Head of the diversion weir☐ 4=other specify _____ /60/

4.26 If there is inequality, which groups of people get less? 1=Female household head☐, 2= individual who have irrigated land at lower end of the main-canal☐,3=other specify_____ /61/

4.27 If there is inequality, do you get more or less? 1= More ☐ 2= less☐ /62/

4.28 If you get less, do you believe this is reasonable? 1=Yes ☐ 2= No ☐ /63/

4.29 If no, what measures do you take in response? 1= Become Reluctant to participate in maintenance ☐, 2=Try to over use water in my turn ☐,3= Conspire with my likes in order to bring about equality☐, 4=other /specify _____ /64/

4.30 Do you use crop water requirement rates for watering your fields?1=Yes☐, 2=No☐ /65/

4.31 If yes, who gives you the rate?_____ /66/

4.32 If yes to Q4.30, do you always stop watering when the rate is met even if the usual time given to watering turn is yet to get? ☐ Yes =1 ☐ No =2 /67/

4.33 If no to Q4.32, why don't you stop at the given rate? _____ /68/

4.34 Have there been any defaulters of water distribution in the scheme? 1=Yes☐ 2=No☐ /69/

4.35 If yes, what is done in cases of water distribution defaults?

4.36 Does the community have a system of rule for controlling water distribution default?☐Yes =1, ☐ No =2 /70/

4.37 If yes, what does the rule say? _____

4.38 If yes, to Q4.36, do you believe the rule is enforced in the way formulated?☐Yes =1, ☐No =2 /71/

4.39 If no, what are the weaknesses? Please, list down in order of importance /72/

1. _____
2. _____
3. _____
4. _____
5. _____

4.40 What body is responsible for enforcing the rules?1=Water users' association executive committee☐, 2= Clan leaders and elders ☐, 3=*Kebele* administration ☐, 4=Do not know☐ /73/

4.41 Whom, do you think; does water belong to when it is at the gate of your plot, just getting to your plot at your watering turn?_____ /74/

4.42 Are there special considerations for crop-type and stage of growth during water allocation? 1=Yes ☐ 2= No☐ /75/

4.43 If No, what happens when somebody is convincingly in higher need of water for his/her field? 1= Can do nothing until his/her term is up☐, 2=Can contract water controlling body in terms of emergency and get water☐, 3= Can negotiate with the irrigator of that turn and get water☐, 4= Other/Specify_____ /76/

4.44 Do you pay any water use fees? ☐ Yes =1 ☐ No=2 /77/

4.45 If yes, what kind? 1=Cost recovery fees for structure construction☐, 2= water use charges ☐,3 both ☐=3, 4= Other/specify _____ /78/

4.46 Do you know what crops have been recommended for irrigation production for your scheme by project designers? ☐ Yes =1 ☐, No =2 /79/

4.47 If yes, do you crop your field according to the recommendation for types of crop and area of land? ☐ Yes =1,☐ No =2

4.48 Is it on your discretion that you plant the crop types that you grow using irrigation? ☐ Yes =1 ☐ No =2 /80/

4.49 If yes, list down the rank of crops you produce using irrigation in terms of area of land devoted to each. Take the crop to which the largest area is devoted as 1st rank/81/

NO	Name of crop	Rank
1		
2		
3		
4		
5		
6		
7		

4.50 What is/ are the reasons for devoting much area of land to your high ranked crops? Household 1=Consumption☐ 2=Livestock feed ☐ 3=Cash income source ☐ 4=Being less laborious☐ 5= Risk sharing with other farmers☐ 6= Others, specify _____ /82/

4.51 If no to Q 30, who dictates you?_____

Part- V. Issues in Resource Use and Irrigation Practices

A. Land Tenure

5.1. In general, whom does the land belong to in your areas? 1= Clans/ Communal ☐ 2= Individual ☐ 3= Government ☐ 4= no ones property ☐ /83/

5.2. Do individual ownership of land the accepted practice in your areas? 1=Yes ☐ 2=No ☐ /60/

5.3. If yes, which type of land can be individually owned? 1=Grazing land☐ 2=farmland ☐,3= other specify_____ /84/

5.4. How can one get land in your areas? 1=Through the decision of clan leaders ☐, 2= from family inheritance ☐,3= through redistribution of land by the government ☐, 4= by purchase of land ☐ 5= other specify _____ /85/

5.5. For what purpose was the land in the command area of the Aura irrigation project used before the introduction of the project? 1=for communal grazing ☐, 2=for rain-fed and traditional irrigation production by local communities' member☐, 3= for rain-fed and irrigation production by state farm ☐, 4= other specify _____ /86/

5.6. Whose did the irrigable area that you hold now belong to before the introduction of the irrigation project? 1= My own farm land ☐, 2= Communal land ☐ 3= State farm☐ 4= No ones Property ☐ ,5= other, specify _____ /87/

5.7. If your answer for Q5.5 is choice #1, which clan did the land belong to before the introduction of the Aura irrigation project? Mention the name of the clan:

Clan name

1._____
2._____
3._____
4._____

5.8. If your answer to Q5.6 includes # 2, 3 &4, how many clans did use the land in the command area before the introduction of the irrigation scheme? Mention the name of the clans: /65/

	Name of Clans	Location/*Kebele*
1		
2.		
3		
4		
5		
6		

5.9. Are all clans using the irrigable land with the introduction of the irrigation scheme in your locality? 1= Yes ☐ 2= No☐ /88/

5.10. If no, which clans are using the land currently? Mention the name of the clan?

	Name of Clans	Location/*Kebele*
1		
2.		
3		
4		
5		
6		

5.11. How the land in the command areas of the Aura irrigation project was distributed to the different clans? 1= based on the decision of committee from the regional and Aura *woreda* government☐ 2= by the decision of the committee comprising members from the *kebele* Administration and clan leaders ☐ 3=by the joint decisions of the community of my clans and the government administration at different level☐ 4=By the decision of a few clan leaders ☐ 5= Other specify _____ /89/

5.12. How much irrigable area do you have from the command area of the project? — (hectare). /69/

5.13. What were the criteria for the allocation of the size of irrigable land to the household? 1= the household must be a clan member that reside at the vicinity of Aura irrigation project as identified by the local government administration and the community☐ 2= the household must be willing to engage in irrigated farming ☐ 3=the household must be a clan member that used to

use the land for grazing before the project ☐ 4=All eligible household get equal size of irrigable area☐ , 5= other specify _____ /90/

5.14. Do you think the distribution of the land for irrigation was done fairly? 1= Yes ☐ 2= No ☐ /91/

5.15. If no, why?1= Local administrator favored their near and dears ☐, 2= All households of the clans' members that used the land for grazing before the project not included ☐,3=the land was distributed not to individual HH but group of household head ☐, 4=the distribution of the land to different clans undermined the clan that owned the total size of the land traditionally☐, 5= I want the land to be used for grazing =4 6= other specify _____ /92/

5.16. Have you engaged conflicts with any other members of the local communities because of the land distribution and allocation for Irrigated farming?1=Yes ☐, 2= No ☐ /93/

5.17. In which time of the year have you engaged in conflicts after the land allocation? 1=in wet season of the year ☐, 2= during dry season of the year, ☐ 3= in both wet and dry seasons☐ 4= when the year is sever drought year☐ /94/

5.18. If no to question 16, why?1=Fear of local gov't ☐ 2= some of their family has got irrigated land ☐ 3= Because of the mediation and negotiation through clan leaders was effective☐ /95/

5.19. Who were the people you engaged in conflicts with after the land allocation? 1= Non irrigation beneficiaries household☐ 2= irrigation farming beneficiaries☐ 3= with both of the above ☐ 4=sub clan's members no included in the irrigation beneficiary *kebeles* ☐ /96/

5.20. What do you think are the causes of these conflicts? Put in order of importance :(1 for the first important cause, 2 for the second and so on). 1. Conflicts in land use ———, 2. Water use problem b/n irrigators and non-irrigator——, 3. Water use problems among irrigators——, 4. conflict between customary land right and the formal land right with the project —— /97/

5.21. What are the losses that the conflicts have brought about to your household asset? 1=Damaged all my crop on the field ☐,2= Damaged my irrigated forage ☐,3=Death of my livestock ☐,4= no asset loss /98/

5.22. How have the occurrence of conflicts changed since the time of irrigation land distribution and allocations were carried out? 1=Increasing very much ☐ 2=Increasing ☐ 3=Decreasing very much ☐ 4=Decreasing ☐ 5=Hardly any change ☐ /99/

5.23. If your answer to Q5.22 is decreasing or decreasing very much, what were the reasons? 1=The local government took sever punishment ☐,2=Local by-laws that includes land uses arrangement on the irrigable land was made with the consensus of all clans/sub clans members ☐, 3= both one and two ☐, 4=Communities members understood that it is no use to quarrel with their kins and relatives, 5=other, specify_____ /100/

5.24. If your answers for question 5.23 include #4, what are the arrangements? 1=Livestock owner have to water their herd outside of the irrigation structure ☐, 2=Livestock herder of the local clan's/sub clan's member allowed to graze on the irrigated land after harvest☐ 3= both one and two above ☐ 4= Livestock herders of other clan's/sub clan's members were allowed to graze in dry seasons and drought period time through negotiation with clan leader☐, 5=other , specify ☐ /101/

5.25. If your answer to question 24 included choice 3 who established the institution and prepare the by-laws? 1=They existed long ago but improved to embrace irrigation issue ☐ 2= The implementing NGO and the government along with the community ☐ 3=Clan leaders and elders ☐ 4= the local government only ☐ 5=other specify_____ /102/

5.26. How do you evaluate the function of the local institution in enforcing the local laws for irrigation and grazing resource utilization? 1=Best ☐ 2= better ☐ 3= good ☐ 4= very poor ☐ /103/

5.27. Do you accept the role of the local institution and abide by the rule? 1=Yes ☐ 2= No ☐ /104/

5.28. If yes, what do the rules say? Mention the rule_____

_____

5.29. Does the local institution have relationship with formal government? 1=Yes☐, 2=No☐ /105/

5.30. If yes to question 5.30, in what aspect do they relate? 1= conflict resolution through formal court☐ 2=discussing communities' local development problems☐ 3=maintaining peace and order☐ 4=resolving conflicts on irrigated and water issues at local level ☐ 5=other specify_____ /106/

5.31. Can you rent you irrigable land? 1= Yes☐ 2= No☐ /107/

5.32. If no, why? 1= It is not allowed to rent the irrigable land ☐, 2=I want my household engage in irrigated farming☐,3= I feel that I may lose my land to outsiders ☐, 4= No demand for land rent☐,5= other specify _____ /108/

5.33. If yes to Q5.31, why do you rent your land? 1=I do not have adequate skill in farming ☐, 2= labor shortage☐, 3=I do not want to engage in farming ☐, 4= other specify _____

_____ /109/

5.34. If yes to Q5.32, whom do you rent the land to? 1=local community members who have capacity☐, 2=Farmers in north Wollo Amhara region ☐, 3= Local government employees☐, 4=other specify _____

_____ /110/

5.35. If yes to Q5.31, on what base do you rent your land? 1=on share cropping basis☐, 2=On cash bases for 1-2 years ☐,3= Other specify _____ /111/

5.36. If yes to Q5.31, did not the community members complain on the rental practice?1=Yes ☐ , 2= No ☐ /112/

5.37. If no to Q5.31, , do you feel that the land belongs to you 1= Yes☐ 2= No ☐ /113/

5.38. Under whose title is the land you are using for irrigation? 1=My self ☐, 2=My spouse ☐, 3= the family☐,4=My self and my spouse ☐, 5=No title is given so far, 6=Others, specify _____ /114/

5.39. Do you have child/children who is/are at the age of claiming land under their own title? 1=Yes ☐ 2=No ☐ /115/

5.40. If yes, how is/are the child (children) going to get the land? 1=Through redistribution of the whole irrigation land newly ☐,2=Through allocation of some marginal land not under cultivation but potentially irrigable ☐,3=Through allocation of some marginal land not under cultivation nor potentially irrigable ☐,4=Through inheriting land under my title at my will any time ☐ 5=Through inheriting land under my title when I pass away ☐, 6=Others, specify _____

_____ /116/

5.41. Do you think the land you are using will be under your title through out your life? 1=Yes☐, 2=No ☐ /117/

5.42. If yes, what relations does this feeling of yours have with improving productivity of your land? 1=It motivates me to improve the fertility and conserve soil ☐, 2= It assures me of the fact that the land is mine, and I have to take every care of it ☐, 3= both ☐, 4=Doesn't make any difference ☐ 5= Others, specify _____ /118/

5.43. If no to Q43, what relations does this feeling of yours have with improving productivity of the land? 1=I am not motivated to improve fertility and soil conservation ☐ 2= I am not sure that is my land, so I don't bother much about the care for the land ☐ 3= both =3 4= Others, specify _____ /119/

Part-VI. Supporting Organization

6.1 What government and NGO organizations are in your areas that help your irrigation farming activities? 1=SSD☐ 2= Pastoralist and Agriculture development office☐, 3=DA☐, 4=PCDP, 5=other, specify _____

6.2 Have you ever supported by Agricultural extension workers in your irrigation practices? 1=yes☐ 2=No☐ /159/

6.3 8.3. If Yes, during which operation? 1=Land preparation☐ 2= planting/transplanting☐, 3=Watering☐ 4=Harvesting ☐ 5=other specify_____/160/

6.4 Is there government assigned DA in your area to support your in irrigation farming?1=yes☐ 2=No☐/161/

6.5 If yes, have you got any extension supports from the DA regularly since the start of irrigation farming in your area? 1= Yes ☐ 2= No ☐

6.6 Which organization has provided you with improved seed and other inputs to you? 1=SSD☐ 2= Pastoralist and Agriculture development office☐ 3 =PCDP 5=other, specify _____ /162/

6.7 Is there irrigation water users association? 1=Yes☐ 2=No /163/

6.8 If yes, what does the role of the association in supporting for the proper functioning of the schemes? Describe _____

6.9 Who set up the water user association? 1=the beneficiary themselves☐ 2=the *woreda* and *kebele* administration☐ 3= project implementing NGO (SSD) ☐ 4= the communities along with the NGO and local administrators☐ other specify_____ /1164/_____ /166/

6.10 Who do you think is the irrigation scheme belongs to? 1=the government☐ 2= NGO☐ 3=the water users association☐ /168/

6.11 What are the traditional organization that exist in your community that deals with resources use conflicts and local development work? Name and describe them_____

6.12 What are the rules and procedures of this organization to deals with such issues?

6.13 How are these related to the local government organization and the project?

Part-XII. Livestock Production and Irrigation Farming

8.1 Who is primarily responsible for livestock rearing activities in the household to the following livestock rearing activities? 1=husband, 2=Wife. 3=male youth , 4= female youth, 5=Children /169/

8.2 To which activity do you allocate your household labor more? 1=to livestock keeping☐ 2=Irrigation farming☐, 3= trading ☐ 4=other specify_____/170/

8.3 How many times in a year do you engaged in irrigation farming? 1=once in a year☐ 2= twice in a year☐ 3=three times in a year☐ 4= I do not know☐ /171/

8.4 If your answer to Q8.3 is #1, what are the reasons? 1=I do not have adequate labor☐ 2=I value livestock keeping more than irrigation farming☐ 3=the irrigable land I hold is so small that I do not waste labor and time to farming☐ 4= I don't have trained oxen to plough my land☐ /172/

8.5 If you engaged more than once in irrigated farming in a year, did you have adequate labor for both livestock and irrigation farming activities? 1=Yes☐ 2=No☐ /173/

8.6 If no, how could you do so? 1=I used hired labor on crop share basis☐ 2=used labor from relatives☐ 3= I used share cropper☐ other specify_____ /174/

8.7 How many times have you cultivated your irrigable land in a year since the start of irrigation farming by the project? 1=NO times ☐, 2=one time ☐, 3=two times ☐,4=four times ☐ /175/

8.8 How does livestock keeping activity affect your irrigation farming? 1=creating labor shortage☐ 2=decreasing wet and dry season grazing land for home herds☐ 3=damage irrigated crops and forage☐ 4=creating conflicts with other members of the pastoral communities☐ 5=other specify——
_____ /176/

8.9 Are livestock rearing and irrigated farming conflicting activities for the household? 1=Yes☐ 2=No☐, /177/

8.10 If yes, why? 1=irrigation has decreased grazing land for domestic herds☐ 2=irrigation brought about difficulty in the way my herds traditionally get to watering points☐ 3=other specify——————
_____ /178/

8.11 If no, why? Describe _____
_____

Part-XI. Projects Effects on the livelihood of the beneficiaries

9.1 What are the beneficial effects of the project to the household? 1=increase income through food for work activities☐ 2=helped household restock its livestock asset☐ 3=increased the use of improved forage☐ 4=enhanced the involvement of the household in the local development affairs☐ /179/

9.2 How frequently do you encounter forage and water shortage for your animal and domestic consumption "without" the project? 1= more frequently☐ 2= frequently☐ 3= less frequently☐, 4=seldom☐ /180/

9.3 What does this situation looks like "with" the project condition now? _____
_____

9.4 What types of improved forage species have you planted using irrigation? List them /181/

9.5 What type of training have you taken from the project in regard to irrigation farming, soil and water conservation measure? 1=Vegetable production☐ 2=Soil and water conservation☐ 3=irrigation water application☐ 4=community organization and leadership training☐ 5=improved forage production and rangeland management ☐ 5= other specify——————
_____ /182/

9.6 Have you applied the knowledge obtained from the training? 1=Yes☐ 2=No☐ /183/

9.7 If yes, how did you apply?

9.8 Where did you practice the soil and water conservation measures introduced by the project? 1= home stead☐ 2= communal land☐ 3= on the farm 4=on all of them ☐ /184/

9.9 What changes have you seen in your areas and livelihood activities by undertaking the introduce soil and water conservation measures? Describe as detail as possible——————
/184/

9.10 How is the level of your crop production for your household consumption after you started irrigated farming? 1=excess of the annual household consumption☐ 2=sufficient for annual consumption☐ 3=sufficient for six months only☐ 4=sufficient for less than four months 5= I don't know /185/

9.11 Estimate the differences in amount of your annual cereal production before and after the project intervention? Fill the table below/192/

Crop types	Average annual production in quintal before the project	Average Annual production in quintal after the project
Maize		
Sorghum		
wheat		
Teff		

9.12 How many meals in a day did you use to have without the project condition? 1= one time☐ 2= twice ☐ 3= thrice☐ 4= four times☐ 5=others specify_____ _____ /193/

9.13 How much time do you get enough meal in a day with the project condition? 1=one time☐ 2 twice☐ 3= thrice☐ 4= four times☐ /194/

9.14 Which of the food grain crops have you adopted with the irrigation scheme? 1=maize, teff and sorghum☐ 2= maize and teff ☐ 3= teff and sorghum☐ 4= vegetables ☐ 5 other specify_____ _____ /196/

9.15 Do you think you will continue to get these benefits if the project phases out?1=Yes ☐ 2=, No☐ /198/

9.16 If yes how? If no why?

Appendix B. Check List for group discussion with the community

Topic 1: How do the people involve in the development of the scheme?

- How did you agree with the local development actors for the development of the scheme in their area?
- Who did initiate the scheme? Do all the members of the local community participated in the planning implementation, operation and maintenance of the scheme?
- How do you evaluate your involvement in the different stage of the scheme?
- What issues do you raise during the design stage of the project?
- What problems did they face in the operation and management of the scheme? How have they been solved?

Topic 2. Effects of clan based land tenure and resource use system on irrigation activities?

- What do you feel about the irrigable land distribution and allocation process?
- How did their traditional institutions for local resource use and managements systems involved in the irrigable land distribution and allocation? What impacts do the land allocation and distribution have on the irrigation practices in the area?
- What problems did irrigation farming practices bring about on grazing land ownership and use in the perimeter of the irrigable land?
- What are their concerns on the communally owned grazing land before the project visa-vise after the introduction of the irrigation scheme?

Topic 3. Conflicts over the irrigation scheme

- What kinds of conflicts have occurred around the irrigation scheme? With whom were the conflicts have occurred? How were the conflicts resolved?
- What problems around the irrigation scheme have not yet been resolved?

Topic 4. How are the extension support services being provided?

- Who provided the extension support services for your irrigation farming practices? Who is getting the supports? Are they based on your need?
- What problems are there in getting the extension support services? Who is regularly providing you with the services?
- How can you get the extension support services? Do you pay for the services? For which kind of extension services do you pay?

Topic 5. What are the contributions of the scheme to the local community?

- Food security, irrigation farming skills, community management activities, extension supports

Appendix C. Checklist for discussion with the government officials

Topic 1. How are small-scale irrigation scheme being developed in pastoral setting in your area?

- What institutional framework that guides the development of development of small-scale irrigation scheme with the pastoral community is put in place? What does the framework requires to be fulfilled before beginning the construction and after the construction of the scheme?
- How was the *Awra* small-scale irrigation project commenced? What were your role in the initiation, planning and through the subsequent stage of operation, maintenances and evaluation stage of the project cycle?
- What institutional and organizational arrangements are there to help forge partnership with local communities, NGOs and other stakeholders to enhance the local food security and self-reliance development through small scale irrigation?
- How do the institutions involve the local community? What contributions have these institutions made to create ownership of irrigation schemes by the pastoral community and help start settled farming.

Topic 2. What are the mechanisms for providing extension support services for irrigators?

- What extension approaches are put in place to provide the supports?
- What are the types of services being delivered to irrigators in the study scheme? How is the extension support services planned and implemented?
- What are the roles the local government organization in the plan and implementation of the annual extension support services delivery to the irrigators in the study scheme?
- What are the strengths and weakness of the currently practiced extension support services provision to the irrigators? What are the sources of the strength and weakness of the practices?

Topic 3. How the local government does manage the change in land tenure and use forms that emerge with the introduction of small-scale irrigation scheme?

- What are the strategies to solve the problems between the clan and/or sub clan based land tenure and use and individual ownership and use of land for crop on the irrigable land?
- How were the irrigable land distribution and allocation to different sub clan and irrigators carried out? What were the problems in the processes? Are they still surfacing up? If not why?
- What are the relationships of the local government with the community and traditional institutions in the study area in solving land tenure and use issues in the command area of the scheme?

Topic 4. Continuity of the operation and maintenances of the scheme

- Presences of irrigation users association
- Sources of resources for operation and maintenances activities of the scheme
- Technical capacity for the major maintenances work at local government level

Appendix D. Check list for discussion with sub clan leaders, elders and *kebele* administration.

Topic 1. Participation of the community in the scheme development

- How was the community involved in the development of *Awra* small-scale irrigation? Do all the elders and the community members agreed on the scheme development?
- What did the community contributed for the project?
- How was the *Awra* small-scale irrigation users association formed? What are the feelings of the community about the formation of the association? How was the participation of the local institutions in the formation of the association?
- How does the community involved in the land distribution and allocation process? Were there problems during the process of land allocation and distribution? What were they?
- How were the rules of the association formulated? What are the views of the community about the rules of the association?
- What are the problems in the operation and maintenance activities of the schemes? Who is responsible for the operation and maintenance of the scheme? What are the specific tasks and responsibilities allocated to the community regarding the activities of the scheme?
- Who coordinate the maintenance and operation activities of the scheme

Topic 2. Changes in land tenure and use in the command area of the scheme

- Whom do the land in the command area of the scheme belong to before the project? For what were it used for?
- Who do you think land in general belong to in your area?
- Which members of the community obtained irrigable land? How did they obtain?
- How were the size of irrigable land allocated to the currently irrigator household? What were the responses of the community to the land allocation processes?
- What are the main problems related to the land use and ownership of the command area of the irrigation project?
- Is a lasting agreement reached among the community on the land ownership and use? Why?

Topic 3. Roles of the local organizational actors evaluation

- What are the roles of SSD, WPARDO, the DA, Regional government and SLUF in the development of the *Awra* small scale irrigation? How did each of the actors involve in the scheme development (adequately, inadequately, not involved, no opinion)

Appendix E. Checklist for interview with professionals

Topic 1.Water allocation and distribution

- How does SSD carry out water allocation and distribution? What are the community's roles in the water allocation and distribution? Do they accept their roles? Why?
- How is the operational cost of water distribution covered?
- What are your relationships with WPARDO and the DA in water allocation and distribution activities?
- What are the major problems encountered in the irrigation water uses among the irrigators between them and the non-irrigators? How are the problems being solved?

Topic 2 maintenance of the structure

- What are the main maintenance activities of the scheme? Is there special maintenances work being done so far?
- What are the roles of the community, SSD, WPARDO in the maintenance work of the scheme? How are they involved in the maintenance activities?
- Who coordinate the regular maintenance work of the scheme? Is there schedule for regular maintenance work? On what base is the schedule prepared? Does the community agree with the schedule?
- What are the main problems in the maintenance activities of the scheme?

Topic 3. Extension support services provision

- What are the extensions supports being provided to the irrigators? Who is providing them?
- How regularly are the services provided in a year?
- What are the mechanisms for providing the extension supports to the irrigators?
- What is the level of coverage of the supports services? Why?
- What are the relationship between SSD and WPARDO and regional governments in the provision of the extension supports services? Is extension approach that SSD and the government partners commonly used for the delivery of information and farm inputs and provision of trainings?
- How is the supports services delivery coordinated?

Topic 4. Irrigation farming practices

- What is the level of engagement in irrigated farming practices by the community?
- How many times in a year do irrigators engaged in farming activities in a year on average? Why?
- What are the main problems that restrain irrigators from practicing irrigated farming regularly?
- What are the main crops that irrigators produce? Why do they produce such crops?
- What do you think about the irrigation practices of the irrigators when the supports of the SSD stop? Why/

Topic 5. Presences of water users' association and its function

- Is there water users association? How was it established?
- What are the tasks and responsibilities of the association? Why was the association formed?
- How does the community perceive the association?
- What are the linkage between the association and SSD (resources, information, etc?)
- What are the roles of the association in the operation and maintenance activities? How does it coordinate these activities?
- Who formulated the rules of the association? Do you think that the community accepted the rules of the association? Why
- What are the problems the association? What are the complaints on the association and its leaders?

Topic 6. Problems in land ownership and use on the command area of the study scheme

- What are the problems emerged with the introduction of the scheme in regard to land ownership and use? What were the responses of the community to such changes?
- What problems have been taken places between irrigators and non-irrigators on the utilization of the command area? How are such problems being resolved?
- Is there land related problems that still affecting the irrigation farming practices? Why?
- How was the land distribution and allocation carried out? Do you think that the land allocation and distribution was fairly done? Why?

Topic 7. Roles of the local organizational actors

- What are the roles of WPARDO, the DA, Regional government and SLUF in the development of the *Awra* small scale irrigation? How did each of the actors involve in the scheme development (adequately, inadequately, not involved, no opinion)

DECLARATION

I , the undersigned, declare to the research and graduate program office of Addis Ababa university that this is the product of my original research work, and all other sources of material are duly acknowledged and that it has not been submitted to any university for award of any academic degree

Name _____

Signature _____

Date _____

32. Are you involved in IEC plans at the district level? 1. Yes 2. No 3. Don't know
33. Have you ever involved local talents or resources in preparing a media campaign?
1. Yes 2. No 3. Do not know
34. Is there any system by which you get opinions/feedback from target audience?
1. Yes 2. No
35. If yes to previous question, what is the feedback system?
1. Informal 2. Formal feedback/evaluation after every programme
3. Audience survey taken from time to time
4. Any Other (specify) _____
36. In case of a system whereby feedback is obtained from audience, how often is the feedback incorporated in planning the next IEC activity? (Tick the most appropriate one)? 1 . Very often 2. Some times 3. Never
37. Give reasons for the above answer

_____

_____

38. How would you describe the supervisory support and guidance that you get in carrying out your IEC activities at the village level? (Tick the most appropriate one)
1. Adequate 2. Somewhat adequate 3. Not at all adequate
39. Who provides the supervisory support? Specify_____
40. Please, give any suggestions that will help you in better implementation of your work.

_____

_____

41. Are you satisfied with your work? Give reasons.

_____

_____

42. How old are you? _____ years
43. Sex of respondent? 1 .Female 2. Male
44. What is your current marital status?
1. Married 2. Unmarried 3 .Divorced/separated 4 . Widowed
45. How many children do you have? _____ children
46. Are you or your spouse currently using any contraceptive method? (Ask only those who are currently married and between the age group of 15- 49 years).
1. Yes 2. No