



**JIMMA UNIVERSITY**

**COLLEGE OF SOCIAL SCIENCE AND HUMANITIES**

**DEPARTEMENT OF GEOGRAPHAY AND ENVIRONMENTAL STUDIES**

**THE ROLE OF SMALL SCALE IRRIGATION ON POVERTY REDUC-  
TION IN JELDU WOREDE: IN CASE OF SHUKUTE KEBELE**

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## **ACRONOMS**

ASL-Above sea level

FAO-food Agricultural organization

FDRE- Federal Democratic Republic of Ethiopia

GDP-Gross domestic product

ILRE-Integral water and land management research in Ethiopia

MOFA-Ministry of foreign affairs

SSI-Small scale irrigation

## **Abstract**

*The study was conducted on the role of small scale irrigation on poverty reduction in Jeldu woreda the case of shukute kebele. Irrigation is one means by which the agricultural production can be increased to meet the growing food demand. The main objective of this study is to examine the overall socio economic contribution of small scale irrigation in the study area. In order to meet this objective the researchers have collected data from primary and secondary data sources. The primary data were collected from 86 sample households through questioners and interview while, the secondary data were collected from different source such as book other published materials and website to support the primary data source the total sample size for this study were selected from shukute kebele using simple random sampling technique. The descriptions of the study area such as location, Demographic, socio economic activity of the study area were included in this document. The data collected from the respondents were analyzed in quantitative and qualitative techniques. Finally the researcher gives the recommendation and suggested solution for the problem concerned with irrigation.*



# CHAPTER ONE

## INTRODUCTION

### 1.1 Back ground of the study

Ethiopia is predominantly an agricultural country where agriculture accounts for about 45% of the country gross domestic product (GDP) 65% of export and 85% of employment (MDFA 2007). One of the feature of the Ethiopian agriculture and the national economy at large is it's in ability to produce sufficient food to the feed population (Samuel, 2006).

Irrigation has a long history on the world starting from the beginning to now. The earliest civilization is found closely to the rivers. That means the rivers are important for simulating agricultural activity especially irrigation is activated by the helps of rivers. Small scale irrigation is one of the interesting practice in view of supplementing rain feed agriculture and alleviate drought and famine condition in Ethiopia. Small scale irrigation is important to produce product at any time without waiting rainfall. It also needs low price to provide and it has great role to reduce poverty levels by providing incomes cultivator plus the society (FAO1994).Currently small scale irrigation development is seen as the main development strategies in different part of the country to improve the problem of food insecurity and maintain the overall growth of rural economy and also small scale irrigation is see as important rural development factors creating employment opportunity it help to increase food production and income generation(lama,2004).

Small scale irrigation is a policy priority in Ethiopia for rural poverty reduction and growth as well as climate adoption (GOE, 2007 and MDF ED, 2006). The governments focused to develop the subsector to fully exploit it potential (Mekuria, 2003; MOFED, 2006, 2010).

Furthermore, it is noticed that the existing farmers are operating at suboptimal levels. Many of the small scale irrigation projects have been operating below the required economic efficiency (Getnet.et al, 2011). Only about 5% Ethiopia irrigable land irrigated (World Bank, 2006) and less than 5% of the total renewable water resource is drown annually (FAD, 2005).

Ethiopia is believed to have the potential of 5.1 million of the land that can be developed for irrigation through pumping underground water, harvesting and other mechanism (MOFED, 2010)

and Awalachew, 2005). Several studies have documented poverty related benefit and cost of irrigation (Hussain, 2004). Most of them indicated irrigation can increase production and productivity. This in turn opens up employment opportunities both on-farm and off-farm and improves the quality of life in the rural areas (Getnet et al., 2011). However, there are no more studies that assessed the poverty impact of small scale irrigation in Jeldu Woreda of West Shewa Zone. The study would be conducted to ensure the role of small scale irrigation towards poverty reduction in the study areas. Thus the researcher would seek to examine the contribution of small scale irrigation and factors affecting the existing irrigation scheme in the study area.

## **1.2 Statement of the problems**

In many parts of Ethiopia production from rain fed is highly fluctuated areas corresponding to the amount and distribution of rainfall and the water table is far deep for irrigation and without irrigation water, farmers are forced to insufficient rain fall to grow low value cereal crops which give very few opportunities to escape poverty (Web, et al 1994). For Ethiopia ensuring food security stands out of the most pressing agenda for the coming decades. At present an estimated 52% of the country population is food insecure or below poverty line (FDRE, 1996). In the study area the role of small scale irrigation towards poverty reduction was not more studied before. Unreliable distribution character of rain fall has resulted in low crop production and pasture failure. In study area, there is inadequate and variable rainfall that is not sufficient for full agricultural activity in turn reduces the income of the farmer as well as reduces the quality of the crop. This in turn brought the shortage of food and famine in the area.

In the area where rain fall is unreliable, irrigation development provision of adequate and sustainable water for agriculture purpose available to secure food production. In the study area, small scale irrigation has been practiced and even now it is on the way of upgrading the existing traditional small scale irrigation. Therefore, this study will focus on the contribution of small scale irrigation towards poverty reduction and the factor affecting it as well as type of agricultural products through irrigation.

## **1.3 Objective of the study**

### **1.3.1 General Objective**

The general objective of the study is to examine to the role of small scale irrigation on poverty reduction in Jeldu woreda, in case of shukute kebele.

### **1.3.2 Specific Objectives**

- ❖ To identifies the major factor that influences the role of small scale irrigation.
- ❖ To identify the major fields of crops and
- ❖ Vegetation grows using small scale irrigation in the study area.

## **1.4 Research question**

- What are the contribution of irrigation scheme to increasing agricultural production and poverty reduction?
- What are the major factors that influence the small scale irrigation?
- What types of crops and vegetables have grown using the small scale irrigation in the study area?

## **1.5 Significance of the study**

It is important to access how irrigation schema helps increasing agricultural production and its contribution to generate income and to improve food security. Conducting the study small scale irrigation in the study area would be one source of information for designing a more target and effective food security related development intervention in the study area. In addition, the study also can be used as a source of information for further investigation for the other researcher in the same topic.

## **1.6 Scope of the study**

Geographically the study was delimited to jeldu woreda, particularly in one kebele, shukute. The household head were taken as the main source of information. Because, decision about production, investment and consumption are taken primarily at the house hold level. Even though there are different problems in study area, this study is delimited to role of and factors affecting small scale irrigation practice as well as types of production through irrigation.

### **1.7 limitation of the study**

Research Any has different limitation, but the degree of limitation is varies from each other based on the methods of the study, nature of the problem under investigation, the study of area and other constraints. The mains limitation of this study was lack of data covering the whole population in the study area to get full information on issue of the study due to finance and time constraints.

### **1.8 Organization of paper**

This paper consists five chapters, in which the first chapter is about introduction or back ground of the study, statement of problem objective of the study, research questions, significant of the study, scope of the study, limitation of the study and organization paper. The second chapter is about literature review, chapter three is about description of the study area, socio-economic characteristics and research methodology. Chapter four is about data analysis and interpretation. The last chapter; chapter five is conclusion and recommendation.

## CHAPTER TWO

### REVIEW LITERATURE

#### 2.1 Definition of Irrigation

Irrigation is an artificial application of water to the soil through various systems of tubes, pumps and sprays. It is normally used in areas where rainfall is inconsistent or dry condition. It also defined as agriculture application of water on to crop land for the purpose of satisfying water requirement necessary for growing different crops and places every role in establishing food production (FAO, 1997).

#### 2.2 Irrigation development of Ethiopia

Ethiopia has long history of traditional irrigation system. Simple river division still is the dominant irrigation system in Ethiopia. According to the Gebremedhin and peden(2002), the countries irrigation potential ranges from 1.0 to 3.5 million hectares but the other research studies indicates that the irrigation potential of the country is higher (Tilahun and paluos,2004).

According to awwachaw.et.al (2010), Estimates of irrigation potential of Ethiopia may be as large as 4.3 million hectares. He added that traditional irrigation schemas cover more than 138,000 hectares where modern small scale irrigation covers about 48,000 hectares. The total current irrigation covers only about 6% of the estimated potential land areas. The primary goal of establishing this small scale irrigation was to improve the rural livelihood through the sustainable crop production for food security and poverty reduction(FAO,2002). Ideas small scale irrigation is very important to rural livelihoods and poverty reduction through sustainable crop production(FAO,2001).

#### 2.3 Classification of Irrigation development

Classification of irrigation schemes into large, medium, and small scale is often applied with reference to the area irrigated scale of operation and type of control and management depend up on different criteria in different areas (smith, 1998).In relation to the specific water control technol-

ogy used, the same author indicated that pump irrigation, small dam irrigation and shallow or deep tube irrigation all are simple termed as small scale irrigation scheme. Large small scale has formally being planned and typically managed by government department for fairly comprehensive control. However, the small scale irrigation development are concentrated with the up grading of traditional community irrigation or village irrigation system, newly designed and constructed irrigation system and ground water and pump development (smith, 1998). In the highland area of Ethiopia, where water is delivered through gravity, small scale irrigation scale scheme the concern the up grading of irrigation works, where the simple diversion structures constructed by traditional community with local means such as stone and brush wood have been replaced by small scale concrete or masonry ways, which divert water in more effective and durable ways. Such upgrading of irrigation works are the major function of all river diversion irrigation project that have been under taken in different part of Ethiopia (smith,1998).Elahi.A and khushalani. B (1990) also shares the same sentiments operation on central agency, but depends or concerns with management of village or community in development process. Since small scale irrigation is manageable, they have no problem of problem of population displacement and serious adverse environment impact (Dessalegn, 1999).

Regarding the small scale of development in Ethiopia, the irrigation scheme in the past decades were classified in to three level according to the size and scale of operation as follow (FAD, 1994: Dessalegn, 1999).

A) Small scale scheme are covering irrigable areas of less than 200 hectares and growing subsistence crops. B) Medium scale irrigation is those exceeding between 200 hectares and 300 hectares and produce a mix of subsistence and cash crops. C) Large scale scheme are those extending from 300 hectares and above which are grow in primarily commercial crops such as cotton and sugar cane and mainly managed by state Corporation.

Among the above scale (type) of irrigation, the study area has much small scale irrigation either through pumping or upgrading of the traditional water diversion.

## **2.4 Small scale Irrigation in Ethiopia**

Ethiopia is the water tower of Eastern Africa and there are many drainage bases in the country and most these rivers are across the national boundaries (FDRE, 2003). Ethiopia is predominantly agricultural country, where it accounts about 45.5% of the country's Gross domestic product (GDP) and poverty reduction is the millennium development goal. Since 1992, the government of Ethiopia has been carrying out measures to reducing poverty in the context of series program in political, economic and social spheres; thus government efforts reduce poverty from 45.5% in 1995/96 to 29.6% in 2010/11(MOFED, 2012). Ethiopia is rich in water resource in Africa and have more small scale irrigation for food production. Since 1992, the government of Ethiopia focused on agricultural production to reduce poverty from the country, regionally or locally as possible for the house holder in order to encouraging the irrigation process. According to (Towshed 1993), poverty is defined as the absence of inadequate diets, amenities, standard of life and that allows people follows the customary behavior expected of them by various of their memberships of society and Ethiopia is one of poorest economics in the world and rural areas where the most people depend on agriculture for their food income, water and food are closely related (FAO, 2003).

The Ethiopia valley development studies authority (FAO 2003) estimates about 2.8 million hectares by adding up the irrigation potential of the country's major river basin and the rift valley lakes are shown in Table-2.1 below.

Table-2.1 Main irrigable regions in Ethiopia

Region	Gross irrigation areas in hectors
Blue Nile River Basin	760,000
Baro Akobo River Basin	600,000
Wabi Shebele River Basin	355,000
Ganale Dawa River Basin	300,000
Omo Gibe River Basin	248,000
Northern River Basin	200,000
Awash River Basin	203,000
Rift valley River Basin	47,000
<b>Total</b>	<b>2,713,000</b>

## 2.5 The role of Irrigation in reducing food security problems

In Many droughts prove countries, including Ethiopia, there has been an optimistic view regarding irrigation development as strategy to sustain agricultural production and ensure food security. In such countries, one of constraints in further increase of agricultural production is attracted to irrigation as a means of support future food strategies. Elahi (1988) pointed out country with arid and semiarid climates, the lack of uncertainty about rain fall along with rising demographic pressure on rain fed lands would strongly be pointed to irrigation as the prime to support future food strategies in medium to long term. Similarly Dessalegn (1999) stated that when that when rainfall is insufficient and unreliable, rain fed agriculture cannot fully support food production, investment on water management schemes will helps to stabilize agricultural production and promote food security.

In Ethiopia the study in economic validity and socio-economic impacts of the small holder's irrigation development are limited, except pronouncing some possible benefits of water resource development. The only practical observation available to researchers was a study undertaken by feud (2001) on small scale irrigation and households' food security on an irrigation schemes.

## 2.6 Types of Irrigation

There are different types of irrigation system, depending on how the water is spreading through the field. Some general types of irrigation system as follows:



### **2.6.1 Surface Irrigation**

Surface irrigation method use the soil surface to spread water across field or to the plant being irrigation and include furrow, border or flood irrigation and basin irrigation. In furrow irrigation small channel furrow are used to convey water across a field .In border irrigation, a field is divided in to strop separated by border ridges running down the slope s of the field in order irrigation is used for tree crops like grain.

### **2.6.2 Sprinkler Irrigation**

In these types of irrigation, water is applied to all field by means of rotating sprinkler or mini sprinkler connected to pressurized pip system. Sprinkler spread water over a radius of 5-300 feet as depending on design. The pipe system supplying the sprinkler can be permanent movable, portable or a combination of three, and the system can be operated either automatically or semi automatically (Howel and Terry,2000);26-33. Some sprinkler can also be hidden below ground level it aesthetician concerned and in response to increase water pressure.

This type of system is commonly used in golf courses, come parks and other turf areas. Sprinkler may also be mounted on movable plots forms connected to the water source by a hose (ILRJ, 1989).

## **2.7 Purpose of Irrigation**

Irrigation is the purpose of supplying water in addition to natural precipitation to field crops, or other cultivated plants. Irrigation water is applied to ensure that the water available in the soil is sufficient to meet water needs. The role of irrigation is to improve production and the effectiveness of their input (Bhattarai et al, 2002).

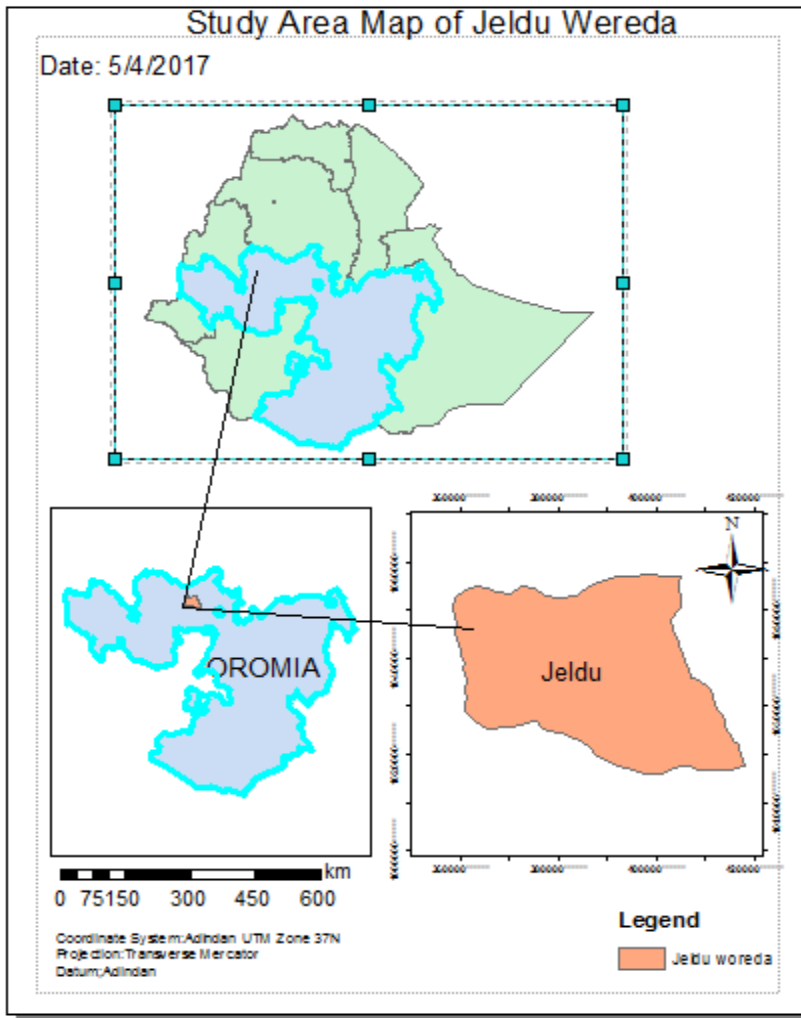
## **CHAPTER THREE**

### **DESCRIPTION OF THE STUDY AREA**

#### **3.1 Description of the study area**

##### **3.1.1 Location**

The study was conducted in jeldu woreda of west shewa zone. Jeldu is one of Oromo region of Ethiopia and part of the west shewa zone. The absolute location of jeldu woreda is between  $9^{\circ}14'N$  latitude and  $38^{\circ}00'E$  longitude. Jeldu is bordered on the south by dendi, on the south west by Ambo, on the north by Gindeberat, on the north east by Meta Robi, the south east by Ejerie. (The administrative center of the Jeldu woreda). This woreda is nearly 40km from Ambo town and at about 113km west Addis Ababa.



**Figure 1: the study of area map**

### 3.1.2 Topography and soil

The wereda has about 488861.3 hectares or 48886.1km<sup>2</sup> of the total areas. Out of this, about 77.1 % is middle elevated land and 22.9% is low land. The topography feature of area includes mountain (hill area), rugged terrain and the other .the altitude of these area is ranged between 1215-1226m a.s.l. They area also has different types of soil. That includes black, brown grey, red and other (Jeldu wereda land administrative office in 2005).

### 3.1.3 Rainfall and temperature

The rainfall of the area has been received the highest rainfall summer season (1300mm) in month such as June , July and August the temperature of the area ranges from 12<sup>0</sup>C - 16<sup>0</sup>C. There

is the seasonal variability of rainfall that led to reduction of agricultural production which resulted in high level poverty on the area (Jeldu woreda Administrative office in 2015).

### **3.2 Socio economic characteristics.**

Concerning to socio-economic activities the majority of population were involved in agricultural activities to generate income and to meet family food consumption as well as to full fill the demand and supply local market (shukute kebele administrative office report in march 21, 2007 E.C).But, the level house hold income per year in the area is very low except, those farmers who have been using the small scale irrigation. Thus, the majority of irrigation users were sustain their living standards and increased income through producing different types of agricultural products, while some of non-irrigation farmers were improved their income by involved in different activity and other were still faced insufficient( shukute kebele administrative office ,2015).

#### **3.2.1 Population of the area**

According to Central Statistical Agency (CSA, 2005) the woreda total population is about 202,716. Out of these 99,896 were men and 102,820 were female population.

#### **3.2.2 Ethnic composition**

Jeldu woreda is the area at which to largest ethnic groups reported where the Oromo(96.51%) and Amara (3.3%).regarding to the religion there have about Ethiopia orthodox church with 49.89% protestant 36.94% and 12.8% practiced traditional religion( Jeldu woreda administrative office 2007).

### **3.3 Research methodology**

#### **3.3.1 Methods of data collection**

The data for this study was collected from primary and secondary data source. The primary data source was collected through questionnaires, interview and field observation.

**3.3.2 Questionnaires:** - the questionnaire for this study was English language and translated in afaan Oromo. It consists both open ended and close ended questionnaires all the respondent free to provided deeper information to the question rather than saying “yes” and “no” but in close ended questionnaires respondent replied fixed answer to each question.

**3.3.3 Field Observation:**-It was made on irrigation site to collect data about types of vegetation crops. Cultivation system, water using methods and condition of the irrigation activity.

**3.3.4 Interview:** - Data was collected about the overall irrigation activity using interview.

**3.3.5 Secondary source:** - data was collected from book and journals as well as the published materials.

### **3.4 Sampling techniques**

For these study the researcher was use the simple random sampling techniques, because everyone have got equal chance from selected kebele house hold and concerned bodies in the study area and also the population of the study area almost homogenous.

### **3.5 Sampling size**

According to shukute kebele Administrative office report of 2015, the total population of the kebele is 1500. From the 600 of total household heads 86 leads are selected by using simple random sampling techniques. The study incorporated a sample size of 14% from the existing household heads.

The Yamane formula for determining the sample size was given by

$$n = \frac{N}{1 + N(0.1)^2} \quad \text{where} \quad n = \text{sample size}$$
$$n = \frac{600}{1 + 600(0.01)}, \quad N = \text{Total population}$$
$$n = \frac{600}{7} = 86 \quad e = \text{sampling error}$$

### **3.6 Method of data Analysis**

The data was analyzed using both quantitative and qualitative methods. Quantitative techniques using numerical number and qualitative was through rating of the respondents.

After the necessary data collected, it was processed through editing, classifying and tabulation to make it suitable further analysis. Finally, the conclusion and recommendation would be drawn from result

## CHAPTER FOUR

### 4. DATA ANALYSIS AND INTERPRETATION.

This chapter deals with the analysis and interpretation of the data that was collected through questionnaire, personal interview and field observation. The collected data is summarized and analyzed by using both qualitative and quantitative methods.

#### 4.1 Back ground information of the respondent

Table- 4.1. Distribution of respondent by age, education level, religion and family size.

Item	categories	Frequency(number)	Percentage
Age of respondents	18-25	33	38.4
	26-33	25	29.1
	34-41	20	23.2
	>41	8	9.3
	Total	86	100
Educational level of the respondent	Illiterate	15	17.4
	Elementary school	40	46.5
	High school	21	24.4
	Preparatory and above	10	11.7
	Total	86	100
Religion of the respondent	Christian	50	58.1
	Muslim	23	26.7
	Traditional	13	15.2
	Other	-	-
	Total	86	100
The household family members	2-6	35	40.7
	7-10	21	24.4
	11-14	20	23.3
	>15	10	11.6
	Total	86	100
Marital status	Single	30	34.8
	Married	56	65.2
	Divorce	-	-
	Widowed	-	-
	Total	86	100

Source: Field survey 2017

According to the above table 4.1, the majority of the respondents (38.4%) were found between 18-25 age groups where 29.1% were found in age group of 26-33 and the minimum numbers of respondents were found between age groups 33-34 and above. In case of the educational level 17.4% of respondents were illiterate, 46.5% were in elementary school while the remaining were at high school level and above. Regarding to religion, the majority of the respondents that means 58.1% 26.7% were Christian and Muslim respectively. But traditional religion follows were minimum in their proportion.

As we have seen in the above table, 40.7% of respondent's family sizes were between 2-6 and small numbers of respondents have large family number. Concerning marital status of the respondents 34.8% were single and 56(65.2%) of respondents were married. Thus, the majority respondents were married and have families.

## 4.2 irrigation practice and its contribution

### 4.2.1. Years of irrigation practices and area of irrigation land

Table-4.2: Respondent's irrigation experience and size of their irrigation land

Item	categories	Frequency(number)	percentage
Duration of irrigation on practice on a years	1-2 Years	29	33.8
	3-5 years	51	59.4
	6-8 years	3	3.4
	>8 years	3	3.4
	Total	86	100
Size of irrigation land per HHH in km <sup>2</sup>	<1km <sup>2</sup>	20	23.2
	1-2km <sup>2</sup>	51	59.4
	3-4km <sup>2</sup>	10	11.6
	>4km <sup>2</sup>	5	5.8
	Total	86	100

Source: Field survey, 2017

As indicate in the above table 4.2, there was variation in years of irrigation practice among farmers. Accordingly, the majority of respondent 51(59.4%) have been practicing for 3-5 years and the next considerable percentage of respondent (33.8%) have been practicing for one to two years. Generally, small scale irrigation practice is at its infant stage. Land is one of the key and important asset need to be owned by farming households in order to produce crops for consumption as well as for marketing purpose. The study results depicted that irrigation land holding size

of the majority (59.4%) were between one to two km<sup>2</sup>. Generally, 97.5% the respondent have on irrigable land <4km<sup>2</sup>.

#### 4.2.2. Source of water for irrigation and its application methods

Table- 4.3 Source of water for irrigation purpose and its application methods

Items	categories	Frequency(number)	Percentage (%)
Source of water for irrigation	River	45	52.4
	Spring	32	37.3
	Pond	3	3.4
	Motorized pump	6	6.9
	Others	-	-
	Total	86	100
Water application methods	Flooding	44	51.2
	Furrow application	9	10.5
	Drip irrigation	33	38.3
	Others total	-	-
		86	100

Source: Field survey 2017.

The supply of water to permit farming is very important for irrigation purpose. According to table- 4.3, 52.4%, 37.3%, 6.9% and 3.4% of respondents used, River, spring, motorized pumping and ponds respectively as the source of water irrigation. Once the water was reached to the irrigable field though different conveyance techniques, application of water at the field is used by flooding (51.2), drip irrigation (38.3%) and furrow application (10.5).



### 4.2.3 Level of food consumption and financial source of irrigation practitioners

Table- 4.4 respondent food consumption level and their source of finance.

Item	categories	Frequency(number)	Percent (%)
Level of food consumption before irrigation	Low	47	54.7
	Medium	25	29
	High	14	16.3
	Other	-	-
	Total	86	100
Source of finance	Selling cereal crop	24	27.9
	Selling vegetation	55	63.9
	Selling animals	7	8.2
	Other	-	-
	total	86	100

Source: Field survey 2017

Sample respondent were also asked to provide the information regarding their food consumption before practicing irrigation. As demonstrated in the above table 4.4, the level of food consumption by majority (63.9%) was low while 29% of respondents mentioned that their consumption level was medium. However, qualitative data gained through interviewing of the respondents show act that there is increment of food consumption level after they have been practicing irrigation. This showed that small scale irrigation in the study site has contributed in minimizing food insecurity by providing additional food supply and as source of finance.

Farmers are also asked about their source of financial to fulfill different household needs. As the above to the revealed, respondent have different source of finance among which selling vegetation (63.9%) and cereal crop (27.9%) were the central source of finance for the majority.

#### 4.2.4 Objective of irrigation

Table- 4.5 respondent objective of irrigation practice

Item	categories	Frequency(number)	Percent (%)
Objective of irrigation	Generate cash income	41	47.7
	Food for hose hold	39	45.4
	Livestock food	6	6.9
	Others(specify)	-	-
	Total	86	100

Source: Field survey 2017.

Irrigation development aims to bring about agricultural production and consequently to improve the economic and social wellbeing of rural population in our country. Properly to implement small holder irrigation with appropriate technologies may have a considerable potential in improving rural livelihoods (camera et al, 2002).In the study area farmers have engaged in irrigation practice for different objectives

Accordingly, equal percentages of respondents have aimed to produce food for household (47.7%) and to generate cash income. However, producing livestock feed is not a major focuses of respondent.

### 4.3 factors affecting small scale irrigation

#### 4.3.1 Sufficiency of water supply and its conveyance methods

Respondents were asked whether their irrigation practices are affected with supply of water and its conveyance methods. Researcher found that sufficiency of water was not the problem for the majority (81.4%) as the replied that there is adequate water supply to their irrigable land. However ,80.3% of the respondents demonstrated that irrigation scheme in the area used traditional water diversion method known as earthen canal for the conveyance of water up to the field (see table 4.6 below).From field observation, we can imagine that this traditional conveyance method could affect amount of water supply negatively as the some portion of water is infiltrated and some other may run on the surface as earthen canal can be easily broken by moving animals and or the force of moving water with in the canals.

Table-4.6 water sufficiency and its conveyance methods

Item	categories	Frequency(number)	Percent (%)
Sufficiency of water for irrigation of the land	Yes	70	81.4
	No	16	18.6
	Total	86	100
Water conveyance methods	Concrete canal	17	19.7
	Earth canal	69	80.3
	Others	-	-
	total	86	100

Source: Field survey 2017

#### 4.3.2 Distance as a factor of irrigation practice

The longer distance either from water source to the field or from farmer's residence to the irrigable land and the market is believed to have the negative effect on irrigation practices. Because, it take much time and energy to construct water conveyance method, to walked for round trip and has high to transport agricultural products in the market for generating cash. More than 50% of the respondents mentioned that there is shorter distance from water source to the farm field as well as from residence to the market and to the field. This is really promising to expand irrigation scheme in the area.

Table- 4.7 distance among resident, irrigation field and market

Item	option	Frequency(number)	Percent (%)
Distance of water from its source to field	10-1000m	80	93.1
	>2000m	6	6.9
	Total	86	100
Distance of irrigation field from the residents	120m-1000m	21	24.5
	2000m-4000m	47	54.6
	>4000m	18	20.9
	Total	86	100

Distance of farmers residence from local market	10m-1000m	53	61.7
	2000m-4000m	25	29
	>4000m	8	9.3
	total	86	100

Source: Field survey, 2017.

#### 4.3.3 Use of credit and availability of training related to irrigation scheme

With regard to access to credit, the survey result revealed that 76.8 percent of the household were able to take credit in 2007 and 2008 but most of them said the credit was not enough for performing their irrigation activities. The remaining respondents were not taking and using credit. Because, they have enough capital to sustain their activities.

Training is one essential factor that should be given to farmers regarding proper utilization of water based demand of crop/vegetation as well as to providing technical support for diverting and applying methods of water. For this reason, the survey tried to assess the condition of training given to the users of irrigation. As result, the finding showed that the majority of the respondents (68.6%) were trained concerning water management. Data from informal interview with respondents also revealed that training have been given twice a year that means at the beginning of the year and at the middle of the year.

Because, the farmers need information how to perform the activity in cultivation and harvesting season. From this have can conclude that the training is not enough as it is conducted only two times that may not raise required awareness of farmers in area. Incontrsat, other people were not interest to take the training and others were involved largely in irrigation activities.

**Table-4.8 respondent training and credit availability**

Item	option	Frequency(number)	Percent (%)
Use credit for irrigation	Yes	66	76.8
	No	20	23.2
	Total	86	100
Training on the water management	Yes	59	68.6
	No	27	31.4
	total	86	100

Source: Field survey, 2017

#### 4.3.4 Other factors affecting irrigation practice

Even though there are some percentage variations of the respondent, the following factors have been affecting irrigation practices and its productivity.

These include:

- ❖ Lack of agriculture in puts such as :seed, fertilizers and other
- ❖ Supportive material
- ❖ Shortage of the land
- ❖ Lack of the road and transportation
- ❖ Absence of the government supporting
- ❖ Shortage of the labor

An like most of small sale scheme in Ethiopia, conflict among farmers in water uses were found to be not the problem in the study sites. The farmer's road from the irrigation site is affecting the perishable agricultural product.

Table-4.9 other factors affecting irrigation practice

Item	categories	Frequency(number)	Percent (%)
Hindering factors for irrigation practice	Lack of agricultural input	15	17.5
	Shortage of the land	20	23.3
	Lack of the road and transportation	20	23.3
	Absence of the gov-ernment support	19	22
	Shortage of the labor	12	13.9
	Other	-	-
	total	86	100

Source: Field survey, 2017

#### 4.4 Irrigation time and types agricultural products

Table 4.10 Irrigation time and types agricultural products

Item	categories	Frequency(number)	Percent (%)
Production frequency in year	Once	1	1.2
	Twice	75	87.2
	Three times	10	11.6
	total	86	100
Types of production			
Vegetables	Tomato	20	23.3
	Potato	35	40.6
	Onion	15	17.5
	Cabbage	10	11.7
	Kostas	6	6.9
	total	86	100
Cereal crops	Maize	20	23.2
	Barley	16	18.6
	Beans	10	11.6
	Wheat	38	44.2
	Coffee	2	2.4
	total	86	100
Fruits	Avocado	5	5.8
	Orange	28	32.5
	Lemon	10	11.6
	Banana	40	46.6
	Apple	3	3.5
	total	86	100

Source: Field survey, 2017

The above table 4.10 shows, the productivity frequency per year and types of agricultural production using small scale irrigation in shukute kebele. Basically, majority of the respondents (87.2%) cultivated their irrigable farm land twice per year while (11.6%) of respondents cultivated and produced three times per year.

Generally, farmers were producing different types of crops, vegetables and fruits by using small scale irrigation without waiting for the rainfall season. Concerning to the types of agriculture production, farmers were producing different types of cereal crops such as wheat and maize, vegetables such as potato and tomato as well as fruit such as banana and orange (see table-4.10 above).

In addition to the data that was collected from sample respondents, the woreda and local administrative offices have also contributed different information and suggestion on Variety products using small scale irrigation. Accordingly, the irrigation scheme has great contribution for irrigation user's food self-sufficiency and to increase their income. The surrounding local community were also beneficiary of irrigation product from the market (jeldu woreda agricultural office, 2008).It was also reported from the woreda administrators that farmers get about 40,000-50,000 birr per year from sailing products of irrigation farming.

## CHAPTER FIVE

### CONCLUSION AND RECOMMENDATION

#### 5.1 CONCLUSION

The small scale irrigation is the important activity increasing the household income and transforming their living standard from poorest to richest. Small scale irrigation is cheap and low cost to processing by any individual householder and import to produce crops at least twice a year without waiting the rain fall season. It provides product that are important for society and play great role to reduce poverty level of local community. Concerning with irrigation practice and its contribution the majority of respondents were used spring source of water through flooding and drip irrigation techniques. There were also factors that influence the small scale irrigation practice in the study area. Among these factors water conveyance method, distance of respondent from the irrigation field and from the market, and different agricultural input are the major factor for this areas. The irrigator also produce different types of crops such as cereal crops, vegetable, fruit and other agricultural product by using the small scale irrigation at least twice a year without waiting the rainfall season.

Small scale irrigation is mostly practiced in the dry and the area of high rainfall variability that is not though for crop growth. In the study area, there is a variability of rain fall that limited the grown of crops and reducing the agriculture outputs. To overcome this climate problem the community of the area have been practiced the small scale irrigation. Accordingly, before irrigation the income of household was low and after they have been using irrigation their schema level is increased and they sustained their family food consumption. According to woredas agricultural administrative and irrigation expert office, the small scale irrigation contributes 40,000-50,000 birr per household per year.



## 5.2 RECOMMENDATION

Based on analysis finding of the study, the following recommendation are forwarded.

- ❖ To overcome the problem of water conveyance methods the woredas and irrigation experts should have to support irrigation users.
- ❖ Jeldu woreda agricultural office also has to take part in investigating and solving problem related to irrigation practices
- ❖ The government should raise the public awareness towards water resource conservation and use
- ❖ To solve the overall problem of irrigation activity the government have to give training to irrigation user and supporting them by providing different agricultural inputs such as; fertility seed, pesticide, insecticide and other material.

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**APPENDEX**  
**JIMMA UNIVERSITY**

**COLLEGE OF SOCIAL SCIENCE AND HUMANITIES**

**DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES**

**Questionnaires For Respondents**

The questionnaire is prepared to collect data from the population under the study for investigation on the role of small scale irrigation scheme towards poverty reduction. Therefore, dear the respondents you are kindly requested the question freely and truly as much as you to

**I, Background information**

A, 1, woreda  2, kebele  3, age

Sex: a, Male  b, Female

B, what is your education level? A, Illiterate  B, elementary  C, high school

D, preparatory school and above

2, religion:  1, Christian  2, Muslim  3, traditional  4, others

3, Initial family numbers of the household \_\_\_\_\_?

A, marital status: 1, single  2, married  3, divorced  4, wid-  
owed

**II, Irrigation practices and its contribution**

1, how long have you practiced irrigation? \_\_\_\_\_year

2, how much is your irrigation land holding size in timid?

1, 1  2, 1-2  3, 3-4  4, >4  5, others specify

3, what is the source of water for your irrigation? \_\_\_\_\_

1, river  2, spring  3, pond  4, motorized pump  Others

4, what is types of irrigation application method do you use mainly? \_\_\_\_\_

1, Flooding \_\_\_\_\_ 2, Furrow application \_\_\_\_\_ 3, Drip irrigation \_\_\_\_\_

4, Other specify \_\_\_\_\_

5, your family food consumption level before irrigation, it available

1, Low  2, medium  3, high  4, other

6, what is the source of your finance?

1, Selling cereal crops  2, Selling vegetation  3, Selling animal  4, other

7, what are the main purposes of using irrigation? (Rank according to importance) \_\_\_\_\_

1, Generate cash income  3, Produce livestock feed

2, Produce food for the household  4, Others (specify)

8, what are the major benefits of irrigation practice?

### **III, factors affecting small irrigation practice**

1, what is the water conveyance method from the source to field?

1, Concentrate canal  2, Earthen canal  3, Other

2, have you are received training on irrigation management or related issues?

3, if the answer for is yes, when and for how long?

4, what is the distance between the sources of water to your irrigable field? \_\_\_\_\_m/km

5, what is the approximate distance of your irrigation field from your residence? (M/km)

6, how at do you travel to get local market \_\_\_\_\_m/km?

7, it amount of the water enough to irrigate your land?

1, Yes  2, No

8, if you say no, how can cope up with the water shortage?

9, what are the roles of water users committee/ association if available?

10, how do you evaluate the strength of your water users committee/ association?

1, strong  2, medium  3, weak

11, if the association is weak what are the main problem? Mention the weakness

12, what is constraints affect you in using your irrigation practice efficiently?

A, lack of agricultural in put B, lack of rural access forbade and transportation

C, confliction water utilization D, shortage of land E, absence of government support  
F, shortage of G, other (specify)

13, if you face all of the problem in Q12 above, then what are your reaction/ solution?

14, have you used credit for irrigation purpose? 1= yes, 0 = No

15, if yes, is credit enough? 1= yes, 0= No

16, if not use credit, why did you not use?

#### **IV, irrigation frequency and item of agricultural products**

1, how many times do you produce per year using irrigation?

1, once  2, twice  3, three times

## V, types of agricultural products using irrigation

No	Vegetable	Cereal crops	Fruit	Other
1	Tomato	Maize	Avocado	-
2	Potato	Barley	Orange	-
3	Onion	Beans	Lemon	-
4	Cabbage	Wheat	banana	-
5	Kostas	coffee	apple	-