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**ABBREVIATIONS AND ACRONYM**

OWWDSE	Oromia Water Works Design & Supervision Enterprise
BoANR	Bureau of Agricultural and Natural Resource
CPB:	Cooperative Promotion Bureau
CSA	Central Statistical Authority
DA:	Development Agent
EPE	Environmental Policy of Ethiopia
EPLUA:	Environmental Protection and Land Use Authority
FC:	Field Canal
GTP	Universal Growth and Transformation Plan Access Plan UAP
I&D:	Irrigation & Drainage
IMO:	Irrigation Management Organization
IWRM	Integrated Water Resource Management
IWUA:	Irrigation Water Users' Associations
JICA	Japan International Cooperation Agency
KA	Kebele Administration
MOM	Management, Operation and Maintenance
MoWRIE	Ministry of Water Resources Irrigation & Electricity
OIDA	Oromia Irrigation _ Authority
QC:	Quaternary Canal
SMS	Subject Matter Specialist
ToT	Training of Trainers
TTI	Teachers Training Institute
UAP	Universal Access Plan
WRMP	Water Resources Management Policy
WSDP	Water Sector Development Programme

## EXECUTIVE SUMMARY

The Hidha-Sombo SSI study project area is situated in East Harerghe zone **Jarso Woreda Badhasa Kebele** of Oromia Regional State.. Its capital city *Ejersa Goro* Town is located at a distance of 36km from **Harar Town** to the north direction and 588 kms from Addis Ababa. The intended project site of “**Hidha Sombo SSI** project is found in Bedhasa kebele at distance of about 18 km from the Woreda capital Town.

One among the strategic focus for improvement in agriculture is small scale irrigation development which is considered as pillars for sustainable food supply, diversified and high market value crop production. Oromia Irrigation Development Authority ( OIDA) the client or project owner - has awarded the study and design works of“**Hidha Sombo** small-scale irrigation development projects to Oromia Water Works Design & Supervision Enterprise (OWWDSE)–the consultant. Following this, detail feasibility and design study was conducted to construct Firi-Qabso t small scale irrigation in order to reduce poverty and to increase productivity at household level.

For the purpose of socio-economic study, both quantitative and qualitative data were collected. And both primary and secondary data sources were used. The structured survey was conducted at the level of 30 randomly selected beneficiary households. Apart from the HH survey, community group members and key informants were used as primary sources of qualitative data. Secondary data were also collected from woreda line departments such as office of agriculture, education, health etc, were included in the socio-economic investigation using structured questionnaires. Moreover, Central Statistical Authority (CSA) and different publications as well as available literature were also searched referred to consolidate the study.

Data collected for the objectives of this study were analyzed using appropriate statistical soft ware of Statistical Package for Social Sciences (SPSS) version 20

Data collected for the objectives of this study were analyzed using appropriate statistical soft ware of Statistical Package for Social Sciences (SPSS) version 20

Farming system of the woreda as well as the project area is Crop-Livestock Integrated Production System. In this system, livestock husbandry and cropping are practiced in association. The

interactions are based on using animal tractions, manure (in cropping) and crop residues as animal feeds

The Population size of the Woreda was projected using annual growth rates of 2.9 %for rural & 4.11 %for urban areas based on 1999 population & housing census, accordingly the total population of the year 2009 were 150,150 and out of these 59,26(3.94%)and 144,224 (96.06%)were urban and rural population respectively.

The survey results regarding the marital status of the respondents indicate that 90 percent are married while 6.7per cent claimed to be single. Educational levels of the household respondents shows that 33, 43.3.10 per cent of the respondents found to be in illiterate, read and write and those who attended 1-4 grade category. Household heads those who have primary level education (from grade5-8) and 9-10 grades are found to be 6.7 per cent each.

As regard to ethnic group, 100 per cent of the respondents of the population in the project area belong to the Oromo ethnic group. As far as religious affiliation is concerned, 93.3 per cent of According to the household survey result, farming is the primary (major) source of income for about 100 % of the surveyed families while trade, farming and daily laborer as a sole source of income is for about 70% 13.3and 13.3% of the families respectively

Livestock production is a major component of the farming system. It is also one of the economic activities for traction powers, provision of dairy products, transportation and for household income generation.

According to the information obtained from office of education, total number of formal and non-formal educational institutions include: 88,4 and 60and, grade 1-4 , 5-8 and 9-10, schools respectively were found (Table7).

Regarding educational services, formal schools are better in their educational services although still there is still a problem of teachers. According to the key informant, in non-formal schools, adult male5989 and female 3495 total 9484 are served during their slack time.

In the study area woreda, the health institutions found to serve the population include: health posts, clinics and health centers. Almost all of the health facilities found in rural areas belong to public sector except some private clinics and rural drug vendors found in towns and district capitals.

The water supply schemes found in the woreda for the year 2010 are 57 hand-dug wells and 58 spring development. According to the woreda office of water resource, energy and mining, total beneficiaries of potable water supply in the year 2009 was 63 % ( 87,530 and in the 2009 this number has increased to 934 % ( 52238 peoples)

In the project kebele, extension services were being provided by respective line departments of the woreda, and some NGOs through demonstrations and training. The most important source of information in the study area is government extension organizations through DAs residing to their respective kebeles

Since most of the would beneficiaries are practicing traditional irrigation on within the commend area of the irrigation project. Therefore, land distribution among the beneficiaries immediately after the construction of the new scheme may not take place. This will be accomplished with the consent of the project beneficiaries and Kebele administration involvement

It is therefore, proposed that one farmer will own and cultivate existing ownership land after the implementation of the new scheme. Hence, there will be no threat of population displacement and conflict as far as the irrigation project is concerned. The expansion of the new irrigation scheme will not displace farmers who presently cultivate in the weir axis area.

The **Hidha-Sombo** Small Scale Irrigation Project will have substantial predictable impacts on the socio-economic development of the area. Aspects of the socio-economic factors are, therefore, wide and multifaceted which cannot be easily measured but can be reflected in the increased production and services in the economy and resulting spillover effect in terms of lowering the cost of food for urban and rural poor, stimulating the non-farm economy and impact on women and the poor..

## **PART I- SOCIO-ECONOMY**

### **Chapter1- INTRODUCTION**

#### **1.1. Background**

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Agriculture is the most important sector in Ethiopian economy and its development is important for general economic development of the country. The significance of agriculture to the Ethiopian economy arises from the fact that in which in the fiscal year of 2007/08 it contributed to about 45.9% of GDP, to more than 88% export and about 85% of employment (CSA, 2008).

Development of the agricultural sector in Ethiopia is therefore seen as central to combating hunger, reducing poverty, and generating economic growth (through the reduction of food imports and the boosting of exports). However, progress in the sector can only be achieved if the main constraints like variability in climate, limited access to technology, low levels of rural infrastructure and poor institutional structures are successfully addressed. Although there are various ways in which the above-mentioned issues can be tackled, one key strategy that could contribute to the alleviation of poverty and improvement in food insecurity in country is assisting poor farmers to increase the productivity of their farms.

In Ethiopia, “Agricultural Development-Led Industrialization (ADLI), policy constitutes various components needed for agricultural growth including technology, finance, rural infrastructure, internal and external markets and the enhanced role of the private sector. Central to achieving the agricultural policy objective is the promotion of irrigated agriculture and integrated water resource management.

The Hidha-Sombo SSI study project area is situated in East Harerghe zone **Jarso Woreda Badhasa Kebele** of Oromia Regional State. The major farming system of the project area is mixed crop-livestock (sedentary) mode of production. The project area population livelihood mainly depends on crop and livestock production. Agricultural production in the study area is constrained by declining soil fertility, unpredictable and erratic rainfall, pests. Farmers are further hampered by ineffective input supply and output marketing and have limited opportunities to earn off-farm incomes. Oromia

Irrigation Development Authority ( OIDA) the client or project owner - has awarded the study and design works of small-scale irrigation development projects to Oromia Water Works Design & Supervision Enterprise (OWWDSE)–the consultant. Following this, detail feasibility and design study was conducted to construct small scale irrigation that has about 46 hectares of irrigable land in order to reduce poverty and to increase productivity at household level. It is through irrigation and integrated crop development that sustainable crop production can be ensured. In this view, the feasibility study of **HidhaSombo** small scale irrigation development project was carried out in Jarso Woreda of East Hararge Zone of Oromia National Regional State to develop 46 hectares of command area. This study provides both quantitative household survey and qualitative results compiled in a table, figure, and text form

## 1.2. Project rationale

The development of irrigation and agricultural water management holds significant potential to improve productivity and reduce vulnerability to climactic volatility in any country. Although Ethiopia has abundant rainfall and water resources, its agricultural system does not yet fully benefit from the technologies of irrigation.

Agricultural production in the study area is constrained by declining soil fertility, unpredictable and erratic rainfall pests, input supply and output marketing and have limited opportunities to earn from off-farm incomes. Other factors which affect agriculture are in-availability of credit scheme and cash for investment, inadequate extension services and poor infrastructure. Moreover, inhabitants of the area have low levels of social services in terms of education, health and water supply. These issues, combined with increasing degradation of the natural resource base, especially in the highlands, aggravate the incidence of poverty and food insecurity.

Therefore, irrigation technology enable farmers to increase crop intensities through double cropping, supplementary watering during drought, thereby increase and stabilize yields to reduce vulnerability and improve productivity. It is with this logical and conceptual understanding that Oromia Irrigation Development Authority (OIDA) signed contractual agreement of **Hidha-Sombo** Small scale Irrigation Development Project Feasibility Study and Design with the consultant, OWWDSE. Accordingly, this socio-economic study was conducted as a step towards the intended

and requiring activities of the **Hidha-Sombo** Small Scale Irrigation Development Project implementation.

### **1.3. Objective of the study**

#### **General objective**

The general objective of the study is to conduct baseline survey regarding socio-economic situations of the beneficiaries and obtain data that can help for the development and implementation of **Hidha-Sombo** small scale irrigation project.

#### **Specific objectives**

To describe salient aspects of socioeconomic conditions of the study area, the specific objectives are:

- to identify and describe the major socioeconomic aspects of the woreda inhabitants in general and beneficiaries of the project area in particular.
- to assess the community's willingness to contribute to the construction of the irrigation project and participation in scheme management.
- to forward the necessary recommendations that can help in formulating feasible development interventions in the project area.
- to conduct economic and financial analysis of the project

### **1.4. Study Methodology**

#### **1.4.1. Data types and source**

For the purpose of socio-economic study, both quantitative and qualitative data were collected. And both primary and secondary data sources were used. The structured survey was conducted at the level of 30 randomly selected beneficiary households. Apart from the HH survey, community group members and key informants were used as primary sources of qualitative data.

Secondary data were also collected from woreda line departments such as office of agriculture, education, health etc, were included in the socio-economic investigation using structured questionnaires. Moreover, Central Statistical Authority (CSA) and different publications as well as available literature were also searched referred to consolidate the study.

#### **1.4.2. Methods of data collection**

The study methodologies adopted to assess the socio-economic aspects include household survey and participatory assessment by conducting group discussions with the beneficiaries and secondary data collection from various sources.

##### **A. Formal survey**

Formal household survey was conducted by employing structured questionnaire prepared to be compatible with the situation of irrigation beneficiaries and their farming system. Accordingly, enumerators who have knowledge of the culture, acquaintance with socio-economic concepts and proficiency of local language were recruited and trained before actual data collection commenced.

##### **Sampling**

Undertaking of the Sample household survey followed or employed purposive sampling approach in which 30 household heads respondents were selected randomly from the total population of the kebele.

##### **B. Informal survey**

Local peoples' perceptions, believes and attitudes, values as well as prevalent social and economic problems and potential for future development has been assessed.

Focus Group Discussion (FGD) and community consultation meeting meetings

**Focus Group Discussion** was conducted to obtain the necessary data on general issues and problems of the beneficiaries in the study area. Based on the prepared check list, reliable information was collected community representatives, including the youth and women.

Moreover, and awareness creation and community consultation meeting was held with beneficiaries in the presence of peasant association leaders. Finally, by employing checklists; key-informant interview was made to provide additional information. (See Appendix)

### **1.4.3. Data Analysis**

Data collected for the objectives of this study were analyzed using appropriate statistical software of Statistical Package for Social Sciences (SPSS) version 20. Household Survey results and other quantitative data from different sources were analyzed by using descriptive statistics like frequency, mean, percentage and standard deviation. Moreover, qualitative data were also organized in order to fill the gaps in the data.

### **3-REVIEW OF LITERATURE**

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#### **3.1. The Water Resources and Environmental Policies and Legal Frameworks**

##### **3.1.1. Water Resources Management Policy, Strategy,, Programs and Plans**

The Ethiopian Water Resources Management Policy (WRMP) was issued in 1999. It deals with the overall water resources of the country, including both surface and groundwater. The Policy sets out how these water resources should be economically and sustainably used for different purposes, including water supply and sanitation, irrigation and hydropower.

The overall goal of the WRMP is ‘to enhance and promote all national efforts towards the efficient, equitable and optimum utilization of the available Water Resources of Ethiopia for significant socioeconomic development on sustainable basis’ (MoWR, 1999). It establishes several fundamental principles to guide the management of water resources, including statements that ‘water is a natural endowment commonly owned by all the people of Ethiopia’, and ‘as far as conditions permit, every Ethiopian citizen shall have access to sufficient water of acceptable quality to satisfy their basic needs’ (MoWR, 1999). The Policy recognizes the need for an integrated and comprehensive approach to management of water resources that is compatible with the goals of other sectors, including health. It also promotes the participation of all stakeholders, including user communities and particularly women. On water pricing and tariff setting, the Policy recognizes water as a natural resource with an economic value that should be paid for, but the price for water should not be so high that it discourages water use, nor too low, which could encourage over-use and wasting of water.

##### **3.1.2. Environmental Policy**

The Environmental Policy of Ethiopia (EPE), issued in 1997, goes beyond the statement of high-level policy to include implementation and regulatory aspects. Its overall goal (FDRE, 1997) is: to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human-made

and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

To support this goal, the EPE sets out 19 key principles, which include the following:

- Every person has the right to live in a healthy environment.
- The development, use and management of renewable resources shall be based on sustainability.
- The use of non-renewable resources shall be minimized and where possible their availability extended (e.g. through recycling).
- Appropriate and affordable technologies which use renewable and non-renewable resources efficiently shall be adopted, adapted, developed and disseminated.

### **3.1.3. Water Sector Strategy and Programme**

Strategies are documents developed to operationalise policies, in other words to translate policies into action. Programmes consist of sets of related activities, projects or events that are intended to enact policies and strategies. While policies require the approval of the national parliament, strategies and programmes are endorsed by ministries.

#### **a) Water Sector Strategy**

The Ethiopian Water Sector Strategy developed in 2001 has been described as a road map to achieve the objectives stated in the Water Resources Management Policy (WRMP) (Tafesse, 2008). The guiding principles of the Water Sector Strategy (WSS) remain the same as those of the WRMP. These principles are:

- Water is a natural endowment commonly owned by all the people of Ethiopia.
- As far as conditions permit, every Ethiopian citizen shall have access to sufficient water of acceptable quality to satisfy basic human needs.
- In order to significantly contribute to development, water will be recognized both as an economic and social good.
- Water resources development shall be underpinned by rural-centred, decentralised management, a participatory approach, and an integrated framework.

- Management of water resources shall ensure social equity, economic efficiency, systems' reliability and sustainability norms.
- Promotion of the participation and community management of all stakeholders and user communities, particularly women's participation in the relevant aspects of water resources management (MoWR, 2001).

The WSS is divided into separate strategies for four sub-sectors: general water resources, hydropower, water supply and sanitation, and irrigation. The section on general water resources uses similar section headings to the WRMP but expands on each of them to give more information on how they should be implemented.

### **b) Water Sector Development Programme**

The Water Sector Development Programme (WSDP) was issued in 2002 to further elaborate on the Policy and the Strategy. The WSDP is a large document in two volumes that proposes plans and projects throughout all regions of Ethiopia covering the period from 2002 to 2016. It identifies priority intervention areas and projects for this 15-year time period. It includes specific targets for improving water supply and sewerage coverage, and also for irrigation, hydropower, water resource development, and institution and capacity building.

The WSDP focuses particularly on actions to (MoWR, 2002):

- make clean water available for drinking and improve sanitation
- make water available for livestock in nomadic and other special areas
- extend irrigation for agricultural development to the maximum possible
- expand generation capacity to meet hydroelectric power needs
- provide water for industrial development
- provide water for, among other uses, fisheries, tourism and transportation.

The WSDP therefore provides details for implementing the Water Resources Management Policy and the Water Sector Strategy. The Policy was the first to come followed by the Strategy and then

the Development Programme. Changes in the Development Programme may lead to revisions to the Policy and Strategy as needed.

### **c) National development plans**

Alongside these specific policies, strategies and programmes, the government of Ethiopia has also adopted several major plans for national improvement. The Growth and Transformation Plan (GTP) is a national development plan prepared by the Government of Ethiopia. It aims to improve the national economy and bring an end to poverty by increasing opportunities for commercial agriculture, large-scale industry and infrastructure development. All sector plans are aligned to the GTP. The first phase, GTP I, covered the period from 2010 to 2015. A follow-up plan, GTP II, will cover the next five years to 2020 and is expected to build on progress made so far and set further goals for economic development for Ethiopia.

In 2005, partly in response to the target in Goal 7 of the Millennium Development Goals), the Ethiopian government adopted the Universal Access Plan (UAP). The UAP is a national WASH plan that sets out the targets for WASH improvements. It initially covered the period from 2006 to 2010 and was revised to align it with GTP targets and strategies. This second iteration, UAP II, has been in place from 2011 to 2015.

### **3.3.5. Proclamation on Ethiopian Water Resources Management**

Proclamation No. 197/2000 was issued in March 2000 and provides legal requirements for Ethiopian water resources management, protection and utilization. The aim of the Proclamation was to ensure that water resources of the country are protected and utilized for the highest social and economic benefits, to follow up and supervise that they are duly conserved, ensure that harmful effects of water use prevented, and that the management of water resources is carried out properly.

The Proclamation defines the ownership of water resources, powers and duties of the Supervising Body, inventory of water resources and registry of actions, permits and professional licenses, fees and water charges. According to the Proclamation, all water resources of the country are the common property of the Ethiopian people and the State. As provided in the Proclamation, the Supervising Body shall also have the necessary power for the execution of its duties under the provisions of this Proclamation.

According to Article 11 (1), no person shall perform the following activities without a permit from the Supervising Body without prejudice to the exceptions specified under Article 12:

- construct water works;
- supply water, whether for his own use or for others;
- transfer water which he/she abstracted from a water resource or received from another supplies; and
- Release or discharge waste into water resources unless otherwise provided for in the regulations to be issued for the implementation of this Proclamation.

As defined in Article 12, any person shall utilize water resources for the following purposes without requiring a permit from the Supervising Body:

- dig water wells by hand or use water from hand-dug wells;
- Use water for traditional irrigation, artisanal mining and for traditional animal rearing, as well as for water mills.

### **3–RESULTS AND DISCUSSION –SOCIO-ECONOMY**

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#### **3.1. Description of the Project study Area**

##### **3.1.1. Location**

**Jarso Woreda** lies between **9<sup>0</sup> and 9<sup>0</sup> 44'N** Latitude **42<sup>0</sup> AND 42<sup>0</sup> 26** Longitude to the North East of Harar Town. It is Bordered by Dire Dawa council to the north , Cinaksen district to north east, Gursum District to the south, Hararari Regional State to the south and Kombolcha District to the West directions. The **Woreda** has a total area of **633 Km<sup>2</sup>** accounting for about **2.605** of the total area of East Hararge Zone. Its capital city **Ejersa Goro** Town is located at a distance of 36km from **Harar Town** to the north direction and 588 kms from Addis Ababa. The intended project site of “**Hidha Sombo SSI** project is found in Bedhasa kebele at distance of about 18 km from the Woreda capital Town.

##### **3.1.2 Climate**

##### **3.1.3. Climate**

The Study district is classified into Dega, Woinadega and kola agro-Climatic Zones covering about 20%,55%and 17%of the total of the district respectively, Daga agro-climatic zone (2300-3036m.a.s.l.) is characterized by average annual rainfall and temperature varying between 950 and 1300 mm and 10 and 17 c. Similarly, Woindage agro-Climatic Zone (1500-2300 m.a.s.l) is explained by average annual rainfall and temperature varying between by average annual rainfall and meteorological station under the control of ministry and sun shine.

##### **3.1.4. Farming System**

Farming system of the woreda as well as the project area is Crop-Livestock Integrated Production System. In this system, livestock husbandry and cropping are practiced in association. The interactions are based on using animal tractions, manure (in cropping) and crop residues as animal feeds. Interactions are more frequent in the midland of the Woreda where cereals are the major crops grown. In this farming system, cereal, root crops and cash crops (chat) are dominant, while

oxen cultivation where livestock production is undertaken complimentarily with crop production. Therefore, the proposed irrigation project as a land use system supports the subsistence requirements of the small holders particularly, in providing animal feeds for fattening and milk production.

### 3.2. Population and Demography

#### 3.2.1. Population

In this study, population and demographic data analysis will focus on household characteristics like: total population, sex ratio, population density and age structure. The Population size of the Woreda was projected using annual growth rates of 2.9 %for rural & 4.11 %for urban areas based on 1999 population & housing census, accordingly the total population of the year 2009 were 150,150 and out of these 59,26(3.94%)and 144,224 (96.06%)were urban and rural population respectively.

**Table 1: Population size of the district by rural, urban & sex of year 2009- 2010**

Year	Area	Sex		
		Male	Female	Total
2009	Rural	72,994	71230	144,224
	Urban	3,105	2821	5926
	Total	76,099	74051	150,15
	%	50,68%	49.32%	100%
2010	Rural	74,623	72818	147441
	Urban	32,33	29,37	61,70
	Total	77856	75755	153,611
	%	50.68	49.32%	100%

Source: Jarso Woreda Economic and Finance Dev/t Office

The total population has grown to 153,611 in the year 2010 out of which 6170 (4.02 %) accounts for urban population while the remaining 147441(95.98%)accounts for rural population. the crude

population densities have shown from 237 persons km<sup>2</sup> of an area in the year 2009.to 242 persons /km<sup>2</sup> of an area in the year 2010. Density of population and population growth in relation to total geographic area as well as productive land potential are good indicators to determine the aggregate demand for land both in quantity and composition.

### 3.2.2. Sex, age and household size

Out of the total sample HH respondents, 20 % are female while 80 % are males. As regard to age of the respondents, the average or mean age is 33.7 years with 5.57 Standard deviation ( S.D) and 25 and 50 minimum and maximum years, respectively. Concerning marital status of the respondents the survey result disclosed that 90% of the respondents are married and 6.7 % are found to be single.

### 3.2.3. Population Size by Age Group

The population age structure is an essential demographic data for different planning purposes especially for the development of service sectors like health, education water supply employment and other similar socioeconomic issues.

Population categorization by age group is essential input for designing of appropriate development strategies and plans so as to ensure the balancing of demand for resources with available and/or potential supplies of an area. The use of such disaggregated demographic data is essential for designing accurate and realistic plans; because, effective demands influenced by age and sex structures of the population (Table 2).

Table 2: population size of the project woreda by working age group

Age Group	Population Size in:	
	Number	Percent (%)
0 -- 14 years (Young age group)	105	49.29577
15 – 64 years (Adult age group)	84	39.43662
65 and above (Old age group)	24	11.26761
Total	213	100

Source: Survey Result, 2018

The younger population below the age of 15 years constitutes 49.2944% while the economically active age group (15 – 64) holds 39.43% and old age group 65 and above years shares the remainin11.26.1% of the total population. In respect of the population burden on economically active population, the population data for the project area disclosed that every 100 economically active individuals are responsible to 60 individuals for their living.

Based on the household survey results, the mean average household size among the area community population household respondents was found to be 5.6 persons/household with standard deviation of 2.10

### **3.2.3. Demand for labor**

The availability of workforce is among the demographic and economic factor that influence irrigated crop development of the study area. The demand for labor in agricultural production, varies with the type of crop produced i.e. some crops like vegetable seeks large labor than cereal crops provided that the farm size is equal and other limiting factors are constant for both crops. Therefore, labour constraints may call for the modification of land utilization types, reduction of the area to the profitable but labour intensive crops, or modification of cropping pattern to ease peak seasonal labour requirements of the annual crops. At full development, the annual labour requirement of the envisaged production activities per hectare is 1679 man-days. It is assumed that average land holding size allotted per household is 0.25 hectare, and the labour requirement for 0.25 hectares man-days. Accordingly, as the demographic surveys results of this study indicate, HHs on average have sufficient active working force (women and children) estimated to be 8 which is 1040 man-days. Moreover, for the proposed irrigation, since most of family labor is free when irrigation farming is under taken, then the demand of labor during this period will be satisfied and some farmer hire during peak period.

Table 3: Family size and age structure of sample households ???

### 3.2.4. Marital Status, Education level, Ethnicity and religious affiliation

The survey results regarding the marital status of the respondents indicate that 90 percent are married while 6.7per cent claimed to be single. Educational levels of the household respondents shows that 33, 43.3.10 per cent of the respondents found to be in illiterate, read and write and those who attended 1-4 grade category. Household heads those who have primary level education (from grade5-8) and 9-10 grades are found to be 6.7 per cent each.

As regard to ethnic group, 100 per cent of the respondents of the population in the project area belong to the Oromo ethnic group. As far as religious affiliation is concerned, 93.3 per cent of the interviewed respondents replied that they are followers of Islam religion while3.3 per cent are belonging to the Orthodox- Christian religion.

### 3.4. Livelihood and Major Economic Base of the Study Area

In this sub section, data on annual amount of income earned, major sources and annual expenditure by the sample households are presented and discussed.

#### 3.4.1. Types of sources of income

According to the household survey result, farming is the primary (major) source of income for about 100 % of the surveyed families while trade, farming and daily laborer as a sole source of income is for about 70% 13.3and 13.3% of the families respectively.

Table 4: Income sources of the sample HHs

Source Of Income	Frequency	Per Cent
<b>Primary</b>		
Farmer	30	100.0
Total	30	100.0
<b>Secondary</b>		
Trade	21	70
Farming	4	13.3
Daily Laborer	4	13.3
Total	30	100

Source: Survey Data, 2018

### 3.4.2. Rain-fed Crops production of the Area

As the soil and climate is suitable for a wider variety of crop types, different crops and varieties are growing by farmers of the kebele in the project area. However, improved technologies are not fully and adequately utilized, mainly because of inadequate extension services rendered to the farmers, inaccessibility of the area, insufficient supply, poor distribution and unaffordable price of the improved technologies. According to the data obtained from the woreda Agriculture Office and the nearby DA Center, the information about the last cropping season has been compiled in the following table.

Table 5: Major Staple Food Crops of Jarso Woreda and the Project Kebele

S/N	Major crops (rain-fed)	Jarso Woreda			Bedhasa Kebele		
		Area Coverage		Yield, (qt/ha)	Area Coverage		Yield, (qt/ha)
		ha	(%)		ha	(%)	
1	Maize	4159	40.07	34.0	105	13.12	25.0
2	Wheat	2920	28.13	30.0	400	50.0	15.0
3	Barley	170	1.64	27.0	40	5.0	8.0
4	Sorghum	1572	15.14	30.0	50	6.25	15.0
5	F. bean	17	0.16	15.0	5	0.62	15.0
6	Potato	1540	14.83	121.0	200	25.0	120.0

Source: Jarso Woreda Office of Agriculture and Development Agents Office of the project kebele

On the other hand, the farmers in and around the project area have long experience in producing horticultural crops using traditional irrigation practices. During the field assessment period nearly 80% of the command area is cultivated for production of different horticultural crops, dominantly potato, tomato, garlic, onion, carrot, cabbage and the likes. The following crops have been harvested with traditional irrigation development in Jarso Woreda for the period of 2008 - 2010 cropping seasons, which could be used as baseline for the proposed irrigated agriculture.

Table6: Crops Harvested with Irrigation in Jarso Woreda in the last three years

S/N	Crops harvested	2008		2009		2010	
		Area (ha)	Total prod. (qt)	Area (ha)	Total prod. (qt)	Area (ha)	Total prod. (qt)
<b>1</b>	<b>Cereals</b>						
1.1	Maize	32	1210	40	1560	56	2408
<b>2</b>	<b>Vegetables</b>						
2.1	Cabbage	12	2100	18	3240	30	5550
2.2	Garlic	10	520	12	580	12	560
2.3	Tomato	18	1260	16	1272	20	1410
2.4	Pepper	8	210	12	250	10	232
2.5	Onion	14	840	8	650	15	920
<b>3</b>	<b>Roots and Tubers</b>						
3.1	Potato	50	10,000	30	5850	55	11,550
3.2	Beetroot	7	1225	10	1842	21	3885
3.3	Carrot	6	368	8	480	12	860
	<b>Total</b>	<b>157</b>	<b>17,733</b>	<b>154</b>	<b>15,724</b>	<b>231</b>	<b>24,967</b>

\*Source: Jarso woreda irrigation development authority.

### 3.4.3. Livestock Production

Livestock production is a major component of the farming system. It is also one of the economic activities for traction powers, provision of dairy products, transportation and for household income generation. Oxen are selected for speed and endurance in pulling traditional ploughs. Small ruminants and chickens are generating additional incomes for the community. Traditional beekeeping is also normally known in the area. Modern beekeeping is not as such significantly practiced, but small scale activities are there in few pocket areas. Equines serve as means of transport for human beings and agricultural products. The major type and quantities of livestock in Jarso Woreda and the project Kebele (where the proposed irrigation project is located) are indicated in the table below.

**Table 7: Livestock Types, Quantities and Common Diseases in Jarso Woreda and the Project Kebele**

S/N	Jarso Woreda		Bedhasa Kebele	Diseases of the area
	Type of livestock	Qty	Qty	
1	Cattle	127823	3350	Foot & Mouth disease (FMD), Lumpy Skin Disease (LSD), Bovine and Ovine Pasturellosis, Senoryosis, sheep & goat pox, African horse sickness (AHS), endo and ecto parasites Newcastle, fowl typhoid, Coccidiosis, etc.
2	Sheep	244385	8950	
3	Goats	262233	862	
4	Horses	31	12	
5	Donkeys	32560	650	
6	Mules	3	1	
7	Camel	5907		
7	Poultry	345,238	23,235	
8	Beehives			
	-Traditional	7230	50	
	-Transitional	60	2	
	-Modern	300	8	

Source: jarso woreda livestock health clinic and nearby development agents offices.

According to the information obtained from woreda livestock agency and health clinic, and the community, FMD, Pasturellosis, AHS, sheep & goat pox, Newcastle and Coccidiosis are the most prevalent diseases in the area. Vaccination and treatment is the major means of preventing these diseases and farmers use their traditional healing mechanisms practiced from generation. In the area natural grazing is the major sources of feed for livestock.

### 3.5. Land Use and Land Holding

#### 3.5.1. Land Use

The land use pattern is mainly composed of an extensive grazing, subsistence type of agriculture and scattered settlement, situated within different landforms. The major land use types in the command area include cultivated land, grazing (fallow) land, and scattered settlement. Among the use types, arable land takes the largest proportion (80%) followed by grazing land (15%), and

settlement land (5%). On the cultivated lands, crops such as wheat, barley, F. bean, F. pea, and other highland oil crops are cultivated under traditional way of farming practices. As the information obtained from the farmers and physical observation made in the field, about 70% of the command area is covered with mainly potato and the remaining land with horticultural crops such as tomato, onion, garlic, beetroots, carrot, and others with traditional irrigation system during the field assessment period. Average landholding size of the study area is 0.5ha per household. According to the information obtained from the woreda agriculture and DA offices, the following land use patterns for the woreda and the project kebele are identified.

Table8: Land Use Pattern of Jarso Woreda and Bedhasa kebele

S/N	Types of Land Use	Jarso Woreda		Bedhasa Kebele	
		(ha)	(%)	(ha)	(%)
1	Arable land	22,356	40.52	631	84.70
2	Cultivated	20,620	92.23 of arable land	408	64.66 of arable land
3	Grazing land	1175	2.13	25	3.36
4	Settlements	2817	5.10	20	2.68
5	Forest lands (including bushes & shrubs)	22,640	41.04	52	6.98
6	Other land	6180	11.20	17	2.28
	<b>Total</b>	<b>55,168</b>	<b>100</b>	<b>745</b>	<b>100</b>

Source: Jarso Woreda Agriculture Office, Bedhasa kebele DAs offices

### 3.5. 2. Land Holding

Land tenure refers to the type of ownership or use rights of land. Some of them are private, communal or state ownership. In the study area, all these types of land ownership exist. Unfavorable tenure conditions may restrain the natural economic forces that normally determine efficient farm size and crop selection. At Woreda level, land holding per farm family ranges from 1 to 5 hectares with an average holding size of 3 hectares. In the project area, however, land holdings

ranges from 1 to 0.25ha with an average of 0.625. These holdings are fragmented and some farmers cultivate land both within and outside the scheme area.

The size of population and distribution of land is not the same among the community or the beneficiaries of the project .i.e. due to increment of the population. According to the key informants, in the study area, there is no shortage of cultivable land. So, most of the farmers cultivate their own land and interestingly the PA administration allocates land for the landless youth as an employment opportunity.

Shortage of Oxen: Oxen are the major source of farm power. However, due to scarcity of grazing land and other feed sources shortage, about 6 % of the farming population has no oxen; 94% of the farmers own oxen in the project area, While in the peasant association in which the project is located about 7.5 % of the farming population has no oxen and 92.5% own oxen. (Appendix Table 4)

## **3.6. Social Services**

### **3.6.1. Education**

Therefore, educational level of all members of the family is important for the acquisition, comprehension and acceptance of information about improved farming as well as ways of living. According to the information obtained from office of education, total number of formal and non-formal educational institutions include: 88,4 and 60\_and, grade 1-4 , 5-8 and 9-10, schools respectively were found (Table7).

Regarding educational services, formal schools are better in their educational services although still there is still a problem of teachers. According to the key informant, in non-formal schools, adult male 5989 and female 3495 total 9484 are served during their slack time.

Table 9: Number of teachers by qualification and sex

Qualification	Male	Female	Total
Degree	151	27	178
Diploma	540	158	698
TTI	31	11	42
Total	-	-	-

Source:-Malka Balo district education office, 2009/10 E.C

With regard to formal schools, there is less number of teachers and teacher vs subject ratio is also not in balanced. With regard to the number of school teachers by level of qualification, 178 degree holders, 698 diploma holders and 42 TTI graduated teachers are serving in schools found in the woreda.

### 3.5.2. Health services

The intent of the health data over view is to identify and evaluate changes in human health, risk that might arise as the result of change in physical, biological, social and psycho-social factors of the environment. In the study area woreda, the health institutions found to serve the population include: health posts, clinics and health centers. Almost all of the health facilities found in rural areas belong to public sector except some private clinics and rural drug venders found in towns and district capitals.

Table 10: Health institutions in the District in the year 2009 and 2010

No	Health institution & Medical Personnel	Year	
		2009	2010
1	Hospital	-	-
2	Health Center	5	5
3	Clinic	4	4
4	Health Pos	22	22
5	Drug Shop	4	4

Sorce:-Jarso Worega Health Office

Healthy Society Man Power is the basic & decisive factors the development of any Society to the welfare/Health of the people of any so. Different service give by the health Institutions are preventive that are different general treatment and different service for mother and children. The number of children % women vaccinated the type of vaccination are indicated below in table9.

**Table 11: Distribution of Medical Personnel in Jarso Woreda**

Year	Medical Personnel												
	Doctor	Health Office	Nurse	Pharmacist	Health Extension	X-rays	Lab Technician	Sanitarian	Health assistant	Primary Health Worker			
2009	-	6	27	6	33	-	5	-	-	-			
2010	-	6	27	6	40	-	5	4	-	-			

Sorce :-Jarso Woreda Health Office, December,2018

According to (Ministry of Health, 2005), health policy in Ethiopia is rooted in the primary health care approach which has health education (education in personal and environmental hygiene), nutrition, immunization and family planning for standard components. Thus, it is advisable to integrate both prevention and curative health care system in the area.

Table12: The top ten diseases of the woreda (in order of importance)

<b>N<sub>o</sub></b>	<b>Type of Disease</b>	<b>Remark</b>
1	Typhoid fever	
2	U.r.t infection	
3	Wound	
4	Helmenthiasis	
5	U.t infection	
6	Disease of blood and blood forming	
7	Diarrhea	
8	Conductivities	
9	Disease of digestive system	
10	Otitis media	

### 3.5.3. Portable water supply

Most of the people found in the study woreda as well as project area, get water from unsafe sources. Currently, people of the area are using all available water sources such as rivers, unprotected springs, shallow wells and hand dug wells for livestock and sanitation purposes.

**Table 13: Water supply by type and year**

Type Of Potable Water Supply	Years		Total Beneficiaries			
	2009	2010	2009		2010	
			People	%	People	%
Deep Well	-	-				
Shallow Well	-	-	87,530		52238	93
Hand Dug Well	55	57				
Spring Development	58	58				

Source Jarso Woreda Water & Mineral Office

The water supply schemes found in the woreda for the year 2010 are 57 hand-dug wells and 58 spring development. According to the woreda office of water resource, energy and mining, total beneficiaries of potable water supply in the year 2009 was 63 %( 87,530 and in the 2009 this number has increased to 934 %( 52238 peoples). Major problems are in relation to water supply include budget, water contamination and shortage of water treatment chemicals.

Though the daily water consumption is too low in the area, the responsibility to fetch is largely gone to adult woman or wives 96.7 Adult woman plus adult man may be husbands are sharing the responsibility (3.3. Children both male and female are fewer participants to fetch the household water requirements. This shows that accessioning enough water to households is directly mean creating relief for women in the area.

### Toilet facilities

Toilet and bathing facilities are essential components of sanitation, personal and environmental hygiene for households and community members. The majority of households 80 have no toilet facility within their compound/courtyard while 20 percent without. There are very few households that are using pit latrine in their courtyards. Open field execration is very common disposal system of the well field

### **3.6. Infrastructure and utilities**

The benefits from rural infrastructure development activities are inter-related and generally, are targeted at increasing services and access as a means of improving rural living standards and incomes. Thus, infrastructures such as road networks and utilities like telephone and electricity facilities provide support to a range of rural development activities by providing improved access to areas outside the village and reducing the time burden on family members.

#### **3.6.1. Road network**

According to the available information, There is 157.95 kms rural Road in the district in this year the total length of toad network that connects the district with zonal Capital is 36km in the year 2010. The TOTAL Road Density of all-Weather Road Of The District is 157.95Kms (From this Urea Prgramme 153Km) Due to geographical structure, there is No other means of transport Except road transport in the district. In The Hand road efficiency (all-Weather Road To Population ratio)in the district is 0.001028kms of all Weather road per 972 population in the year 2010.

#### **3.6.2. Electricity and telecommunication**

Utilities like telephone and electricity facilitate socioeconomic development of a certain locality. For modern communication and industrial development, electricity is one of the crucial services utilities. In the study, area like other social and economic infrastructure, electricity service is very limited. Currently the woreda is connected to national grid system while the kebele is without. From the existing modern communication technology, telecommunication is one. Accordingly Jarso Woreda capital Town has one international telephone calls service and\_\_\_ 3 employees (one office worker and two guards) the office give services SIM card and mobile card also receive telephone bile. As far as the project area is concerned, currently, the area is within the coverage of mobile net work.

#### **3.6.3 Banking and postal service**

Postal service is one of means of communication for the region. Postal service communication service is, specially, useful for rural areas where other modern communication facilities are lacking. At present time, the woreda capital Town Ejrsa Goro (located at 18 kms away from the project site) is the nearest center of postal services.

Similarly, the nearest banking services center place is the Woreda capital Town. The banking services is provided by Government and private Banks.

### **3.7. Institutional services**

#### **3.8.1 Extension services**

In the study area woreda, there are many public and civil societies, development organizations supporting smallholder (livestock and crop development) through the provision of knowledge/information, finance, production inputs. The major institutional services available include: agriculture and health extension, credit services and input supply.

In the project kebele, extension services, were being provided by respective line departments of the woreda, and some NGOs through demonstrations and training. The most important source of information in the study area is government extension organizations through DAs residing to their respective kebeles. The current government system of extension provision is based on Training of Trainers (ToT) method that participate woreda SMS, each DAs and Model Farmers. In the project area, currently three DAs are assigned to crop production animal husbandry, animal health and natural resource management professions, respectively. However, as regard to extension services and input supply for irrigation based crop production it seems less emphasis was given.

In summary, extension service delivery to Participating households needs to be improved and strengthened through: training in irrigation water applications; setting up demonstration plots; use of compost manures; farmer exchange visits; improving access to better farming techniques (less laborious) and post-harvest technology. Moreover, strengthening irrigation extension capacity, by increasing the number of capable development agents and contact farmers is needed.

### **3.8. Community Based Organizations**

#### **3.8.1. Cooperatives**

As to cooperatives, there are 55 farmer's cooperatives & 1 Union, their members were 22 with a total capital of 36,701,733 and 33,461,341 in the year 2017&2018 respectively. The major activities on which the cooperatives had been engaged were general trading, saving & credit, irrigation and handcraft.

Service Cooperatives by their Members, Male 35,410 &Female 13,737 Total 49,147 .The major types of services delivered by the cooperatives for the members, chat, apple, consumer ( sugar cane, oil& etc),saving & credit, livestock production. total capital of service cooperatives that is fixed asset 65,325,901.74, operational 70,141,600, all total capital run by cooperatives 135,467,501.74 birr.

No. Of Member of Farmers Association in Which the Cooperative Operatives in the district are 19 and 15,943 respectively in the year 2009 and out of the total number of the members, male are 13956 and 1987 are female. As regard to compare the farmers cooperative in the district in the year 2009 with in the year 2010 the same numbers of members association, but the total number of farmer are changed to 15943 out of which male and female are 13956 and 1987 respectively.

**Table 14:** the number of the farmers cooperatives, their members and the farmers Associations in which they operate in the year 2009 and 2010.

year	No. of Cooperatives	Legally Recognized	No. Of Member Farmers Association in Which the Cooperative Operatives	Number Of Member Farmers Family Heads		
				Male	Female	Total
2009	38	38	19	18,200	4169	22369
2010	38	38	19	999	275	

Source Jarso Woreda Cooperative Office

**Table 15:** Number of farmers’ cooperative engaged in taped activities

Type year	No of cooperative	No of. Members in which the cooperative operates	No. Of farmers cooperative engaged in trade					Type of service give by cooperative	
			Chat trading	Coffee trading	Vegetable trading	Mineral trading	Multi-purpose	Saving & credit	Water pump renting(action)
2009	6		2	4	-	-	-	-	-
2010	6	19	-	2	4	-	-	-	-

Source: Jarso Woreda Cooperative Office

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## Chapter 4- LAND DISTRIBUTION WITHIN THE CONTEXT OF THE NEW SCHEME AND EFFECT OF DISPLACEMENT

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The beneficiaries of the intended project(Firi-Qabso) are practicing traditional irrigation (on owned land) within the command area of the irrigation project. Therefore, land re-distribution among the beneficiaries immediately after the construction of the new scheme may not take place. However, any dispute which may arise due to implementation of the project e.g.for farmers crops which could be destroyed due to irrigation canal construction consent of the project beneficiaries and Kebele administration involvement made consent to bring a solution. However, with reference to the existing land holding and production conditions the following factors are considered to under the context of the existing traditional irrigation scheme:

- Agricultural production will be possible at least two times in one year
- High value cash crops will be produced
- Forage crops will be introduced that will be used for livestock fattening
- Assuming that land suitability (of the command area) for the proposed cropping Pattern is nearly the same for the entire beneficiaries.

It is therefore, proposed that one farmer will own and cultivate existing ownership land after the implementation of the new scheme. Hence, there will be no threat of population displacement and conflict as far as the irrigation project is concerned. The expansion of the new irrigation scheme will not displace farmers who presently cultivate in the weir axis area.

**Firi-Qabso-Sombo** Small Scale Irrigation Project will have substantial predictable impacts on the socio-economic development of the area. Aspects of the socio-economic factors are, therefore, wide and multifaceted which cannot be easily measured but can be reflected in the increased production and services in the economy and resulting spillover effect. Therefore, the following relevant socio-economic factors are used in the economic analysis.

### 1) Employment and direct impact on income of rural population

Irrigation can support crop intensification through which small plots of land can produce more *per capita*. The available household labor can also be engaged throughout the year, thereby improving

labor productivity. Studies consistently show that agricultural productivity gains have raised rural incomes by directly increasing farmer income and, of Particular income to the poorest, by increasing employment opportunities and wage rate.

## **2) Lowering the cost of food for urban and rural poor**

In the areas where food supplies are not kept Pace with population growth, increased production of food has often has a dramatic effect on food prices. Therefore, first, reduced market prices enable poor households to buy food that they couldn't otherwise afford thereby improving their nutrition intake. Secondly, poor households spend a high proportion of their household income buying food and free up their income for other needs like education, health etc. fees.

## **3) Stimulating the non-farm economy**

Agriculture is the main root of economic growth in most developing countries by providing employment, generating domestic national income and export revenues. Therefore, the intended project will help agriculture to perform well in which, the impact is felt quickly, not just in the agriculture sector but also in wider non-farm economy through the forward and backward linkages between irrigation production and commodity value chains.

## **4) Impact on women and the poor (equity)**

The overall irrigated land use system, will contribute to the increment of production and productivity of the HHs. This can provide equal opportunity for both men and women in terms of employment and access to and control over resources According to some studies, the switch from rain fed agriculture to irrigation usually places additional demand on woman's' workload.

## Chapter 6- CONCLUSION AND RECOMMENDATIONS

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### 6.1 Conclusion

The investigations of the socio-economic impacts of Hidha-Sombo Small Scale Irrigation Project, call for socially and economically more comprehensive and transparent decision making implementation procedure. Accordingly, major socio-economic, organizational and institutional issues are summarized as follows:

- The intended project will have the impacts of raising rural incomes by increasing employment opportunities and wage rate, lowering the cost of food for urban and rural poor and stimulate wider non-farm economy through the forward and backward linkages between irrigation production and commodity value chains.
- The community is aware of the benefit to be achieved from an irrigation project. They have showed their willingness to participate by means of labor as the project's cost sharing. Users would also contribute all naturally occurring materials required for construction. Moreover, the administration council of woreda as well as Kebele also considers the project as a sustainable development opportunity to reduce poverty among the rural communities. They have expressed their interest and willingness for the realization of the project by promising to contribute all needed.
- Women and the poor, can Participate in irrigated agriculture as farm laborer, land owner or decision makers. In addition, increased income resulted from the proposed scheme will address basic needs of women. This can provide equal opportunity for both men and women in terms of employment and access to and control over resources. However, in spite of the recognition of the roles of women can play in irrigation development and management, woman may not be the full beneficiaries of the enhanced farm productivity and increased income unless purposeful measures are taken by the concerned stakeholders.

Finally, the socio-economic study of this irrigation project indicates that there are favorable conditions in aspect of farmers experience administration council of woreda as well as Kebele administration commitment and future market prospects are great and would demand the implementation of the project.

## 6.2. Recommendations

Sustainable farmers managed small scale irrigation development can be realized if only measures of core issues of irrigation development addressed properly. Therefore in order to make the project viable the following points are suggested.

- 1) In order to take in legal identity and assuming full responsibility for scheme operation and maintenance by WUAs, implementing appropriate institutional framework and providing comprehensive training (in areas of operation and maintenance, water distribution, management, simple accounting and aspects of monitoring) to water users committee is highly important.
- 2) Strengthen their capacity and coordinate institutions dealing with small scale irrigation to support smallholder farmers through the provision of knowledge/information, finance, production inputs and services. Moreover, the contact/model farmers system should be adopted to provide extension directly to farmers in the recommended ratio.

It is therefore, important that:

- Extension officer should equally be qualified in providing practical training and
- Model farmers attend periodical training programmes to train the beneficiaries.

3) Financial systems in the different schemes should be in place so as to solicit funds to support sustained development activity to meet cash requirement of target beneficiary which will PAVE way to increase the expected benefits.

4) As irrigation involves large investment in capital and labour, farm produce is also need to be geared towards marketable commodity. Lack of dependable market, inadequacy of marketing infrastructure, storage, and transportation, flooding the market with similar crops and lack of information are issues of marketing in the project area. Therefore, for successful marketing and farm profitability identify:

- Good practices in terms of crop selection, good quality seed, and timeliness of produce, extension and marketing link are imperative.

- Upgrade farmers' and Development Agents' skills in irrigated agriculture extension, business case preparation and thereby increase productivity, impact and sustainability of irrigation schemes

5) Women Participate in irrigated agriculture both as farm labourer, land owner and decision makers. However, women may not benefit from the enhanced farm productivity and increased income unless purposeful measures could be taken farm and organization levels. Therefore in order to improve women's status:

- Ensure their Participation in WUA, decision making, land right and leadership and
- Use in gender inclusiveness (gender analysis) in planning and adapt gender performance indicators in monitoring and evaluation programmes to insure decisive roles of women in the socio-economic development.

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**PART II-AGRICULTURAL BUSINESS ENTERPRISES AND MARKETING**

## **Chapter -1 INTRODUCTION**

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### **1.1. General Background**

Privately managed (small-scale) irrigation schemes in most of the Sub-Saharan Africa (SSA) countries, show that there is business potential for private entrepreneur involvement in irrigation (CTA, 2001). Irrespective of the level of profitability of a given technology, lack of marketing services and/ or the existence of a relatively small market size may hamper the widespread adoption of the technology in question. It is possible to generate the total impact of technological changes in terms of increment in production, additional marketable surplus, quantity which can be commercialized through the existing market outlet and possible variations in prices.

In any economic system beyond the subsistence level (including Ethiopian small holders farmer), produce certain goods beyond and above their requirements. This gives rise to an exchange process and ultimately to specialization. The above explanations make it clear that in non- subsistence economic systems, producers will have to take into account the above question. The responses that the producers could give to these questions will depend on the availability, reliability and adequacy of relevant and precise information. It is noteworthy that from the producers' point of view production is only half the job the other probably not the least important one is marketing. Therefore, producers must be cautious and vigilant in making their production decision.

### **1.2. Objective**

- Review of concepts related to agricultural business, marketing systems, functions and actors;
- Assess existing situation of (constraints and potentials) of marketing of the project study area;
- Make recommendations towards the creation of an enabling business environment for intended small-scale irrigation project beneficiaries.

### **1.3. Approaches**

#### **Approaches used for the above objectives include:**

- Review of marketing concepts in terms of marketing functions, principles, actors etc.
- Assessment on marketing situation of small-holder farmers and ;
- Key informant and discussion with farmers

## **Chapter2-AGRICULTURAL BUSINESSES AND MARKETING-AN OVERVIEW OF THE EXISTING SITUATION**

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### **2.1. Agricultural Business and Agricultural Marketing Systems**

#### **2.1.1. Criteria for Agricultural Business Enterprises**

When establishing a new agricultural enterprise, it is important to consider the economic value it will contribute to the owner. Undertaking farm level economic analysis is the most realistic way of assessing the viability of the envisaged enterprise and its suitability to the farming system.

There is no single and correct way of analyzing the impact of a given technological innovation on farmers' livelihood. In fact, different farmers have well defined priorities and specific criteria for judging the viability of innovations. Consequently, on-farm data need to be analyzed with maximum care and conclusions should be drawn by taking into account farmers' decision making criteria. In what follows, attempts will be made to summarize the most important points which are commonly employed in evaluating the viability of new technologies/enterprises.

#### **A) Promotion Criteria**

This refer to exploring the feasibility of using the new technology within the existing farming system given the prevailing agro-ecological, technological, socio-economic and institutional factors and farmers' management capacity e.g. (Comparative economic analysis within the existing system).

The most commonly used tools include:-

- Gross Margin Analysis
- Net Margin Analysis
- Partial Budgeting
- Whole Farm Analysis

**B) Sustainability Criteria-**

These criteria help to evaluate the long-term viability of new technologies. Experience shows that technologies come and go. A technology which was popular at one time may fade out of public memory at another time. Therefore, it becomes necessary to gauge the sustainable nature of technologies by looking into the existence of:-

- Viable Product Markets;
- Sustainable Institutional Support;
- Accessible Inputs;
- Sharp Falls In Levels Of Outputs;
- Variations (Fluctuations) in input and output prices; etc.

**2.1.2. The Dynamic Nature of the Evaluation Process**

As agricultural development activities are aimed at bringing perceptible (detectible, Noticeable) changes in the sector, the potential impacts of improved technology transfer must be assessed on regular basis. This is mainly because the farmers operate in an ever changing production environment so much so that they need to take account of and adapt to changing conditions.

The environmental factors can be divided into two:

- 1) The micro - environment; and
- 2) The macro - environment.

The micro-environment has to do with the intra-farm production conditions over which producers have relatively high degree of maneuver. Examples include: allocation of available resources to alternative uses; what and how much to produce; when and how much to sell; which techniques of production to use; etc. It should be noted that decisions on some of the aforementioned points could be influenced by circumstances beyond the control of the producers. All the same, the latter are free to make whatever decision they find appropriate.

The macro-environment deals with factors which producers can hardly manipulate and is divided into two:-

- a) The proximate macro-environment; and
- b) The wider external environment.

**The proximate macro-environment:**--The proximate macro-environment which includes all aspects which have closer links with producers in that the latter cannot do without them. The proximate macro environment consists of input supplier', output distributors and competitors' environment. Changes in these elements will have substantial bearing on the producers' decision making.

**The wider external environment:**- encompasses all those factors which are completely beyond producers' control. More specifically, the producers are at the mercy of these factors. The wider external environment includes: the economic environment; the technological environment; the political and legal environment; the social and cultural environment; and the institutional patterns.

Given the fact that changes in the environmental variables will be passed on to the producers, the latter revise their decisions and make adjustments in resource use and requirements by taking the prevailing conditions into account. A technology which was found viable at a given point in time may become less important at another time. It is, therefore, imperative to evaluate the viability of technologies through time.

## **2.2. Agricultural Marketing Systems and Functions (Market Agents, Information**

**(Input supply, finance, market outlet, coordination and facilitation of markets)**

### **2.2.1. Marketing agents/ market intermediaries/market middlemen**

The performance of all business activities involved in the flow of food products and services from the point of initial agricultural production until they are in the hands of consumers (-Kohls & Uhl). These are market "participants" who perform different marketing functions in order to obtain economic benefits. In general, three groups of market intermediaries can be distinguished: **merchant middlemen, commission agents/brokers** and facilitative organizations. Merchant middlemen take title to the product, commission agents and brokers carry out marketing functions on commission, and facilitative organizations assist merchants in their marketing activities in the marketing system.

**a) Merchant middlemen**

Merchant middlemen take title to, and therefore own, the product they handle. They can be classified as follows:

**B) Assemblers:** Sometimes also known as traders/transporters/country buyers, they are the first link between the farmer and other middlemen. They often carry out the initial task of assembling goods from dispersed farms or local rural markets. Assemblers may be farmers, shopkeepers, itinerant traders or some co-operative or government-buying agency.

**c) Wholesalers:** The role of wholesalers is to transfer goods from producers or assemblers to retailers or other wholesalers. Thus, their role may overlap with that of assemblers, in that they may deal directly with producers. They often finance the movement of goods themselves and consequently bear the cost of marketing risks.

**d) Retailers:** The main function of retailers is to buy wholesale agricultural produce and sell to consumers at convenient locations and times in various forms and quantities. In town, retailers often buy from wholesaler-distributors or their brokers and resell to the consumers. Retailers may have a fixed base: a stall, a shop or a place on the ground, or they may be hawkers, who carry their products around.

**e) Packers/Manufacturers/Food processing companies:** Enterprises that use agricultural commodities as raw material. For instance, in the case of meat processing business, processors have a very important role in the marketing channel.

**f) Exporters/State Owned Enterprises (SOEs):** In general, these are companies that mostly buy and sell agricultural products in foreign markets. These products vary from those freshly harvested to those that have gone through various stages of processing.

**g) Agent Middlemen (Commission agents – Brokers)**

Agent middlemen can be distinguished from merchant middlemen in that they don't take title to goods. These agents work for a commission on behalf of other participants. They operate at all levels of the marketing channel. Typically, they work for either a flat rate or percentage (of the selling price) commission. Brokers bring buyers and sellers together and assist in negotiations on a

more ad hoc basis. Some brokers may operate as auctioneers, auctioning products on behalf of collecting wholesalers.

#### *h) Facilitative Organizations (Facilitators)*

Facilitative organizations aid the various middlemen in performing their tasks. These organizations don't, as a general rule, directly participate in the marketing process either as merchants or agents. The majority of the literature in marketing refers to three types of facilitators: first, **physical distribution firms**, including warehousing firms and transportation firms;

**second, marketing service companies**, including standardization (grading and quality assurance) agencies, marketing research firms, market intelligence (advertising and promotion) agencies, trade associations, livestock auctions/grain exchanges, and market information service; and other firms that help **finance and/or insure risks** associated with the buying and selling of goods.

### **2.2.2. Marketing channels**

A marketing channel describes the movement of a product from the site of production to the place of consumption. It may include transportation, handling and storage, ownership transfers, processing, and distribution. The marketing channels for agricultural products could be broadly divided into the following two categories:

- ☞ A 'short' or zero level channel (direct marketing where the producers sell to consumers without the use of middlemen); and
- ☞ A 'long' and multi-level channel (indirect marketing where producers sell their products to consumers through the use of middlemen). Available evidence shows that most producers do not sell direct to end users. There is normally at least one level of intermediary, frequently a retailer. One reason for the use of intermediaries is that they specialize in particular activities.

### 2.2.3. Market Information

The availability of accurate and adequate market information is essential for producers, market intermediaries, and consumers, if market mechanisms are to work efficiently. Information helps the protagonists in the marketing system to balance supply and demand in particular markets and thus avoid gluts and surpluses with their corresponding fluctuations in prices.

Information concerning probable supply levels and corresponding prices will enable producers to make their decision on:

- What to produce?
- When to produce?
- How much to produce?
- How to produce? etc.

Market information helps to produce products which accurately reflect the needs & wants of customers. Market intermediaries could also operate more efficiently and avert business risks if they are provided with reliable information for this helps them to improve their knowledge of buyers demand and sellers supply levels as well as factors affecting prices. In order to aid decision- making market information must be:

- Relevant, i.e. its content must be related to the information needs of the target group;
- Meaningful i.e. precisely specified with regard to location, time and other features and formulated in a way which can easily be understood;
- Reliable i.e. accurately & regularly collected & transmitted;
- Promptly available , i.e. published within a few hours of being collected; and
- Easily accessible.

**Some of the variables on which market information could be collated are:**

<ul style="list-style-type: none"> <li>▪ Prices obtainable through the various outlets open to the producers;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Resource availability;</li> </ul>
<ul style="list-style-type: none"> <li>▪ Volume of trade;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Competitors(type &amp; number);</li> </ul>
<ul style="list-style-type: none"> <li>▪ Market potential(foreign domestic);</li> </ul>	<ul style="list-style-type: none"> <li>▪ Supplies &amp; raw materials;</li> </ul>
<ul style="list-style-type: none"> <li>▪ Level of production ;</li> </ul>	<ul style="list-style-type: none"> <li>▪ retail prices;</li> </ul>
<ul style="list-style-type: none"> <li>▪ Conditions of sales;</li> </ul>	<ul style="list-style-type: none"> <li>▪ government actions &amp; policies;</li> </ul>
<ul style="list-style-type: none"> <li>▪ Product problems;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Costs of production;</li> </ul>
<ul style="list-style-type: none"> <li>▪ New processes &amp; technologies;</li> </ul>	

**2.3.2. Market Opportunities of the project study areas**

Jarso Woreda area farmers are in the vicinity of big Towns like Dire Dawa , Harare and Jijiga as well as Universities of haromaya which are potential consumers, including different businesses like hotels, restaurants, snacks; government correction centers and thus no fear of market problem to face. Farmers of the project area are already producing vegetables like potato and cabagge and linked to traders of Somalia and Djibouti. The existence of cross country routes (Ethio-Somali land) close to production site is another opportunity to be captivated if quality and quantity produce is consistently supplied. Therefore, if the necessary marketing promotion and measures taken, farmers could be benefited from intended irrigation project.

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## **Chapter3- PROPOSED CROP BUSINESS ENTERPRISES AND MARKETING**

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### **3.1. Gross Margin Calculation for small-Holders Crop Enterprises**

The gross margin for an individual farm enterprise is defined as the difference between the value of its output and the value of the variable costs incurred in producing that output. The gross margins per hectare of crops and per head of livestock are widely used for comparative analysis of activities on one farm, and between farms in similar environments. Valid comparisons can, of course, only be made in terms of a production unit common to all the farms of activities being compared. This unit can be the land area, if land used by each activity is equally suitable. The procedure is to select the highest gross margin per unit of the most common limiting resource (land, capital, man hour or man day) and expand it until some other restraint (self possession, Limit) is met.

One easy and quick way of looking into the potential effects of new technologies on the productivity and income of farmers is by comparing gross margins on per unit of the most common limiting resource. However, no generalization should be made on the basis of such results which, in fact, should be interpreted very carefully because of the following reasons:

- The results can be affected by variations in climatic factors (depending on whether we have a good or bad year);
- The soil type and method of seed bed preparation can affect the yield level; and
- Changes in input and output prices can affect the level of gross margin.

Suppose that a farmer has 2 hectares of land on which he plants wheat. On one hectare he used a local variety along with traditional methods whereas on the other he planted an improved variety and applied modern inputs. The following table summarizes the information on costs of production and output levels.

### 3.2. Facts and assumptions used in the analysis

*a) Yield estimates/projection:* The yield (production per hectare) of the crops proposed is presented in the agronomic study document. The yield level considered in the financial analysis is the maximum attainable yield level presented in the agronomic study document for the project.

*b) Estimated Production cost per hectare for the different crops:* The production cost per hectares for each of the selected/proposed crops is estimated based on the input requirements and their market prices during the study period. The production inputs considered include: human labor, oxen labor, seed, fertilizers, insecticides, fungicides and herbicides. The summary of the estimated production cost per hectare for the different crops for the first year is provided in the following table. It is assumed that the production cost will increase by 5 percent every year over the 25 years of the project’s life span.

Table 15: Recommended crops total production cost

S/ N	Selected Crops	Fertilizers, (Birr/ha)		Pesticide Birr all types			Total Cost
		NPS	Urea	Pesticide(all types) Birr	Labor cost	Estimated costs of seed, material and equipments	
1	Potato	1335	1269	600	<b>10,960</b>	3500	17664
2	Onion	1335	1269	4500	<b>17,120</b>	6500	30724
3	Cabbage	1335	630	600	<b>14,160</b>	1500	18225
4	Tomato	2002	1269	3200	<b>17,420</b>	4000	27891

**Table 16: Recommended crops gross margin profit**

S/N	Selected Crops	Production Cost	cost per quintal	Yield (qt/ha	Total product cost/Ha	Gross margin Profit	Remark
1	Potato	17664	600	65	39000	21,336	
2	Onion	30724	800	70	56000	25,276	
3	Cabbage	18225	500	120	60000	41,775	
4	Tomato	27891	800	150	120000	92,109	

The above table shows that production using modern inputs with irrigation is preferable because for an additional expense it resulted in an additional gross margin indicated in the above table. It is also important to note that the gross margin does not measure profit. It shows the contribution of each enterprise to fixed costs, interest and capital expenditure. Therefore, enterprises can be compared on the basis of their gross margins, provided fixed costs are the same.

## 3.2. Proposed Measures for Markets Improvement

### 3.2.1. Market facilitation and coordination

#### 1) Small-scale communal irrigation schemes

- Synchronies production with marketing.
- Assess market demand before production.
- Market assessments and surveys carried out by the government and supporting
- Focus on the production of high-quality produce so as to be able to compete with other produce
- Form/strengthen WUA/farmer cooperatives and marketing organizations.
- Plan as a group as this increases the bargaining power;.
- Farming should be approached as a business – there is a need to develop marketing skills.
- Diversify; explore the possibility of growing other crops that are high in demand.
- Contract growing with buyers, possibly for export – this provides an assured market.

## 2) Explore other markets.

- Access roads need to be upgraded and maintained; government and donors have a critical role to play here.
- Collection centres are needed within the communities. These centres can also be used as a meeting place for the community.
- Exchange visits for farmers should be arranged within the country and outside – so as to expose them to other practices and models.

### **3.2.2. Support system and services**

#### **1) Production systems**

- □ Farmers need to adopt an agri-business approach to their operations and be prepared to practice crop rotation and diversification.
- Farmers' organizations should be involved in seed multiplication programmes to enable access to good seeds as well as reduce seed costs.

#### **2) Support systems**

##### **General**

- Extension service delivery to participating households needs to be improved and strengthened through:
  - training in irrigation water applications; -
  - setting up demonstration plots; -
  - promoting organic farming and use of compost manures;
  - - farmer exchange visits;
  - Improving access to better farming techniques (less laborious) and
  - Post-harvest technology.
  - The contact/model farmers system should be adopted to provide extension directly to farmers

#### **3) Government support**

The government has a critical role to play in supporting farmers to realize their potential. The points listed below all relate to what the government needs to do.

- Provide infrastructure support to cooperatives such as storage sheds, equipment, etc, and;

- Provide training in management and maintenance of the infrastructure as well as new extension requirements;
- Ensure that the extension service provides: - new, cost-effective techniques in the utilization of the irrigation equipment service to small-scale farmers involved in out-grower schemes; - business skills such as negotiating skills to the farmers' cooperatives;

#### **4) Beneficiaries**

- Farmer-based organizations, community-based organizations, WUA, etc., should be established
- Improve marketing linkages/infrastructure and involve private sector participation as a way of increasing support to the farmers;
- Gender issues – women should be encouraged to participate in the process and given leadership roles. Ways of doing this include promoting the formation of women's groups to carry out income generation projects involving processing, storage, postharvest technologies and marketing.

**Appendix I: Supportive**

**Appendix Table 1: Household characteristic**

NO	Variables	Frequency	Percent
1	<b>Sex of the respondent</b>		
	Female	6	20.0
	Male	24	80.0
	Total	30	100.0
2	<b>Marital status of the respondent</b>		
	Married	27	90.0
	Single	2	6.7
	Total	30	100.0
3	<b>Religion of the respondent</b>		
		1	3.3
	Orthodox	1	3.3
	Muslim	28	93.3
	Total	30	100.0
4	<b>Ethnic of the respondent</b>		
	Oromo	30	100.0
5	<b>Educational status of the household head</b>		
	Illiterate	10	33.3
	Read and write	13	43.3
	Attended grades 1-4	3	10.0
	Attended grades 5-8	2	6.7
	Attended grades 9-10	2	6.7
	Total	30	100.0

Appendix Table2: Households profile on community participation

No	Means of participation		
1	Through formal community organization	14	46.7
2	Through idir and/or other related informal social organizations	9	30.0
3	Through esteemed elders	5	16.7
4	other	1	3.3
	Total	30	100.0
No	Type of work	Frequency	Percent
1	Missing	2	6.7
1	a forestation	15	50.0
2	Soil and water conservation	13	43.3
	Total	30	100.0

Source: Survey data, 2019

AppendixTable3: Respondent concerns and contributions for the project

No	Contribution	Frequency	Percent
1	Labor	9	30.0
2	Material	18	60.0
3	Labor and material	2	6.7
4	Idea provision	1	3.3
	Total	30	100.0
	<b>respondent concerns</b>	Frequency	Percent
1	No fear	25	83.3
2	Fear of losing land	2	6.7
3	Reduction of income from crop production	2	6.7
4	Reduction of income from livestock	1	3.3
	Total	30	100.0

Appendix Table 4: Households profile on community participation

No	Participation in community development	Responses					
		Yes		No		Total	
		No	%	No	%	No	%
1	Soil & water	13	65	7	35	20	100
2	Social services	15	75	5	25	20	100
3	Afforestation	17	85	3	15	20	100
4	Road construction	15	75	5	25	20	100
5	Do you like to carry out fattening	16	80	4	20	20	100
6	Receive improved breed	12	60	8	40	20	100
7	Extension, training and credit for livestock	16	80	4	20	20	100
8	Traditional CBOs participation	17	85	3	15	20	100
9	Conservation of feed	16	80	4	20	20	100

Source: Survey data, 2013

Appendix Table 5: Households profile on income, food security and constraints

Variables	Frequency	Per cent
Source of income		
Sale of Crop	7	35
Family members sale of labour	2	10
Sale of livestock	8	40
Borrowing	1	5
Sale of forest product	1	5
Sale of forest product	1	5
Total	20	100

<b>Months HH rely on Yearly produced food</b>		
3-6 months	2	5.4
6-9 months	4	10.8
9-12 months	5	13.5
Total	11	29.7
<b>Main sources water for drinking</b>		
River	7	35
Hand dug well	2	10
Protected spring	6	30
Piped water	5	25
Total	20	100

Source: Survey data, 2019

**Appendix Table 6: Households profile on income, food security and constraints**

<b>Months HHs to rely on produced food</b>	<b>Frequency</b>	<b>Per cent</b>
3-6	2	10
6-9	4	20
9-12	5	25
Total	11	55
<b>Main sources of water for drinking and food cooking</b>		
River	7	35
Hand dug well	2	10
Protected spring	6	30
Piped water	5	25
Total	20	100
<b>Major constraints in health services</b>		
No constraint	2	10
Absence of health service in the nearby	1	5

Shortage of medicine	13	65
High treatment and drug cost	4	20
Total	20	100
<b>Second major constraints of health service</b>		
No constraint	2	10
Shortage of medicine	6	30
Lack of health personnel	2	10
High treatment and drug cost	9	45
Lack of accessibility to reach to health centers	1	5
<b>Total</b>	<b>20</b>	<b>100</b>
<b>What is women's' need ?</b>		
Maternal and child health care	9	45
Credit and saving schemes	3	15
Credit and saving schemes	8	40
All of the above	20	100