SSIGL 9

# NATIONAL GUIDELINES

## For Small Scale Irrigation Development in Ethiopia

## Socio-economy and Community Participation

November 2018

Addis Ababa

*MINISTRY OF AGRICULTURE*

*National Guidelines for Small Scale Irrigation Development in Ethiopia*

# SSIGL 9: Socio-economy and Community Participation

**November 2018**
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# National Guidelines for Small Scale Irrigation Development in Ethiopia

**First Edition 2018**



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***Financed by Agricultural Growth Program (AGP)***

***DISCLAIMER***

*Ministry of Agriculture through the Consultant and core reviewers from all relevant stakeholders included the information to provide the contemporary approach about the subject matter. The information contained in the guidelines is obtained from sources believed tested and reliable and are augmented based on practical experiences. While it is believed that the guideline is enriched with professional advice, for it to be successful, needs services of competent professionals from all respective disciplines. It is believed, the guidelines presented herein are sound and to the expected standard. However, we hereby disclaim any liability, loss or risk taken by individuals, groups, or organization who does not act on the information contained herein as appropriate to the specific SSI site condition.*

## FORWARD

Ministry of Agriculture, based on the national strategic directions is striving to meet its commitments in which modernizing agriculture is on top of its highest priorities to sustain the rapid, broad-based and fair economic growth and development of the country. To date, major efforts have been made to remodel several important strategies and national guidelines by its major programs and projects.

While efforts have been made to create access to irrigation water and promoting sustainable irrigation development, several barriers are still hindering the implementation process and the performance of the schemes. The major technical constrains starts from poor planning and identification, study, design, construction, operation, and maintenance. One of the main reasons behind this outstanding challenge, in addition to the capacity limitations, is that SSIPs have been studied and designed using many ad-hoc procedures and technical guidelines developed by various local and international institutions.

Despite having several guidelines and manuals developed by different entities such as MoA (IDD)-1986, ESRDF-1997, MoWIE-2002 and JICA/OIDA-2014, still the irrigation professionals follow their own public sources and expertise to fill some important gaps. A number of disparities, constraints and outstanding issues in the study and design procedures, criteria and assumptions have been causing huge variations in all vital aspects of SSI study, design and implementation from region to region and among professionals within the same region and institutions due mainly to the lack of agreed standard technical guidelines. Hence, the SSI Directorate with AGP financial support, led by Generation consultant (GIRDC) and with active involvement of national and regional stakeholders and international development partners, these new and comprehensive national guidelines have been developed.

The SSID guidelines have been developed by addressing all key features in a comprehensive and participatory manner at all levels. The guidelines are believed to be responsive to the prevalent study and design contentious issues; and efforts have been made to make the guidelines simple, flexible and adaptable to almost all regional contexts including concerned partner institution interests. The outlines of the guidelines cover all aspects of irrigation development including project initiation, planning, organizations, site identification and prioritization, feasibility studies and detail designs, contract administration and management, scheme operation, maintenance and management.

Enforceability, standardization, social and environmental safeguard mechanisms are well mainstreamed in the guidelines, hence they shall be used as a guiding framework for engineers and other experts engaged in all SSI development phases. The views and actual procedures of all relevant diverse government bodies, research and higher learning institutions, private companies and development partners has been immensely and thoroughly considered to ensure that all stakeholders are aligned and can work together towards a common goal. Appropriately, the guidelines will be familiarized to the entire stakeholders working in the irrigation development. Besides, significant number of experts in the corresponding subject matter will be effectively trained nationwide; and the guidelines will be tested practically on actual new and developing projects for due consideration of possible improvement. Hence, hereinafter, all involved stakeholders including government & non-governmental organizations, development partners, enterprises, institutions, consultants and individuals in Ethiopia have to adhere to these comprehensive national guidelines in all cases and at all level whilst if any overlooked components are found, it should be documented and communicated to MOA to bring them up-to-date.

Therefore, I congratulate all parties involved in the success of this effort, and urge partners and stakeholders to show a similar level of engagement in the implementation and stick to the guidelines over the coming years.

H.E. Dr. Kaba Urgessa
State Minister, Ministry of Agriculture

## SMALL SCALE IRRIGATION DEVELOPMENT VISION

*Transforming agricultural production from its dependence on rain-fed practices by creating reliable irrigation system in which smallholder farmers have access to at least one option of water source to increase production and productivity as well as enhance resilience to climate change and thereby ensure food security, maintain increasing income and sustain economic growth.*

## ACKNOWLEDGEMENTS

The preparation of SSIGLs required extensive inputs from all stakeholders and development partners. Accordingly many professionals from government and development partners have contributed to the realization of the guidelines. To this end MOA would like to extend sincere acknowledgement to all institutions and individuals who have been involved in the review of these SSIGLs for their comprehensive participation, invaluable inputs and encouragement to the completion of the guidelines. There are just too many collaborators involved to name exhaustively and congratulate individually, as many experts from Federal, regional states and development partners have been involved in one way or another in the preparation of the guidelines. The contribution of all of them who actively involved in the development of these SSIGLs is gratefully acknowledged. The Ministry believes that their contributions will be truly appreciated by the users for many years to come.

The Ministry would like to extend its appreciation and gratitude to the following contributors:

- Agriculture Growth Program (AGP) of the MoA for financing the development and publication of the guidelines.
- The National Agriculture Water Management Platform (NAWMP) for overseeing, guidance and playing key supervisory and quality control roles in the overall preparation process and for the devotion of its members in reviewing and providing invaluable technical inputs to enrich the guidelines.
- Federal Government and Regional States organizations and their staff for their untiring effort in reviewing the guidelines and providing constructive suggestions, recommendations and comments.
- National and international development partners for their unreserved efforts in reviewing the guidelines and providing constructive comments which invaluably improved the quality of the guidelines.
- Small-scale and Micro Irrigation Support Project (SMIS) and its team for making all efforts to have quality GLs developed as envisioned by the Ministry.

The MOA would also like to extend its high gratitude and sincere thanks to AGP's multi development partners including the International Development Association (IDA)/World Bank, the Canada Department of Foreign Affairs, Trade and Development (DFATD), the United States Agency for International Development (USAID), the Netherlands, the European Commission (EC), the Spanish Agency for International Development (AECID), the Global Agriculture and Food Security Program (GAFSP), the Italy International Development Cooperation, the Food and Agriculture Organization (FAO) and the United Nations Development Program (UNDP).

Moreover, the Ministry would like to express its gratitude to Generation Integrated Rural Development Consultant (GIRDC) and its staff whose determined efforts to the development of these SSIGLs have been invaluable. GIRDC and its team drafted and finalized all the contents of the SSIGLs as per stakeholder suggestions, recommendations and concerns. The MoA recognizes the patience, diligence, tireless, extensive and selfless dedication of the GIRDC and its staff who made this assignment possible.

Finally, we owe courtesy to all national and International source materials cited and referred but unintentionally not cited.

Ministry of Agriculture

## DEDICATIONS

*The National Guidelines for Small Scale Irrigation Development are dedicated to Ethiopian smallholder farmers, agro-pastoralists, pastoralists, to equip them with appropriate irrigation technology as we envision them empowered and transformed.*

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# ACRONYMS

| | |
|---|---|
| ANOVA | Analysis of variance |
| CAD | Computer Aided Design |
| CBO | Community Based Organization |
| CSA | Central Statistics Agency |
| DA | Development Agent |
| DEM | Digital Elevation Model |
| DTM | Digital Terrain Model |
| EC | Electrical Conductivity |
| ESIA | Environmental and Social Impact Assessment |
| ET | Evapotranspiration |
| FGD | Focus Group Discussion |
| FTC | Farmers Training Center |
| GIRDC | Generation Integrated Rural Development Consultant |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| HHH | House Hold Head |
| HHI | House Hold |
| IWUA | Irrigation Water Users Association |
| IWUDC | Irrigation Water Users' Design Committee |
| M & E | Monitoring and Evaluation |
| MOANR | Ministry of Agriculture and Natural Resource |
| MOWIE | Ministry of Water, Irrigation and Electricity |
| MS | Microsoft |
| NGO | Non-governmental Organization |
| O & M | Operation and Maintenance |
| PAP | Project Affected People |
| RuSACCO | Rural Saving and Credit Cooperatives |
| SPSS | Statistical Package for the Social Sciences |
| SRS | Simple Random Sampling |
| SSID | Small Scale Irrigation Development |
| SSIGL | Small Scale Irrigation Guideline |
| SSIP | Small Scale Irrigation Project |
| SSIS | Small Scale Irrigation Scheme |
| StRS | Stratified Random Sampling |
| SyRS | Systematic Random Sampling |
| ToR | Terms of Reference |
| TUG | Tertiary Unit Groups |
| WUA | Water Use Association |

# PREFACE

While irrigation development is at the top of the government's priority agendas as it is key to boost production and improve food security as well as to provide inputs for industrial development. Accordingly, irrigated land in different scales has been aggressively expanding from time to time. To this end, to enhance quality delivery of small-scale irrigation development planning, implementation and management, it has been decided to develop standard SSI guidelines that must be nationally applied. In September 2017 the Ministry of Agriculture (MoA) had entrusted Generation Integrated Rural Development Consultant (GIRDC) to prepare the National Small-scale Irrigation Development Guidelines (SSIGLs).

Preparation of the SSIGLs for enhancing development of irrigated agriculture is recognized as one of the many core initiatives of the MoA to improve its delivery system and achieve the targets in irrigated agriculture and fulfill its mission for improving agricultural productivity and production. The core objective of developing SSIGLs is to summarize present thinking, knowledge and practices to enable irrigation practitioners to properly plan, implement and manage community managed SSI schemes to develop the full irrigation potential in a sustainable manner.

As the SSIGLs are prepared based on national and international knowledge, experiences and practices, and describe current and recommended practice and set out the national standard guides and procedures for SSI development, they serve as a source of information and provide guidance. Hence, it is believed that the SSIGLs will contribute to ensuring the quality and timely delivery, operation and maintenance of SSI schemes in the country. The SSIGLs attempt to explain and illustrate the important concepts, considerations and procedures in SSI planning, implementation and management; and shall be used as a guiding framework for professionals engaged in SSI development. Illustrative examples from within the country have been added to enable the users understand the contents, methodologies presented in the SSIGLs.

The intended audiences of the SSIGLs are government organizations, NGOs, CSOs and the private sector involved in SSI development. Professionally, the SSIGLs will be beneficial for experienced and junior planners, experts, contractors, consultants, suppliers, investors, operators and managers of SSI schemes. The SSIGLs will also serve as a useful reference for academia and researchers involved and interested in SSI development. The SSIGLs will guide to ensure that; planning, implementation and management of SSI projects is formalized and set procedures and processes to be followed. As the SSIGLs provide information and guides they must be always fully considered and applied by adapting them to the local specific requirements.

In cognizance with the need for quality SSIGLs, the MoA has duly considered quality assurance and control during preparation of the guidelines. Accordingly, the outlines, contents and scope of the SSIGLs were thoroughly discussed, reviewed and modified by NAWMP members (senior professionals from public, national and international stakeholder) with key stakeholders in many consultative meetings and workshops. Moreover, at each milestone of SSIGL preparation, resource persons from all stakeholders reviewed and confirmed that SSIGLs have met the demands and expectations of users.

Moreover, the Ministry has mobilized resource persons from key Federal, National Regional States level stakeholders and international development partners for review, validation and endorsement of the SSIGLs.

Several hundreds of experienced professionals (who are very qualified experts in their respective fields) from government institutions, relevant private sector and international development partners have significantly contributed to the preparation of the SSIGLs. They have been involved in all aspects of the development of SSIGLs throughout the preparation process. The preparation process included a number of consultation meetings and workshops: (i) workshop to review inception report, (ii) workshop on findings of review of existing guidelines/manuals and proposed contents of the SSIGLs, (iii) meetings to review zero draft SSI GLs, (iv) review workshop on draft SSI GLs, (v) small group review meetings on thematic areas, (vi) small group consultation meetings on its final presentation of contents and layout, (vii) consultation mini-workshops in the National States on semi-final versions of the SSIGLs, and (viii) final write-shop for the appraisal and approval of the final versions of SSIGLs.

The deliberations, concerns, suggestions and comments received from professionals have been duly considered and incorporated by the GIRD Consultant in the final SSIGLs.

There are 34 separate guidelines which are categorized into the following five parts concurrent to SSI development phases:

Part-I. Project Initiation, Planning and Organization Guideline which deals with key considerations and procedures on planning and organization of SSI development projects.

Part-II. Site Identification and Prioritization Guideline which treats physical potential identification and prioritization of investment projects. It presents SSI site selection process and prioritization criteria.

Part-III. Feasibility Study and Detail Design Guidelines for SSID dealing with feasibility study and design concepts, approaches, considerations, requirements and procedures in the study and design of SSI systems.

Part-IV. Contract Administration and Construction Management Guidelines for SSI development presents the considerations, requirements, and procedures involved in construction of works, construction supervision and contract administration.

Part-V. SSI Scheme Management, Operation and Maintenance Guidelines which covers SSI Scheme management and operation.

Moreover, Tools for Small Scale Irrigation development are also prepared as part of SSIGLs.

It is strongly believed and expected that; the SSIGLs will be quickly applied by all stakeholders involved in SSI development and others as appropriate following the dissemination and familiarization process of the guidelines in order to ensure efficient, productive and sustainable irrigation development.

The SSIGLs are envisioned to be updated by incorporating new technologies and experiences including research findings. Therefore, any suggestions, concerns, recommendations and comments on the SSIGLs are highly appreciated and welcome for future updates as per the attached format below. Furthermore, despite efforts in making all types of editorial works, there may still errors, which similarly shall be handled in future undated versions. .

# UPDATING AND REVISIONS OF GUIDELINES

The GLs are intended as an up-to-date or a live document enabling revisions, to be updated periodically to incorporate improvements, when and where necessary; may be due to evolving demands, technological changes and changing policies, and regulatory frameworks. Planning, study and design of SSI development interventions is a dynamic process. Advancements in these aspects are necessary to cope up with the changing environment and advancing techniques. Also, based on observation feedbacks and experiences gained during application and implementation of the guidelines, there might be a need to update the requirements, provisions and procedures, as appropriate. Besides, day-by-day, water is becoming more and more valuable. Hence, for efficient water development, utilization and management will have to be designed, planned and constructed with a new set up of mind to keep pace with the changing needs of the time. It may, therefore, be necessary to take up the work of further revision of these GLs.

This current version of the GLs has particular reference to the prevailing conditions in Ethiopia and reflects the experience gained through activities within the sub-sector during subsequent years. This is the first version of the SSI development GLs. This version shall be used as a starting point for future update, revision and improvement. Future updating and revisions to the GLs are anticipated as part of the process of strengthening the standards for planning, study, design, construction, operation and management SSI development in the country.

Completion of the review and updating of the GLs shall be undertaken in close consultation with the federal and regional irrigation institutions and other stakeholders in the irrigation sub-sector including the contracting and consulting industry.

In summary, significant changes to criteria, procedures or any other relevant issues related to technological changes, new policies or revised laws should be incorporated into the GLs from their date of effectiveness. Other minor changes that will not significantly affect the whole nature of the GLs may be accumulated and made periodically. When changes are made and approved, new page(s) incorporating the revision, together with the revision date, will be issued and inserted into the relevant GL section.

All suggestions to improve the GLs should be made in accordance with the following procedures:

I. Users of the GLs must register on the MOA website: Website: www.moa.gov.et
II. Proposed changes should be outlined on the GLs Change Form and forwarded with a covering letter or email of its need and purpose to the Ministry.
III. Agreed changes will be approved by the Ministry on recommendation from the Small-scale Irrigation Directorate and/or other responsible government body.
IV. The release date of the new version will be notified to all registered users and authorities.

Users are kindly requested to present their concerns, suggestions, recommendations and comments for future updates including any omissions and/or obvious errors by completing the following revisions form and submitting it to the Ministry. The Ministry shall appraise such requests for revision and will determine if an update to the guide is justified and necessary; and when such updates will be published. Revisions may take the form of replacement or additional pages. Upon receipt, revision pages are to be incorporated in the GLs and all superseded pages removed.

**Suggested Revisions Request Form (Official Letter or Email)**

To: ----------
From: ----------
Date: ----------
**Description of suggested updates/changes:** Include GL code and title, section title and # (heading/subheading #), and page #.

| GL Code and Title | Date | Sections/ Heading/Subheading/ Pages/Table/Figure | Explanation | Comments (proposed change) |
|---|---|---|---|---|
| | | | | |
| | | | | |

Note that be specific and include suggested language if possible and include additional sheets for comments, reference materials, charts or graphics.

**GLs Change Action**

| Suggested Change | Recommended Action | Authorized by | Date |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Director for SSI Directorate**:** _____**Date:** _____

The following table helps to track initial issuance of the guidelines and subsequent Updates/Versions and Revisions (Registration of Amendments/Updates).

**Revision Register**

| Version/Issue/Revision No | Reference/Revised Sections/Pages/topics | Description of revision (Comments) | Authorized by | Date |
|---|---|---|---|---|
| | | | | |
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# SSIGL-9A: SOCIOECONOMIC STUDY

# 1 SCOPE AND OBJECTIVES OF THE GUIDELINE

## 1.1 SCOPE OF THE GUIDELINE

The country has ample potential of irrigable land and water resources that could be developed through small scale irrigation systems. Together with the contribution of rain water, it could be possible to produce more than once in a year and this could lead to increased level of crop production by the beneficiary farmers.

The development of small scale irrigation project require different kinds of studies of which includes the study of socio economy. For a project to be implemented, it must be feasible from all aspects in order to benefit the farmers and the country at large. In this regard, the study of socio economy which addresses the various socio economic conditions of the project has to be conducted.

There are various phases of SSIPs which range from planning up to operation stages. These are classified in to site identification and investment prioritization; feasibility study, detail design and tender document preparation; contract administration, construction supervision & construction and operation and management. These various phases are essential for the attainment of optimum benefits from the project under consideration and the socio economy study is to be conducted at various levels & depth. In accordance to it, this document presents the main tasks to be accomplished

The guideline covers different socio economic issues and concentrates how to optimize social benefit from the implementation of the project. It analyses the existing as well as projected socio economic conditions that need to be included into the planning process of projects which could lead to effective implementation and their sustainable use. It also discusses the potential positive and negative project impacts together with their remedial measures. Identification of stakeholders and constraints enables to run the project in a coordinated manner.

## 1.2 OBJECTIVES

In order to optimize the benefit that could be obtained from the implementation of small scale irrigation projects, the socio economy study has to represent the socio economic conditions of the area. This guideline is therefore prepared to assist professionals who are engaged in the socio economy study of small scale irrigation projects.

# 2 SOCIOECONOMIC STUDYTECHNIQUES

## 2.1 DATA COLLECTION METHODS

Selection of appropriate data collection methods are one of the major tasks of socio-economists during the feasibility study and design of an irrigation projects. The common socio-economy data collection methods in the feasibility study and design are field observation, measurement, surveys; public consultation and focus group discussions. Most of the socio-economic data are collected using surveys. In this case, the data will be collected using census or sampling data collection methods. In the census data collection method a complete enumeration of all households under consideration are required. On the other hand, the socio-economist could also select sample households using statistical sampling data collection methods and infer the findings of the survey to the population of the area. In those methods standardized questionnaires are prepared and data is collected from each member of the household by using the questionnaires.

Similarly, the socio-economist could also uses participatory data collection methods through public consultation and focus group discussions with farmers, youth, women groups and other stakeholders around the project area using unstructured questionnaire or checklists or formats. The participatory data collection methods accommodate the participation of all stakeholders situated around the project area. This participatory data collection method assists farmers to contribute to the development of the proposed scheme, thereby generating a sense of involvement which is essential for long term project sustainability. Participatory data collection method will also generate realistic and consistent information both from beneficiaries and local level government institutions and enable community and potential stakeholders to reflect their concerns and interests. Moreover, secondary source of data also used in the study and the main issues to be considered from secondary sources are reliability, accuracy, timeliness and whether the data fit for our objective or not. In general, the overall methodologies which are employed for data collection in the study and design of an irrigation project are described below.

## 2.2 IDENTIFICATION OF STAKEHOLDERS

The initial effort to promote participation in the development of the proposed irrigation project is the identification and consultation of existing potential stakeholders situated at different level. Stakeholders are groups/communities who may directly or indirectly, positively or negatively affect or be affected by the outcomes of the projects. The socio-economist should undertake stakeholder identification, analysis and find out the people, groups, communities and institutions which are liable to be affected or to affect in some way by a proposed project. With respect to irrigation projects those stakeholders will be farmers, persons or groups of farmers displaced by the project, government institutions, lending institutions, NGOs, input suppliers, service suppliers, buyers and others.

In the analysis the socio-economist first identify the existing stakeholders who are liable to have an interest or impact in the proposed project and assess the involvement of all relevant Federal, Regional, wereda, kebele and project level stakeholders including the user's community in the planning, study, design, construction and operation of irrigation projects. The wereda, kebele and project level stakeholders should be given the opportunity to participate at all levels of implementation. This method helps the experts to estimate the potential social impact of the project and the willingness of the various stakeholders to participate in project activities. In a similar manner the expert should classify the stakeholders as primary, secondary and external

stakeholders. Primary stakeholders are the beneficiaries of the projects or those directly affected (positively or negatively) by it. They include local populations (individuals and community based organizations) in the project area, in particular, poor and marginalized groups who have traditionally been excluded from participating in development efforts. Secondary stakeholders are those who influence the project or are indirectly affected by it. They include the local government institution, implementing agencies, civil society organizations, private sector firms, the Bank, micro credit institution, NGOs and other development agencies. External stakeholders are those who are influenced by or have influence over a project without being directly affected by it.

Once these stakeholders have been identified, the socio-economist should conduct consultation and establish key information about them such as their interests, their potential impact on the project and the relative priority of their interest. Specifically the major points of consultation the socio-economist should focus are on points regarding participation, implementation and operation; identification of project impacts and benefits, monitoring and implementation plan and others. At this time the expert should use consultation tools such as checklists, points of discussion (Agendas), discussion minutes, names of participants, responsibilities, their organization, signature and date will be prepared and attached with the final study and design report of the project.

## 2.3 TYPES OF DATA REQUIRED

In the feasibility study and design of an irrigation project identification of the required types of data has a significant value for the socio-economists and for subsequent analysis. This data is a collection of facts, such as numbers, words, measurements, observations or descriptions of things and situations around the project area. The types of data collected in the study and design of the projects can be qualitative or quantitative. **Qualitative data** is descriptive information (it describes something) whereas **quantitative data** is numerical information (expressed in numbers). Some examples of qualitative data are farmers' interest in using irrigation, farmers' attitudes and willingness for the project, gender, names, sex, marital status, and etc.

**Similarly, quantitative data** can be discrete or continuous. Discrete data is counted data or numeric such as number of children, number of students, it can be categorical like red or blue or male or female, good or bad, etc. Continuous data can take any value within a range such as weight, height, etc. and found by measurement. Some examples of quantitative data are irrigated land size, number of water user associations, amount of fertilizer used, number of farming households, etc. In the feasibility study of an irrigation project the socio-economist should collect and responsible for collecting such types of data by using questioners, checklists and well prepared format.

## 2.4 PRIMARY AND SECONDARY DATA COLLECTION/ QUANTITATIVE AND QUALITATIVE DATA COLLECTION METHODS

### *2.4.1 General*

There are various methods to collect socioeconomic data for projects like small scale irrigation projects. Quantitative, qualitative or both methods can be used to collect the required socioeconomic data for the project. Usually both quantitative and qualitative methods are employed based on the condition of the project area under consideration. The commonly used quantitative method used to collect quantitative data is survey (census or sample). There are

different qualitative and participatory methods such as focus group discussions, key informant interview, transact walk, community consultation, etc. to collect qualitative data for the socioeconomic study of the project.

### *2.4.2 Primary data collection procedures*

Primary data is the first hand information and it is one of the sources of data collected directly or face to face from the households who have assets and livelihood bases within the various project component areas. The data would be collected by the socio-economists or selected enumerators from each irrigation project component areas using questionnaires, checklists and formats. Prior to the field work the questionnaires, checklists and formats should be prepared by taking into account the scope and objectives of socio-economic study and importance of the data for anticipated purposes. The sources of the primary data could be communities and existing stakeholders at different level. The methods of collection of such data is through the application of census, sampling, direct measurement, field investigation or observation, focus group discussion, community discussion, key informant interviews and even through telephone interviews. Brief description of the recommended primary data collection tools and their procedures are presented in the following sub-sections. These are:

#### 2.4.2.1 Field transect walk observation

Site observation is first hand important source of qualitative data for the feasibility study and design of an irrigation projects. Prior to any data collection the socio-economist should conduct clear site observation through **transect walks** with the study and design crew. The site observation helps the expert to grasp and have an overview of the existing water sources, water abstraction sites, irrigation canal route, the command areas, community settlement pattern, status of social services, housing conditions, economic activities of the community and overall situation of the project area. It involves the systematic noting and recoding of activities, behaviours, features, settings and physical objects. As one of the study and design crew member the socio-economist conducts his/her observation with respect to socio-economic environment of the project area. The site observation will be conducted together with DAs, knowledgeable persons of the area, kebele administration representatives, village/sub-village leaders, existing traditional irrigation users' group representatives and wereda level irrigation experts, who have better knowledge and understanding about the project sites. The observation can often be a rapid and economical way of obtaining basic socio-economic information on households or communities. Parallel to site observation, discussions on the transect walk route will be conducted with water users groups representative and communities to explore opinion and attitudes towards the project. At the time of site observation processes the expert will take records, conduct location or sketch maps, take pictures and related phenomena of the existing systems.

#### 2.4.2.2 Focus group discussion (FGD)

A focus group is a qualitative data collection method in which expert (s) and beneficiaries meet as a group to discuss relevant issues, in which the participants responding to open-ended questions. Focus group discussion should focus on various socio-economic issues related to the socio-economic and development constraints, community attitude, livelihood strategies, conflict management, farming experiences, income generation development, and marketing and development recommendations.

**Determination of number of focus group:** ***(Primarily we need to answer the question: How many focus groups required for a given SSI project?)*** The number of focus group required for data collection for socio-economic assessment can be ranging from 4-6 groups depending on the size of the command area and socio-cultural setup. The focus group discussions should be organized in different parts of the command area (head-middle-tail or head-middle, head-tail of the command area). If the command area is located in different kebeles, the focus group discussion shall be undertaken in each of the project kebele.

In most cases the focus group discussions need to be conducted with representatives from beneficiaries, youth, women, disadvantages group, traditional irrigation users, PAPs (Project Affected People) separately.

***Participant recruitment:*** The richness of the data is emerging from the group members' diversity because of difference in age, gender, farming experiences, technology exposure, and access to resources, landholding size and other factors. Different views will likely be expressed by participants because of their diversified socio-economic and cultural backgrounds. The recommended number of households participating in each focus group session shall be ranging from 10 – 12 households or beneficiaries representing different wealth groups like poor, middle and rich wealth group of each of the above recommended social group. Socio-economic groups like women headed households, elders, youth group, model farmers and traditional irrigation users (if any). The facilitator has to be recruited from the project wereda or kebele those who knows their local language. If not a translator is required to assist the lead interviewer.

Focus groups work best when conducted by two persons including facilitator and note taker. The facilitator is responsible for the focus group discussion, posing all questions specified in the focus group question guide, keeping the discussion on track, and encouraging all participants to contribute

***FGD session time span:*** Focus group sessions might require one to two hours and should include time for participants to take health breaks and allow them to interact to each other entertaining certain common issues. As you begin the discussion, consider how much time you are likely to have and set realistic goals for covering all the questions in the checklists. Allocate time frame for each discussion point. It is highly advisable to be precise in asking questions to clearly set what is being asked and to briefly capture the main essence of replies.

**Self-introduction:** In conducting focus group discussion it is important to start by welcoming participants and briefly introduce yourself and the study team, the purpose of the focus group discussion in order to establish clear understanding among participants and encourage smooth flow of ideas. Explain the main purpose of study as to understand the overall farming system and potential entry points for development interventions with particular focus on small-scale irrigation development. So that participants are free and expected to share experiences, opinions and points for consideration and confirm that the responses will be used for preparing small-scale irrigation development projects.

***Issues expected to be covered but not limited to:***
The main issues to be discussed during focus group discussion are existing agricultural production systems, existing input accessibility and marketing, input prices, crops grown in the project area, traditional irrigation water managements; their crop preference for anticipated project, social service accessibility, health, education and potable water availability, cost sharing, labor availability, possible social conflicts, existing conflict resolution mechanism, appropriateness of selected headwork site, road crossings, cattle trough locations, socio-economic development constraints and opportunities; and comments on type of irrigation structure

***Debriefing session:-*** Debriefing session should take place immediately after the completion of focus group session to summarize the findings to develop common understanding and their acceptance. Please refer the checklists in Appendix II.

### 2.4.2.3 Key informant interview

Key informant interview is one of the tools uses to collect primary data and suggested to carrying out with selected knowledgeable and informative farmers to capture very important information on critical points. The socio-economist should interview only limited key informants taking into account the information gaps observed in others data collection methods and to verify some important information.

**Purpose**: The key informant interview is a qualitative and in-depth interview that allows a free flow of ideas and information. The key informant interview could enrich and support the information obtained from farmers during focus group discussions and can fill the data gap which is supposed and difficult to get by other data collection tools.

**Participant**: Key informants should be selected for their special knowledge on agriculture and socio-cultural issues. In the context of the irrigated agriculture development study the potential key informants could be traditional irrigation users, elders, innovative and knowledgeable farmers, and women farmers. In addition, in the selection process, it is important to balance the gender mix, youth group and model farmers with better experience

The number of participants for key informant interview at project site should not exceed more than 3-4 informants. Because this tool is designed to complement data collected through other methods. It is also vital to make sure that KIIs shall be considered depending on the command area size, beneficiary Kebeles (representing near the head, middle and downstream of the command area) and socio-economic setting of the area.

**Self-Introduction**: Start by thanking the key informant for agreeing to the interview. Introduce who you are and representing from which institute you are coming. Explain briefly the purpose of the key informant discussion.

**Issues to be covered:** The main issues to be discussed during key informant interview are existing crops yield, existing input utilization level, input prices, traditional irrigation practices, water managements; their crop preference for anticipated project, social service accessibility, health, education and potable water availability, cost sharing, labor availability, possible social conflicts, existing conflict resolution mechanism, appropriateness of selected headwork site, road crossings, cattle trough locations, socio-economic development constraints and opportunities; and comments on type of irrigation structure

**Time required**: It is recommended to spend 15-25 minutes with each participant identified for key informant interview

**Data analysis:** Prepare interview summary sheet to compile the information based on the pre-determined topics and additional issues raised and discussed. Some of the points that should be noted, in summary sheet are: **Name of key informant, key informant position, main points raised and discussed, summary of important points and recommendations**.

### *2.4.3 Secondary data collection*

#### 2.4.3.1 Stakeholders' consultation

Stakeholders' consultation is a most valuable information source for SSIP study. The consultation will be undertaken at different levels from the grass root level up to regional relevant offices as required. Water users' committee, wereda experts and concerned regional bureau and agency expertise need to be consulted on various issues including

- policy & strategy issues,
- socio-economic impacts of the irrigation project,
- food security status,
- inputs supply network,
- credit facilities and accessibility,
- alternative livelihood basis,
- farming system and agricultural production,
- institutional responsibilities during construction and implementation of the project,
- potential agribusiness and marketing network practices,
- experiences of existing IWUAs and
- others, as appropriate.

Consultation and data collection in selected offices can be undertaken together with other study team members to discuss the issues from different aspects. The stakeholder checklists should be prepared to use as a guidance to conduct discussions with experts and concerned bodies.

#### 2.4.3.2 Review on-going sectoral study

The findings from others feasibility sectoral studies such as irrigation agronomy, land evaluation study, engineering, environmental and social impact assessment; and watershed need to be exchanged for socio-economic analysis and recommendations. Before the commencement of the field work, the socio-economist has to provide list of data required from each sector study.

#### 2.4.3.3 Review of reports and research output documents

Secondary data obtained from different stakeholder offices, periodical reports and research outputs and proceedings shall be referred and valuable data need to be noted from the respective documents.

## 2.5 QUANTITATIVE DATA COLLECTION METHODS

Based on the size of the target population, we either use the census or the sample survey method to collect socioeconomic data. We usually use census survey to collect socioeconomic data when the size of the target population is reasonably small (less than one hundred households) and we have no shortage of resource. When the target population is large (greater than 100 households) the sample survey option will be conducted. In a census survey, the data should be collected from every member of the target households.

When the number of project beneficiaries is large or we have resource constraint such as shortage of finance, time, personnel or other resource, we use sample survey to study the socioeconomic conditions. Sample survey is a process by studying a small portion of the target population to make inference about the whole population.

A carefully and well-planned selected sample enables the planner to generate representative data for target population of the study area. In a sample survey, first we have to determine the sample size and select the sample households and collect the socio-economic data from the selected beneficiaries.

The type of study, target population size, the objective of the study or the required decision, the specific project conditions and the availability of resource determines whether to apply census or sample household survey methods. The sample size should be determined at planning stage of the project.

## 2.6 SAMPLE SIZE DETERMINATION AND SAMPLING TECHNIQUES

There are two ways of determining a sample size for socioeconomic study of SSIPs. The first method is determining the sample size by taking a certain perecent, which usually ranges from 10% to 30% depending on the variability of the target population. The conventionally recommended sample size is usually about 5-10% of the households from each project components. The recommended sample size of 5% to 10% is applied if the target population is big. If the members of the target population are more similar or homogeneous, small sample size could be enough.

However, if the target population size is small, the sample size can go up to 30%. For example, if the target population is 100households and we take 10%, our sample size will be 10 farmer households, which is small. Hence, we need to take 30% sample size, which are 30 farmer households. This implies an inverse relationship between the number of HH and sample size. Due to the fact that the area of SSIP and its households are very limited, more representative data could be possible from larger sample sizes. As the farmer household number increases, the required data could be obtained from a lesser sample size while more sampling is required for less number of farmers HHs. Here the recommendation is of 10% to 30% sample of the households by considering the homogeneity of the farmer households is valid. The choice is left for the socio-economist conducting the socio-economic survey of the SSIP in consultation with the project implementers.

The second option is to determine the sample size using a formula as follows;

**Determining Sample Size Using Formula**

Determining the sample size statistically for the socio-economic survey of the SSIP is often a difficult task because it requires the fulfillment of many factors. The difficulty arises due to unavailability of enough information about the target population (variability), assumptions have to be made in order to achieve the required relative precision.

The main factors to determine optimal sample size are the maximum budget available, time limit, and nature of the study, the desired level of precision, confidence level and variability within the target population. The margin of error is the amount of deviation that we tolerate the sample statistic from the population parameter. The confidence level tells us how sure we can be on the estimate and expressed as a percentage. For example, the commonly used 95% confidence level for socio-economic studies means we can be 95% certain that the parameter lies in the interval. The population size is the number of people in the target population that our sample represents. Hence, we use either of the following formulas to determine our sample.

The formula for estimating sample size of population mean proportion is:

To estimate population mean: $n = [z^2.N.\acute{S}\text{^}2/[(N-1)e^2+z^2S\text{^}^2]$

Or

To estimate population proportion: $n_1 = [z^2P\text{^}(1\acute{}-P\text{^})/e^2]$

Adjusted (final) sample size = $n_2 = n_1(N/(N+n_1))$

Where S^^2=estimate of population variability: P^= estimate of the population proportion; n=sample size; N=population size; e=desired margin of error proportion; z=a value corresponding a desired level of confidence;

***Rule of thumb.1***: take P^=0.5 if the population proportion is unknown. This value of p is usually taken when the target population size is 5,000 or more.

***Rule of thumb.2***:- in most of socio-economic surveys, we take a margin of error (e) = 0.05 and confidence level 5%.

Example: In an SSIP command area, there are 6,500 household beneficiaries. The socio-economist wants to determine the sample size using the margin of error 0.03 and the confidence interval 95%. As information on the target population proportion is unknown and the population is large, we can take P(cap) = 0.5 and determine the sample size using the above formula.

We have N= 6,500 households, margin of error = 0.03, P(cap) = 0.5 and confidence interval = 95%. The unadjusted sample size (n1) determined using the above formula is:

$n_1 = [z^2P\text{^}(1\acute{}-P\text{^})/e^2]$

$= [(1.96)^2(0.5)(0.5)/(0.03)^2] = [((3.8416)(0.25))/(0.0009)]=1,068$

Hence the first estimate of the required sample size (n1) =1,068

Adjusted sample size = n = n1(N/(N+n1))= 1,068*(6,500/(6,500+1067))= 918

Therefore, our final sample size is 918 households.

Note that we use this formula to determine the sample size when we need high precision. However, most of the time the target population is usually less than 5,000 and we require only

rough estimation and we determine the sample size by taking some percentage of the target population as described above we believe it is enough.

The third method of determining the sample size for our socioeconomics survey is selecting the sample size we want using the suggested sample size (generated by computer software like Epi Info) based on the confidence interval we intend to use. Sample size varies as confidence level varies. For example, the required sample size based on population size of 999,999 and a different confidence level is displayed in the table below.

**Table 2-1: Suggested Sample Sizes for Selected Confidence Levels**

| Confidence level | Sample size |
|---|---|
| 80% | 164 |
| 90% | 270 |
| 95% | 384 |
| 97% | 471 |
| 99% | 663 |
| 99.90% | 1082 |
| 99.99% | 1512 |

**Alternatively:**

As there is resource constraint (shortage of time and money), the socio-economist may decide to take only 10 percent of the target population, that is, 650 farmer households and supplement it with data collected using qualitative methods.

**Note**:- One method to lower the sample size is to decrease the confidence level, that is, to decrease the confidence level from 99.99% or 99% to 95% or 90% or 85% or 80% and so on. Usually, taking below 80% confidence level is not recommended.

## 2.7 METHODS OF DRAWING A SAMPLE

The two methods used to draw a sample from a target population (in our case potential SSIP user farmer households) are probability and non-probability sampling methods.

### 2.7.1.1 Non-probability sampling method

In this method, we select members of the sample purposively, that is, the sample households are selected subjectively based on the socioeconomic surveyor's judgment. Here every member of the target population does not have known chance of being included in the sample.

Although there are many non-probability sampling methods, the two commonly used non-probability sampling methods, which can be used in the socio-economic studies of SSIPs, are purposive /judgmental/ and quota.

***Purposive (judgmental) sampling****:* members of the sample are chosen based on the judgment or opinion of the socio-economist. Steps to conduct purposive sampling are:

- Identify individuals or groups, who have adequate knowledge, of different mix of age, wealth and experience on the subject, willing and available to give data
- Be sure the selected participants can communicate experiences and opinions in a clear, expressive and reflective manner.

- Determine the sample size and select the respondents.
- Collect the data from the selected respondents.

***Quota sampling***: quota sampling is one of the widely used non-probability sampling method. In quota sampling, we select members of the sample from the various groups of the target population by giving a specified quota to each group. The size of the quota for each group is usually proportional to the size of group.

Steps to create a quota sample:

- Identify exhaustive and mutually exclusive relevant groups. For example, male-headed and female-headed farmer household or area locations such as upper, medium or lower area of the SSIP
- Divide the population into the identified groups
- Determine the sample size
- Assign quota to each group
- Select the respondents using the selected sampling procedure (usually non-probability) and
- Collect the data from the selected respondents.

**Example:** The socio-economic team of the SSIP decided to conduct focus group discussion to identify and prioritize the problems, select strategies and the overall socio-economic and natural resource of the SSIP area. It planned to use quota sampling to select the 12 farmers who participate in the focus group discussion by giving a quota of four farmers for the main command area, canal construction area and lower area. Then the socio-economist together with local administrators selects four farmers in each area of the project usually purposively.

#### 2.7.1.2 Probability sampling methods

The second method to select members of the sample is probability sampling. In this method, members of the sample are selected based on chance only or randomly. The selection of members of the sample is free to the interest. Every member of the target population has a known non-zero chance of being included in the sample. For example, if we have a target population of 100 SSIP beneficiary households and each household would have a 1 percent chance of being chosen in the sample if we randomly chose one farmer household.

In probability sampling method, the factors we use to select the members of the sample are: availability of a sampling frame (list of the target population like list of farmer households)

- Variation among the population members (measured by standard error),
- Available resource and
- Type of data analysis to be used.

The four commonly used probability sampling methods, which can be used in the socio-economic studies of SSIPs are simple random, systematic, stratified and multi-stage. Usually we use a combination of two or more methods like simple and stratified or simple and systematic or simple, stratified and multistage together.

***Simple random sampling (SRS):*** SRS method, which is completely random and unbiased, gives equal chance to each member of the target population to be included in the sample. It requires a finite target population and a fresh and complete sampling frame. Homogeneity of the members of the target population is the basic assumption of a SRS method.

Steps to select simple random sample

- Prepare the sampling frame (for example, a complete list of farmer households).
- Determine the sample size.
- Choose the selection method of members (lottery method or Table of Random Numbers).
- Select sampling units.

Example: In Kunzila SSIP, there are 60 SSIP user farmer households and we decided to select a sample containing 6 farmer households using SRS. We decided a Table of Random Numbers method. We proceed as follows:

- List the 60 SSIP user farmer households starting from 01 to 60.
- We need a two-digit column in the Table of Random Numbers (as 60 is a two digit)
- Decide to move up, down, left or right to select the three digits
- Close your eyes and put your finger in any place in the Table of Random Numbers to select starting point.
- We select the numbers until we get 6 SSIP user farmer households.
- We collect data using our questionnaire from the selected SSIP user farmer households.

The sampling frame is the list of household heads of a Kunzila SSIP project shown in the Appendix I

The sample members selected using SRS in the order of their selection as shown in Appendiox I are 30, 01, 40, 21, 16 and 59 which are Abich Tihayneh, Demeke Melese, Alene Abiye, Dilmeta Tebebal, Smachew Demissie and Melese Kebede respectively. We collect the data for the socio-economic survey from these farmers.

The advantage of simple random sampling is that itcreates samples that are highly representative of the population. The disadvantage of simple random sampling is that, it is tediousness, time consuming and costly in large samples. If there are significant differences among the members, it might give undesirable result.

***Stratified Random Sampling (StRS):-*** we use StRS when there is heterogeneity among the respondents and there are distinct, more homogeneous and mutually exclusive groups (strata). The main reason for stratification is to get a better representative data.
Steps to draw stratified random sample;

- Divide the sampling units into mutually exclusive groups/strata/ based on shared attribute of its members such as gender.
- Determine the sample size.
- Allocate the sample size to each strata (usually proportionally).
- Prepare sampling frame for each strata.
- Use simple or systematic random sampling to choose members from groups.

The advantage of stratified random sampling is that it creates highly representative samples of the population, minimizes sample selection bias and ensures the inclusion of members for each group and avoids over or under representation of some segments of the population. Tediousness, time consuming and not applicable when we could not find mutually exclusive and distinct groups are the main disadvantages.

Example:A socio-economist wants to study the socio-economic situation of Kunzila kebele having 60 farmer households for SSIP using StRS. We stratified the population by using village of SSIP user farmer household heads live and there are 15farmer households in Sanqeta village, 21 farmer households in Mehalzegie village and 21 farmer households in Cheba village. We want a sample of 6 farmer households. We allocate the 6 households of the sample proportionally as follows.

- For Senqeta village = n1 = (6)(15/60)=1.5 ≈ 2 farmer households
- For Mehalzegie village = n2 = (6)(21/60)=2.1 ≈ 2 farmer households
- For Cheba village = n3 = (6)(15/60)=1.5 ≈ 2 farmer households

Then we select 2 farmer households from each of Senqeta, Mehalzegie and Cheba villages. We created the sampling frame for each village as shown in Appendix I.

Therefore, the selected farmer households for the sample of the survey as Appendix I are Melese kebede and Sewbihon Achenef from Cheba village; Beregnaw Abie and Damtew Tadesse from Mehalzegie village and Smachew Demissie and Dilmeta Tebebal are selected from Sanqeta village.

**REMEMBER:** stratified random sampling is a highly recommended and commonly used probability sampling technique to collect socio-economic data for SSIPs. It gives a more representative data. Moreover, the population must at least be classified by gender as gender disaggregated data is mandatory requirement by the project.

***Systematic Random Sampling (SyRS):*** uses systematic selection of members of the target population to be included in the sample. It divides the population into groups using an interval and takes one respondent from each group. For example, selecting every respondent by fourth SSIP user farmer household is what makes the sampling systematic because there is an interval system. It is a random sample because the researcher cannot influence the selection of what farmer household will be included in the sample and ensures that all farmer households are given equal chance of getting selected in the sample.

Steps to draw a systematic random sample

- Prepare a complete list of all the respondent farmers of the target population.
- Determine the sample size.
- Create an interval k (k=population size / sample size).
- Choose one farmer household using simple random sampling from the first interval.
- Choose every “kth” farmer household until we choose all members of the sample.
- Collect data from the selected farmer respondents.

In order to avoid bias, the socio-economist must ensure that the selection of farmer households does not follow any sort of pattern in the selection.

Example: The manager of Kunzila SSIP project wants to send 6 farmer household heads to a training. He wanted to use systematic random sampling method to select the 6 farmer household heads. He will proceed as follows.

- Prepare a list of 60 farmer household heads of SSIP users (labeling from 1 to 60).
- Create an interval (population size/sample size = 60/6=10)

- Select a beginning member by randomly selecting a farmer household head from the first interval of farmers (listed from 1 to 10)
- Select the remaining farmers by adding 10 from the previous selected farmer list number until the 6 farmer household heads selected.

Preparing the sample frame: Here it is good to prepare the list of farmer households by writing completely the farmers' of one village followed by another. Hence the frame is shown in Appendix I

Using SRS, the farmer household head on the serial number 04 as shown in the Appendix Iis selected, that is, Nigusse Terefe. Then the remaining five farmers were selected by adding 10, which are 14 (4+10), 24 (14+10), 34 (24+10), 44 (34+10) and 54 (44+10). Hence, the sample selected with SySR comprised of Nigusse Tarefe, Adnew Yeshwas, Masresha Abie, Bazezew Alebel, Damtew Tadesse and Mequanint Demeke farmer household heads. from the first group, that is, from 1 to 10 list, we select randomly

The advantage of systematic sampling is that it is relatively easy and convenient. It also ensures the evenly selection of farmers and creates samples that are more representative of the population. The disadvantage of systematic sampling is that it is not as random as simple random sampling. The process of selection may cause to select a hidden periodic trait within the population.

REMEMBER: SySR is appropriate when the members of the target population are more similar and there is no clear pattern in the intervals. We use SyRS frequently and it is important to carefully consider its limitation.

***Multi-stage random sampling:*** this method is often used when target population is very large and we need to pass through multiple stages. It uses a combination of techniques. It divides large populations into stages to make the sampling process more practical and usually uses a combination of stratified, simple or systematic random sampling. In order to classify multistage sampling as probability sampling, each stage must involve a probability sampling method.

***Steps to use multi-stage sampling***

- Identify and select largest group(s) and select the first sampling unit.
- Select the second sampling unit and continue the process until you reach the last stage.
- In the last stage, we select respondents and
- Collect the data from respondents.

Example: Ministry of Natural Resource of Ethiopia needs to study need assessment of SSIP user farmer households and planned to use multistage sampling method to select the sample of SSI user farmer households. It may proceed as follows. It selects:

- Stage I: regions either purposively or randomly.
- Stage II: zones in the selected regions purposively or randomly.
- Stage III: woredas in the selected zones randomly or purposively.
- Stage IV: kebeles in the selected woredas either purposively or randomly and finally
- Stage V: SSI user farmer households randomly in each selected kebele.

The advantages of multi-stage sampling are simplifying the sampling process, flexible, reduces cost and time. The disadvantages of multi-stage sampling are its arbitrariness and lost data.

REMEMBER: we can use multistage sampling to collect socio-economic data of SSIP user farmer households. The selection of the method mainly depends on the availability of resources and to some extent the level of hierarchy.

## 2.8 DEVELOPING A QUESTIONNAIRE

A questionnaire is the most widely used data collection instrument for surveys, which is the main tool for gathering the required data in many socio-economic studies. To get accurate and reliable data, we must carefully and properly design the questionnaire and evaluate if possible with knowledgeable people in the study area. The questionnaire must be pretested and modified properly using the feedbacks obtained from the pre-test and from professionals of the field prior to conducting data collection. Developing good questionnaire requires knowledge, experience and patience. There are some guiding criteria to develop a good questionnaire.

Steps to develop a good questionnaire

- ***Determine the purpose*:** decide what to know and the reason to know it.
- ***Identify indicators*** *(decide what to measure)*: based on the objectives of the survey, all the necessary indicators must be identified. For example, some of the indicators for an SSIP are number of farmer households in the irrigation area, total land size of the irrigation area, average land size per household, average family size, etc.
- ***Identify the appropriate respondent*** *(who should be asked)*: for an SSIP socio-economic survey the household heads are appropriate respondents.
- ***Consider the interest of data users*:** who are the users, for what purpose do they need the data, what level of detail they need are some of the questions we need to answer when we identify the users of the data.
- Prepare draft questionnaire;
- ***Field test*** *the questionnaire*: test the questionnaire with other people similar to the respondents of the survey to ensure its appropriateness, improve unclear questions or procedures and detect errors beforehand. Note that pre-testing a questionnaire is ignored by surveys due “time and resource reasons” but it is wrong. Pre-testing the questionnaire on the contrary helps to reduce resource wastage and improve the results of the survey.
- Choose appropriate measurement scale (nominal, ordinal, interval or ratio). Here it is important to consider carefully the purpose of the survey and the intended indicators.
- Give proper title to the questionnaire: title of the questionnaire will let the respondent know what it’s about, include a brief purpose of the study especially it is a mailed questionnaire.
- Start with easy and non-threatening questions: make the first questions relevant to the title/purpose and easy to answer. This helps the respondent to relax and give right answers to the questions that follow.
- *Include simple instructions*: how to complete each section and how to mark answers. For example, you instruct to circle a choice, thick a box, etc.
- *Use plain language*: be direct, use simplest language necessary and avoid jargon.
- *Be brief*: keep the questionnaire as short as possible and focus on “need to know”.
- Put most important questions at the beginning and less important data at the end.
- *Ask only one question at a time*: Avoid “double-barreled” questions. For example, avoid asking what fertilizers and selected seeds you use? (Double-barreled question). Instead ask as separately as what fertilizers do you use? What selected seed do you use?

- Avoid “loaded” or biased question. For example, You support the government program. Right? This is a leading and biased way of asking the respondent. We are forcing the respondent indirectly to answer “Yes”.
- Arrange in a logical order and group similar questions together.
- *Minimize open-ended questions*: open-ended questions should be at minimal. If you use many open-ended questions in your questionnaire, it will be time consuming and difficult to finish the analysis.
- *Provide space to tell more*: Give respondent room to comment about individual questions or the survey as a whole. Ask for any additional comments or suggestions.
- *Thank respondents*: on questionnaire, in cover letter and end of interview, thank the respondent properly.

## 2.9 STEPS TO CONDUCT A SURVEY (CENSUS AND SAMPLE)

- Collecting data for the socio-economic survey of SSIP requires careful and proper planning, implementation and follow up. It involves the following steps so as to execute the survey effectively and efficiently by utilizing optimal resource.
- Prepare survey action plan or terms of reference (ToR) of the survey and get approved: the first step in conducting a socioeconomic survey is preparing a comprehensive and well thought out survey plan and get approved by the management.
- Establishing the survey team: select the right persons for the survey. It is recommended to make the survey team multidisciplinary or have different professions. If possible, it is good to include an economist, a sociologist, an environmentalist, and agronomist, and other professionals in the team depending on the size project.
- Develop, test and duplicate the data collection instrument: after selecting the right data collection instrument, the team develops the data collection instrument, test it and duplicate it with enough copies.
- Depending on the size of the survey, it might be necessary to hire additional personnel such as supervisors, data collector and others as necessary.
- Make ready enough equipment, material, financial resource, etc. for the survey.
- Provide training to supervisors, data collectors and other concerned bodies.
- Prepare sampling frame (the list of the target population or the population to be studied).
- Select the respondents if it is a sample survey.
- Announce the survey for all the concerned bodies: before starting the data collection process it is crucial to announce the survey to all the concerned bodies at all levels. This contributes to collect good data and prevent problems during data collection. Conducting launching workshop for the survey is the preferred means.
- Conduct field data collection, onsite supervision and collect the filled questionnaire: as per the schedule, the data collection and its related activities shall be conducted. It is very important to seriously supervise the data collection to reduce errors and improve the accuracy of the survey results.
- Recruit and train data entry clerks, conduct data entry and clean the data.
- Generate output, prepare draft report, get comment and incorporate the comment.
- Conduct workshop on the result of the survey and enrich the document.
- Finalize the write-up, print and distribute it to users.

## 2.10 CHECKLIST TO CONDUCT A SURVEY

- In conclusion, we need to use the following checklist when we plan to conduct a census or sample survey
- Decided on the purpose of the survey. The purpose may be to identify real problems or solutions, to identify attitude of respondents on an issue, etc.
- Decide whom you will survey (identify your target population).
- Ensure the existence of the required resource for the survey and get it approved.
- Decide type of survey to use: whether to use sample or census survey.
- Decide the method of data collection for the selected survey.
- Prepare the action plan of the survey (ToR) and get approved.
- Decide the data collection instrument, prepare, pretest and print it.
- Decide how you analyze your data (qualitatively or quantitatively).
- Write draft reports, collect and incorporate comments.
- Get the result of the survey published and distribute the final results of the survey to the concerned stakeholders.

## 2.11 DATA ANALYSIS

The primary purpose of collecting data for SSIP project is to make data analysis and extract important information to be used for decision-making for the project. Both primary and secondary data need to be checked for its validity. It is crucial to examine carefully when we use secondary data for our socio-economic analysis. We must be sure on the credibility of the source and check how it is collected and processed and by whom, when, etc.

### *2.11.1 Basic concepts of data analysis*

Data compilation and preparation is ensuring data quality or integrity. Data integrity is checking the data accuracy and reliability. It is checking for completeness, consistency, uniqueness, validity, accuracy and timeliness. It is important to know the meanings of these terms.

- Completeness means all required data collected.
- Consistency means there is no conflicting data in the data set.
- Uniqueness means there is no duplicate datum in the dataset.
- Validity means the data match the rule or the data complies its requirement.
- Accuracy means the data is free from error.
- Timeliness means the data represent reality from the required point in time.

**Data coding:** the purpose of data coding is to make the data analysis easier because coding facilitates the organization, retrieval and interpretation of data leads to conclusions on the basis of that interpretation. Data coding is assigning a numerical value for each category or answer of the questionnaire and document the coding. We code our data before entering to a computer.

For example, for sex of respondent, we collect as Male and Female. We cannot enter sex as Male and Female in statistical software because it will be difficult to analyze it. Instead we code it as Male = 1 and Female = 2 and we enter 1 or 2 for sex of the respondents.

**Developing a dataset structure**: After coding and before data entry, we must create the data structure of the dataset using the software we selected for data entry and management. The data structure contains the variable, the data and the documentation (meaning attached to each variable). That is, developing a data structure is defining the variables properly and documents them.

If we chose the SPSS software for data entry and analysis, we use the Data Editor window of SPSS for data structure creation and data entry. We use the (Variable View) to define and/or modify variables and Data View tab to enter or modify data. In SPSS data structure, a case contains one questionnaire and a variable contains a piece of information or an answer to a question.

When we create a dataset entry, we should make it as simple as possible; enable to enter categories like male or female using coded numbers or numerical values, etc.
The Checklists for data entry are:

- A variable that uniquely identifies a questionnaire must be entered (For example use variable name code for questionnaire code)
- Enter data directly from the original questionnaires whenever possible
- Enter in the same order that they were collected
- Enter all the data and as soon as collected if possible
- Data should be entered carefully (no hurry in data entry to minimize error)
- Use software for data entry, which has data checking facilities (if possible). For example, MS Excel or CSPro
- Consider using double entry whenever possible. The second entry is done by a different person.
- Transform the data into familiar units (e.g kg/ha) before entering the data. This may help the checking process by easily showing odd value.
- See extreme values, boxplots to compare groups of data and highlight outliers, scatterplots, tables of the data, etc. to check your data.

**Data entry:** The collected socio-economic data should be entered into software for storage, retrieval and analysis. Usually as the volume of socio-economic data is large, we need to employ data entry clerks to enter the data. Data entry clerks must be properly trained to enter the data.

**Data cleaning:** Before starting any analysis on the collected socioeconomic data, we need to clean the entered socio-economic data and make sure the data is free from errors as much as possible. Data cleaning is the process of checking data for adherence to standards, consistency, validity, miscoded or missing data, possible outliers, non-normal distributions etc. and to replace incorrect data with correct data. Cleaning data is finding incorrect responses or errors and correcting them. The screening is usually done using computer software like SPSS.

**Securing data:** Ensuring the safety of the collected data physically and electronically is one key task of data management. Physical protection of data is putting the questionnaires, computers, data storage devices and related items at safe and least risk areas. The access to the data must be limited to avoid an accidental deletion and intentional manipulation of the data. That is copy or backup the data in different flash disks or CDs and put it in different places or with different persons. It is also better to use strong passwords for the computer as well as files. If the data is not confidential, keeping the data in your email addresses is another way of securing the data.

### 2.11.2 *Methods of data analysis*

The commonly used data analysis methods are descriptive and inferential. In descriptive data analysis, we explain the results using descriptive measures such as percentage, graphs, averages, medians, modes, ranges, standard deviations, percentiles, etc. Knowingly or unknowingly, we always use descriptive method of analysis in our studies. For example, we may analyze the following data descriptively as follows.

**Table 2-2: Sample Data for Data Analysis**

| ID | Household head Name | Village | Sex | Age | Male | Female | Total | No. of Years in village | PrimaryOccupation | Cattle | Equines | Goat&Sheep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Fentabil Kassahun | Cheba | Male | 52 | 6 | 5 | 11 | 52 | Rain-fed Agri. | 13 | 3 | 4 |
| 2 | Alelign Chanie | Cheba | Male | 40 | 4 | 4 | 8 | 40 | Rain-fed Agri. | 11 | 0 | 4 |
| 3 | Abich Yeshwas | Cheba | Male | 51 | 5 | 3 | 8 | 51 | Rain-fed Agri. | 5 | 1 | 5 |
| 4 | Nigusse Terefe | Cheba | Male | 42 | 4 | 2 | 6 | 42 | Rain-fed Agri. | 12 | 1 | 3 |
| 5 | Mazengia Chanie | Cheba | Male | 40 | 5 | 2 | 7 | 40 | Rain-fed Agri. | 4 | 2 | 2 |
| 6 | Girum Bayih | Cheba | Male | 39 | 4 | 3 | 7 | 39 | Rain-fed Agri. | 8 | 1 | 6 |
| 7 | Tesfie Alem | Cheba | Male | 43 | 3 | 3 | 6 | 43 | Rain-fed Agri. | 7 | 1 | 4 |
| 8 | Degu Abie | Cheba | Male | 36 | 4 | 3 | 7 | 36 | Rain-fed Agri. | 9 | 0 | 3 |
| 9 | Alem Meles | Cheba | Male | 40 | 3 | 2 | 5 | 40 | Rain-fed Agri. | 11 | 0 | 6 |
| 10 | Yekoye Maleda | Cheba | Male | 60 | 4 | 4 | 8 | 60 | Rain-fed Agri. | 8 | 2 | 6 |
| 11 | Melaku Tesfaye | Cheba | Male | 33 | 2 | 3 | 5 | 33 | Rain-fed & irrig Agri. | 6 | 1 | 6 |
| 12 | Adugna Degu | Cheba | Male | 27 | 3 | 2 | 5 | 27 | Rain-fed & irrig Agri | 2 | 2 | 10 |
| 13 | Aderajew Melku | Cheba | Male | 31 | 4 | 3 | 7 | 31 | Rain-fed & irrig Agri | 5 | 1 | 4 |
| 14 | Adnew Yeshwas | Cheba | Male | 34 | 4 | 3 | 7 | 34 | Rain-fed & irrig Agri | 7 | 2 | 5 |
| 15 | Tayachew Yalew | Cheba | Male | 29 | 3 | 2 | 5 | 29 | Rain-fed & irrig Agri | 4 | 1 | 3 |
| 16 | Melese Kebede | Cheba | Male | 37 | 3 | 3 | 6 | 37 | Rain-fed & irrig Agri | 8 | 1 | 7 |
| 17 | Demeke Melese | Cheba | Male | 32 | 3 | 2 | 5 | 32 | Rain-fed & irrig Agri | 11 | 1 | 5 |
| 18 | Tebeje Mola | Cheba | Male | 39 | 3 | 3 | 6 | 39 | Rain-fed & irrig Agri | 7 | 1 | 3 |
| 19 | Sewbihon Achenef | Cheba | Male | 28 | 3 | 3 | 6 | 28 | Rain-fed & irrig Agri | 6 | 1 | 3 |
| 20 | Muluken Abie | Cheba | Male | 33 | 4 | 4 | 8 | 33 | Rain-fed & irrig Agri | 2 | 1 | 2 |
| 21 | Adane Kebede | Mehalzegie | Male | 50 | 4 | 3 | 7 | 50 | Rain-fed Agri. | 4 | 0 | 4 |
| 22 | Aleme Abu | Mehalzegie | Male | 48 | 4 | 5 | 9 | 48 | Rain-fed Agri. | 5 | 1 | 0 |
| 23 | Feleke Lakew | Mehalzegie | Male | 46 | 3 | 3 | 6 | 46 | Rain-fed Agri. | 4 | 1 | 3 |
| 24 | Masresha Abie | Mehalzegie | Male | 38 | 2 | 3 | 5 | 38 | Rain-fed Agri. | 5 | 1 | 4 |
| 25 | Wasie Tesfa | Mehalzegie | Male | 42 | 1 | 1 | 2 | 42 | Rain-fed & irrig Agri | 2 | 1 | 0 |
| 26 | Woretaw Kassahun | Mehalzegie | Male | 48 | 5 | 4 | 9 | 48 | Rain-fed & irrig Agri | 6 | 2 | 3 |
| 27 | Kassa Mengist | Mehalzegie | Male | 40 | 4 | 1 | 5 | 40 | Rain-fed & irrig Agri | 2 | 2 | 1 |
| 28 | Babey Worku | Mehalzegie | Male | 42 | 2 | 6 | 8 | 42 | Rain-fed & irrig Agri | 8 | 2 | 0 |
| 29 | Nigatu Ayichew | Mehalzegie | Male | 48 | 5 | 2 | 7 | 48 | Rain-fed & irrig Agri | 3 | 1 | 0 |
| 30 | Abunie Belete | Mehalzegie | Male | 40 | 2 | 4 | 6 | 40 | Rain-fed & irrig Agri | 4 | 1 | 2 |

| ID | Household head Name | Village | Sex | Age | Male | Female | Total | No. of Years in village | PrimaryOccupation | Cattle | Equines | Goat&Sheep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | Demas Abiye | Mehalzegie | Male | 41 | 3 | 4 | 7 | 41 | Rain-fed & irrig Agri | 5 | 0 | 5 |
| 32 | Simachew Yeshambel | Mehalzegie | Male | 43 | 3 | 3 | 6 | 43 | Rain-fed & irrig Agri | 3 | 0 | 4 |
| 33 | Ayitenew Fentabil | Mehalzegie | Male | 42 | 4 | 3 | 7 | 42 | Rain-fed & irrig Agri | 2 | 1 | 5 |
| 34 | Bazezew Alebel | Mehalzegie | Male | 46 | 3 | 3 | 6 | 46 | Rain-fed & irrig Agri | 2 | 2 | 3 |
| 35 | Alene Abiye | Mehalzegie | Male | 48 | 4 | 4 | 8 | 48 | Rain-fed & irrig Agri | 4 | 1 | 5 |
| 36 | Girmaw Amsalu | Mehalzegie | Male | 43 | 5 | 4 | 9 | 43 | Rain-fed & irrig Agri | 10 | 2 | 0 |
| 37 | Beregnaw Abie | Mehalzegie | Male | 48 | 4 | 5 | 9 | 48 | Rain-fed & irrig Agri | 5 | 1 | 2 |
| 38 | Birhanu Yihun | Mehalzegie | Male | 58 | 3 | 3 | 6 | 58 | Rain-fed & irrig Agri | 2 | 0 | 2 |
| 39 | Bayu Fentabil | Mehalzegie | Male | 48 | 4 | 3 | 7 | 48 | Rain-fed & irrig Agri | 5 | 3 | 6 |
| 40 | Belayneh Gesese | Mehalzegie | Male | 68 | 3 | 2 | 5 | 68 | Rain-fed & irrig Agri | 3 | 1 | 0 |
| 41 | Derebe Mengistu | Mehalzegie | Male | 52 | 3 | 4 | 7 | 52 | Rain-fed & irrig Agri | 2 | 2 | 0 |
| 42 | Ademe Demissie | Mehalzegie | Male | 43 | 3 | 4 | 7 | 43 | Rain-fed & irrig Agri | 4 | 1 | 0 |
| 43 | Adalu Moges | Mehalzegie | Male | 40 | 4 | 3 | 7 | 40 | Rain-fed & irrig Agri | 3 | 2 | 0 |
| 44 | Damtew Tadesse | Mehalzegie | Male | 41 | 3 | 2 | 5 | 41 | Rain-fed & irrig Agri | 4 | 1 | 0 |
| 45 | Yeshambel Gelagay | Sanqeta | Male | 40 | 4 | 2 | 6 | 40 | Rain-fed Agri. | 9 | 1 | 1 |
| 46 | Chalie Yalew | Sanqeta | Male | 38 | 5 | 2 | 7 | 38 | Rain-fed Agri. | 6 | 1 | 3 |
| 47 | Jember Abera | Sanqeta | Male | 49 | 8 | 2 | 10 | 49 | Rain-fed Agri. | 8 | 1 | 4 |
| 48 | Chiyew Kassie | Sanqeta | Male | 48 | 4 | 2 | 6 | 48 | Rain-fed Agri. | 9 | 1 | 2 |
| 49 | Gebrie Melese | Sanqeta | Male | 45 | 4 | 4 | 8 | 45 | Rain-fed Agri. | 5 | 0 | 3 |
| 50 | Adisu Tebik | Sanqeta | Male | 42 | 3 | 3 | 6 | 42 | Rain-fed Agri. | 6 | 0 | 3 |
| 51 | Smachew Demissie | Sanqeta | Male | 38 | 4 | 2 | 6 | 38 | Rain-fed Agri. | 4 | 1 | 2 |
| 52 | Tayachew Yalew | Sanqeta | Male | 38 | 3 | 1 | 4 | 38 | Rain-fed Agri. | 1 | 1 | 3 |
| 53 | Dilmeta Tebebal | Sanqeta | Male | 41 | 4 | 5 | 9 | 41 | Rain-fed Agri. | 4 | 1 | 0 |
| 54 | Mequanint Demeke | Sanqeta | Female | 36 | 2 | 1 | 3 | 36 | Rain-fed Agri. | 0 | 0 | 0 |
| 55 | Teseru Eristu | Sanqeta | Male | 51 | 4 | 4 | 8 | 51 | Rain-fed Agri. | 10 | 2 | 7 |
| 56 | Edimieale Yazie | Sanqeta | Female | 45 | 3 | 2 | 5 | 45 | Rain-fed Agri. | 0 | 0 | 3 |
| 57 | Emakonech Minale | Sanqeta | Male | 33 | 3 | 2 | 5 | 33 | Rain-fed Agri. | 5 | 1 | 4 |
| 58 | Sisay Mengistu | Sanqeta | Male | 37 | 3 | 5 | 8 | 37 | Rain-fed Agri. | 4 | 1 | 5 |
| 59 | Tizaz Kebede | Sanqeta | Male | 32 | 3 | 3 | 6 | 32 | Rain-fed Agri. | 12 | 1 | 7 |
| 60 | Abich Tihayneh | Sanqeta | Male | 37 | 1 | 1 | 2 | 37 | Rain-fed Agri. | 5 | 1 | 3 |

To take an example on descriptive method of data analysis, let us analyze village, sex and age data using the SPSS software. The outputs generated are displayed in the tables below.

**Table 2-3: Number of Kunzila SSIP beneficiaries by village (Example)**

| Village name | Frequency | Percent |
|---|---|---|
| Cheba | 20 | 33.3 |
| Mehalzegie | 24 | 40.0 |
| Sanqeta | 16 | 26.7 |
| Total | 60 | 100.0 |

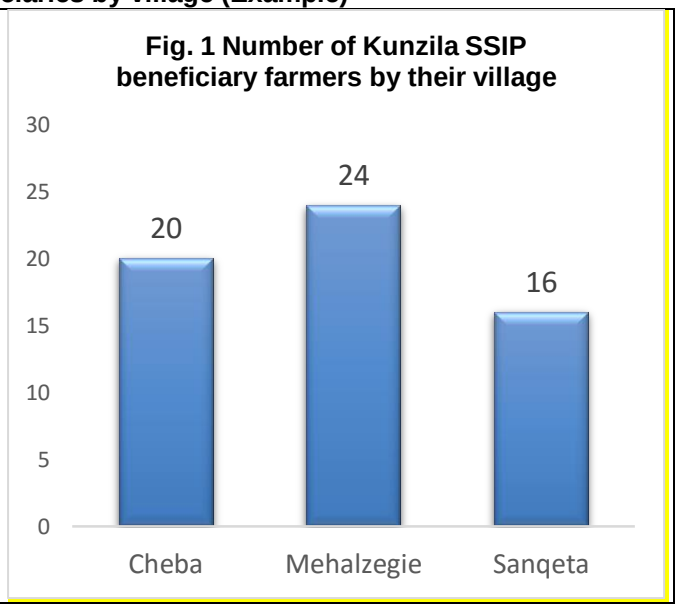
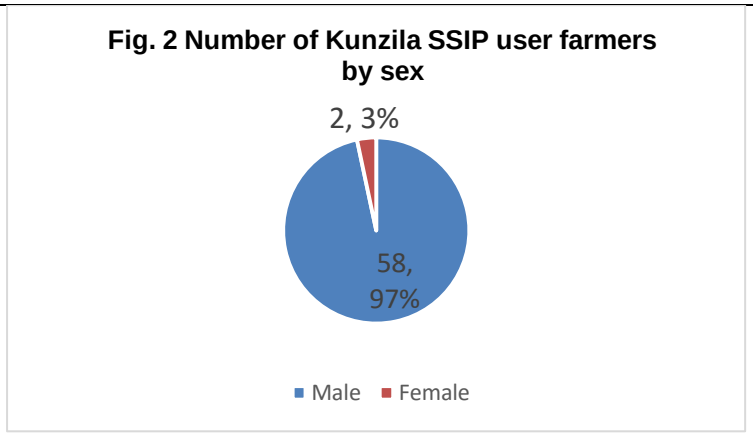



**Table 2-4: Sex composition**

| Sex | Frequency | Percent |
|---|---|---|
| Male | 58 | 96.7 |
| Female | 2 | 3.3 |
| **Total** | **60** | **100.0** |

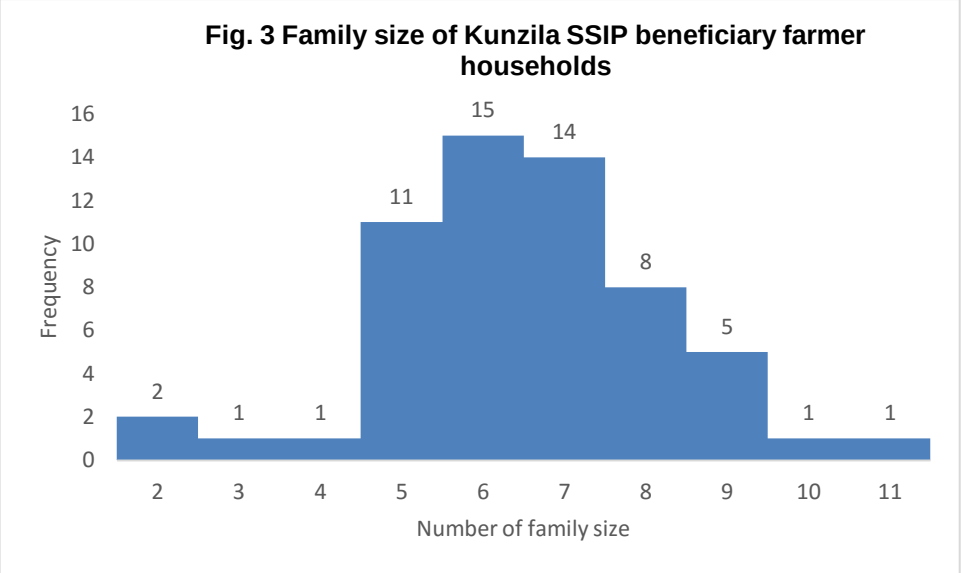



Present the sex composition data using tables or pie chart graph as follow

**Table 2-5: Family size of households (computed from sample data)**

| Family size | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| 2 | 2 | 3.3 | 3.3 |
| 3 | 1 | 1.7 | 5.0 |
| 4 | 1 | 1.7 | 6.7 |
| 5 | 11 | 18.3 | 25.0 |
| 6 | 15 | 25.0 | 50.0 |
| 7 | 14 | 23.3 | 73.3 |
| 8 | 8 | 13.3 | 86.7 |
| 9 | 5 | 8.3 | 95.0 |
| 10 | 1 | 1.7 | 96.7 |
| 11 | 1 | 1.7 | 98.3 |
| **Total** | **60** | **100.0** | |

Or using histogram, the family size data can be depicted as:




One may analyze descriptively the data in the above three tables as follows. The numbers of Kunzila SSIP user are sixty. The majority (96.7%) of the Kunzila SSIP beneficiaries are male-headed farmer households. The numbers of female-headed households benefiting from the project are small. They live in three villages called Cheba, Mehalzegie and Sanqeta, which have 20, 24 and 16 farmers respectively. Regarding family size, 75 percent of the households have more than five members in their households, which is big. Households whose family sizes are from 6 to 8 comprise 61.6 present. The distribution of the family size of Kunzila SSIP user farmer households is skewed to the left.

We can also use graphs to describe our socio-economic data descriptively as shown above. We used different graphs for the above village, sex and family size data. That is, bar graph for village data, pie chart for sex data and histogram for family size. This makes our descriptive analysis more understandable.

The other methods used in descriptive data analysis are using summary measures. For example, the following summary measures are computed from the above data.

**Table 2-6: Descriptive measures of the above data**

| Variable | N | Mean | Median | Mode | Standard Deviation | Range | Minimum | Maximum | Percentiles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Age of HHH | 60 | 41.98 | 41 | 40 | 7.719 | 41 | 27 | 68 | 37.3 | 41 | 48 |
| Number of male member of the family | 60 | 3.55 | 3.5 | 3 | 1.126 | 7 | 1 | 8 | 3 | 3.5 | 4 |
| Number of female member of the family | 60 | 3.15 | 3 | 3 | 1.821 | 13 | 1 | 14 | 2 | 3 | 4 |
| Family size | 60 | 6.7 | 6.5 | 6 | 2.265 | 16 | 2 | 18 | 5.25 | 6.5 | 8 |
| Year of residence in the village | 60 | 41.98 | 41 | 40 | 7.719 | 41 | 27 | 68 | 37.3 | 41 | 48 |
| Number of cattle | 60 | 5.52 | 5 | 4 | 3.133 | 13 | 0 | 13 | 3.25 | 5 | 8 |
| Number of equines | 60 | 1.08 | 1 | 1 | 0.72 | 3 | 0 | 3 | 1 | 1 | 1 |
| Number of sheep and goats | 60 | 3.17 | 3 | 3 | 2.256 | 10 | 0 | 10 | 2 | 3 | 5 |

From the above table, different descriptive analyses of the variables can be made. As an example, let us take the age of Kunzila SSIP beneficiary farmer household heads and make one possible descriptive analysis. The mean age of Kunzila SSIP beneficiary farmer household heads is 41.98 years (SD=7.719 years). The minimum and maximum ages of household heads are 27 years and 68 years respectively. The median age (41 years) and the mode age (40 years) are quite close to the average age (41.98 years), which indicates that the mean age is a good estimate. About 25 percent of the household heads have age of 37.3 years or less and 75 percent of the household heads have 48 years or below. Only 25 percent of the household heads have an age greater than 48 years. The analysis of other variables may be done in a similar way.

### Inferential data analysis

In the inferential method of analysis, the type of analysis to be used depends on the purpose of the study. As an example, let us suppose that the socio-economist wants to test whether there is a real difference in the average family size of farmers whose occupation is farming and Agriculture and irrigation for the above data. Since it is an example, let us assume that the distribution of family size of Kunzila SSIP user farmers' family size distribution is normal. Hence we use the Independent Samples T-Test. The result is displayed in the following table.

**Table 2-7: Results of the T-test group statistics**

| | Primary occupation of HHH | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Family size | Crop & Livestock (mixed farming) | 30 | 6.97 | 2.834 | .517 |
| | Agriculture and irrigation | 30 | 6.43 | 1.501 | .274 |

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | t-test for Equality of Means | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Family size | Equal variances assumed | 2.468 | .122 | .911 | 58 | .366 | .533 | .586 | -.639 | 1.706 |
| | Equal variances not assumed | | | .911 | 44.086 | .367 | .533 | .586 | -.647 | 1.713 |

The above result shows that there is no real mean family size (t=0.911; df=58; sig.=0.586) difference between farming and Agriculture and irrigation occupations of SSIP user farmer households of Kunzila. Other inferential analyses go in similar fashion.

## 2.12 SELECTING APPROPRIATE SOFTWARE FOR MANAGING SOCIO-ECONOMIC SURVEY DATA

Entry, processing and output generation of the socio-economic survey data of SSIPs involves software selection, providing training for data entry clerks on the selected software, supervising the data entry process, generating the output and keeping the security of the data both physically and electronically.

As there are various software to analyze the collected SSIP survey data, the criteria to select right software that gives optimal use to our purpose are user friendly and easy to use, multipurpose, require minimum resource (money and time) to use and availability of supportive staff. Therefore, the software to be selected should be familiar to the user, easy to use, can be used for different functions, requires little time and money to train and use. Moreover, the software should provide easy transfer option to other softwares for process and managing.

To store, retrieve and process the socio-economic data of small scale irrigation projects, database softwares (MS Access, MS SQL, …), spreadsheet softwares (MS Excel, …), statistical softwares (STATA, SPSS, SAS, Minitab, etc.), EVIEWS, GAMS, etc. can be used depending on the available resource and skilled manpower. However, due to high cost, expert requirement and extended time for training, database softwares, statistical softwares such as STATA (uses console), SAS, EVIEWS, GAMS and MINITAB are not advisable to recommend for the SSIP data management and analysis, because they require intensive training and technical assistance during application

Based on the reasons and the criteria of software selection given above, the two competitive softwares recommended for SSIP data entry, analysis and management are MS Excel and SPSS (Statistical Package for Social Scientists). Both softwares can be used for data storage, retrieval and analysis. Both have their own advantages and disadvantages. MS Excel is less powerful for data analysis, reporting and generating derived variables but it has very important function, data validation, which prevent errors by limiting the values to be entered. On the contrary, SPSS can store, retrieve and analyze the survey data. It is rich in survey data analysis functions and easy to generate derived variables, compute numerous statistical estimates, generate report, conduct statistical tests and others. It is easily used by any expert starting from beginners to highly specialized experts. We can easily migrate data from SPSS to other softwares easily such as MS Excel and MS Word.

The structure of SPSS is almost similar to MS Excel and it is very easy to use. Experts of the SSIP can learn and use it easily with short-term trainings. Relatively, we can get more experts on SPSS than other statistical softwares for training and advices. The other big advantage of SPSS is that we can easily use it as a database. That is, it provides data entry and storage functionalities in addition to data analysis. The other good feature of SPSS is that we can easily transfer data, which is entered in CSPro, MS Excel, MS Access or other softwares.

Therefore, SPSS is the recommended software for data entry and data analysis for SSIP socio-economic data.The socio-economists shall take the training on its application.

## Some features of SPSS

Windows of SPSS are similar to MS Excel windows as depicted below.

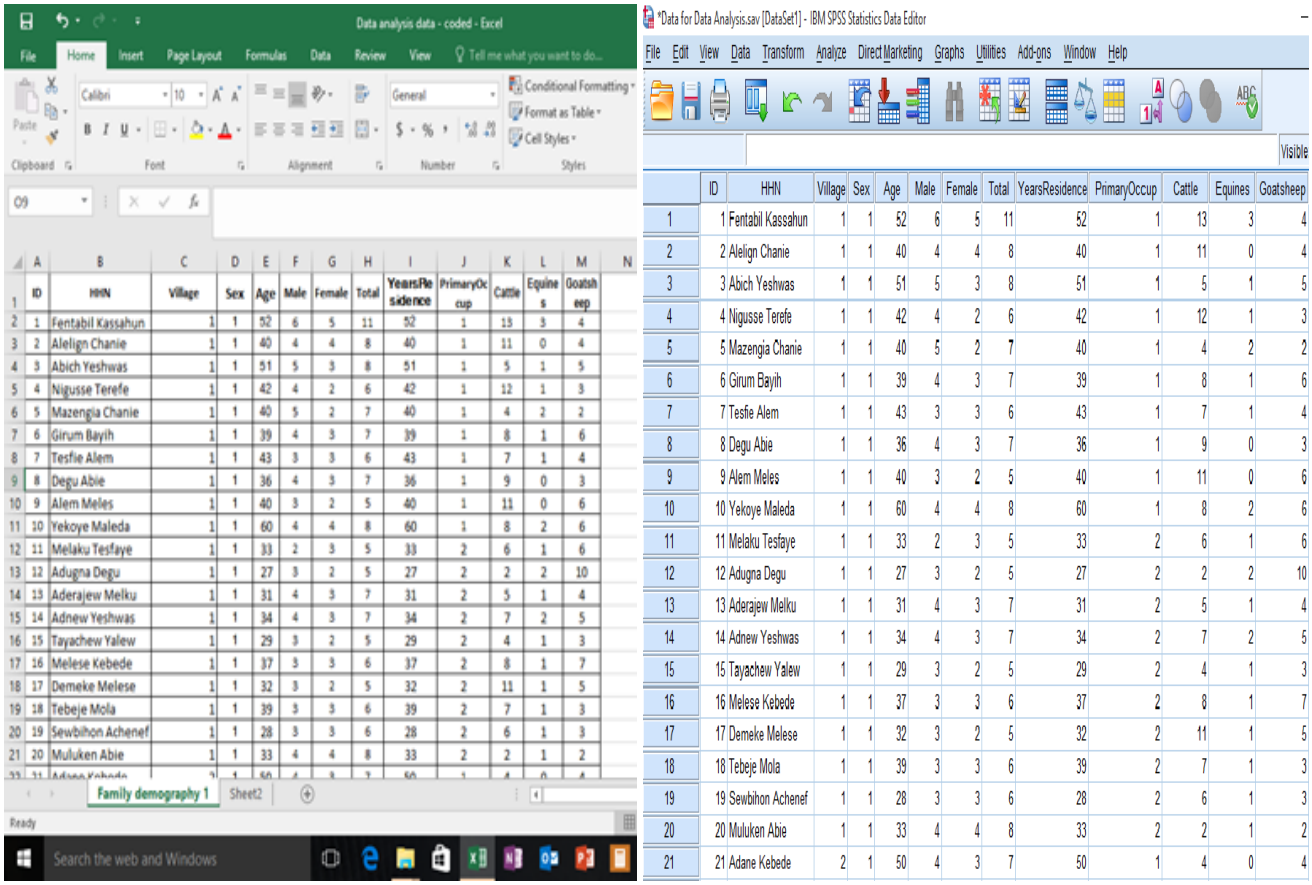


**Figure 2-1:MS Excel window (left) and SPSS window (right)**

From the above figure, one can easily understand that SPSS's interface is quite similar to MS Excel and it is easy to be used by socio-economists of the SSIPs.

Like any other software, there are three steps to analyze data using SPSS software. The steps are designing the data structure, entering and cleaning the data, and generating the required results.

SPSS has many windows. The two commonly used windows are the Data Editor window and the Viewer (output) window. There are other windows like the Syntax window.

**Data Editor Window**: The Data Editor window is used to design the data structure (file) of SPSS and to enter or modify data. It has two sub windows namely Data View Tab and Variable View Tab. In the Variable View Tab, we design the data structure of the file. The Data Editor window is shown below.

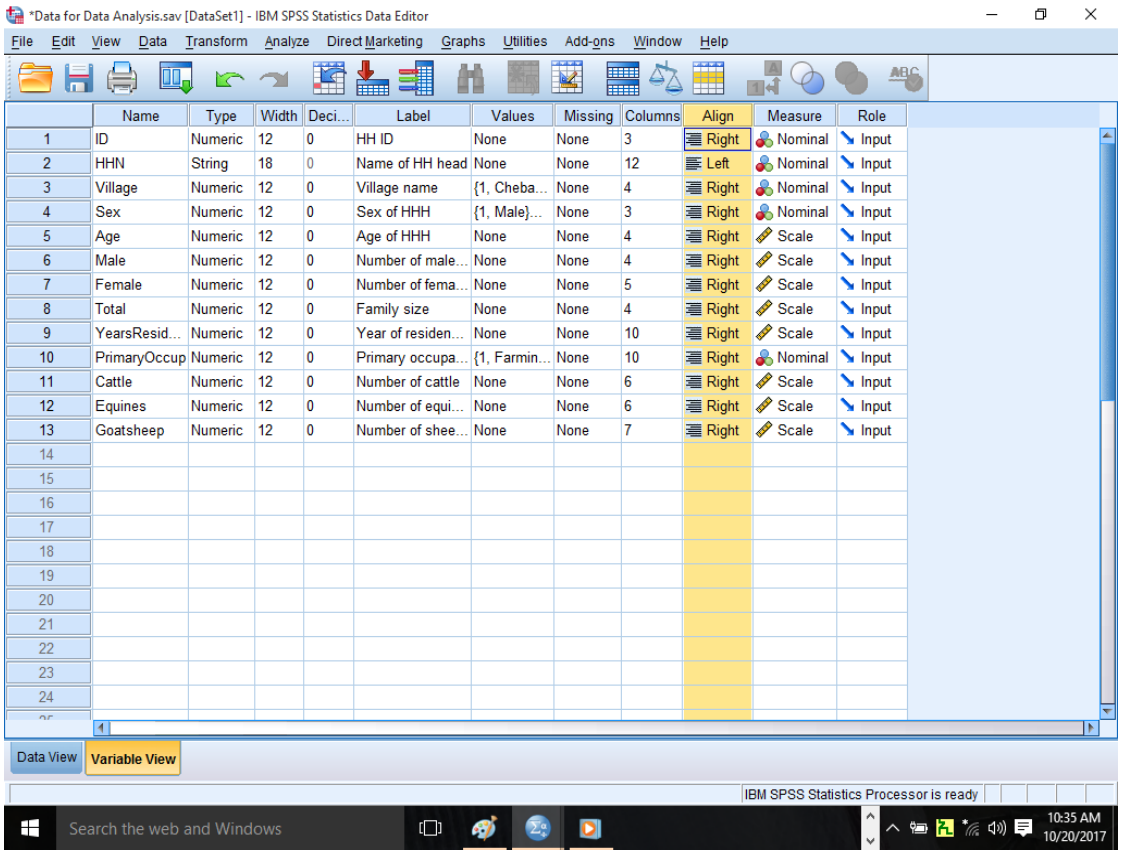


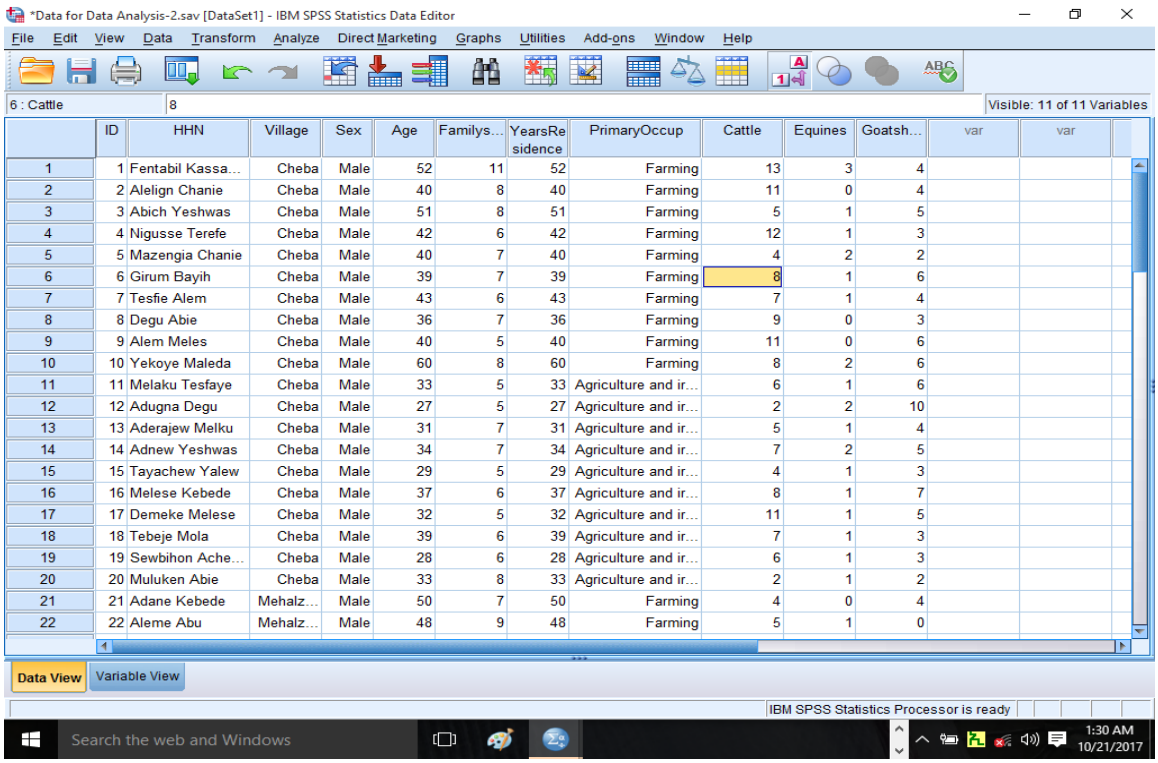

**Figure 2-2: The Variable view tab of SPSS on Data Editor Window**

We create or modify the data structure using the Variable view window. Creating or modifying the data structure involves:

1. Defining the variable name: variable name contains data of each question.
2. Type of the variable: Numeric, String, Dollar, Date, etc.
3. Decimal places: number of digits after the decimal point for float type variables
4. Label: description of what the variable is
5. Values: define the categories of a categorical values
6. Missing: define user-defined missing values
7. Measure: select the measurement type of the variable (Nominal, Ordinal, Scale)

When we want to change or modify variable characteristics, we open Variable view, select the variable we want to modify or change and make the appropriate corrections.

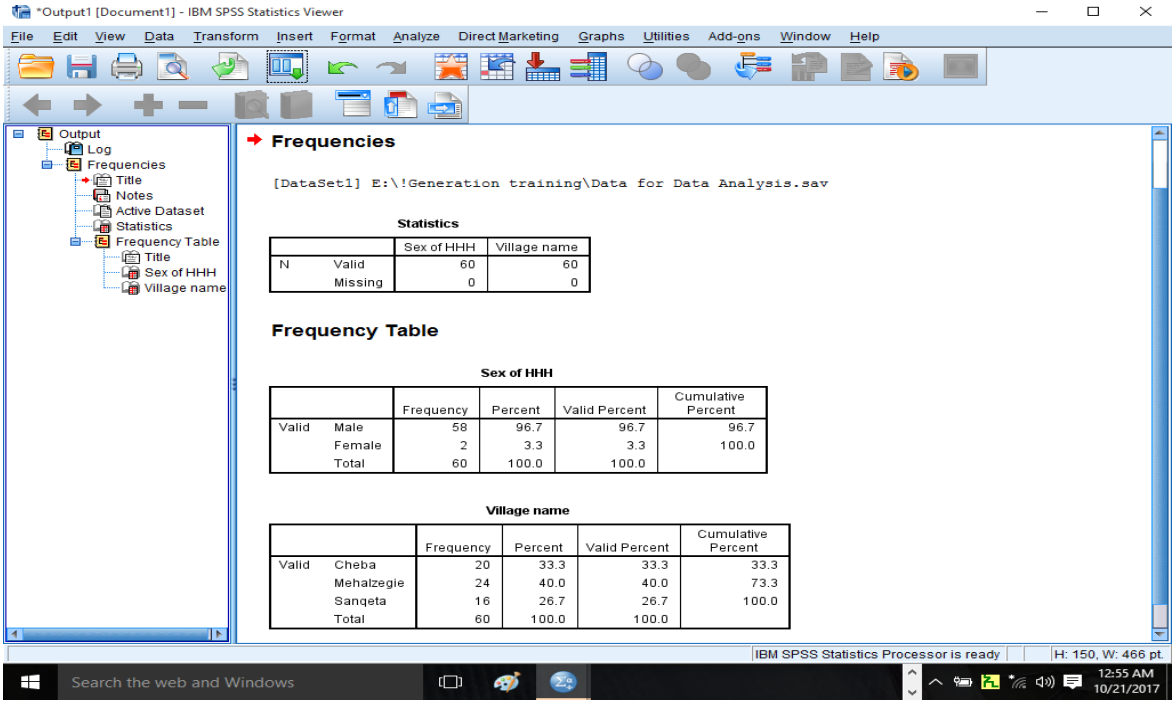
**Data View Tab**: We enter or modify data in the Data View window.




| | ID | HHN | Village | Sex | Age | Familys... | YearsResidence | PrimaryOccup | Cattle | Equines | Goatsh... | var | var |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Fentabil Kassa... | Cheba | Male | 52 | 11 | 52 | Farming | 13 | 3 | 4 | | |
| 2 | 2 | Alelign Chanie | Cheba | Male | 40 | 8 | 40 | Farming | 11 | 0 | 4 | | |
| 3 | 3 | Abich Yeshwas | Cheba | Male | 51 | 8 | 51 | Farming | 5 | 1 | 5 | | |
| 4 | 4 | Nigusse Terefe | Cheba | Male | 42 | 6 | 42 | Farming | 12 | 1 | 3 | | |
| 5 | 5 | Mazengia Chanie | Cheba | Male | 40 | 7 | 40 | Farming | 4 | 2 | 2 | | |
| 6 | 6 | Girum Bayih | Cheba | Male | 39 | 7 | 39 | Farming | 8 | 1 | 6 | | |
| 7 | 7 | Tesfie Alem | Cheba | Male | 43 | 6 | 43 | Farming | 7 | 1 | 4 | | |
| 8 | 8 | Degu Abie | Cheba | Male | 36 | 7 | 36 | Farming | 9 | 0 | 3 | | |
| 9 | 9 | Alem Meles | Cheba | Male | 40 | 5 | 40 | Farming | 11 | 0 | 6 | | |
| 10 | 10 | Yekoye Maleda | Cheba | Male | 60 | 8 | 60 | Farming | 8 | 2 | 6 | | |
| 11 | 11 | Melaku Tesfaye | Cheba | Male | 33 | 5 | 33 | Agriculture and ir... | 6 | 1 | 6 | | |
| 12 | 12 | Adugna Degu | Cheba | Male | 27 | 5 | 27 | Agriculture and ir... | 2 | 2 | 10 | | |
| 13 | 13 | Aderajew Melku | Cheba | Male | 31 | 7 | 31 | Agriculture and ir... | 5 | 1 | 4 | | |
| 14 | 14 | Adnew Yeshwas | Cheba | Male | 34 | 7 | 34 | Agriculture and ir... | 7 | 2 | 5 | | |
| 15 | 15 | Tayachew Yalew | Cheba | Male | 29 | 5 | 29 | Agriculture and ir... | 4 | 1 | 3 | | |
| 16 | 16 | Melese Kebede | Cheba | Male | 37 | 6 | 37 | Agriculture and ir... | 8 | 1 | 7 | | |
| 17 | 17 | Demeke Melese | Cheba | Male | 32 | 5 | 32 | Agriculture and ir... | 11 | 1 | 5 | | |
| 18 | 18 | Tebeje Mola | Cheba | Male | 39 | 6 | 39 | Agriculture and ir... | 7 | 1 | 3 | | |
| 19 | 19 | Sewbihon Ache... | Cheba | Male | 28 | 6 | 28 | Agriculture and ir... | 6 | 1 | 3 | | |
| 20 | 20 | Muluken Abie | Cheba | Male | 33 | 8 | 33 | Agriculture and ir... | 2 | 1 | 2 | | |
| 21 | 21 | Adane Kebede | Mehalz... | Male | 50 | 7 | 50 | Farming | 4 | 0 | 4 | | |
| 22 | 22 | Aleme Abu | Mehalz... | Male | 48 | 9 | 48 | Farming | 5 | 1 | 0 | | |

**Figure 2-3: The Data View of the Data Editor window**

**The Viewer (output) window**: it opens automatically when we generate outputs and it contains outputs. The following is an output window of SPSS.




**Statistics**

| | | Sex of HHH | Village name |
|---|---|---|---|
| N | Valid | 60 | 60 |
| | Missing | 0 | 0 |

**Frequency Table**

**Sex of HHH**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 58 | 96.7 | 96.7 | 96.7 |
| | Female | 2 | 3.3 | 3.3 | 100.0 |
| | Total | 60 | 100.0 | 100.0 | |

**Village name**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Cheba | 20 | 33.3 | 33.3 | 33.3 |
| | Mehalzegie | 24 | 40.0 | 40.0 | 73.3 |
| | Sanqeta | 16 | 26.7 | 26.7 | 100.0 |
| | Total | 60 | 100.0 | 100.0 | |

**Figure 2-4: Output window of SPSS**

**Entering and Cleaning Data**: After completing creating the data structure, the next step is entering data to the software. We enter data either directly to the software by keying on the keyboard or import from other softwares like MS Excel. When we finish the data entry, we clean the data mainly by generating frequencies and/or using graphs like scatterplots or boxplots to see whether there is discrepancy in the data. We continue cleaning the data until we are comfortable. For example, let us clean the sex and age variables of the Kunzila SSIP data, look at the following frequency table and identify possible errors.

**Table 2-8: Sex of HHH**

| Sex | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Male | 57 | 95.0 | 95.0 | 95.0 |
| Female | 2 | 3.3 | 3.3 | 98.3 |
| 11 | 1 | 1.7 | 1.7 | 100.0 |
| Total | 60 | 100.0 | 100.0 | |

**Table 2-9: Age of HHH**

| Age | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 5 | 1 | 1.7 | 1.7 | 1.7 |
| 27 | 1 | 1.7 | 1.7 | 3.3 |
| 28 | 1 | 1.7 | 1.7 | 5.0 |
| 29 | 1 | 1.7 | 1.7 | 6.7 |
| 31 | 1 | 1.7 | 1.7 | 8.3 |
| 32 | 2 | 3.3 | 3.3 | 11.7 |
| 33 | 2 | 3.3 | 3.3 | 15.0 |
| 34 | 1 | 1.7 | 1.7 | 16.7 |
| 36 | 2 | 3.3 | 3.3 | 20.0 |
| 37 | 3 | 5.0 | 5.0 | 25.0 |
| 38 | 4 | 6.7 | 6.7 | 31.7 |
| 39 | 2 | 3.3 | 3.3 | 35.0 |
| 40 | 7 | 11.7 | 11.7 | 46.7 |
| 41 | 3 | 5.0 | 5.0 | 51.7 |
| 42 | 5 | 8.3 | 8.3 | 60.0 |
| 43 | 4 | 6.7 | 6.7 | 66.7 |
| 45 | 2 | 3.3 | 3.3 | 70.0 |
| 46 | 2 | 3.3 | 3.3 | 73.3 |
| 48 | 7 | 11.7 | 11.7 | 85.0 |
| 49 | 1 | 1.7 | 1.7 | 86.7 |
| 51 | 2 | 3.3 | 3.3 | 90.0 |
| 52 | 2 | 3.3 | 3.3 | 93.3 |
| 58 | 1 | 1.7 | 1.7 | 95.0 |
| 60 | 1 | 1.7 | 1.7 | 96.7 |
| 68 | 1 | 1.7 | 1.7 | 98.3 |
| 333 | 1 | 1.7 | 1.7 | 100.0 |
| **Total** | **60** | **100.0** | **100.0** | |

In the sex data, we see an odd value (11), which is meaningless. Because sex is coded as Male = 1 and Female = 2. The possible error is pressing 1 two times instead of once. Checking it from the questionnaire, it is found Male or 1. Similarly in Age variable, two values namely 5 and 333 are meaningless because they say the age of the farmer household head is 5 years or 333 year. We need to check the questionnaire and found that 5 years is 50 years and 333 years is 33 years. In this manner, we clean all incorrect values of the variables.

After removing all the errors, we again run the frequency distribution and check whether the errors are removed. Let us see the results.

**Table 2-10: Sex of HHH**

| Sex | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Male | 58 | 96.7 | 96.7 | 96.7 |
| Female | 2 | 3.3 | 3.3 | 100.0 |
| Total | 60 | 100.0 | 100.0 | |

**Table 2-11: Age of HHH**

| Age | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 50 | 1 | 1.7 | 1.7 | 1.7 |
| 27 | 1 | 1.7 | 1.7 | 3.3 |
| 28 | 1 | 1.7 | 1.7 | 5.0 |
| 29 | 1 | 1.7 | 1.7 | 6.7 |
| 31 | 1 | 1.7 | 1.7 | 8.3 |
| 32 | 2 | 3.3 | 3.3 | 11.7 |
| 33 | 2 | 3.3 | 3.3 | 15.0 |
| 34 | 1 | 1.7 | 1.7 | 16.7 |
| 36 | 2 | 3.3 | 3.3 | 20.0 |
| 37 | 3 | 5.0 | 5.0 | 25.0 |
| 38 | 4 | 6.7 | 6.7 | 31.7 |
| 39 | 2 | 3.3 | 3.3 | 35.0 |
| 40 | 7 | 11.7 | 11.7 | 46.7 |
| 41 | 3 | 5.0 | 5.0 | 51.7 |
| 42 | 5 | 8.3 | 8.3 | 60.0 |
| 43 | 4 | 6.7 | 6.7 | 66.7 |
| 45 | 2 | 3.3 | 3.3 | 70.0 |
| 46 | 2 | 3.3 | 3.3 | 73.3 |
| 48 | 7 | 11.7 | 11.7 | 85.0 |
| 49 | 1 | 1.7 | 1.7 | 86.7 |
| 51 | 2 | 3.3 | 3.3 | 90.0 |
| 52 | 2 | 3.3 | 3.3 | 93.3 |
| 58 | 1 | 1.7 | 1.7 | 95.0 |
| 60 | 1 | 1.7 | 1.7 | 96.7 |
| 68 | 1 | 1.7 | 1.7 | 98.3 |
| **Total** | **60** | **100.0** | **100.0** | |

**Generating output**: based on the required results, we generate various results using the different functionalities of SPSS like Frequencies, Crosstabs and other descriptive or inferential analysis functions. Note that detail training on how to use SPSS software is crucial to properly analyze the socio-economic data. An example of generated outputs of frequencies, tables, One-Way ANOVA is given below.

Frequencies: A sample frequency output of SPSS

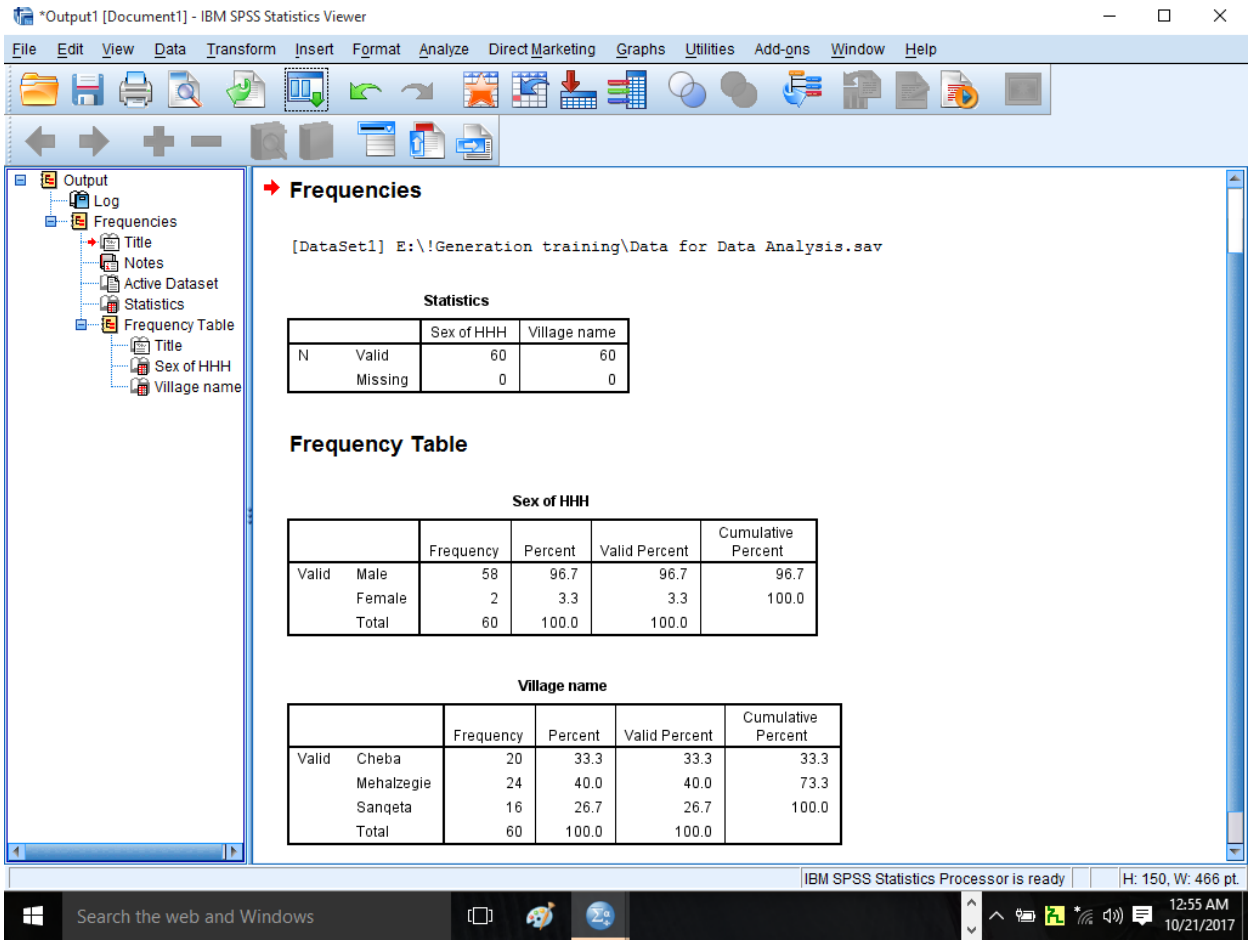



**Figure 2-5: some frequencies of variables generated from Kunzila SSIP data:**

Sample Crosstabs (tables) generated using the Crosstab function of SPSS of Kunzila SSIP data.

**Table 2-12: Village name * Sex of HHH cross tabulation**

| | | | Sex of HHH | | Total |
|---|---|---|---|---|---|
| | | | Male | Female | |
| Village name | Cheba | Count | 20 | 0 | 20 |
| | | % within Village name | 100.0% | 0.0% | 100.0% |
| | | % of Total | 33.3% | 0.0% | 33.3% |
| | Mehalzegie | Count | 24 | 0 | 24 |
| | | % within Village name | 100.0% | 0.0% | 100.0% |
| | | % of Total | 40.0% | 0.0% | 40.0% |
| | Sanqeta | Count | 14 | 2 | 16 |
| | | % within Village name | 87.5% | 12.5% | 100.0% |
| | | % of Total | 23.3% | 3.3% | 26.7% |
| Total | | Count | 58 | 2 | 60 |
| | | % within Village name | 96.7% | 3.3% | 100.0% |
| | | % of Total | 96.7% | 3.3% | 100.0% |

**Table 2-13: Primary occupation of HHH * Sex of HHH Cross tabulation**

| | | | Sex of HHH | | Total |
|---|---|---|---|---|---|
| | | | Male | Female | |
| Primary occupation of HHH | Farming | Count | 28 | 2 | 30 |
| | | % within Primary occupation of HHH | 93.3% | 6.7% | 100.0% |
| | Agriculture and irrigation | Count | 30 | 0 | 30 |
| | | % within Primary occupation of HHH | 100.0% | 0.0% | 100.0% |
| Total | | Count | 58 | 2 | 60 |
| | | % within Primary occupation of HHH | 96.7% | 3.3% | 100.0% |

**Table 2-14: Some summary measures with histograms graph of selected variables of Kunizila SSIP data**

**Statistics**

| | | Age of HHH | Number of male member of the family | Number of female member of the family | Family size | Year of residence in the village | Number of cattle | Number of equines | Number of sheep and goats |
|---|---|---|---|---|---|---|---|---|---|
| N | Valid | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| | Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | | 41.98 | 3.55 | 2.98 | 6.53 | 41.98 | 5.52 | 1.08 | 3.17 |
| Std. Error of Mean | | .996 | .145 | .147 | .222 | .996 | .404 | .093 | .291 |
| Median | | 41.00 | 3.50 | 3.00 | 6.50 | 41.00 | 5.00 | 1.00 | 3.00 |
| Mode | | 40[a] | 3 | 3 | 6 | 40[a] | 4 | 1 | 3 |
| Std. Deviation | | 7.719 | 1.126 | 1.142 | 1.722 | 7.719 | 3.133 | .720 | 2.256 |
| Variance | | 59.576 | 1.269 | 1.305 | 2.965 | 59.576 | 9.813 | .518 | 5.090 |
| Range | | 41 | 7 | 5 | 9 | 41 | 13 | 3 | 10 |
| Minimum | | 27 | 1 | 1 | 2 | 27 | 0 | 0 | 0 |
| Maximum | | 68 | 8 | 6 | 11 | 68 | 13 | 3 | 10 |
| Percentiles | 25 | 37.25 | 3.00 | 2.00 | 5.25 | 37.25 | 3.25 | 1.00 | 2.00 |
| | 50 | 41.00 | 3.50 | 3.00 | 6.50 | 41.00 | 5.00 | 1.00 | 3.00 |
| | 75 | 48.00 | 4.00 | 4.00 | 8.00 | 48.00 | 8.00 | 1.00 | 5.00 |

a. Multiple modes exist. The smallest value is shown

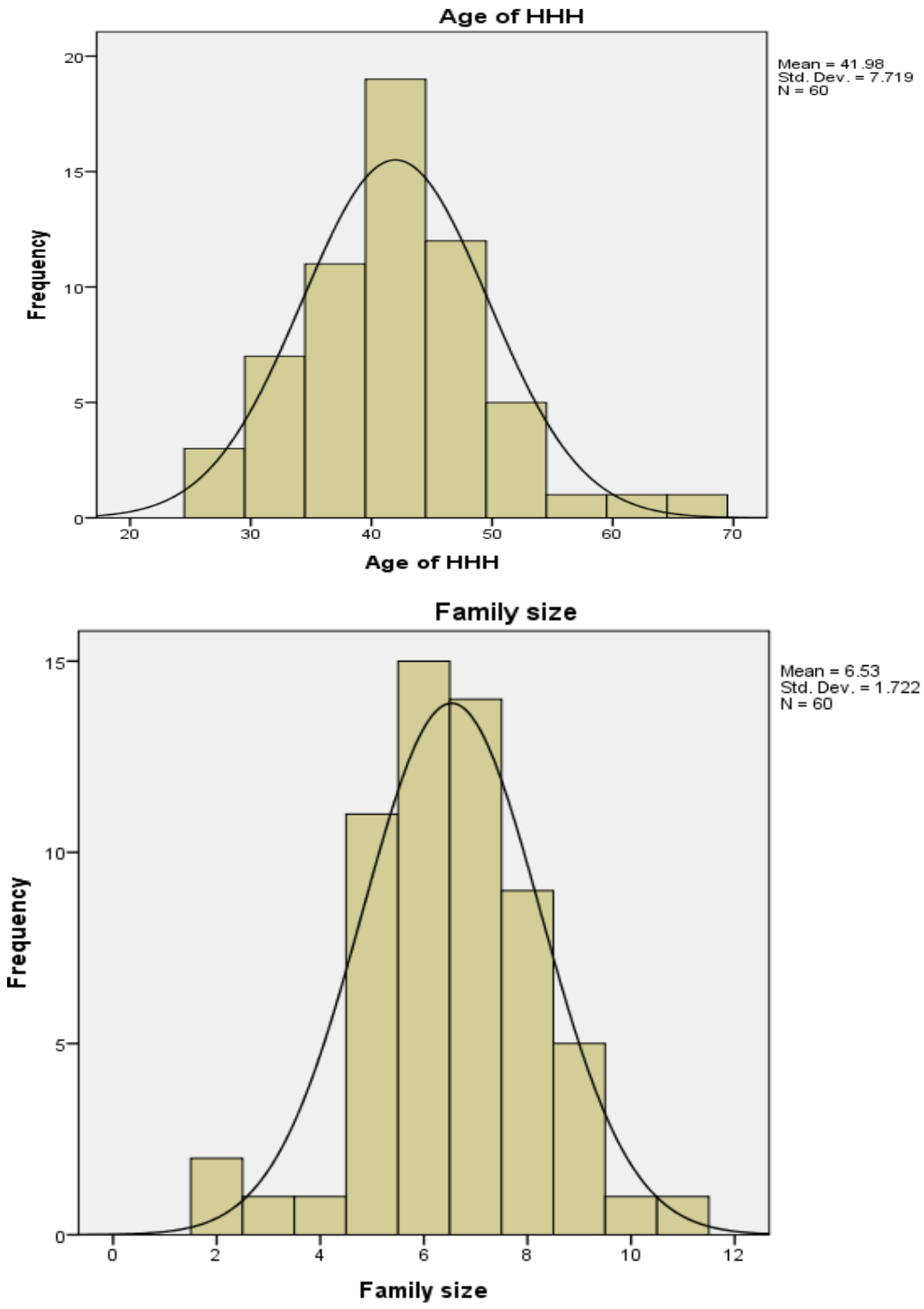



**Figure 2-6: Histogram of age and family size variables**

Finally, it is highly recommended that the experts of SSIP need to take a detailed training on how to use SPSS is crucial.

# 3 PROJECT AREA ANDDEMOGRAPHIC CHARACTERSTICS

## 3.1 IDENTIFICATION OF PROJECT AREA

An initial task that should be undertaken prior to conducting the socio economy study is identification of the demarcated project areas and boundaries of the different kinds of project components. The project component refers to classification of project lands according to their predestined use. These components which would be available at the final stage of design works are head work places, quarry sites, command area, access roads, main canals, camp sites working places and other places that may be additionally identified as required.

The socio economist summarizes lists of project components, their respective areas and their location i.e. the kebeles and GPS locations from the engineering final design works. The importance of producing this database is to guide the study team to work within these demarcated project boundaries and areas. The format to be used to register project boundaries of the different project components are as follows.

**Table 3-1: Formats for Registration of Area and Boundaries of Different Project Components**

| No | Project Components | Area (ha) | Kebele | Sub-village | GPS Location |
|---|---|---|---|---|---|
| 1 | Command Area | | | | |
| 2 | Head Work Places | | | | |
| 3 | Main Canals | | | | |
| 4 | Access Roads | | | | |
| 5 | Material Sites | | | | |
| 6 | Camp sites | | | | |
| 7 | Others (specify) | | | | |
| | Total | | | | |

The different project components and their demarcated boundaries should be identified in the field before collecting data and information within them. The surveying benchmarks which are made in place during preliminary design stage could be changed at the detail design stage. In the meantime, bench marks may also not found in their places. Therefore, the socio economist should have clearly demarcated areas in the field. This identification of project components and their respective project boundaries could be made using two ways. The first is with adequate explanations and elaborations from the project engineer, to give location and boundary maps to the socio economy study team which can guide to identify the project places. The second way is to assign a surveyor for short duration to work with the socio economy team in the field. The surveyor will show the places to the study team by placing benchmarks at different interval places. For the sake of accuracy, the second method which is assigning a surveyor is considered as a preferred option. The advantage of identifying project areas is that only those places which are required for the project would be covered in the study. In the meantime, it helps to avoid the exclusion of unrequired place from the study.

## 3.2 IDENTIFICATION OF HOUSEHOLD NUMBER

The second step of the socio economy study which directly follows from project areas is identification of project population found within those identified different project components. Identification of households would be done at two levels. The first is registration of household heads and the second is making their census survey.

The first level is to register their names in consultation with kebele administration office, development workers, and most likely with project sub-village leaders. These different bodies would be consulted either separately or as a group. However, for the sake of reaching into agreement and consensus, they are better to come in joint discussion forums. They will count the number of available household heads and provide their names with breakdowns into male and gender compositions. The people of the project areas could live within and/or outside the project areas as well as at distant places while they have landholdings situated within the project areas. These people can either have their total or partial landholdings within the stated places. In this step, all the names of households who have got land within project components will be identified closely with the stated partners. The list of registration helps as a major data source to conduct successive studies.

A given household could be registered more than once if he/she has got lands in different project components. Under this condition, a person will be registered for all of the lands under his/her possession whereas will be counted only once for determining the number of households. A person who is registered more than one should be marked "'R'' which is to mean repeatedly registered.

The names of the household heads and number of their family will be collected through prepared formats shown below. The items that will be included in the registration format are 1) Nr, 2) title 3) full name4) sex, 5) project component and 6) kebele. The name of the household head should include grandfather's name in order to distinguish different persons having similar names.

**Table 3-2: Registration format for identifying household number of project places**

| Nr | Title | Full Name | Sex | Project Component* | Kebele |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

*1)head work places, 2) quarry sites, 3) command area, 4) access roads, 5) main canals, 6) camp sites 7) others (specify)

The second step of identifying the names of household heads is to contact sample selected registered households through a household survey. In the process of census survey, new household heads that are not originally identified by the partners could be found. On the other hand, there could be names that may not be available and contacted due to different reasons. These two extremes should be solved in consultation with development workers and the kebele administration office.

The registration is conducted to collect different basic socio economic data while in the meantime provides lists of households and population number found within them. Therefore, registration is conducted for multipurpose use and is to be conducted following the identified lists of households. Please refer the attached sample format for project beneficiary registration. All beneficiary

households must be signed and the list of the households will be attached to the socio-economic feasibility study report.

## 3.3 POPULATION NUMBER IDENTIFICATION

The population number is to be identified from registration format. In the registration, every household provides the number of wives as well as his/her family number by their gender compositions. While collecting the basic data of population number from households, care must to be taken how to register the number of family members in a consistent manner. The number of family members should exclude the household heads.

The number of households summarized from the lists of households and the population number should be provided in a single table as shown in the example below whereas the lists of household is to be provided in the appendix of the report.

**Ex 1: Estimated Households and Population Number of typical SSIPs** The total number of households of a given SSIP who have got land within the different project components namely the command area, head work places, main canals, access roads, material sites and camp sites is summarized from the collected lists of households and are 81 consisting of 62 male and 19 female. The total population obtained through registration amounts to 567consists of 305 male and 262 female. Total number of household heads and population could then be depicted in the following table.

**Table 3-3: Population Number of Project Areas**

| Nr | Project Component | Household Number | | | Total population | | |
|---|---|---|---|---|---|---|---|
| | | Male | Female | Total | Male | Female | Total |
| 1 | Command Area | 40 | 10 | 50 | 190 | 160 | 350 |
| 2 | Head Work Places | 4 | 2 | 6 | 22 | 20 | 42 |
| 3 | Other Places | 18 | 7 | 25 | 93 | 82 | 175 |
| | Total | 62 | 19 | 81 | 305 | 262 | 567 |

## 3.4 DEMOGRAPHIC CONDITIONS

### *3.4.1 General*

The major types of demographic characterization that will be collected at the feasibility stage will be Average Family Size, Age Composition, Sex Composition, Composition of Religion, Ethnic Composition, Language Composition, Educational Status, and Marital Status. The identification and study of existing demographic features helps to investigate and analyze the possible future interaction that will take place between the project and the people. It also helps to identify the sources of data and information that would be used for the different types of socio economy study elements.

Demographic characteristics could be given for household heads, for the population as a whole and for both. The percentage distributions of demographic characterization do not yield same result for the households and for population. Household and population characterization could however be provided using same table.

As an example, sex compositions of the households and the population are shown using percentages and figures in the following two examples.

**Ex Sex Composition of Households**: -
Out of the total number of 50 households of the command area, 40 are male and 10 female.
or
Out of the total number of households of the command area, 80% are male and 20% female.

**Ex Sex Composition of the Population:-**
Out of 350 population of the command area, 190 constitutes male and 160 female.
or
54% and 46% of the population of the command area are male and female respectively.

The sources for the distribution of the demographic characterization of the people will be both from registration format and household survey which has to be collected for all households that will be impacted either positively or negatively by different project components. The sources for the household level demographic conditions would be registration format. In this respect, Average Family Size; Age, Sex, Religion, Ethnic and Language compositions; Educational Status; Marital Status; Occupational Category and Average Income would be summarized from the registration format. On the other hand, the Age compositions, Educational Status, Marital Status, and Occupational Category of the population will be collected also from sample survey while the rest of population level demographic conditions which are Sex, Religion, Ethnic and Language compositions will be adopted from their registration basic data. With regard to their presentation in the socio economy report, each of the different demographic characterization will have to be discussed separately with support of their own separate tables.

The demographic characteristics could be discussed either for the entire project as a whole orfor the specific project component. These different approaches could be explained by taking sex compositions as examples.

The first approach is that the entire number of households found in different project components can be taken as a single unit of project population. The approach is more appropriate while discussing the project as a whole. This approach can be explained using the example given below.

Example- : Out of the total number of male households within the different components of the project, about 49% are found within the command area.

The second approach is that every project component can be taken independently by themselves as units and will be evaluated by itself. The approach is more convenient when discussing a particular project component independently.

Example:-Out of the total household number of the command area, 80% are male and 20% female.

The different demographic characteristics which are included in this guideline are presented below.

### 3.4.2 Average family size

Average household size is to be calculated from the registration format data and this is done by dividing the population number found within different project components by their respective number of household heads. The figure is to be provided in a single digit after decimal. The average family size has to be provided for the of project places as a whole. The study should also show average number of male and female members. Average family size of the project areas could either be different or similar among different project components. As shown in the example, male and female average family size is calculated by dividing each of them by the number of households using a formula.

$$Average\ Male/Female\ \ Familiy\ size = \frac{Male\ /Female\ \ Population}{Total\ Households}.$$

The example provided below is for the command area and for the rest of project components

Example: The average family size of a project having 567 populations and 81 households is calculated to be 7 consists of 3.8 male and 3.2 female. See the following table.

| Nr | Project Component | Household Number | | | Family Members | | | Total population | | | Average Family size | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Male | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| 1 | Command Area | 40 | 10 | 50 | 150 | 150 | 300 | 190 | 160 | 350 | 3.8 | 3.2 | 7.0 |
| 2 | Head Work Places | 4 | 2 | 6 | 18 | 18 | 36 | 22 | 20 | 42 | 3.7 | 3.3 | 7.0 |
| 3 | Other Places | 18 | 7 | 25 | 75 | 75 | 150 | 93 | 82 | 175 | 3.67 | 3.32 | 7.0 |
| | Total | 62 | 19 | 81 | 243 | 243 | 486 | 305 | 262 | 567 | 3.8 | 3.2 | 7.0 |

Alternatively, average family size could also be given in accordance to the number of family member distributions and can be given either for the project as a whole or for each of specific project areas. The example provided below shows the distribution of average family members for the entire project components of a given SSIPs having an aggregate population number of 567. By referring the example provided in the table below, there are a total of 82 populations found within 12 households and this represents about 14.4% of the population of the project areas. Therefore, 15.4% of households of the project areas or a total of 12 households have got an average family number of 5.

Ex: - The distribution of the population in accordance with the number of average family size is provided in the following table.

| | Head of Households | | Population | |
|---|---|---|---|---|
| Family Size | Number | Present | Number | Present |
| 1 | 1 | 1.8 | 47 | 8.3 |
| 2 | 4 | 5 | 67 | 11.8 |
| 3 | 7 | 9.2 | 82 | 14.4 |
| 4 | 11 | 13.1 | 87 | 15.4 |
| 5 | 12 | 15.4 | 82 | 14.4 |
| 6 | 13 | 16.1 | 71 | 12.6 |
| 7 | 11 | 13.9 | 53 | 9.3 |

| | Head of Households | | Population | |
|---|---|---|---|---|
| Family Size | Number | Present | Number | Present |
| 8 | 13 | 16.2 | 54 | 9.5 |
| 9 | 3 | 3.7 | 11 | 1.9 |
| 10 | 2 | 2.5 | 6 | 1.1 |
| 11 | 1 | 1.3 | 4 | 0.7 |
| 12+ | 1 | 1.8 | 3 | 0.6 |
| Total | 81 | 100 | 567 | 100 |

Apart from providing average family members, their implications should be provided in terms of the project. As an example, the following conclusions could be forwarded for the population having higher average family size.

- For a higher average family size, it could be recommended to introduce family planning measures in order to control the fertility rate.
- Average family size enables to recommend whether to introduce land redistribution or not. Higher family members imply that there are more family members that share the irrigation land with their households which make recommendation towards land redistribution impractical.
- It also means that there is higher crop demand to feed the population which potentially reduces marketable share of products.
- The average family size indicates that the demand for farm labor could be met.

### *3.4.3 Age composition*

The age composition of the population is to be summarized from the household sample survey whereas those of the households are to be summarized from the registration. The summary has to be given for the different project components in order to incorporate project specific issues and recommendations.

The age composition should be given in full digits by rounding instead of using fractions or decimal numbers. Age information is to be collected and recorded in completed years following the methodology adopted by the CSA. As an example, a person whose age is 25 years and 10 months should be recorded as 25. This approach has to be given to the data collectors before their actual work. There could also be cases where respondents may not be able to tell their actual age. In such cases, the enumerator has to be instructed to reasonably estimate the age by the physical conditions of the person and by consulting other respondents as well as by taking historical events told by the respondents.

The survey collects the ages of the respondents whereas it will be grouped latter in the analysis. The age group distribution is recommended to be in accordance to standards set by the Central Statistical Agency of the country. The age distributions in 5 years' interval ranging from the age of 0+ up to the age of 75+ as shown below.

**Table 3-4: Distribution of age groups**

| | | | |
|---|---|---|---|
| 0 - 4 | 25 - 29 | 50 - 54 | 75 - 79 |
| 5 - 9 | 30 - 34 | 55 - 59 | 80 - 84 |
| 10 - 14 | 35 - 39 | 60 - 64 | 85 - 89 |
| 15 - 19 | 40 - 44 | 65 - 69 | 90 - 94 |
| 20 - 24 | 45 - 49 | 70 - 74 | 95+ |

The age groups of CSA are only up to 75+ whereas the analyst can go beyond this level if there are people within that age range. On the other hand, the lower limit can also be increased depending on the available minimum age limit of the population.

Example: - The age distribution of every household of SSIPs is to be collected through registration from all households found in different project components. Accordingly, the age distribution for a typical project having a total of 81 households could be represented by the table provided below. Sample survey is also conducted from 30 households or 37% of households. The number of population found under these households is 171 representing about 30% of the population.

**Table 3-5: Age distribution of households and population**

| Age Category | Total Number of Households | | | %age of total households' Age Distribution | | | Population age distribution collected from 30 Sample HH Survey | | | %age of Sample Age Distribution | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| 0 - 9 | - | - | - | - | - | - | 9 | 8 | 17 | 5% | 5% | 10% |
| 10- 19 | - | - | - | - | - | - | 11 | 9 | 20 | 6% | 5% | 12% |
| 20- 29 | 12 | 3 | 15 | 15% | 4% | 19% | 13 | 14 | 27 | 8% | 8% | 16% |
| 30 -39 | 15 | 5 | 20 | 19% | 6% | 25% | 16 | 13 | 29 | 9% | 8% | 17% |
| 40 - 49 | 13 | 3 | 16 | 16% | 4% | 20% | 17 | 15 | 32 | 10% | 9% | 19% |
| 50 - 59 | 9 | 3 | 12 | 11% | 4% | 15% | 9 | 7 | 16 | 5% | 4% | 9% |
| 60 - 69 | 6 | 2 | 8 | 7% | 2% | 10% | 7 | 6 | 13 | 4% | 4% | 8% |
| 70 - 79 | 3 | 1 | 4 | 4% | 1% | 5% | 5 | 4 | 9 | 3% | 2% | 5% |
| 80 - 89 | 2 | 1 | 3 | 2% | 1% | 4% | 4 | 2 | 6 | 2% | 1% | 4% |
| 90+ | 2 | 1 | 3 | 2% | 1% | 4% | 1 | 1 | 2 | 1% | 1% | 1% |
| Total | 62 | 19 | 81 | 0.77 | 0.23 | 1.00 | 92 | 79 | 171 | 54% | 46% | 100% |

The results of age groups should have meaningful conclusion and recommendation towards the project. One of its advantages is that the age category indicates availability of labour for construction and operation. It can also help to justify whether to implement land redistribution or not. The age distribution helps to distinguish vulnerable groups by age found within project affected places in order to provide them especial treatment in maintaining their affected livelihoods.

One of the conclusions can also be given in terms of economic activity status of households and population. Availability of active age groups helps to justify that project operations and hence crop production wouldn't be constrained by labour shortages.

As per the CSA, the term economic activity status refers to the size and distribution of the work force of economically active and non-active population. Persons aged ten years and over who were engaged or available to be engaged in the production of economic goods and services during a given reference period were classified as economically active. In accordance to this, the lower age limit to be termed as economically active population is 10. On the other hand, the higher limit is not established except the official retirement age of 60. People could remain productive beyond that year specifically in the rural areas where the physical strength could be retained. Therefore, the socio economist should define the maximum economically active age limit in consultation with focus groups. In the example provided above, 93% of households and 85% of the population are found within economically active age limit of 10 and 79. The example assumes that the people below the age of 80 and higher than 10 are economically active.

### 3.4.4 Sex composition

Sex composition of households and the population of SSIPs are to be obtained from registration data. The composition has to be given for the different project components and shouldn't be limited only for the command area. Recommendations have to be given pertaining implications of sex compositions. One of the recommendations is to include women households in the management of water user associations of the schemes. It can also be recommended to arrange credit facilities for the purchase of inputs during the initial project operational years. People participation during project investment could take sex compositions into consideration. In addition, the proposals regarding how to make the project beneficial to both gender compositions should be addressed. Composition of Religion

The names of the religion of the people are to be collected in the survey for all project components. Different religious practices that can influence a given SSIPs negatively and positively have to be identified together with their recommendations. The effect of these practices could be reducing number of working days and hours. The study is expected to show the lengths of working hours and days that can influence irrigation schedules and which should be incorporated in irrigation planning. Identification of religion and practices recommendation should be provided for the types of measures to be taken during project construction phase and which could enter as contract administration issues. The identification of contractual issue helps to avoid potential conflicts between the contractors and people. Quantification and estimation of replacement costs for religion related assets and properties situated over project lands should take into consideration the religious values of the population.

### 3.4.5 Ethnic composition

Ethnicity is to be collected for all of households as well as for the families of sample households. The data is equally required for all project components and should be discussed separately and as a whole. The study should show the extent to which different ethnic groups live in harmony to each other which contributes for project sustainability. It should also show the extent to which different groups are positively or negatively affected by the project. The study is expected to provide recommendation towards making different ethnic groups to be benefited from the project. The cultural values of the ethnic groups should be studied which could have impacts upon construction and operational phases. The findings should be clearly incorporated to the study of the socio economy report so that important points which help for further project stages could be referred it.

### 3.4.6 Language composition

Language compositions of households and the population would be the results of the socio economy survey. The presentation would be by major classification into mother tongue languages, secondary or additionally spoken language/s and an official working language of the surrounding places. The data are to be collected by simply asking respondents about their primary languages whereas secondary and official working languages are to be collected from the kebele administration offices and group discussions.

Having the summarized language compositions, the socio economist has to explain their importance in terms of the given project. In this respect, recommendation towards the kind of language to be used for preparing bylaws, for communications with kebele administration bodies and for monitoring and evaluation activities would be recommended. In addition, the impact of the

languages during construction, operation, marketing activities and social relations would be discussed.

### 3.4.7 Educational status

Data concerning educational status of households and the population of the project areas has to be collected in the survey. Educational attained would be collected by asking the grade level and this refer to status as of the interviewed date whether interrupted or not. The collected different grade levels are then to be grouped as per the standard classification of the country. The classified grade levels are basic education , KG, Nursery, 1-4, 5-6, 7-8, 9-10, preparatory (11-12), vocational, diploma, and university.

The classification of educational status is to be given in general terms of literate and illiterate. As per the definition given by the CSA, every person aged five years and over is considered as literate if he/she can read and write a simple sentence in any language; otherwise he/she is categorized as illiterate. The socio economist has to provide the implication of educational status from the point of view of the project. Education could have many interrelated impacts upon the project and few of them could be stated as follows.

The availability of higher number of students in the project could reduce the availability of the farm labour and the families may insist their children to withdraw. Similarly, higher income from irrigated farming may tempt students to interrupt their education. On the other hand, higher income could enable parents to send their children to schools which have to be coupled with fulfilling schooling facilities and opening new schools. The availability of more illiterate households may demand the launching of basic education in order to enable the farmers to optimize the project benefits. Besides this, the availability of more illiterate people may lead to the misuse of compensation money from lost assets and has to be matched with training program.

The study should provide quantitative estimates and recommendations which latter will be taken as part of project cost.

### 3.4.8 Marital status

At the time of the survey, the marital status of the study should take the classification of the CSA which are termed as single, Married, Divorced, Separated, Widow / Widower. Marital status has to be provided for households of both sexes found within different project components. Similar types of data could be provided for the population level. However, its implication for the project is not significantly important and thus, household level presentation suffice for describing the project. The results of the findings could be discussed in different perspectives. In this respect, it can be discussed for single project area such as only for the head work and can be given as “the household of the head work constitutes only married and widows”. It can also be discussed for the entire project components as a whole and presented as “Out of the total number of 81 households of the project, 2.5% are single, 82.7% married, 9.9% divorces, 1.2% separated and 3.7% widow/widower”.

As an example, the marital status of a project having a total of 81 household heads is provided below.

**Table 3-6: Example of marital status of households**

| Nr | Marital Status | Command Area | Head Work Places | Main Canal | Access Roads | Material Sites | Camp sites | Total | %age |
|---|---|---|---|---|---|---|---|---|---|
| **1.0** | **Single** | **2** | **-** | **-** | **-** | **-** | **-** | **2** | **2.5%** |
| 1.1 | Male | 2 | - | - | - | - | - | 2 | 2.5% |
| 1.2 | Female | - | - | - | - | - | - | - | - |
| **2.0** | **Married** | **40** | **5** | **8** | **8** | **4** | **2** | **67** | **82.7%** |
| 2.1 | Male | 32 | 3 | 6 | 7 | 3 | 1 | 52 | 64.2% |
| 2.2 | Female | 8 | 2 | 2 | 1 | 1 | 1 | 15 | 18.5% |
| **3.0** | **Divorced** | **5** | **-** | **2** | **-** | **1** | **-** | **8** | **9.9%** |
| 3.1 | Male | 4 | - | 1 | - | - | - | 5 | 6.2% |
| 3.2 | Female | 1 | - | 1 | - | 1 | - | 3 | 3.7% |
| **4.0** | **Separated** | **1** | **-** | **-** | **-** | **-** | **-** | **1** | **1.2%** |
| 4.1 | Male | 1 | - | - | - | - | - | 1 | 1.2% |
| 4.2 | Female | - | - | - | - | - | - | - | - |
| **5.0** | **Widow / Widower** | **2** | **1** | **-** | **-** | **-** | **-** | **3** | **3.7%** |
| 5.1 | Male | 1 | 1 | - | - | - | - | 2 | 2.5% |
| 5.2 | Female | 1 | - | - | - | - | - | 1 | 1.2% |
| **6.0** | **Total** | **50** | **6** | **10** | **8** | **5** | **2** | **81** | **100.0%** |
| 6.1 | Male | 40 | 4 | 7 | 7 | 3 | 1 | 62 | 76.5% |
| 6.2 | Female | 10 | 2 | 3 | 1 | 2 | 1 | 19 | 23.5% |

The summary that has to be prepared from the survey data should clearly show the marital status of households.

The socio economist has to discuss the rights of married women in land ownerships and in getting land certificate, the power to decide in selection of cropping pattern and participation in irrigation activity and the extent to which married women can be involved in WUA. Similarly, the impacts of the different marital status with respect to labour availability, participation of WUA and irrigation activities is required to be discussed.

### *3.4.9 Polygamy status*

Along with these data, the number of wives has to be collected in the places where the cultural set up of the community allows a polygamy marriage. Asking this question in a place where the practice is hidden may result in to unexpected hostility condition of the study process and thus should be avoided. In such places, only very few people with more than one wife could be available which make the inclusion of the data less important. As a check point, the number of households who have got more than one wife shouldn't exceed the number of married male households.

Once the data is obtained, the expert should be aware that all household based data includes all the demographic characteristics of the wives. The purpose of number of wives is to collect complete demographic data. If on the other hand the data of the number of wives is skipped from the data collection format and from data collection process, the possibility of collecting incomplete data could occur which in turn reduces the number of project population in general. The summarized number of wives could be provided by the help of the following table format.

Example: -Out of the total number of 62 male households of the project areas, 77.4 % are married to only one whereas the remaining 22.6% have got more than one wives. See the following table blow.

| Project Component | Number of wives | | | | Total |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| Command Area | 30 | 5 | 3 | 2 | 40 |
| Head Work Places | 3 | 1 | - | - | 4 |
| Main Canal | 6 | 1 | - | - | 7 |
| Access Roads | 5 | 2 | - | - | 7 |
| Material Sites | 3 | - | - | - | 3 |
| Camp sites | 1 | - | - | - | 1 |
| Total | 48 | 9 | 3 | 2 | 62 |
| %age | 77.40% | 14.50% | 4.80% | 3.20% | 100.00% |

The implication of having more wives from the view point of the project has to be discussed and some of them could be in terms of the followings.

The practice of having more wives would result to higher population number and create population pressure upon the project. Thus, family planning interventions should be strengthened. This recommendation has to be associated by recommending responsible body, budget & source of budget and timing of the interventions. In cases where compensation is to be provided for affected properties of households, concerned wife for the property who is eligible for sharing the compensation should be considered.

### *3.4.10 Occupational category*

Occupational categories refer to the types of occupation which serve as major and secondary source of livelihood income. The lists of the occupations for the specific SSIP should be known and included in the format prior to the period of data collection. A major occupational category for farming community is farming whereas secondary occupations are activities such as retail trading and carpentry. The occupational category of the farmers has to be given for all households found within different project places. As an example, main and secondary occupations could be provided in the following and from it; different conclusions could be made from it.

Example: The number of households engaged in different types of main and secondary occupations could be referred below for typical SSIPs.

**Table 3-7: Main and secondary occupations**

| Project Area | Primary Activity | | | | | | | Secondary Activity | | | | | | | %age | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Farming | Daily Laborer | Apiculture | Cattle Fattening | Masonry | Civil Servant | Total | Farming | Daily Laborer | Apiculture | Cattle Fattening | Masonry | Employment | Total | Primary | Secondary |
| Command Area | 48 | - | - | - | - | 2 | 50 | 2 | 6 | 4 | 8 | 5 | 7 | 32 | 100% | 64% |
| Male | 38 | | | | | 2 | 40 | 2 | 6 | 4 | 6 | 5 | 4 | 27 | 80% | 54% |
| Female | 10 | | | | | | 10 | | | | 2 | | 3 | 5 | 20% | 10% |
| Head Work Places | 6 | - | - | - | - | - | 6 | - | - | 2 | - | - | - | 2 | 100% | 33% |
| Male | 4 | | | | | | 4 | | | 2 | | | | 2 | 67% | 33% |

| Project Area | Primary Activity | | | | | | | Secondary Activity | | | | | | | %age | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Farming | Daily Laborer | Apiculture | Cattle Fattening | Masonry | Civil Servant | Total | Farming | Daily Laborer | Apiculture | Cattle Fattening | Masonry | Employment | Total | Primary | Secondary |
| Female | 2 | | | | | | 2 | | | | | | | - | 33% | - |
| Main Canal | 10 | - | - | - | - | - | 10 | - | 1 | - | 1 | - | - | 2 | 100% | 20% |
| Male | 7 | | | | | | 7 | | 1 | | | | | 1 | 70% | 10% |
| Female | 3 | | | | | | 3 | | | | 1 | | | 1 | 30% | 10% |
| Access Roads | 8 | - | - | - | - | - | 8 | - | - | - | - | 1 | - | 1 | 100% | 13% |
| Male | 7 | | | | | | 7 | | | | | | | - | 88% | - |
| Female | 1 | | | | | | 1 | | | | | 1 | | 1 | 13% | 13% |
| Material Sites | 5 | - | - | - | - | - | 5 | - | 1 | - | 1 | - | - | 2 | 100% | 40% |
| Male | 3 | | | | | | 3 | | 1 | | | | | 1 | 60% | 20% |
| Female | 2 | | | | | | 2 | | | | 1 | | | 1 | 40% | 20% |
| Camp sites | 2 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | 100% | - |
| Male | 1 | | | | | | 1 | | | | | | | - | 50% | - |
| Female | 1 | | | | | | 1 | | | | | | | - | 50% | - |
| Total | 79 | - | - | - | - | 2 | 81 | 2 | 8 | 6 | 10 | 6 | 7 | 39 | 100% | 48% |
| Male | 60 | - | - | - | - | 2 | 62 | 2 | 8 | 6 | 6 | 5 | 4 | 31 | 77% | 38% |
| Female | 19 | - | - | - | - | - | 19 | - | - | - | 4 | 1 | 3 | 8 | 23% | 10% |

The findings of the occupational category have to be explained in terms of the project. It could be concluded that the availability secondary occupations enable project participants to diversify their benefits from irrigated farming. It can also serve for recommending types of agro processioning activities which can further increase farmers' benefit. As part of the recommendations, the required costs and responsible office to implement recommended measures has to be provided. Identification of occupational category helps to recommend labour during construction. As an example, availability of masonry workers and daily labourers helps to hire workers from the project area instead of bringing other workers from outside. Besides, if there are cattle fattening taking place in the project area, the expert has to recommend the contractor to purchase them and to create marketing opportunity for the people. Similarly, availability of different types of secondary activities helps for the staffs of the contractors and which could further be strengthen during operation stage. The study should recommend responsible body that can provide more capacity building for the people in the area of widening and enhancing secondary income generating activities and their marketing.

### *3.4.11 Income*

The level of annual income from primary and secondary activities has to be collected from respondents. The income levels should relate to gross income due to the difficulty of estimating net income by the part of the respondents. The analyst should however estimate the level of net incomes after collecting data from focus group discussions, development workers, wereda offices of concerned sectors (as an example, trade office is more appropriate to provide input and output costs for retail trade).

The income level has to be arranged and analyzed by the expert in the ranges of category which represent the different wealth category of the community. In this respect, rich, middle and poor income levels have to be defined from the standpoint of the community and the data should be grouped in accordance to these wealth classifications. The classification of wealth has to be established by consulting the kebele and other knowledgeable persons. The wealth categories have to be arranged and compared with defined regional or national standards of minimum wage levels whereas it is difficult to put the ceiling levels.

The data to be collected from respondents may have problems of accuracy. There could be significant deviation from the figures that would be estimated by the analyst through the calculation of input and outputs of mainly primary activities. It also could change from the figures that could be estimated by agronomy study. Therefore, the information has to be compared with the results of the agronomy & socio economy estimations and a justifiable and adjusted figure has to be provided. However, the comparison of the figures has to be displayed with justification.

As indicted below, the results of income categories help to provide different kinds of conclusions and recommendations. Furthermore, the figures would be used as input for engineering and financial analysis. It also helps as bench mark for future project evaluation tasks.

- By referring the income level categories of the people, the study has to estimate and recommend the amount of financial contribution that can be covered by the beneficiary farmers during project construction. The amount of financial capacity to contribute for project construction helps the engineers to identify the types of works that can best be covered by farmers. It also helps for financial analysis as one of the input for comparing income levels from existing (without the project) and income that could be achieved from the project without the project cases.
- By the help of the results of income levels, the expert has to analyze the need and the amount of financial credit required by the farmers of the command area for the purchase of farm inputs specifically during the initial years of farming operations. The estimated amount of credit requirement would be used by the financial analyst to estimate the amount of working capital that has to be covered through credit.
- The amount of Income distribution assists the extent of compensation importance for project affected persons.

### *3.4.12 Disability status*

As per the definition of CSA, a person is considered to be disabling if he/she has the following problems. Blind, seeing difficulty, Deaf, hearing difficulty Dumb, Speaking difficulty, Deaf mute, Disability in Hands, Disability in Legs, Physical Organs Movement Difficulty, Mental retardation, Mental Problem and Other. The general understanding of the term with respect to SSIP is that a person who cannot be involved in crop production activity to earn his/her livelihood income by her / himself is considered as a disabled person. Therefore, a person with problems of blindness, disability in hands & legs, Physical Organs Movement Difficulty, Mental retardation, Mental Problem, old age and others to be identified in field study are considered as a disabled. The lists of disabled person with their sex and age distribution have to be summarized and be provided. The disability status focuses at household level instead of the population level at large. On the other hand, Deaf, hearing difficulty Dumb, speaking difficulty, and Deaf mute may not affect physical activities of crop production.

The study should provide recommendations for these persons. As an example, they may not be able to contribute labor during project construction. They may not involve in labor intensive irrigation activities and thus recommendation has to be provided how their farms could be put to the planned irrigation activity by simultaneously securing their benefits. Above all, recommendation to protect their ownership right over their irrigable lands has to be provided. In the meantime, the study has to show how project affected disable persons obtain especial privileges for their affected asset incomes. The study should show higher compensation estimate with justifiable methodologies.

**Table 3-8: The data collection format for demographic characteristics is provided herein under**

| ID | Complete Name | Marital Status | | Sex | Age | Education | Ethnicity | Language | Religion | Years of Residence | Disability | Tel.Nr | Occupation | | Annual Income from | | Signature of HH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Marital Status | # of wives | | | | | | | | | | Primary | Secondary | Primary | Secondary | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

## 3.5 SETTLEMENT PATTERNS AND POPULATION DYNAMICS

Settlement patterns refer to the types and permanency of settlements while population dynamics deals with annual population projections. Estimation of population growth rate which is to be calculated from fertility, mortality and migration are not part of the guideline due to the fact that the rate is established by the central government. Therefore, the guideline suggests applying the officially established regional growth rates for specific projects.

### *3.5.1 Settlement patterns*

**Permanency of Settlement**: One of the objectives of SSIPs is to benefit the local people by assisting them to produce marketable surplus crop production and promoting diversified socio economy development. These objectives can be achieved if irrigation projects are implemented within permanently settled communities and thus, one of the enabling environments to achieve the stated objective of producing marketable surplus crop production is availability of permanent settlement. The settlement patterns could either contribute or hinder the development of the project. Therefore, the settlement patterns of the people that could have influence over the different project phases need to be clearly identified and investigated ahead of time. Together with, remedial measures would be forwarded to improve issues that could be resolved. On the other hand, SSIPs could also be implemented in a place where there are no permanent settlers with planned expectation that other settlers could come in and operate. However, new settlers have to be permanent after they are being settled. Therefore, the availability of settlement patterns is one of the prerequisite for implementing SSIPs. The study of population settlement includes different components and these are given as follows.

The settlement patterns and their significant with irrigation development and management in the project area must be described in depth.

The original causes of settlement are required to be known in order to analyze and predict the trend of population movement and the extent of settlement permanency. Some of the causes could be stated as follows whereas the analyst should investigate the causes of settlement of projects under study.

1) The settlement of the people with respect to labour contribution to irrigation development and management
2) The settlement pattern assessment should identify whether it is in the command area (cultivated area) or not.
3) The settlement place could have been inherited from their ancestors and thus settlement pattern is permanent.
4) The places of the command area could have been recently occupied by different group of people (with respect to identification of who are the major settlers)
5) Peopleof the surrounding places of same ethnic groups could have been attracted by easy access of economic reasons such as by the land and water whereas the places are demarcated as protected forest reserve area and its permanency is for short duration.
6) Peoplecould have settled through a government resettlement program and thus the settlement is permanent.
7) Together with this, social interactions with the rest of the surrounding people as well as attitudes of locality inhabitants towards the people of the command area should be investigated.

The analyst therefore should investigate the causes of settlement and the permanency of the settlement. Future inward and outward population movement trend, new settlement trends and settlement demands that could originate following the materialization of the project has to be analyzed with support of the data evidence. In this respect, the study of socio economy should provide reliable analysis and information to decision takers about the actions that has to be taken to keep the settlement permanent.

**Other settlement patterns**: The other components of settlement pattern are the types of settlement itself i.e. whether it is characterized by clustered, scattered, or any other form. Following the types of settlement patterns, the socio economist has to provide recommendations towards different aspects of which few are provided below.

In consultation with communities, the number and location of foot bridges, washing basins and cattle trough structures which are parts of investment of SSIPs should be recommended by the expert by using the types of settlement patterns as one of the criteria. To the extent possible, the locations of the camp sites which would later be used for WUA should also be at convenient common place to the residence. The locations of canals should also be recommended by the socio economy study team to be designed and constructed in way that do not affect any of residential houses.

The types and number of residential houses and other structures such as the types of cattle sheds and grain stores are the other components which are required to be studied. The study has to show the classification of wealth category in terms of the types and number of houses and structures. Besides, the data serves as one of the baseline socio economy data.

**Settlement effects**: The impact of the settlement pattern upon land of different uses & economic activities, social and public services, historical places, public infrastructures, and others are to be investigated. Besides, the potential merits and demerits of settlements towards the implementation of the proposed project are to be analyzed. On the other hand, the analysis includes positive and negative impact of the project upon the overall settlement area, communication and transportation. For project affected places, impacts upon their settlement patterns, alternative measures including resettlement options if needs arise due to negative effects of the project have to be investigated.

The sources of data and information for the above mentioned aspects of settlement patterns are community consultation, field observations, consultation with the elderly, key formants, kebele and wereda level administration offices, development workers, and religion leaders. Year of residence could also be taken from the survey. In addition, representative photographs that show settlements and the trend of urbanization is required.

### *3.5.2 Population projections*

The annual population projection is done for the command area whereas it is less important for other project components. Projection is made for existing eligible beneficiary found under households who have land within the command area. Annual rural population growth rate of the specific region established by CSA are to be applied. The projection is made for the corresponding analysis period of a project. The analysis period is the summation of 1 year each for project preparation and construction and operational periods of the scheme. The life of the analysis depends on the types of irrigation types and should be provided in engineering study. The projection is made using exponential function represented as $f_x$ *in the formula bar of EXCEL.*

$P_t = P_o e^{rt}$

Where,

$P = Population\ at\ Year\ t$

$P_o = Base\ Year\ Population$

$e = Constant\ e, the\ base\ logarithm$

$r = Population\ Growth\ Rate$

$t = Projection\ Year$

**Example:** Annually projected number of population for a typical surface SSIP which has population number of 350 is given table below. The growth rate established for rural parts of a given region is being used for the projection. Projection is made for a total of 27 years which consists of one year each for project preparation & construction and 25 operational years.

**Table 3-9: Population projection**

| Year | Growth Rate of ----------Region in % | Projected Population Number of the Command Area | | |
|---|---|---|---|---|
| | Rural | Male | Female | Total |
| 1 | 2.20 | 190 | 160 | 350 |
| 2 | 2.00 | 198 | 166 | 364 |
| 3 | 2.00 | 202 | 170 | 371 |
| 4 | 2.00 | 206 | 173 | 379 |
| 5 | 2.00 | 210 | 177 | 386 |
| 6 | 2.00 | 214 | 180 | 394 |
| 7 | 1.70 | 214 | 180 | 394 |
| 8 | 1.70 | 217 | 183 | 401 |
| 9 | 1.70 | 221 | 186 | 407 |

| Year | Growth Rate of ----------Region in % | Projected Population Number of the Command Area | | |
|---|---|---|---|---|
| | Rural | Male | Female | Total |
| 10 | 1.70 | 225 | 189 | 414 |
| 11 | 1.70 | 229 | 193 | 421 |
| 12 | 1.40 | 224 | 189 | 414 |
| 13 | 1.40 | 228 | 192 | 419 |
| 14 | 1.40 | 231 | 194 | 425 |
| 15 | 1.40 | 234 | 197 | 431 |
| 16 | 1.40 | 237 | 200 | 437 |
| 17 | 1.10 | 229 | 193 | 422 |
| 18 | 1.10 | 231 | 195 | 426 |
| 19 | 1.10 | 234 | 197 | 431 |
| 20 | 1.10 | 236 | 199 | 436 |
| 21 | 1.10 | 239 | 201 | 440 |
| 22 | 0.70 | 222 | 187 | 408 |
| 23 | 0.70 | 223 | 188 | 411 |
| 24 | 0.70 | 225 | 189 | 414 |
| 25 | 0.70 | 226 | 190 | 417 |
| 26 | 0.70 | 228 | 192 | 420 |
| 27 | 0.70 | 229 | 193 | 423 |

# 4 ECONOMIC ACTIVITIES OF THE PROJECT AND THE KEBELE

Existing economic conditions refer to major economic activities and the level of incomes which are the basis of livelihood of the people found within the project area. The economic activities can be classified into primary and secondary livelihood basis category. In order to analyze the economic conditions of the project areas from primary income generating activities, identification of existing land use patterns, the types of economic activities taking over those places, the level of outputs, the types and quantity of inputs usage and other income sources are required to be identified and analyzed as shown below.

## 4.1 CROP PRODUCTION

### *4.1.1 Existing land use of the project*

For a land based economy, identification of existing land use patterns is an initial step that has to be known by the analyst for analyzing the existing economic conditions of the people of the project areas. The land use of the command area can be obtained from soils and land suitability study sector assessment results. In addition to the command area land use information, the socio-economist should have noted the types of land use types on other project components including quarry sites, camp place and headwork sites. The type of land uses for access road, main canal, night storage and headwork sites can be identified with the help of GIS expert by overlaying the final scheme design and existing land use map of the survey area

The land use patterns of the command area and project kebele indicates mainly the economic basis of the communities. For instance, if the area has extended grazing land comparing to cultivated land it indicates that animal husbandry would significant contribution to the household economy. On the other hand if the area is dominated by cultivated land use it shows that the communities are mainly rely on crop production. Therefore the economist should describe the land use of the project area from economic and livelihood basis point of view

The major classification of project lands in accordance to their economic use are cultivated land, grazing land, residence, tree plantation& perennial crops, uncultivated or others. The land use patterns could also take different patterns and thus, the study expert shouldn't be restricted only to those mentioned types. The land use pattern of the project areas could be given by the help of the following example.

**Example:**

For a typical SSIP, the consulted project participants were requested to provide the land distribution of headwork site, main canals, access roads, quarry sites, and camp places into cultivated, grazing, residence, tree, perennial crops, uncultivated land, fallow and others. They estimated for each of these components and the resultant figure as computed by the expert are as follows. The head work is entirely occupied by 10% grazing and 90% of tree lands. The main canals occupy 80% of cultivated and 20% grazing lands. 70% and 30% of Access roads are cultivated and grazing lands while quarry sites and camp sites are entirely composed of farming and grazing lands respectively. Moreover, the study of Soils and land suitability shows that 62% of command area is devoted for cultivation whereas the remaining land use patterns of 10% is used for grazing, 1% for residence, 4% for tree plantation and 5% perennial crops.

From the above classified types of land use patterns, the area of lands could be estimated and presented in a form of a table. Accordingly, the land use patterns for a SSIP having an area of 81ha of consisting of 70ha of command area, 2ha of headwork, 3ha of main canals, 5 ha of access roads, 1ha of material sites and 0.04ha of camp sites could be given as follows. These data could be available from soil and land suitability study of the concerned SSIP.

**Table 4-1: Existing land use patterns of a typical SSIP**

| No | Project Component | Land Use In Ha | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | Farming | Grazing | Residence | Tree plantation | Perennial Crops | Free/ Idle | Others | |
| 1 | Command Area | 43.38 | 7.00 | 0.70 | 2.80 | 3.50 | 7.00 | 5.60 | 69.96 |
| 2 | Head Work Places | - | 0.20 | - | 1.80 | - | - | - | 2.00 |
| 3 | Other Places | 6.90 | 2.14 | - | - | - | - | - | 9.04 |
| | Total | 50.28 | 9.34 | 0.70 | 4.60 | 3.50 | 7.00 | 5.60 | 81.00 |

### *4.1.2 Crop production and gross income*

The types of crops grown, frequencies of annual crop production with breakdowns of long and short rainy seasons & irrigation if any, percentage coverage of crops and area of crops grown in every cropping seasons, yield levels and farm gate prices are the types of data to be collected. Some of the data like seasonal cropping patterns and crop yield performance should be available from the agronomy study while the socio-economist needs to concentrate on data like farm gate price and annual crop production contribution to the household economy. The level of contribution needs to be determined in consultation with communities during focus group discussion or on public meeting

Major crops grown in the command area and economically important crops must be considered in description of the economic activities. Try to incorporate crops from each crop group and advised to consult the agronomist in the study team. The data should be consistent with other sector reports. Moreover, the crop intensity of the command area need to be described in which the information could be investigated during focus group discussion, key informant interview or from agronomy sector assessment results. The area of land allotted for each crops production could be used more than once in a year which has to be incorporated in the study.

The average yield levels of crops which are used to be obtained by many of the farmers in normal harvesting years are to be taken. Crop by-products occupy an importance economic importance for the farmers and thus, their yield levels constitutes the study part. The total volume of main and by-product crop production of each crop is estimated through the multiplication of yield levels by the total area coverage of each crop.

There are periodic price variations in different months and years. However, the average price level prevailed during the study period has to be considered. Finally, the gross income from crop production that could be obtained from a given project area as well as average income are to be estimated.

### *4.1.3 Existing cost of crop production and net income*

The cost of crop production has to be estimated in order to calculate the net income from crop production. The estimation of production cost would be easier if it is first be prepared for one ha of crop land and then multiplied by the total area of the project. The economist can have the data on "without project crop budget" for existing cropping pattern from irrigation agronomy sector study and multiplied by total land coverage of each crop indicated in cropping patterns. The production estimated by multiplying the average yield with cropland area should be multiplied by farm gate price to get gross income. Further the production cost of each crop will be deducted from calculated gross income to get net income.

1) As an initial step, all the types of inputs which are actually applied on one ha of a particular type of crop have to be identified. The common types of these inputs are labour, seed, fertilizer, oxen power, fertilizers, packing materials, land tax, and miscellaneous items. The types of inputs which are applicable by many farmers have to be taken as representative items. 2) The second step is to determine quantities of every input which are actually applied for one ha of crop land. 3) The next step is to collect current year purchase prices of these inputs. The quantity of currently used inputs for one ha of land is then multiplied by the respective farm gate unit prices.4) The total production cost of every type of crops is the summation of input costs applied over one ha of land.

5) The total cost of production of every crop type required for one hectare of land is then multiplied by their respective area of land which corresponds to the area of land provided in cropping patterns. 6) Finally, production costs of every crop are added and then the summation of these different crop lands provides total production cost of the project area. 7) Net income is then estimated by deducting the cost of production from the gross income.

## 4.2 INCOME FROM GRAZING LAND

The other source of annual income in most high land area for the people of the project area could be from grazing land. Grazing land is one of the basic livelihood sources of the community and is used for feeding their animal resources. The study of grazing and animal feeding should include type of grazing land i.e. whether it is free grazing or protected feeding; types of grazing ownerships i.e. own land, communal land, or leased land; distance from home. The socio-economist should identify and estimate such sources of income as much as possible, but these sources of income in most area will be insignificant and will be assessed with caution.

## 4.3 INCOME FROM PERENNIAL CROPS

Perennial crops include eucalyptus and other fruit bearing trees either are consumed or marketed. The level of income from these assets should be estimated in financial terms. These resources however may not be valued at the current practice of the community whereas the analyst has to provide estimated values for it by taking the experience of other neighboring places.

## 4.4 LIVESTOCK PRODUCTION

Livestock production is one of the most important economic activities and also contributing to crop production by supplying drought power. The people also get annual benefits from the sale and consumption of various products of livestock. They use to benefit from their by-products such as consumption of butter, meat, milk, and egg.

The study of socio economy should identify the types of available livestock in accordance to major classification of cattle, equines, poultry, beehives colony, sheep &goat; average livestock holdings per household; total livestock number of the project area; the types of benefits generated from sales of livestock and livestock products i.e. number of livestock sold in the last year and the amount of money obtained number and type of other products sold and the money obtained; marketable and consumable share of products; their contribution in the household economy, their estimated annual watering requirements; the location of cattle trough which have to be constructed by the project; the status and types of animal feeding with and without the project; major problems including livestock diseases and remedial measures; the impacts of livestock upon the proposed project and impacts of the project upon livestock development, and wealth status of the project area in terms of livestock ownerships.

The total numbers of livestock owned by the beneficiaries are to be computed from registration and household survey whereas the kebele figure is to be obtained from its administration office or from development workers. Kebele based data is required as a reference. Please refer the data collection format in the Appendix part of this guideline.

| ID No | Complete Name | Oxen | Bull | Cow | Heifer | Total | Equines | Sheep | Goat | Total | Poultry | Apiculture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

## 4.5 OFF FARM ACTIVITIES

Off farm activities such as trading, carpentry, mason, weaving, blacksmithing, poetry, remittance, serves as means of income source for communities engaged in farming activities. The income levels from these activities are to be estimated from a household survey and also by collecting reference figures from the kebele and development workers.

## 4.6 HOUSEHOLD ECONOMY

Household economy is explained by the difference between income and expenditure of the farming community in general. The analysis is done at farm level of the command area in general. The household economy is the summary of income provided under the different income sources identified at various income making activities and expenditures. The expenditures consist of farm level as well expenditure for domestic consumption use. Farm level expenditure consist of variable farm inputs i.e. labor, oxen power, fertilizers, transporting and packing materials, land taxes and miscellaneous. Domestic consumptions include costs incurred for food, school, health, transportation, and miscellaneous.

The main reason why household economy should be conducted is due to its significant importance to explain the economic status of the people under consideration.
It helps for:

- Comparison of the economic status of the people under with and without the project conditions;
- Identifying various income making activities underwent within the community and to assess the effect of those income making activities on the proposed irrigation project;
- Assessment of those burdens of households that cause for undesirable expenditure;
- Judging the economic utilization of financial and material resources of households; and
- Preparing a bench mark data to be consumed in the evaluation of the project effectiveness on economic and social conditions of the community in the post - implementation period.

# 5 AGRICULTURAL MARKETING AND AGRIBUSINESS DEVELOPMENT

## 5.1 AGRICULTURAL MARKETING

The study of marketing has to be done for both of the outputs that are currently grown under the existing farming conditions as well as for proposed crops which will be grown in irrigation as shown below.

### *5.1.1 Legal Backgrounds*

The government policy with regard to specified crops of the project in ensuring sufficient supply and market stabilization, to safeguard the interest of the consumers and also to provide incentives to producers, to stabilize the market and control artificial shortages should be discussed. In discussing the marketing aspects, relevant government policy on crop marketing and legal backgrounds applicable for the marketing of agricultural outputs and inputs in general and for particular items of products that exceptionally have got their own legal issues such as restricted crops for exports either for short or long duration have to be assessed. Marketing analysis has to be undertaken within those legal frameworks whereas suggestions and recommendations to improve existing legal backgrounds should be discussed.

### *5.1.2 Market Structure*

The study should show existing marketing divisions in to the available functioning structure types as well as their limitations and advantageous to the marketing of inputs and outputs of the project. These types of agricultural markets could be provided in broad classification between open and public market as well as primary and secondary markets. Furthermore, the marketing structure should also show the domestic and international markets for the identified crop types.

Open market which is taking place directly between private producers, traders and consumers; local grain traders, assemblers, whole sale merchants and retail traders. The number of transactions in the flow of goods from farmers to final consumers; major collection points; transportation and storage facilities; the market share of open markets; the requirement of trading licensee to operate, should be described.

**Marketing institutions and marketing channels**: For Public markets aspects, the names of cooperative and governmental major agencies involved in handling and operating the public sector market, the mechanism of buying and selling of crops and inputs, marketing amount in terms of whole and retail trade of inputs, outputs and by-products, industrial products, animals and their products have to be discussed.

From the view points of the nature of primary markets in terms of location i.e. distance to the project area and names of marketing places if there are fixed places at nearby regular market places or describing them if conducted at dispersed farming household levels and the level of relative dominancy of retail and whole sale trade.

The extent of primary and secondary markets in terms of types of participants (whole sale and retail traders, producers, and consumers), size of participants i.e. large and small, marketing

volumes (whole sale and retail marketing), marketing places& distance and marketing dates should be discussed. The study has to discuss whether the places are traditionally classified as surplus with respect to crop production or not , the contribution of the project in creating marketable crop and livestock & their by-products surplus in the area, and the potential of absorbing existing and projected volume of project outputs.

This information is to be collected through observation, community consultation and wereda level marketing office.

The types of existing and proposed crops which are prominent items of export source of foreign exchange earner for the country, the volume of annual export levels for the recent 5 years' period by major importing countries, and price comparisons, competitive pressure in the world markets, advantage of the country with respect to quality, private and public sector merchants involved in export of these markets, trend of import and export markets and the existing and projected share of the project for export markets and import markets need to be provided with support of figures. In this regard, the annual volume of crop production exported and imported and their values have to be analyzed.

### *5.1.3 Demand and Supply Assessment*

The points that should at least be covered under this topic are demand and supply for food crops and existing shortfall of the surrounding areas, the trend of growth in population and agricultural production of the project area, incremental production from the project, the trend of crop production to flow out of the project area, the capacity of the surrounding markets to consume project outputs, the months in which most of marketable surplus are supplied to the market.

### *5.1.4 Prices of Outputs and Inputs*

The price levels of outputs (main and byproducts) and inputs that have to be collected for describing the economic status, for use of financial analysis purposes and estimation of compensation for project affected crop lands are farm gate prices prevailing within or near to the project areas. Inputs includes seed, fertilizers, oxen power, labor and others while outputs include the production of different crop types which are cereals, pulses, vegetables, oilseed, root crops, perennial crops.

In this respect, data for the farm gate price levels of different items prevailed at different months have to be collected and analyzed. Price levels will be collected for both open and public marketing structures. The analysis includes the divergence of monthly price levels, differences between open and public price levels and the extent of economic benefit received by the farmers.

If different grades of same crop types grow in similar proportion, their prices are first to be collected and then their average prices which are assumed to represent their average quality will be estimated and applied for different purposes. However, only the price of the dominant crop grade will be taken if others occupy insignificant area of land. Cereals crops such as Teff and wheat could be mentioned as examples and these have got three grade levels which are white, black and mixed and they have different prices. Generally, the prices of white grains have got higher prices than the rest two.

The collection of price data could be made in any month of a year while price levels should cover a one-year data including the price levels revealed at the month of the study and the previous immediate 11 months. The price level for the current month is easily possible to obtain from the farmers. On the other hand, finding monthly price data from farmers for the previous 11 months could just be simple estimate which may not accurately represent the prices and thus the development workers of project kebele could be consulted. If, however data is not available from this office, it is advisable to obtain the data from the wereda Agriculture office. The problem of wereda figures are however that they are not site specifically prepared for a particular project areas and kebles. In such cases, the analyst should convert wereda level price levels into project price levels using the proportion of the two prevailed at the month of study period.

As an example, assume that the kebele and wereda price levels of same product prevailed at the month of study period are known. Let us further assume that Birr X/qt is what is recorded at the wereda level and Birr Y/qt is the price level collected from project kebele. Then the proportion of project price to kebele price level is provided as $\frac{Y}{X} = Z$. Then keble level price levels are to be estimated by multiplying the recorded monthly wereda level prices by the same proportion of "Z." This methodology applies for all the identified types of crops which are grown without the project and also for the crop which are proposed to be grown with the project case. If, however, the proposed crops are new to the wereda itself, their estimated farm gate price levels have to be adopted from those available prices in the other marketing places.

The study should show the trend of farm gate price levels. For this estimation, prices levels prevailed during the past 5 years' period have to be collected or estimated in same methodology provided below. The price trend level could also be projected by the help of a trend line chart in EXCEL. However, the projected price levels are not dependable since the projection doesn't consider a factor that influences price levels.

### *5.1.5 Marketing Share of Crop Outputs*

Marketing Share of Crop Products has to be established for the existing crops grown in all project areas as well as for crops recommended to be grown within the command area. The level of farm produces for the existing crops of the command and other project areas are to be taken from the already established figure of the socio economy study whereas the marketing share of crops has to be estimated by consulting the marketing section of the Irrigation Development Authority and Agriculture office of the wereda. The percentage of the shares differs from crop to crop whereas the general estimate used by the offices could be established.

In addition, describing and justifying whether marketable share represents surplus production or is simply allotted for fulfilling domestic demands of other product types have to be specified. Together with this, the peak marketing months of products are required to be provided together with their estimated quantities.

Quantities of crop production that could be produced with the project have to be obtained from the agronomy study and from it; the marketable share could be estimated by adopting reference benchmark figure. The annual quantity of crop required by a person for consumption should be adopted and multiplying the figure by the number of population of the command area gives total quantity of crop for consumption and by deducting the result from the total volume of produce can represent marketable share of crop production.

Similarly, the marketing share of crops could be estimated by consulting communities and key informants. The proportional percentage of consumption and marketable products are estimated from these sources whereas the quantities of the two shares are computed by applying the rates recommended by respondents for each crop. The percentage of the shares differs from crop to crop. Following the established rates, the share for home consumption and marketable crop products will be estimated and summarized in table format

**Table 5-1: Consumption and marketing share of existing crop products (example from Shore SSIP study)**

| No | Crop | Consumption share in qt | | Marketable share in qt | | Total production, qt |
|---|---|---|---|---|---|---|
| 1 | Maize | 60% | 1,227 | 40% | 818 | 2,046 |
| 2 | Sorghum | 60% | 96 | 40% | 64 | 160 |
| 3 | Haricot Bean | 50% | 1 | 50% | 1 | 2 |
| | Total | 60% | 1,325 | 40% | 883 | 2,208 |

### *5.1.6 Marketing Infrastructures*

This discussion refers to types of access roads to market places, types of transport, marketing information and channels.

The types of accessible roads that link to the different marketing places and their distances, modes of transportation including travel on foot, use of cart and three-wheels vehicle (Bajaj) transportation, the types of storage facilities used in market centers and at household level by the community and traders; the constraints in accessing the market infrastructures have to be investigated and discussed.

With regard to marketing information, the media of getting market information such as informal communication with their neighbors and relatives as well as by their mobile phones and extent of information coverage to market information. The study of marketing channels includes the different bodies that involve at different marketing levels in delivering products to the users.

**Analysis of market information:** Extension agents may need to do certain level of processing and analysing market information before they communicate it to farmers for decision-making. Well-analysed historical market information enables farmers to make production decisions in line with urban consumer demand, including those related to new products. It also permits farmers to make better decisions regarding the viability of intra and, perhaps, inter-seasonal storage. The most common and simple analysis include mapping of supply chains, computation of average prices, price ranges, price trends, and price seasonality.

**Disseminating market information:** Market information must be disseminated to farmers in time. Market information that does not reach farmers in time may be of little use to farmers in making their decisions. There are many possible methods of disseminating market information to farmers. Each method may have advantages and disadvantages. Hence selection of methods to disseminate market information should consider the context and the preference of farmers. Usually, a combination of methods should be used.

The most common methods of disseminating market information include direct contact with farmers, telephone contact with farmers, central repository of market information, market

information billboards, local radio and television programs, and market information bulletins and newspapers. With the development of ICT, CD-ROMs and the internet can also be used, if and when farmers have access to computers and the internet and are able to use them. Below, are given brief descriptions of the most common methods.

### *5.1.7 Agricultural Value Chain Analysis*

The socio economy study should discuss available experience of the project area in value add activities of such as preparation of washed coffee, preparation of wheat flour and bread, processed pepper and delivering to the market; processing costs of inputs and benefits for the crops grown in the project area; the prospects for developing under the project cases, the participants, problems, and remedial measures should be provided.

The study should show how the farmers could be engaging themselves individually or collectively in high value commercial orientation. In this respect, the points that would be discussed in the study are assessment of existing value chain studies which are practiced by different agencies and individuals, and identify the gaps; Identify value chain linkages for selected commodities, and map out and produce a flow chart for each of the crops selected; Identify value chain development supporting institutions including cooperatives and key private or public entities; Identify and explain all issues, problems and constraints at each transfer point in the chain: volume, value, prices, payment systems, transport, quality, frequency of transfers (points of sale); storage limitations; processing limitations (low technology), and so on. Assess value adding opportunities, marketing services and channels, identify product flow between sectors and cover all local use (rural) and consumption of the crops and their value-added products: Assess the status and opportunity for improvement, provide insight on the issues and problems, make recommendations and propose necessary value chain development interventions.

### *5.1.8 Market Linkage*

Based on the ranges of market opportunities available to the farmer, there can be several types of market linkages. Market linkages can be formal (written linkage arrangements) or informal (based on trust and understanding). Linkages can also be farmer initiated (farmers approaching buyers), buyer initiated (buyers approaching sellers) or facilitated by third parties (e.g. the extension staff, NGOs). Linkages can also be between individual farmers and buyers, through lead farmers, between groups of farmers and buyers, and between formal farmer cooperatives and buyers. Irrespective of how linkages are initiated, the extension staff may have role to play in supporting farmers' link with and benefit from market. Following are brief description of these linkages.

**Farmer to domestic trader:** This is the linkage between farmers and traders who buy at local markets or at the farm gate on one-to-one basis. Economies of scale efficiency can benefit the trader if purchasing is done at local markets as this enables the trader to buy sufficient quantities. On the other hand, purchases at farm gate can be extremely inefficient most of the time contributing to high marketing costs arising from the fact that producers are dispersed across a wide area. This problem can be alleviated if farmers can gather their produce at a certain point for pick up by traders. However, to make this group arrangement possible, an external catalyst is required in most cases. Government extension staff can be considered as good external catalysts. For most traders, even if they are interested in working with smallholder farmers on marketing of the produce, they consider the negotiation and persuasion process with farmers as a time taking and costly process. Therefore, extension people need to undertake the initiative to facilitate this

type of linkage. This linkage requires high level of trust, which, if sustained, may lead to long-term relationship.

**Farmer to retailer:** Large retailers such as supermarkets may not find it in their interest to deal with individual producers, since they need sustainable and regular supply of produce that satisfy minimum quality and food safety standards. Hence, the preference is for large-scale supplies on a long-term and sustainable basis. To make this happen, external organizations such as extension staff and NGOs can help bring small producers together and create the linkage with large retailers. The success of such linkages depends critically on the timely supply of agreed volume, and meeting variety, quality and safety standards

**Farmer to agro-processor:** Inadequate and irregular supply of raw materials is the major causes of underutilization of capacity for many agro-processors. Hence, agro-processors may initiate market linkage with growers to ensure full utilization of their capacity. Extension staff or NGOs working in agricultural development may also facilitate linkages between producers and agro-processors. Farmers can be organized to bulk up produce for collection by agro-processors and facilitate input supply and technical assistance. In addition to the advantages of having secured markets, and the possibility of input supply and technical advice to farmers, the agro-processors usually provide transport for the produce. Farmers may be required to meet certain quality and food safety standards.

An example of linkage between farmers and an agro-processor was observed for honey, where a honey processing company, Beza Mar, collected raw honey from producers in the Goma district, south-western Ethiopia. Another example of such linkage was observed in Atsbi district, in northern Ethiopia, where Dimma Honey Processing collected raw honey from producers.

**Farmer to exporter:** One of the key problems of exporters of agricultural produce face is supply of agricultural products that meet export standards. In most cases, smallholder farmers do not fulfill the requirements of large sophisticated world markets unless interventions are made. This is mainly due to inadequate, human, technological and financial capacity on the side of the smallholder farmers. Therefore, market linkages developed by exporters appear to be essential for continuous success of the export sector in high value markets. In such type of linkages, exporters may help farmers to get organized for technical training, financial assistance or on-farm monitoring. Linkages with exporters often require organizing suppliers. If export standards can be achieved, such linkages can bring high returns to farmers.

Exporters often provide transport, packaging and other market services. On the other hand, export markets involve high risk. An example of linkage between farmers and an exporter was observed by the IPMS project for Kabuli chickpea in the Ada'a district in central Ethiopia, where a pulse exporting company collected chickpea from the district farmers. Similarly, a linkage between coffee producers and coffee exporters was observed in the Dale district in southern Ethiopia.

**Farmer to institutional buyers:** Institutional buyers are buyers such as universities, hospitals, the military, schools and other organizations who are in need of supply of agricultural commodities regularly and sustainably at certain level of volume. The institutional buyers usually initiate linkage with farmers, or the linkage can be facilitated by extension staff or NGOs or cooperatives or unions. Institutional buyers do not usually provide technical assistance or credit, but they can be

sources of secure markets. An example of farmer to institutional buyer linkage was observed in Bure district in northwestern Ethiopia, where cattle fatteners sold to a military camp in the area.

**Farmer to government marketing parastatals:** Governments may establish agricultural marketing boards or parastatals for different purposes. Some governments establish such organizations to stabilize market prices by buying when prices fall and selling when price rise. Other governments establish such organizations to supply food to urban consumers at low prices. Whatever the objective, linking farmers with such buyers remains an option to link farmers with markets. However, marketing parastatals cannot be sources of secured markets as their buying decision may depend on market conditions. Moreover, they have little interest in providing technical assistance, extension services or credit to farmers.

**Linkages through a leading farmer(s):** Lead farmers can be those with the potential to supply large volume of the produce of their own or those who have better knowhow and experience in marketing agricultural produce even though their own produce may not be large. Such farmers coordinate supply from other farmers in their area. The motive of such farmers is not altruistic, but based on expected business opportunities: increasing volume of produce made available for sale may open up new business opportunities. The lead farmer's role emanates from their ability to coordinate a large volume of produce as a result of bringing the smaller farmers on board. Farmers coordinating supply through a lead farmer usually operate as informal groups coordinated by one or a few leading farmers. Such an arrangement increases the negotiation power of farmers because of the volume offered for sale. Disadvantages of this approach include the possibility of the lead farmers pulling out of the venture and delayed payment. An example of market linkage through a lead farmer was observed in Fogera district, north-western Ethiopia, where cattle fatteners sold their animals through a lead farmer.

**Linkages through groups or cooperatives:** Farmer organizations can be informal in the form of farmer groups or formal as farmer cooperatives. Farmer groups can be organized for various purposes, including procurement of inputs, output marketing, or credit services. Similarly the formal cooperatives can be multipurpose cooperatives or specialized marketing, input supply or saving and credit cooperatives. Farmer linkages with markets can be done through multipurpose or marketing cooperatives, or marketing groups. Multipurpose or marketing cooperatives are not new phenomena in Ethiopia. Several examples of well-functioning multipurpose and marketing cooperatives exist in Ethiopia, as are also those that struggle to survive or have collapsed altogether. Farmer groups or cooperatives can be instrumental in securing technical assistance or input supply to farmers. These organizations can also perform several of the marketing functions such as packaging, grading, storing, and sometimes processing. For marketing cooperatives to serve as effective linkages for their members, they need to be business-oriented, independent of political interference, acquire adequate managerial skills, and avoid elite capture.

**Contract farming:** Contract farming is an arrangement between growers and buyers entered into before the production season for delivery of product of certain quality and standards at future time at agreed prices. Contract farming has been practiced for many years throughout the world. The experiences are mixed. While many companies engage in producing raw materials for their own processing, they have often also engaged in contract arrangements with smallholder farmers for the supply of the same raw material. Contract farming has the advantage to companies of overcoming land constraints land avoiding diseconomies of scale which comes as a result of stretching their managerial capacity. Moreover, it is politically friendly as it does not displace

smallholder farmers for investment purposes by companies. However, farmers do sometimes engage in extra-contractual marketing (selling outside of the contract). The need to ensure that production is to the required standard and the task of organizing input supply, technical assistance and timely collection of outputs require considerable human and financial resources of companies.

**Out-grower schemes:** Out-grower scheme refers to schemes where agribusiness has considerable control over the smallholder production process, providing a large number of services, such as inputs, credit, tillage, spraying and harvesting. The smallholder provides land and labour in return for this comprehensive extension/ input package. Hence, out-grower systems are schemes that provide production and marketing services to farmers on their own land. The advantages of out-grower schemes include that working with small-scale farmers overcomes land constraints faced by companies, purchase can be more reliable and sustainable while the company faces less risk by not being responsible for production. Moreover, more consistent quality can be obtained. However, adequate research, staffing, finance and management skills may be required. Poor management and lack of consultation with farmers may lead to farmer discontent and results in a long and expensive learning process for the firm. There is also the risk of farmers selling outside the arrangement and diverting inputs into other purposes.

Generally, proposed irrigated crops basically require appropriate and defined marketing system and value chain assessments as described above. The defined marketing system may be expressed as a chain, all the way from the farm gate to the consumer, involving the physical exchange of products and inputs, the implementation of rules and regulations governing quality standards, and the exchange of information and marketing. The marketing expert or socio-economist should find the proposed crops, volume of scheme production at optimum and find or proposed possible market outlet or market linkage as indicated in the Table below.

**Table 5-2: Possible Market Linkage and Market Outlet for Proposed Crops**

| No | Proposed Crops | Unit | Scheme Production at Optimum | Possible Marketing Outlet |
|---|---|---|---|---|
| 1 | Maize | Qt | | |
| 2 | Onion | ,, | | |
| 3 | Pepper | ,, | | |
| 4 | Sweet Potato | ,, | | |
| 5 | Tomato | ,, | | |

Similarly, the **Main Marketing Channels and Market Networking** extend from producer to consumers through different trade actors located in different centers such as assemblers, retailers, wholesalers, agro-processing enterprises, cooperatives, unions and institutions. The flow of products starts from the site or project level to primary, secondary and tertiary market centers as indicted in the Figure below which will be developed using GIS software.

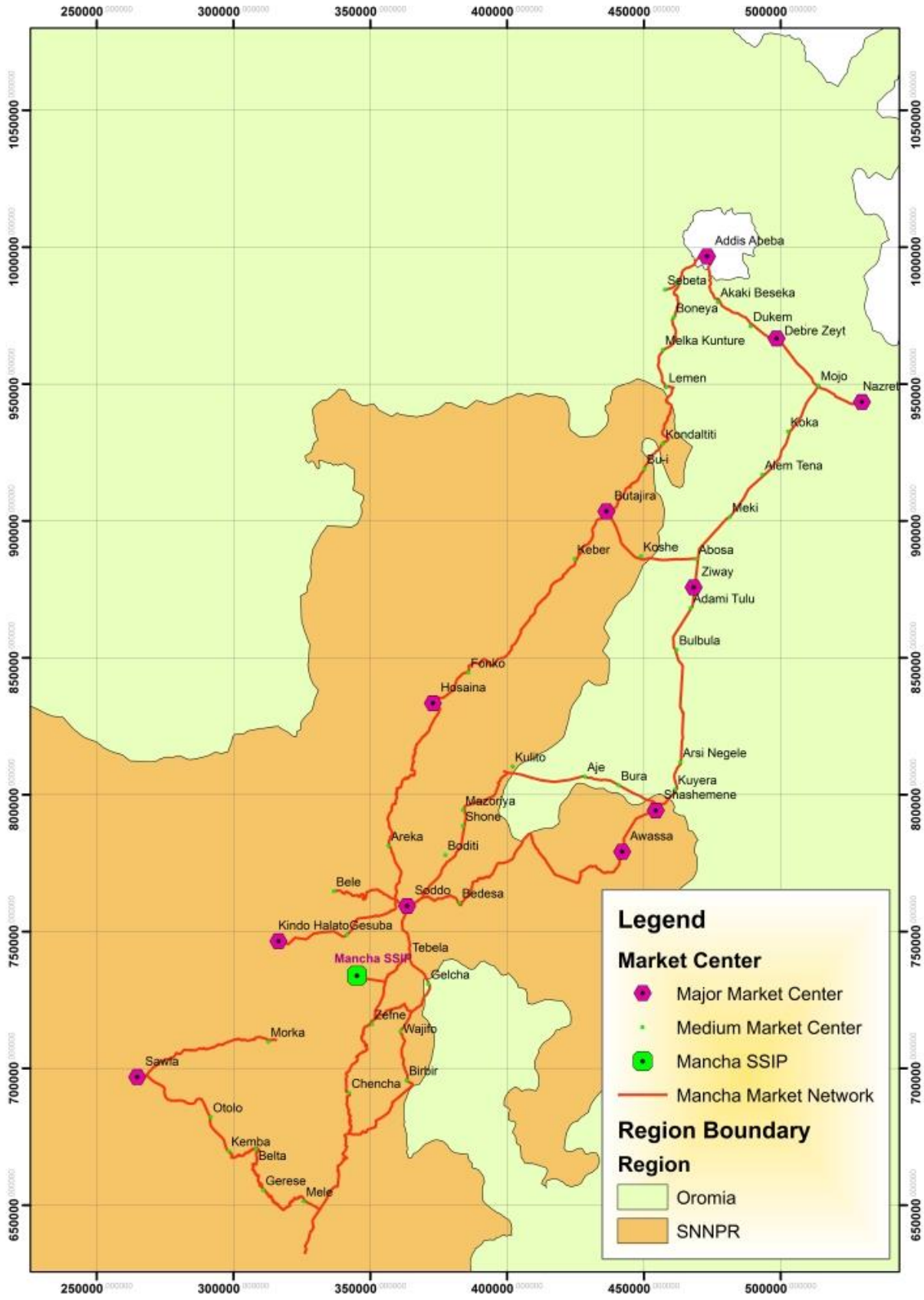



**Figure 5-1: Example of Main Marketing Channels and Market Networking for Mancha SSI**

## 5.2 AGRI-BUSINESS DEVELOPMENT

### *5.2.1 General*

Agri-business development is one of the basic project aspects that have to be considered in the study of the command area. Agribusiness is the business of farming, which includes the production, processing, value adding and supply of agricultural goods and services to the users and markets. Agribusiness also encompasses a business of farming equipment, machinery, chemicals, supplies and related services, which supports the irrigated agriculture.

In the assessment of agribusiness systems development the size of the agricultural land (command area) and year round crop cultivation possibility is the leading opportunity to create an agribusiness which can easily compliment irrigation project. Input supply, technical support and output supply services could easily be integrated and feed each other. The size of agri-business in the project area could encourage the creation of big service markets and supply chain to potential buyers and distributors who can network and establish sustainable production and business environment. Primary cooperatives, unions, wholesalers, private business agents, marketing share companies, agricultural input and output marketing agency are the major actors to be involved in domestic and export market of irrigation scheme products. Agricultural primary cooperatives, unions and private sectors are also providing important agricultural machineries and implements, renting of cool storage and transport facilities services that might beyond the reach of individual smallholder's farmers.

In the feasibility study and detail design of an irrigation project the socio-economist could assess a wide range of agribusiness activities or options of agri-businesses and some of the possible agribusiness includes:-

### *5.2.2 Agricultural Inputs and Improved Technologies Supply*

It is one of the most significant agri-business recommendations in most of Irrigation Project area through primary cooperatives and cooperative union. The business includes the purchase and supply of wide range of agricultural inputs such as improved seed, fertilizers, chemicals (herbicides, insecticides, pesticides & other), farm implements and chemical sprayers to the agricultural communities (irrigators), whole sellers, retailers, distributors, private investors and P.L.Cs around the project area. It is also possible to supply the inputs and technologies to the direct project beneficiaries; adjacent woreda rain fed agriculture producers, out growers, state farms, other primary cooperatives, retail shops, whole sellers and distributors in many areas of the region through primary cooperatives and cooperative union. The expert should also assess the project profiles, cost estimates, marketing aspects and implementation strategies.

### *5.2.3 Purchase and Supply of Agricultural Grain (Produce)*

It will be one of the important agri-business assessed and will be recommended in most of irrigation project area. The agri-business activities will be managed and controlled by the common interest groups (CIG), primary cooperatives/unions and individual farmers. This business will purchase and supply raw agricultural products such as cereals, vegetables, pulses and root crops to the existing agro-processing plants, big consumers (hospital, universities, supermarkets and hotels) located in the local big towns and export markets. The socio-economist should assess the possible market area and the existence of potential for export of vegetables, fruits and pulses to neighboring and Middle East other countries.

The primary cooperatives and union can also purchase different crops and supply to retailers, whole sellers, distributers, agro-processing plants and export markets. In order to facilitate such types of business facilities warehouse, collection and distribution centers should be assessed. The project profiles, cost estimates, marketing aspects and implementation strategies should also be investigated during feasibility study of the project.

Similarly, farm mechanization rental services, farm tools and machinery maintenance workshop (Garage), fattening of animals, dairy farming, animal health service provision, animal feeds processing, fish production and marketing, multipurpose consumers' business center and saving and credit enterprise are also the possible agri-business development areas that needs detail assessment in the feasibility study of an irrigation projects. The produce and sell of honey, beeswax and other bees' products both in domestic and overseas also needs assessment as one area of agri-business activities.

### *5.2.4 Rural Youth Multipurpose or Common Interest Groups (CIG) Enterprise*

Currently, there are an increasing number of rural youth in an Irrigation and Watershed Management Project area. Rural unemployed and under employed youth farmers in the command area will have a potentials and opportunities to organize themselves in to rural youth multipurpose enterprise or **Common Interest Groups (CIG)** who can actively participate in the production, services delivery, marketing and related areas that support the irrigation production and marketing systems. The rural youth also one of the most important sources of skilled and unskilled labour service giving sources for the production activities of most irrigation project. Similarly, there are TVET, College and university skilled graduates in the rural area and these youth can have an opportunity to organize, establish and participate in multipurpose projects in the command and upper catchment area activities. Some of the activities that have significant potentials and opportunities for rural youth include: Catchment treatment, seedling production, development and marketing, construction and operation services, maintenance services provision.

Moreover, small and micro enterprise organization and development will be one of the significant options for agri-business development leading to commercialization and industrialization in and around irrigation project area. In this respect, there are known business and enterprise development specialization area, namely: Urban and semi urban agriculture, textile and garments, food preparation, wood and metal works and services provision area. Agriculture based small-scale and micro-enterprise includes modern dairy development, apiculture promotion, poultry farming, forestry (seedling preparation), fruits and vegetables, fodder and concentrate preparation and modern irrigation development. Therefore, rural youth will have a wider option and alternatives to involve in small scale and micro-enterprise or agri-business development, which should be assessed by the socio-economist in the study and design stage of an irrigation projects as a synergy to SSID.

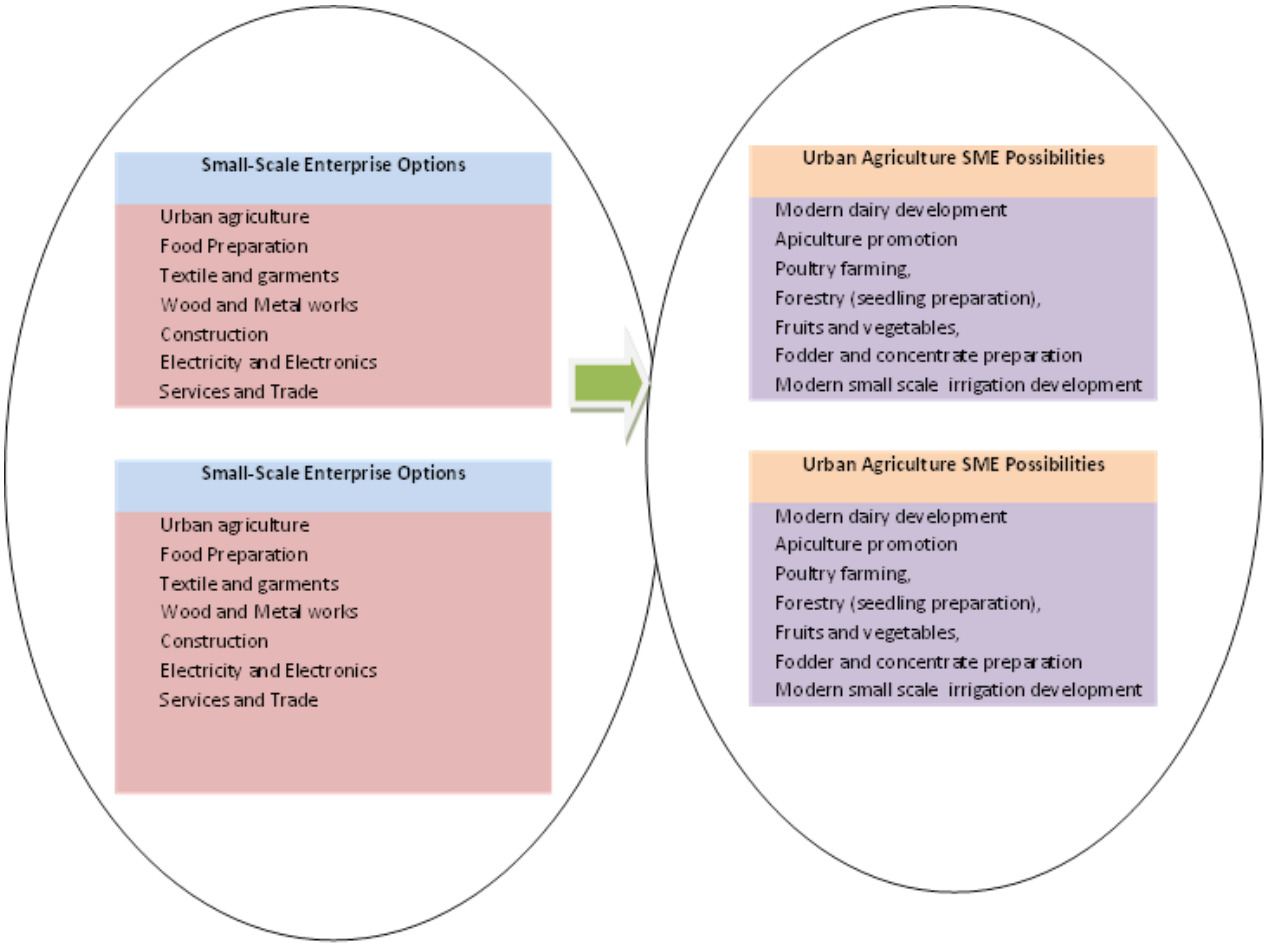



**Figure 5-2: Small scale and micro enterprise development options for rural youth groups**

### *5.2.5 Women Multipurpose Enterprise*

Women shall be organized in to women multipurpose enterprise and involve in several household, backyard and village centered agri-business such as seedling production, small ruminant production and fattening, poultry, dairy, cottage industries…etc.

Women can start with traditional food Value Adding Practices: - this may use local products such as pulses, red pepper, barley and oats, vegetables such as garlic and onion to produce traditionally processed food staffs and value added products traditionally called 'Baltina' products. Women and young girls can be organized in to micro and small scale industries or agri-business and facilitate to produce the different Balitnas. The experience in larger towns of the country indicated that there is a good local and export market potential if well linked to local and international traders, these opportunities should be assessed during the study and design stage of an irrigation projects.

Moreover, in recent years the sale and even export of traditional processed products has gone far from home-based production to large scale processing firm, from local market to international market, from limited number of products of one or two brands to a number of brands. This is an indication that this can be expanded from limited urban areas to rural women with limited resources such as landless women, widows and even others. The export series data needs detail potential assessment that, different ''Balitina'' types and marks are export possibilities to USA,

Australia, Middle East, South Africa etc. where Ethiopian Diasporas are living and fetch Hard currency.

Pulses, cereals and some vegetables could be handled using traditional means assisted by training and quality control mechanisms individually or in organized form. Later on the women can also expand the business in to other ventures.

From pulses it is possible to prepare what is called in Amharic ''Shuro'' in various forms ('mitin', blended with many other pulses and with spices). From red pepper it is possible to prepare grinded and finalized, will processed and packed ready to use known as ''berbere''. From lentils and field peas it is possible to prepare 'Kik'. From onion during excessive harvest and where there is market problem, it is possible to dry, grind the onion and mix with some spices to prepare what in some area is called 'Mekelesha', a product of onion used in grinded form to make 'Wat". It 'can also be prepared from 'garlic' mixed with different spices. Several other product can also be prepared a mixed of vegetables and spices. From grains such as barley and wheat home based products such 'Kolo', 'Bikil' (product used to prepare various local drinks (alcoholic and nonalcoholic); ''beso'', ''Ambasha'' and so on can be prepared and sold in supermarkets or given to wholesalers and retailers. Fresh fruits and vegetables juices can also be prepared, in various forms and serve visitors, tourists, and travellers.

All the above cottage business can best be done by organized women in the project area, specially the unemployed youth, the landless and so on. However, it may be necessary to organize them in to CIG or cooperatives, train, supervises and build their capacities from time to time so as to supply quality products. The products can be supplied to rural and urban retail shops and distributors in other areas of the country. Once again they can directly supply to big consumers like universities, hospitals...etc. through contract arrangement. Important of all, the product has to be quality assured certified, standards given, licensed under sole trade mark, packed and promoted. Roadside retail shops may be used to sell and introduce the products to travelers, tourists which will help gradually to widen their markets. Therefore, the socio-economist in his study should assess the possibilities and potentials of all-round agri-business developments and recommendations in the particular irrigation project sites.

The socio-economist also has to assess the organization and management of agri-business, cost estimate, fund sources, business plans, implementation strategies, schedules, monitoring and evaluation modalities with respect to the existing situations.

## 5.3 FINANCIAL RESOURCES, SERVICES AND CHALLENGES

Farmers (producers) and traders are influenced by their financial capacity in their planning, implementation and volume of activities they perform and handle. That is, the availability, adequacy of financial sources especially for small-scale cereals, pulses, fruit and vegetable producer and traders in the project area should be assessed. Therefore, in the assessment financial services should be identified as critical enabling factor for sustainable farmers' and private sector participation in marketing and agribusiness activities.

Assessment of existing informal and formal financial institution in and around the project area should be conducted.

***Informal Financial Sources: -*** The informal financial sources include private money lenders, resource full farmers, middlemen, neighbors, friends, relatives and traders existing in the project area. In this assessment the lending capacity, collateral requirement and interest rate on such loans of the informal sectors should be well identified.

***Formal Financial Sources: -*** The formal financial sources incudes micro-financial institutions, saving and credit Cooperatives and Unions, government and private banks, NGOs, Input Suppliers and Agricultural and Natural Resource Offices. These institutions should be assessed with respect to:-

- The types of loans or business or activities they provided (for what purpose)
- Their ultimate target clients and accessibility to the clients
- Their lending capacity (financial & technical capacity)
- Allowable lending limits/ credit ceiling (the minimum and maximum lending capacity)
- Their collateral requirement (fixed asset, individual, team/ groups, cooperative & business organization collateral)
- Loan handling systems and their length of supply chain
- Their interest rate (minimum and maximum)
- Loan repayment periods,
- Deposit levels
- Penalties for Arrears

Specially, Rural Saving and Credit Cooperatives (RUSCO) and multi-purpose cooperative unions are community based organizations, established to mobilize rural financial resources from their members and assist farmers in their production, marketing and agribusiness activities. In these cooperatives there are mostly limitations of financial capacities to provide their members as their demand. However, these, cooperatives in the future are the most and possible sources of finance for producers, youth and women group members for irrigation production, marketing and agribusiness activities. In the assessment, the member's saving habit, saving capacity and saving purpose should be seen in detail.

The financial resources and services challenges of small-scale producers and traders in and around the project area should be identified and assessed well. In these respect the major focus area of the challenges could be:-

- Interest Rates
- Farmers Knowledge about credit
- Acceptable collateral
- Debts
- Natural Hazard on Farming
- Financial Capacity Limitation of Lenders

# 6 BASIC SOCIAL SERVICES AND PUBLIC INFRASTRUCTURES

The major items that need to be investigated are water supply, health, education, CBO, public supporting institutions, and transport and communication infrastructures, energy and current rural electrification coverage, Market centers, religious and community service centers etc. of the SSIP area. Brief discussion on the major ones is as follow.

## 6.1 WATER SUPPLY

Water supply aspect is one of the basic project components that have to be considered in the study of the command area. The data required for discussing the water supply aspect is types, and number of water sources for drinking, cooking, washing, sanitation and livestock watering purposes; yield levels of the sources; quality of the water; water charges if there are any; future programs; distance of water sources in terms of distance and round trip walking distance, responsibility of water fetching tasks between male, female and children; the capacity of the water sources to fulfil established daily water consumption rate standards; water supply coverage; means of water transportation; types of storage & transportation containers. Using the projected population, annual level of water supply and demand would be done.

The data and information serves to discuss the water supply and sanitation conditions of the command area. On top of these, the existing water supply conditions helps for situation analysis of demand and supply situation and to provide recommendation to fill the gap if there is any. It also shows the possible sources of water that could be used during project construction. The data is required to recommend additional water supply points for human and livestock consumptions from the irrigation water. The recommendation includes the locations of the proposed water sources to be built on the irrigation structures. The data would be used by the engineers to design water supply schemes for the community. The source of data and information for water supply aspects are mainly the wereda office of water as well as focus group, health office and development agents of kebeles.

## 6.2 HEALTH SERVICES

The identification of health services in and around the project areas and importance to alleviate health problems together with constraints and remedial measures have to be discussed. Health services are provided at kebele levels and the project under study couldn't have existing institution only for itself alone. In the study, give the name of health services together with higher health services where patients beyond their capacity got treatment, number of and name of kebele served and the number of people served and the status of health coverage; number of health professionals; types and number of treatment rooms; lists of problems faced by health institution such as medical, equipment and staff shortages.

The prevailing types of the ten top diseases, the number of health cases and Infant and Child Mortality of the project area have to be identified. In addition, the types of diseases that are handled by the health institution including with respect to family planning aspect should be identified and discussed. Contribution of health services for the project during the periods of project implementation and operation phases; and limitations to expand its scope of services if there is any requires to be identified. In addition, remedial measures to alleviate the problem and to capacitate the service should be provided with estimated costs. The recommendation includes responsible bodies for improving the health status as well to cover the required improvement and

upgrading costs. The main responsible body for this is regional Bureau of Health through its wereda level health office. As the availability and capacitating of health institutions greatly contributes for the productivity of the beneficiary farmers, the implementation of recommended measures should be taken as part of the project component interventions.

Specific information for the specific project sites may not be available. In such cases, the information of the kebele level at large has to be collected and estimates for the project areas have to be provided by the expert in close collaboration with the health services. Data and information for the health services should be collected from the health institution of the kebele from which the project is located.

## 6.3 EDUCATION

The study should evaluate the importance given by the society for the education sector. Besides the extent to which the people relates the success of the project with education has to be discussed. The readiness of the people to educate themselves as well as to send their children to schools has to be discussed. In this respect, data and information has to be collected regarding schools, students, teachers, encountered problems and recommendations.

Grade levels and types of schools including adult education and water supply & sanitation facilities; its future plan; the places for higher education levels; the number of students with gender classification and their annual growth trends; the reason for gender based number of differences of students if there is any; and dropouts, the reasons for dropouts such as financial problem, marriage and also other reasons; attitudes of the community towards the importance of education for male and female students; the measures taken by the schools such as the provision of materials free of charges and awareness; to minimize the percentage of the dropouts, have to be collected and discussed.

## 6.4 ASSOCIATIONS, INSTITUTIONS AND SERVICES

**Gain mills**: Availability of grain mills within or near to the project command area, number and types, charge rates, its contribution for the project workers during project construction; their roles in processing project outputs; and possible future plans are the major points that should be discussed.

**Financial institutions and access to credit**: Names of financial institutions that operate in and around the project areas such as Busa Gonofa and Wisdom in Oromia, ACSI in Amhara, OMO in SNNPRS and Rahwa Saving & credit scheme & Dedebit Micro-finance institution in Tigrai; the types of loans provided for the farmers such as for purchases of oxen and farm implements; the conditions of loans i.e. interest rate, collaterals, loan repayment periods, deposit levels , credit ceilings and penalties for arrears; has to be discussed. In addition, attitudes of the people towards the conditions of financial institutions need to be discussed. The beneficiary farmers could require the provision of credit facilities to finance their input requirements during project operation phase. In this respect, the readiness and capacity of the institutions to assist the farmers in getting short term loans to cover their operating costs has to be part of the study. The source of data and information to accomplish these mentioned tasks are wereda level micro finance institutions, wereda & kebele level office of Agriculture and the community through focus group and kebele level discussions.

**Farmers training centres**: The assessment of training center should show the achievements of the available centres of the kebele in assisting the farmers as well as the role to be played specifically during the operation of the project. In this respect, the availability, capacity and plan of the centres has to be assed in terms of their contribution for the project. The points that have to be addressed are name, location and accessibility of the center; types of training courses; number of trainers; available facilities of the centre; recommended training courses for the famers of the project area; and constraints and recommendations. In related issues to the project area, the recommendation should also have estimated cost with its source. The sources of data and information for assessing the training centers are the wereda office of Agriculture.

***Agricultural extension* services*:*** The study should discuss the role actually played and recorded results achieved by the services in promoting agricultural development and increasing crop production. This helps to identify limitations faced by the services and to recommend measures that have to be taken to improve their level of services. The types of the services include development workers assigned by the office of Agriculture and universities and research centers found around the project area. Assessment should be done regarding the responsibilities and focusing area of the centers; number of staffs and area of involvements; coverage of people by extension service; exhibited changes by the farmers; and limitations if there are any. The study should recommend how to make use of the services when the irrigation project becomes operational. The recommendation should provide estimated cost and responsible body for implementing the recommended measures. The sources of data and information for assessing the training centers are the wereda office of Agriculture.

**Veterinary services**: The contribution of availability and proper functioning of veterinary services contributes much for the places where there are livestock populations. Among other things, crop production of the command area depends on the availability of healthy and strong oxen. Thus, the study collects and discusses the status of available veterinary services and their contribution for the project. The analysis requires collection of name and location of the service found within the project kebele; the number of staffs; regular tasks of the service including vaccination, treatments and training; availability of working facilities and offices; constraints and recommendations including cost to strengthened and capacitated the service so that they could provide required services to the people of the command area. Data and information for analyzing veterinary services is to be collected from the wereda office of livestock.

**Archeological, historical, and mineral sites:** The study should investigate availability of archeological sites within the command area as well as within the places of different project components. if available, adequate information with respect to names, actual locations, its background history, and if it is movable estimated replacement cost with lists of activities to be performed have to be investigated. The places could also be important due to historical events undertaken within it or due to special importance attached to it by the community. The availability of identified mineral resource places that could be affected by the command area as well as by different project components have to be assessed.

A project should be implemented in a place which is free from those factors or else should be implemented after remedial measures are being taken in consensus with concerned project participants. The kebele, the community and Culture and Tourism Office of the wereda will be responsible to provide this information. The study should have confirmation letter from kebele

administration offices, wereda level Culture and Tourism Office and also consultations minutes of meetings with the community.

**Energy supply**: The place of project places as source of energy supply from wood plots, charcoal, animal by-products and crop residues and how the implementation of the project would change the sources of energy supply by adopting new technology on area of energy consumption such as use of bio gas plants and cooking stoves for their home consumption.

**Telecommunication: -** Telecommunication is one of the inputs required for ease of communication in the project area. The availability of mobile telephone service, internet, full time network availability, the issues and challenges with the existing telecommunication services should be assessed and indicated explicitly.

# 7 CROSS CUTTING ISSUES

## 7.1 GENERAL

Nowadays cross cutting issues such as gender and youth, nutrition, HIV/AIDs, environment, vulnerability and the issue of disadvantaged groups are getting significant attentions and focuses by government, different development partners, funding organizations and international communities. In this respect the assessment of issues, opportunities and challenges that address the cross cutting issues shall be mandatory. Therefore, the socio-economist in his/her feasibility study stage of an irrigation project should collect primary and secondary data, conduct consultation, key informant interviews and focus group discussion on the issue of gender and youth, nutrition, HIV/AIDs, environment, vulnerability and disadvantaged groups. Based on the existing available data the socio-economist should carry out the data analysis and propose possible recommendation.

Moreover, the expert should strategically assess the way and plan how these groups could assist the implementation and development of irrigation project and also how could they will be benefit from the multiplier effect of an irrigated agriculture. The socio-economist should assess the issues accordingly as:-

## 7.2 GENDER

In the feasibility study of an irrigation project the socio-economist should see and investigate the equality of men and women in the project area, which can be seen the role of women and men in agricultural activities, in community decision making process, in assets possession or resource ownership, access to different social services, traditional practices that hinders women participation and the participation of women in Community based Organizations. Similarly, the role of women in future irrigated agricultural activities, opportunities and challenges that face women headed and widow household should be assessed.

## 7.3 YOUTH GROUPS

It is obvious that, youth represent a large and diverse category of people who face their own particular constraints to improve their livelihoods. The category includes both young female and male who have left school but remain living with their parents, relatives or alone. In the youth groups assessment the socio-economist give focus and assess the role of youth in agricultural activities, employment, unemployment and underemployment situation of youth in the project area, the role of youth in community decision making process, in resource ownership, access to different social services, traditional practices that hinders youth participation, the participation of youth in Community based Organizations (CBO), the role of youth in future irrigated agricultural activities, opportunities and challenges that face youths. Similarly, the assessment also looks in to the possibilities and options of organizing youth groups together to improve their livelihoods irrespective of their sex. Possibility of organizing youths in to common Interest group (CIG) should be studied and planned

## 7.4 NUTRITION

In the study of SSIP the socio-economist should assess the existing nutritional status of the community, the existing gaps, and challenges and propose the contribution of the project recommended crops and vegetables in promoting the nutrition status of the project beneficiaries, especially women and children. Moreover the study shall be assessed to how to bridge the gaps.

## 7.5 HIV/AIDS, STD AND OTHER TRANSMISSION DISEASE

Adverse human health occurrence and impacts especially those communicable diseases such as HIV/AIDS, malaria, STD, are concern of existing community and also concern during the project construction and operation phase due to influx of construction work force to the project area. In depth assessment of the occurrence of these diseases are very necessary and the socio-economist in consultation with the study crew, project beneficiaries and existing health institution should propose mitigation measures. Consultation with project area health office should focus on who will be more affected, mitigation measures, strategies and resources requirements.

## 7.6 ENVIRONMENT

Environment is one of the basic cross-cutting issues and assessment of existing natural vegetation in the project area is mandatory. The socio-economist in consultation with EIA expert during feasibility study should conduct trend analysis of the existing natural vegetation cover, indigenous trees and habitat of wildlife, land use pattern, the effect of irrigation on aquatic environment, pollution, soil erosion and land degradation. Positive and negative impact of the irrigation project on the existing environment and its mitigation measures should be assessed during feasibility study of the project.

## 7.7 VULNERABILITY AND DISADVANTAGED GROUPS

These are the susceptible groups of people or segments of the community that needs special attentions and considerations. These valuable and disadvantage groups of people are parts of the community and therefore, a person or groups with these problems should be identified and consulted in field study. The lists of those groups or persons with their sex and age distribution have to be summarized and be provided. The status or basic reasons of those groups focus at household level and population level at large. The study at the end should provide recommendations for these persons and the study also has to show how project benefit these groups of people in the project area at large.

# 8 DEVELOPMENT POTENTIALS, CONSTRAINTS AND OPPORTUNITIES

## 8.1 GENERAL

The development potentials could either be related with the project or may relate to other development potentials which can affect project implementation. Out of the types of economic activities which affect the project implementation relates to existing or planned economic activities which share or utilize project resources as discussed below.

The project has to be implemented in a place where competitive use of resources projects /activities does not exist. Even if it has to be implemented, the exact status of investment activities has to be clearly identified and distinguished. The availability of such information and analysis helps to make comparisons and/or decisions before incurring additional resources on either side of projects. In this respect, the following activities will be performed to examine the availability of such projects over the proposed project areas.

Ongoing/Planned investment activities can affect the entire project or part of the project components. For example, there could be ongoing or planned extraction of quarries on the proposed quarry site of SSIPs. Similarly, the command area could be proposed for other private or governmental development programs or the places could be demarcated as forest reserve areas. In this respect, identification of such investment activities should be carried for each components of the project.

Identification of ongoing /planned investment projects over the different project components should be identified. Once the existences of such activities are identified, the following study aspects should concentrate on the different aspects. Few of these points are Owners and licensing agencies, the start and end periods of projects, the purpose and major outputs of projects, recommendations and comparison between the ongoing/planned Investment Projects and the implementation of SSIPs. If the comparison shows makes the implementation of the SSIPs feasible, required compensation costs to remedy for compensating the invested costs on planned /existing investments has to be estimated.

The sources of information for the identification of investments are kebele administration office, development workers, focus group discussions, key informants, and public & wereda level officials. The wereda and kebele level administrative councils will be consulted on this and other issues. Once investment activities are identified, consultation with the owners of investments as well as with the licensing agency has to be conducted.

## 8.2 POTENTIALS AND OPPORTUNITIES

The potential and opportunities identified and conducive means to utilize have to be formulated. These are but not limited to;

- Strategies, policies and National and International plans like GTP, SDG
- Availability of budget and Fund
- Availability of Water, Land resources
- Technical and management capacity of planning and implementing stakeholders including private sector

- Provision of Input and technologies
- Market system both local and international
- Others to be identified by the study team as specific to SSIP and appropriate in the area

## 8.3 CONSTRAINTS AND THREATS

SSID have inherent internal and external constraints/threats. These have to be identified and mitigation measures formulated during study, design and implementation. The min constraint in SSID is lack of/insufficient community participation. Insignificant participation of stakeholders has also a constraint in SSID. The study team has to identify other constraints and threats in SSID development specific to the SSIP area or the scheme as appropriate

# 9 SOCIO ECONOMIC IMPACTS OF SSID AND MITIGATION MEASURES

The part of the project which results in positive and negative impacts have to be identified. The Project places that affect properties such as headwork, quarry sites, camp sites and main access roads as well as places that benefit the people which are the command area should be clearly distinguished. Along with these broad classifications, the possible negative impacts within the command area as well as positive impacts within the places of other project places should also be identified.

To the extent possible, the socio economist has to advice project designers to select camp sites to be over communal lands. Besides, the expert has to make consultative meetings with the kebele administration council, the people and wereda level officials to secure land in these places if such places are available at common places. The places could also be located nearby within the premises of the kebele administration office if sufficient space is available and agreement could be obtained from responsible bodies of the kebele and wereda. For securing the place, the socio economist has to play important and leading role in making the responsible bodies to agree on the idea. It has to explain to them that the place will be used as an office for the water user association after the construction of the project is completed. If on the other hand such places are not available, the socio-economist has to record all available permanent assets situated over it.

Similar advice and suggestion has also to be provided for project engineers that access roads and main canals shouldn't affect permanent assets specifically residential houses found along the routes. It should advise that the design should change its route wherever there are assets to be affected, if not however possible to change the route, full asset inventory has to be recorded.

The purpose of registering the assets is not necessary to provide cash compensation for all of the lost assets. The issues of compensation are to be settled through the known legal system of the region under consideration. The people could also have self-compensating mechanisms in order to implement the project within their places and this has to be accounted as one part of people's contribution in covering part of initial investment costs. The other similar mechanism is that people could forgo their assets for the project without asking compensation for the damage by considering benefits which very much exceeds the level of the existing forgone benefit. However, careful review of prevailing laws as well as consultation with the people of the command area, the affected people and the kebele administration office including wereda level officials is crucial.

With this understanding, the socio economy study has to register through census survey all assets and properties that could be affected. The expert should define the purpose of registration from taking legal background and community & partners' perceptions into consideration. The purpose could be to estimate the extent of people's contribution in covering initial investment costs or providing cash compensation to project affected properties.

After the recording affected assets, the next step is estimation of replacement costs.

**Method of Valuing Replacement of Affected Houses**: The replacement cost has to be taken for estimating the value of affected houses. This refers to the gross current replacement cost which is defined as the estimated cost of erecting new building having the same gross external area as that of the existing with the site works and services on similar piece of land. In this method, allowances for depreciation are not considered. Secondly, those houses that some portion of it will be affected are assumed as if the entire gross house size will be affected. The estimate of the houses will be done on the basis of available materials to replace houses. For houses built with grass roofing, the cost will be by CIS roofing if grass is not commonly available in the surrounding areas. Otherwise, their replacement will be made using similar type of construction material per the original house. The residuals of the original assets are to be given to the affected households. Moreover, compensation is to be estimated for psychological inconveniences and asset damages during transfer. Responsible body for the construction of houses is the wereda level office of Agriculture.

**Compensation for Loss of Crops**: It is required to explain that land belongs to the public and the government which can be used for development purposes and certain project lands could also be used only at temporal levels. It should show that places of quarry sites will be used for temporal terms and will be returned to previous landholders after extracting required materials from it concluding that compensation doesn't seem to be required due to these reasons. Regardless of these facts, the expert has to estimate monetary compensation for households whose lands will be taken /affected by the project. In order to do this, the expert should justify why estimating compensation is required.

The use of compensation has to be justified from the fact that it is used to replace forgone output but not the land itself. Quarry sites are required to be compensated due to the fact that the top soil could be affected by the project activities and the land may remain un-productive for unspecified period of time. In addition to this, the camp sites remain under the ownership of IWUA for the sake of administrating irrigation scheme. Therefore, regarding the agricultural lands that will be taken/affected by the project, it is advisable to consider that people found on those areas would be affected permanently thus requiring compensation.

The valuation of compensation will be done by taking different types of crops grown in the area and on farm gate prices. The types of crops grown, land proportion of each crops, crop area in ha, yield levels, farm gate prices, gross income per ha and gross income of the given land proportion will be calculated. The result represents the level of gross income for crops grown in the projects area and its produce from a given hectare of land.

**Table 9-1: Gross Annual Income of Farmers per ha of Land**

| Project Component | Type of Crop | Land Proportion in percent | Crop Are (ha) | Yield (qt/ha) | Yield (qt/crop area) | Farm gate Price (Birr/qt) | Gross Income/ha | Gross Income (Birr) |
|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4= 3x1ha) | (5) | (6=5x4) | (7) | (8=6x7) | (9=8x4) |
| Command Area | | | | | | | | |
| Head Work | | | | | | | | |
| Main Canal | | | | | | | | |
| Camp site | | | | | | | | |
| Pond sites | | | | | | | | |
| Access Road | | | | | | | | |
| Total | | 100% | | | | | | |

The production of crops is possible only through the application of different types of inputs ranging from human labor up to the application of modern inputs. Therefore, the expert has to identify major inputs and expenses of farmers required for one ha of land by taking one representative crop which require minimum inputs.

| No | Input Type | Unit of Measurements | Input Requirement per ha of land | Average Unit Price | Total Price |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6=4x5) |
| | | | | | |
| | | | | | |

By deducting the input estimate from a gross income of the farm lands, the result is the net income that can be obtained from one hectare of land.

**Table 9-2: Average Annual Net Income from a ha of Farm land**

| Project Component | Crop Type | Average Annual Gross Income (Birr/crop area) | Average Cost of Production(Birr/crop area) | Average Annual Net Income (Birr/crop area |
|---|---|---|---|---|
| (1) | (2) | (3) | (4= Crop Are (ha)x Total Price) | (5=3-4) |
| Command Area | | | | |
| Head Work | | | | |
| Main Canal | | | | |
| Camp site | | | | |
| Pond sites | | | | |
| Access Road | | | | |
| Total | | | | |

The total average annual net income is then estimated at the compensation rate which is equivalent for the loss of 10.23 years' net income.

For a stream of net income ($x_1$) accruing in each year (t), the Present Value (X) is given by applying the planning discount rate (i) over infinity.

$$X = \sum_{X=1}^{\infty} \frac{x^t}{(1+r)^t}$$

This is a finite sum because the net income will not have a growth rate as high as the discount rate over any longer period. The present value of the above formula can be reduced to the following formula.

$$X = \frac{x_0}{r}$$

Where

X= Net Present Value

r= the discount rate

The current discount rate of the country is 10.23% and by applying the above formula, the net present value can be calculated by dividing the average annual net income from a ha of land by the stated discount rate. The above formula is equivalent to 10.23 –year income from the products and therefore, the net income forgone has to be multiplied by 10.23.

**Compensation for Perennial Crops**: - Regarding the compensation of stream of future incomes that can be obtained from the sale of the products of fruit bearing trees, the present value of delayed annuity is calculated in two steps. The first step is to compute the present value of the annuity at the date that annuity is started, while the second step is to discount that value to some other date. The discount rate of 10.23% has to be applied for the computation. In the estimation, it has to be assumed that all trees are at their seedling stage and thus establish uniform rate for similar type of trees without considering the benefits which are already received by the owners. The types of data required for the estimation are as follows.

The required basic data to be collected and estimated are the length of time required for the specified tree to start giving yield after its seedling date, annual quantities of production that could be collected from one parent trees including from its copy stems, and unit farm gate price of products. The next stage is to calculate the present value of the streams of future incomes from one parent tree using present value of delayed annuity method. The applied discount rate to be used is the standard 10.23% discount factor of the country.

As an example, banana tree starts giving yield after 1 year of its seedling time. As A total of 200 banana fruits could be collected per year from a given parent tree and its copies and the farm gate price of one piece of banana is assumed to be sold at a rate of Birr1. Thus, present value of delayed annuity from banana tree could be calculated as follows.

$$P = A\ X\ PVA(10yR, 10.23\%)$$

$$A = \frac{(1+i)^n - 1}{i(1+i)^n}$$

$$Birr1{,}217/Banana\ Tree = Birr200\ X\ 6.084322$$

The socio economist has to recommend that all of compensation have to be effected prior to the starting of civil works.

The implementation process of compensation and responsible bodies to implement the plan have to be provided together with implementation budget and schedule. Besides, grievance redress mechanisms have to be provided.

# SSIGL-9 B: COMMUNITY PARTICIPATION AND ORGANIZATION

# 1 COMMUNITY PARTICIPATION

## 1.1 OVERVIEW AND PURPOSE

Participation of project beneficiaries and community become the basic requirement for any development project identification, planning and implementation. The participation of the beneficiaries (resource owners) and stakeholders at all project stages is indispensable, particularly in smallholder managed irrigation project to secure sustainability of the project in resource utilization and lifetime management.

In this case, the communities have enriched local knowledge and skills to contribute in technical, social, institutional and environmental studies. The communities by themselves and through their representatives have to be allowed to involve in idea generation, site identification or confirmation, physical resource assessment, social and environmental assessments and watershed studies to enrich the study outputs and being part of the study team.

Currently, participatory development paradigm has increasingly been associated with people and their aspirations to make decisions affecting their own future lives. Central to these aspirations, their desire to plan and participate in the identification, planning and management of their needs without outside prescriptions is the basic issue. Community participation in project planning and management is essential in enhancing development at the basic community level, a critical tool and sustainable or influences development and a foundation for national development. This also promotes equity, legitimizes decision-making processes, builds consensuses, strengthens self-determination and predisposes people toward a more self-governing behavior and sustainable development.

Similarly, Irrigation development project, which enable to increase the frequency of crop production, household income, helps to produce sufficient outputs for the fast growing population, raw materials for industry, increase commercialization and youth employment, needs community consultations and participations for the smooth operational and sustainable functioning of the project.

Thus, Community Consultation and Participation on irrigation development project generally focus on users' participation and willingness at different project stages, rules and regulations regarding operation of irrigation systems, questions concerning systems management, and the role of markets. One evident observation is that smallholder managed irrigated agriculture cannot be improved by technology alone; without their strong commitment, participation through their indigenous knowledge, labour, materials, finance and their managerial capabilities in irrigation scheme utilization and appropriate institutional setup are also required.

## 1.2 PARTICIPATION

Participation is the process of bringing people together & provide them with space & opportunity (enabling them) to act on common concern and problems. It is the process in which people join together to take action to accomplish one or more objectives. By and large participation refers to the capability and willingness of beneficiaries to work/take responsibility, action and determine the nature of the development. During socio-economic studies of small-scale irrigation project the socio-economist must create conducive ground to practice the following basic principles of

community participation and make sure that the study reflect the interest of the communities in all study phases.

**The basic principles:-**The basic principles that should guide the community participation and consultation in the preparation and implementation of an irrigation development plans are:

- **Participatory and holistic,** the community or households, women, men and youth that would be directly impacted by the project actually get involved by providing time and other available resources at their disposal in the preparation and implementation of irrigation plan;
- **Demand driven**, the nature of activities that will be supported under the project articulates the needs that is identified and listed by the community members through an unbiased consultation process;
- **Transparent,** the participation and consultation process that is put in place for planning and implementation of the activities are disclosed in public domain at the community level for ensuring that all those that are directly or indirectly impacted by the project are informed;
- **Ownership and sustainability***,* the process of irrigation development planning and real implementation happens in a manner that creates ownership from all direct stakeholders and the investments made provide returns/outcomes that are sustainable; and
- **Market Led**, the process of planning will be based on value chain approach that will focus on improving production and productivity of agricultural commodities in a sustainable manner, strengthen marketing and facilitate value addition of selected agricultural commodities.
- Similarly other principle such as structured participation, legal frame Work Based, Clarity of Purpose, convincing or common understanding, Develop Ownership, Self Benefit and Responsiveness could be mentioned.

### *1.2.1 Project idea initiation and identification stage*

**Idea Initiation and Application:-** The Socio-economist has to know at this stage that, the project idea initiation (generation) and identification stage is the first and the most essential stage in irrigation projects formulation. This stage is the idea generation and identification stage at which the concerned community should take the initiative to point out the idea of SSI development to the concerned government body. The expert should think that the community project initiation idea will come from different perspective at different stages. The idea of the community might be new project, traditional from rivers, springs, ground water development or water harvesting irrigation development. For instance in the case of the development of a completely new SSI scheme, group of farmers through the Kebele Administration request or suggest or apply the existence of water and land resources in their locality and request the study, design and construction of a new SSI scheme. Similarly, in the case of a traditional SSI system, water user groups or the "water fathers" or existing informal water users' committee will suggest or point out the idea for the improvement/upgrading of their scheme. In a modern SSI scheme, the existing water users groups or water users' committee or irrigation cooperatives (if any) will also suggest or point out the idea of rehabilitation and upgrading or expansion of their scheme.

Moreover, the existing water user farmers or groups, water users committee, IWUA (if any), Irrigation Cooperative (if any) or village leaders or Kebele Administration may point out the idea or request the DAs and/or staff of the wereda office to assist farmers with the preparation of the SSI development idea formulation and application. It is also possible that DAs or staff of the wereda office would identify the opportunity to develop a new SSI scheme, improve an existing traditional SSI scheme or rehabilitate an existing modern SSI scheme. In that case, the DAs and/or wereda

staff should consult the concerned farmers and assess if they would be interested. If the concerned farmers are interested, the DAs and/ or wereda staff may support them with the preparation of the SSI development application or request. If the project idea comes from the farmers themselves it has significant contribution for project sustainability and future managements'.

In all the cases the guiding principles and strategic issues for project idea generation is that the project should be demand driven and also ensure public participation. This requires that the project will be implemented in such a way that it shall be a demand driven type in which the first project idea has to come from the community themselves. The undertaking of project initiatives for study, construction and operation should be compatible with the community demands even though some preparatory works is undertaking by local institutions due to technical limitations of the community. Under this situation the community with the support of the kebele administration council will point out their idea or request to the nearest wereda irrigation development institution for the successive stages of project development.

**Identification stage: -** At this stage the socio-economist should conduct review and assessments on how, when and who initiates the project idea/concepts. In the identification stage the socio-economist through close discussion with the communities must work his study on the identification of important issues and points. The basic points that needs attention at this stage includes:-

**Identification of administrative structure and project components: -**In the identification stage the socio-economist together with the study crew and project communities should clearly identify the exact administrative location, structures and accessibility of the project area. The administrative location will include the administrative setup of project kebeles, villages and sub-villages, including the location of the head work or pump station kebele, command area kebele, up and down stream kebeles, sub-villages, growing towns and settlement patterns of the people in the village. Similarly, the expert in collaboration with the study crew and the existing communities should clearly identify the proposed permanent and temporary project components (irrigation infrastructures).

**Estimation of project beneficiaries and supplementary tasks:-**The next step in the identification stage which directly follows from the project area and administrative location identification is the identification of project beneficiaries found within those identified permanent and temporary project component places. In order to conduct beneficiaries consultation, estimation of beneficiary households heads would be the basic tasks of the socio-economists. Similarly identification of administrative location, structure and accessibility, target beneficiaries, settlement pattern, ethnicity, language, occupation and religion, communities experience in water and land resource utilization and management, vulnerability to social conflict, community's willingness for SSI project, existing community organizational set-up, community contribution experience towards project financing, community responsibility for project operation & maintenance, attitudes and willingness of other stakeholders. In this stage the socio-economists should conduct discussion and get approval of the community, kebele and wereda administration council. This has to be supported with discussion minutes, supporting kebele and wereda administration letter, which latter will assists for project prioritization.

### *1.2.2 Project feasibility stage*

Once the project is identified, in the project feasibility stage intensive data collection, consultation, focus group discussion and key informant interview will be conducted with the community, water users committee, water users' groups and IWUA (if any) within the envisaged command area and neighbouring of the proposed SSI project. Under this stage the Socio-economist will be member of the study crew who should strongly activate and facilitates the community awareness creation, participation, data collection, consultation and discussion conducted with the community and different stakeholders at different level of the study.

The socio-economist should assess that the project development must begin with the community and with their concerns and needs. This helps to establish a sense of ownership and control by the beneficiaries over their own projects. This can be achieved through a community demand-led approach where the consent and participation of beneficiaries in the project conception, preparation, construction, and supervision and operation phases are required as the main bases for project funding. Therefore, the expert in this stage should re-check the project will be implemented in such a way that the project shall be a demand driven type in which the first initiation has to come from the beneficiaries themselves.

In the feasibility stage, the communities have important indigenous local knowledge and skills to contribute in technical, social, institutional and environmental parts of the feasibility studies. They have to involve and participate in physical resource (water, land & institutional) assessment, hydraulic engineering data provision; hydrological; geological and geotechnical; agronomic; soil; socio-economic, institutional; social, environmental assessments and watershed studies to enrich the study outputs and being part of the study team.

In these respect, the communities should participate in providing important primary data, describing their issues, threats, participate in decision-making and contribution for civil works investment cost share in the form of labor, local materials and/or finance during project implementation and operation. Such involvement and contributions help to develop a sense of community ownership of the project; enhance local responsibility for long-term operation, maintenance and sustainability; and reduce overall project costs. The feasibility study and design process will proceed in parallel with the process of setting-up the Irrigation Water Users Design Committee (IWUDC). Therefore, the study and design team should provide the liaison with the community and deal with the study, detail of design and construction issues. The final feasibility study must be discussed with and accepted by the community through the IWUDC in order to ensure that the concerns of the community and potential impacts on non-beneficiary local residents are taken into account. Community meetings and continuous dialogue throughout the development process are necessary for the beneficiaries to contribute as well as to identify and avoid potential conflicts.

**Irrigation Water Users' Design Committee (IWUDC):-** It is very important that farmers are properly consulted during the execution of the feasibility studies and effectively participate in the scheme design process. In an existing SSI scheme, the consultation of farmers during the feasibility studies and their participation in the scheme design process could be organized through the existing IWUA. For a new SSI scheme or an existing SSI scheme with a poorly functioning IWUA, it is recommended to form **Irrigation Water Users' Design Committee (IWUDC)**, which would have the authority to represent all concerned farmers during the execution of the feasibility

studies and the participatory scheme design process. The committee will be established at the end of the community awareness process, which is attended by the majority of farmers.

The IWUDC will have the functions and powers to:

- Provide data and information during the execution of various feasibility studies;
- Be consulted during the execution of the feasibility studies;
- Assess the male and female farmers' preferences regarding system layout, including types of distribution system, provision of social structures and water allocation options;
- Participate in design meetings in order to present and discuss the preferences and options regarding the scheme layout;
- Review the draft scheme design, including the proposed layout of the canal system; and review and approve the final detailed designs.
- It is recommended that the IWUDC does not have less than 10 and not more than 20 members and at least 30% of the members must be female.
- To ensure that the IWUDC is representative, it is important that farmers from the upper, middle and lower reaches of the (envisaged) command area as well as different religious and/or ethnic communities (if any) are represented by at least one member.
- Following the formation of the IWUDC, its members must be briefed more in detail on their role and duties during the execution of the feasibility studies and the participatory scheme design process. At the end of the training session, the members of the IWUDC must elect/nominate a Chairperson and Secretary.
- The responsible government staff must use flip charts/Power Point presentations summarizing all the major topics of the training course.
- At the end of the training course, the responsible government staff have to distribute hand-outs among all participants, in which the main topics of the training course are summarized.

**Consensus on the forms/modes/ of community participation:-**Beneficiaries have different interest and amount of contribution for the project at all level of the project cycle. However, clear identification of forms or modes of community participation should be conducted at the feasibility stage of an irrigation projects and at the feasibility stage the Socio-economist first assess the amount and the existing tradition and practices of the community participation and contribution in their kebele level developments such as in the opening of new access roads, construction of community bridges, soil and watershed development activities, FTCs, health centres construction, schools expansion, water supply development tasks and other similar works, which will have significant inputs for the proposed forms of community participation.

The community participation will be established and agreed in the form of labor, material, finance, managerial skills etc. from the total cost of the project. The design engineer in collaboration with the Socio-economist should quantify the community participation work share/tasks in the bill of quantity in terms of volume of the work they involve, money; type and expressed in percentage. The beneficiaries will confirm their participation with their agreement and signed by the beneficiaries and authorized by the kebele and wereda administration councils. This participation shall also be quantified and clearly shown in value (Birr) terms in the project document to clearly state communities project costs share. The beneficiaries' contribution schedule will be done on the basis of the community slack period and the community shall approve the schedule.

**Table 1-1: Example for identification of community work share on labour bases**

| SN | Description | Unit | Qty | Rate | Total Cost | Comm. Share |
|---|---|---|---|---|---|---|
| | **Turnouts (of concrete pipes)** | **Nr** | **116.00** | | | |
| | Site Clearing and grubbing works | m2 | 655.98 | 8.00 | 5,247.84 | 5,247.84 |
| | Soil Excavation and cart away surplus material | m3 | 754.38 | 83.00 | 62,613.29 | 62,613.29 |
| | Backfill and compaction | m3 | 377.19 | 83.00 | 31,306.65 | 31,306.65 |
| | Compacted selected mat'1 for embankment | m3 | 110.84 | 83.00 | 9,199.55 | 9,199.55 |
| | **Tertiary Canal Works** | **Nr** | **116.00** | | | |
| | Soil Excavation and cart away surplus material | m3 | 23,429.12 | 83.00 | 1,944,617.15 | 1,944,617.15 |
| | Soil Fill and Compaction | m3 | 21,280.20 | 83.00 | 1,766,256.80 | 1,766,256.80 |
| | Off takes | Nr | 426.00 | | | |
| | Site Clearing and grubbing works | m2 | 2,409.03 | 8.00 | 19,272.24 | 19,272.24 |
| | Soil Excavation | m3 | 2,770.38 | 83.00 | 229,941.91 | 229,941.91 |
| | Backfill and compaction | m3 | 1,385.19 | 83.00 | 114,970.96 | 114,970.96 |
| | Compacted selected materials for embankment | m3 | 407.04 | 83.00 | 33,784.57 | 33,784.57 |
| | **Tertiary Drainage Works** | **Nr** | **97.00** | | | |
| | Soil Excavation and cart away surplus material | m3 | 44,271.88 | 83.00 | 3,674,565.67 | 3,674,565.67 |
| | Soil Fill and Compaction | m3 | 28,126.88 | 83.00 | 2,334,530.94 | 2,334,530.94 |
| | **Total Engineering estimate of all bills** | | | | **128,260,508** | **-** |
| | **Total Community Share** | | | | **-** | **10,226,308** |
| | **Percent of community contribution** | | | | | **8%** |

Similarly, Community Support Capacity could be described using the composition of labour, materials, and cash contribution from the total project costs, expressed using the formula mentioned below.

$$\mathbf{CSC} = {}^{(\mathbf{M}+\mathbf{F}+\mathbf{L})}/_{\mathbf{X}} * \mathbf{100}$$

Where: M-Financial value of materials contribution
F- Total value of cash contribution
L-Financial value of labour contribution
X-Total cost of the project

### *1.2.3 Participation in the scheme design stage*

In order to develop a sense of ownership and responsibility for operation & maintenance among the (future) users of SSI projects, it is required that the community should involve in all the stages of the development of their SSI scheme. In the project detail design stages there must be liaison between the design teams and the communities. Particularly during the design of the SSI scheme, maximum communities' participation is a prerequisite for successful SSI scheme development, because the most important decisions are made during this stage. To enable farmers to participate effectively in the design of their SSI scheme, it is important to consider the elaboration of the design as a step-by-step process during which design option, farmers' priorities and preferences are matched with technical and financial possibilities.

At this stage, the community should identify the significant **permanent and temporary irrigation project components** and endorse the access roads, camp site, water intake points, main canal, layout of canal network specifically secondary, tertiary and field canals layout based upon farmers and community meetings; decide on the location of canal outlets and turn outs; and location of pumping points (if any) for diversion from canals; endorse location of crossing structures such as foot bridges across canals, and cattle crossings at points; and social structures such as washing points, cattle troughs, steps into the canal for water collection points at locations to be identified by the community; endorse location of camping site and design of office as it will be used for IWUA office, which should be constructed, based on a standardized design; farmers should identify and select lands to be irrigated and the irrigation design team should assist farmers by assessing the suitability of those lands; farmers could provide information on past experience with floods, point out areas with potential for flooding, and suggest to the design team locations for structures such as water abstraction from the river to prevent the pump station or head works from being flooded; farmers should select the crops to be grown in the project and the study and design team should guide them only on technical matters related to the suitability of such crops for the climate, soils, the cost of production and expected returns as well as the marketing potential of these crops. The design team however should also provide farmers with various alternatives to choose from including new crops, especially those that are high-value crops that the farmers may not be familiar with, with clear potential for adaptation to local conditions, and potential for production and marketing (cost and benefit). The communities within the area to be developed should participate in the Environmental and Social Impact Assessment (ESIA) for the project, through contributing vital information, such as current uses of their natural resources, ecology, human health, etc; The design team should facilitate the exposure of the farmers to various irrigation methods and enlighten them as to the advantages and disadvantages of each. The farmers then should propose the irrigation methods they would prefer to be considered during irrigation design; The prospective irrigators should suggest the plot sizes they would prefer to irrigate and the irrigation design team should provide information on the management, labor and input costs required for different plot sizes, as well as on the potential of the land and water resources to satisfy the various sizes.

Generally, the projects designs must be discussed with and accepted by the project community. Therefore, the design team should provide the liaison with the community and deal with the detail of design, construction and operation issues. The final detailed design must be discussed with and accepted by the community through the IWUDC in order to ensure that the concerns of the community and potential impacts on non-beneficiary local residents are taken into account. Meetings and continuous dialogue throughout the development process are necessary for the community and stakeholders to contribute as well as to identify and avoid potential conflicts. There should also be agreements, preferably written and signed, that each party will execute its function throughout the planning, design, implementation, operation and maintenance phases of the scheme.

### *1.2.4 Design appraisal and confirmation*

Design approval and confirmation by the project beneficiaries and existing local level stakeholders at project site level is mandatory. As soon as the draft detailed designs have been prepared together with the final net command area delineation, lay-out of the project and map, the responsible government institution has to arrange draft design appraisal and confirmation meeting with the farmers and study and design committee members in order to review, discuss these documents, and other necessary estimated costs including operation and maintenance costs. All modification or adjustment compared with the first field data collected and the location of the canal

route, social infrastructures must be clearly explained to the farmers and design committee members. In this connection the reasons and justifications for the non-inclusion of any proposed infrastructure must also be explained and discussed in detail with project beneficiary communities. Following the presentation and review of the draft detailed designs, the farmers Irrigation Water Users Design Committee (IWUDC) members have to decide on the approval of the final detailed designs as prepared by the responsible government institution. In the design approval stage there should also be agreements, preferably written and signed by the beneficiary communities, kebele and wereda level administration councils.

### *1.2.5 Design Adaptation*

After the final design approval with the agreements, preferably written and signed by the beneficiary communities, kebele and wereda administration councils, site adaptation of the design works should be conducted on project site or ground level. The design site adaptation tasks will be conducted on the ground through conducting **setting out works** or **fastening of peg** on the ground of every proposed irrigation infrastructures. In this respect, peg will be placed on the head work (weir), pump station, main canal route, secondary and tertiary canals routs, night storage, camp site, access road route and other similar proposed social infrastructures. Design adaptation work will assist for the prior management of **right of way** problems at project level

### *1.2.6 Participation in construction stage*

Construction phase includes the period from signing construction agreement with the contractors to handing over of the project to the project beneficiaries. It is the phase when the major resources are practically implemented, or when constructions will be started and the consumption of resources (labour, material, finance, machinery, managerial capabilities and others) are high. Accordingly, the concerned Bureau in the respective regions are the responsible institution for the project's construction which includes tender preparation, bid evaluation, construction award, construction management, construction supervision and project hand over. The major construction activities are considered to be undertaken by contractors whereas the respective Bureau would manage, follow and monitor the progress of construction activities. The kebele and wereda administration councils plays a significant role in the task of monitoring, evaluation, mobilizing the community participation and resolving local conflict issues if they arise in the construction site.

**Construction site hand over:-** As soon as the contractors of the SSI project known, construction site hand over is the basic tasks that needs the participation of the communities and client. The communities have to know and participate during the construction site is hand over to the contractor of the project. In this stage the communities in collaboration with the project site hand over team will participate on the provision and setting out process of the main irrigation infrastructure such as bench mark of weir site or pump station, main can routs, night storage (pond) site, social infrastructures, camp sites, access road and others. Under this stage the Irrigation Water Users Design Committee (IWUDC) has to play significant role that they recall the specific place of the permanent and temporary irrigation infrastructures and they are the important sources of information, particularly at project level the specific points of the bench marks at the head work, the location of the night storage places, camp sites and access roads selected and approved during the design stage. The communities in collaboration with the local kebele administration have to create fertile ground for the contractor, initially should indicate the access road and camp site to start his construction works, take care of the machineries and equipment.

**Construction activities:** The most common practice related to communities contributions to the irrigation project construction costs is to provide free unskilled labour during the execution of civil works and supply local construction materials to the contractor. This practice often causes tension and conflict between the beneficiaries and the contractor as the concerned farmers do not always provide the agreed amount of free unskilled labour when the contractor needs it and/or that the quantity and/or quality of supplied local construction materials is not sufficient and/or good.

This day the participation of the project beneficiaries and their contributions towards the scheme construction costs during project construction period found to be considerable. The Irrigation Water Users' design committee members and the responsible government institution study and design staffs have to identify and select small civil works from the prepared BOQ that are appropriate to be constructed by the farmers. As mentioned above the selection off appropriate farmers' works should be clearly identified during detail design periods.

The common and appropriate modality for farmers' contributions towards the total scheme construction costs is the construction of small civil works such as access road clearance, head work and main canal site clearances, soil excavation and cart away of surplus material, backfill and compaction, tertiary canal works, tertiary drainage works, excavation and shaping of unlined main canal, control, division, canal related and/or social infrastructures, and/or the construction of all (additional) secondary canals by the farmers through the coordination of their existing or newly established IWUA.

**Scheme development agreement:-**Once the Irrigation Water Users' Design Committee members and responsible government institution staffs have agreed upon the type, quantity and estimated costs of small civil works to be undertaken by the communities, a list with all selected small civil works must be prepared and **Scheme Development Agreement** should be signed (between IWUDC and implementing institution) before starting construction by the Irrigation Water Users' design committee and responsible government institution. The preparation and signing of farmers' works list should be clear to the general project beneficiaries and the schedules for the works' list during the slack period for implementation needs consensuses. The works list provided for communities should not overlap with the contractors' work and the farmers works should be completed in parallel with the contractors works. Care should be taken that the contractor should not include in his payment certificate request the works executed by the communities

**Construction supervision and quality control**: - On the other side, the project beneficiaries should participate on the construction supervision and quality control of the project. The existing or the new established IWUA will be responsible for the operation and maintenance of the entire SSI scheme following the completion of all construction works, it is important that the IWUA is formally involved in monitoring the physical progress achieved in comparison with the implementation schedule of the project as well as controlling the quality of the completed works in accordance with the technical/engineering specifications and drawings. In this connection to facilitate effective construction supervision and quality control during the execution of the construction works, the IWUA may decide to form a Works Sub-Committee who must be literate in order to be able to read work plans and budgets, instructions, designs and inspection reports. For this purpose, prior to the start of the execution of the construction works, the staff of the responsible government institution with the support of the Irrigation DA at site level have to provide a training course in construction supervision and quality control for the members of the IWUA management committee and/or works sub-committee. Similarly, during construction process regular construction supervision

meetings and joint site visits of the IWUA through its works sub-committee, staff of the responsible government institution and/or contracted private company, Irrigation DA and contractor have to review the progress and the quality of the construction works and discuss any problems encountered during the execution of the construction works. Schedule of Labour, materials and financial mobilization of the communities that has been prepared and presented in the feasibility study and design stage should be revised frequently and discussion has to be conducted on the problems, progress and future actions to be taken during the construction process.

### *1.2.7 Participation on scheme management transfer stage*

**Joint inspection/ assessment**:- As soon as the project construction finalized and completed as per the design it will be transferred to the project beneficiaries. However, the contractor and IWUA first should make a joint inspection/ assessment of these works and the joint final inspection of the completed construction works has to be carried out before the demobilization of the contractor, so that any outstanding works identified during the final inspection can be carried out by the contractor without any delay. The final inspection team must consist of the IWUA through its Works Sub-Committee, contractor, staff of the responsible government institution and/or contracted private company and Irrigation DA. During the joint inspection of the completed works, the team has to check if all construction works have been carried out in accordance with the detail designs and the signed contract. In this regard, final inspection report must be prepared by the staff of the responsible government institutions and/or contracted private company, in which the main observations, conclusions and recommendations are summarized. If the joint inspection of the construction works has revealed that some works have not been completed properly, the Final Inspection Report must specify these observations clearly and mention the main reason(s) for non-completion or unsatisfactory completion of these works. In addition, the Final Inspection Report must specify the modalities for the execution of the outstanding works, including a tentative work plan, by the contractor.

**Preliminary hand over of the SSI scheme**:- If the final inspection has revealed that all construction works have been completed properly, the contractor must preliminary hand over of the SSI scheme to the responsible government institution and /or to the IWUA. Then, following the preliminary handing over, the entire SSI scheme must be tested during the entire first irrigation season in order to assess if all structures are functioning properly and the available amount of irrigation water can be distributed throughout the entire canal system. The test run of the entire SSI scheme must be closely monitored by the IWUA, staff of the responsible government institution and Irrigation DA at site level.

If the test run of the SSI scheme has revealed that the system cannot be operated as designed, the responsible government institutions with the support of the Irrigation DA must investigate the cause(s) and identify any remedial measures, which have to be discussed with the contractor and the IWUA. If the malfunctioning of the SSI scheme is the result of one or more construction faults, the contractor has to out the necessary repair and/or reconstruction works at its own expense. However, if one or more design faults are the reason for the malfunctioning of the SSI scheme, any remedial works should be executed by the contractor at the expense of the responsible government institution and these points should clearly described in the detail design stage.

**Final handing over of irrigation infrastructures**:- On the other hand, if the test run has revealed that the entire SSI scheme infrastructure is fully functional, the final handing over of all irrigation infrastructures and canal-related structures from the contractor to the responsible government

institution and/or IWUA can take place, these will be conducted through **Irrigation Management Transfer Agreement** prepared by SMIS and Appendixes in this Guideline. However, before the final hand over of the project conducted the socio-economist and the concerned engineer should prepare in collaboration the exit strategy of the scheme.

**Exit strategy development*:* -** After the handover of the project, the existing project will terminates its support to the community and after the completion of project implementation, the community becomes responsible for on-going operation and maintenance of the system and the project is no longer able to provide periodic technical advice and assistance. Since small-scale irrigation schemes are small to be fully managed by the beneficiaries, the beneficiaries are expected to cover all costs of O&M except for major damages due to uncertainties. The community institution established/strengthened at site level will coordinate the project operation and management.

To help the community understand and prepare for these transitions, the project should work with the community to prepare a plan for transferring responsibilities to them. Therefore, the implementing institution should develop a handing over and exit strategy plan for the transfer of its responsibilities at the completion of the project to the IWUA. The handing over and exit strategy plan should include the followings:

**Training and experience sharing: -**Rural communities do not have the knowledge and skills required to manage SSI development systems. Therefore, beneficiaries require intensive assistance and training to cope with the technical and financial requirements for O&M of the systems. The socio-economist should see the task of training and advising the community, perhaps through the IWUA, as a top priority of project development and sustainability. Appropriate interventions could include training on planning, leadership, committee organization, operation and maintenance, financial management and dispute resolution.

In general, the need for O&M and preventive maintenance in order to avoid costly major works at later time shall be part of the training provided to the IWUA. Staff capacity building, both in terms of numbers of staff and adequate knowledge and skills, is essential to ensure proper technical and social support to the beneficiaries/IWUA. It should be ensured that experts at all levels are adequately trained to plan, develop, monitor and supervise the operation and management of the projects. Experts responsible for project development should be properly trained and have relevant experience to carry out their responsibilities.

Soon after completion, additional management training is offered to the IWUA members. The objective of this training is to strengthen managerial skills to guarantee smooth operation of the system. Issues like fundraising and use of the funds, community meetings & recording of the decisions made, maintenance of the system, source protection, and waste-water management are covered in this training. The different roles and responsibilities of the IWUA, and Water Technicians are once more discussed and reinforced.

After project completion during operation and maintenance refresher trainings and experience sharing tours shall be undertaken in order to guarantee consolidation of management skills and project sustainability. Refresher training on sustainable operation, irrigation scheduling, improved agronomic practices, dispute resolution, marketing and financial management for schemes implemented and rehabilitated by the project and experience sharing with the most successful target Kebeles and other successful community projects should be conducted.

**Preparation of O&M manual: -**An operation and maintenance manual should be prepared along with study and design works. It should be prepared as being part of project planning and design aspect of irrigated agriculture development and finally adjusted by the contractor. The woreda experts and the beneficiaries/IWUA should be provided this important manual to operate and maintain the scheme for successful and sustainable management.

The operation and maintenance manual shall address issues such as scheme water distribution, allocation, agricultural extension, allocation of O&M fees or similar fees, operation of structures, maintenance of the system, and training of woreda experts and beneficiaries. The organizational management structure, its operation and functions or the duties and responsibilities of various stakeholders in the operation and maintenance phase should be clearly stated in the O&M manual. It will be advisable if this manual is prepared with the local language for IWUA.

**Preparation of as built drawing and design document:-**changes in the design should be allowed when needed for technical reasons, and it is necessary that at all stages of construction works a comparison has to be made between the design reports and what is actually encountered during construction. Laboratory and field tests are to be undertaken to confirm the nature and quality of materials so encountered and then to adopt any design modifications according to the changed parameters or data collected by different sampling methods during construction. For proper operation and maintenance works, the modified designs and drawings has to be compiled to produce as built design report. Contractors should produce “as constructed “drawings (certified by the construction supervisor), which is required for approval and conducting of the final payments and it will serve as a base for future scheme life time operation and maintenance.

**Preparation of agricultural development plan:-**The agricultural development plan shall include the demonstration of recommended crops, inputs utilization, improved agricultural practices, amount of water application, scheduling and water management tasks. Similarly, such plan has to indicate the requirement and significance of field days for farmers, development agents and wereda stakeholders. The plan should be prepared in the way of assisting farmers to produce high value crop development and management tasks.

### *1.2.8 Participation in SSI scheme operation and management*

Small-scale irrigation schemes are small to be fully managed and operated by small-holder beneficiaries; the beneficiaries should participate and cover all costs of O&M except for major damages due to uncertainties. The community institution (IWUA) established or strengthened at the project level and Water Users Groups will coordinate the project operation and management.

The community should fully participate on the continued operations of the SSI system and responsibility for the continuing management and operation of the SSI system will be with the community, most likely through the IWUA. It should be ensured that the community understands that, unless it accepts this responsibility long-term sustainability of the system will be under remarks. In the meantime, capacities should be established with woreda governmental offices to provide technical support for major repair work if needed.

The community should have a plan to support and carry out routine maintenance and repairs and this outlining routine maintenance and repairs should be accepted by the community. Management and maintenance of the system should be the primary continuing responsibility of the IWUA.

In general, routine maintenances are the responsibilities of farmers, major maintenance are the responsibilities of farmers and Woreda offices (requires proper inspection and planning) and minor emergency maintenances could be the responsibilities of farmers and woreda offices. Whereas, major emergency damages such as head works which are beyond the financial capacity of the IWUA might require support and involvement of the region.

The entire approach of community participation is geared towards the establishment of a strong sense of ownership of the scheme. The collection of an O&M fund should be starts early and before the completion of the construction work. It should be assessed and agreed that motivation for the collection of an O&M fee is critical and it is important for the community to realize that the collection of a fund is for their own future benefit. Therefore, no rigid criteria are set to determine the percentage, relative to total cost of the O&M fund. The decision on how to collect and the size of the target fund depends on the bylaws they have. However, the expert and implementing institution should motivates the people to collect an amount that corresponds to their ability to pay and takes into account the size of the scheme.

The fund raising scheme should be seen as a continuous process, not a one-time activity. It should start early in the overall process and continue during the operation and maintenance phase. On average, the socio-economist should clearly look that the O&M fund should enable to cover O&M costs and replacement costs. Similarly, community should also hostilely participate on irrigation water management, conflict management, upper catchment treatment and other similar tasks that can improve the sustainability of the scheme.

### *1.2.9 Participation in SSI scheme performance assessment*

Farmers and IWUA committees should participate on SSI scheme performance (M & E) assessments. Performance assessment (M&E) of an irrigation scheme is important in order to provide information about how an irrigation scheme is performing/ operating. Some of the basic reasons for carrying out Performance assessment (M&E) includes:-

- Keep track of the progress of irrigation scheme development activities during implementation and to remain alert in case of shortfalls or deviations from projections to enable them to be corrected;
- Determine the relevance, efficiency and effectiveness of irrigation scheme development activities and the impact on direct beneficiaries and other different stakeholders;
- Learn lessons for future irrigation scheme development planning, in order to improve the formulation and implementation of projects and increase their performance
- Share significant progresses and results with others

In this respect, record of irrigation project development activities must be maintained as an aid to future maintenance, trouble-shooting, system modification and evaluation. It is important that records of all essential information about the project (e.g. design documents, survey data, well logs, water quality tests results, soil test results, geology test results, system designs, O & M expenditures, fee collections records & other necessary data) should be available in the IWUA office, as well as regional and woreda line Bureaus.

The following five areas of scheme performance M&E indicators are important for irrigation schemes performance assessment and the implementing institution, IWUA and farmers should jointly employ these points for the performance assessment of SSI schemes. These are:

a) Technical performance

b) Agricultural performance
c) Financial performance
d) Socio-economic performance
e) Managerial performance

**Table 1-2: Scheme Performance Indicators**

| 1. Technical performance | 4. Socio-economic performance |
|---|---|
| ▪ Quantity and quality of constructed infrastructure | ▪ Asset ownership |
| ▪ Distribution uniformity of irrigation water | ▪ Change in living conditions |
| ▪ Equity of irrigation water distribution between head and tail users | ▪ Employment creation |
| ▪ Condition of equipment, canals, reservoirs and other structures | ▪ Backward and forward linkages |
| ▪ Relative water supply = Total water supply/Crop demand | ▪ Improvement in service provision |
| ▪ Relative irrigation supply = Irrigation supply/Irrigation demand | ▪ Appropriateness of technology |
| ▪ Water delivery capacity = Canal capacity at the system head/Peak consumptive demand | ▪ Adoption rate of technology |
| | ▪ Change in livelihood |
| **2. Agricultural performance** | **5. Managerial performance** |
| ▪ Type of crops grown and area per crop grown | ▪ Management structures, roles, responsibilities and skills |
| ▪ Crop quality and Cropping intensity | ▪ Knowledge management and training at all levels |
| ▪ Type, quality and quantity of agricultural inputs used | ▪ Conflict resolution |
| ▪ Cultural practices used | ▪ Farmer organization and management ability (self-management) |
| ▪ Yield levels | ▪ Equity, reliability, flexibility, adequacy and timeliness of water allocation and distribution. |
| ▪ Pests and diseases encountered and control measures | |
| ▪ Timeliness of operations | |
| ▪ Output per cropped area (birr/ha) = Production/ Irrigated crop area | |
| ▪ Output per unit irrigation supply (birr/m3) = Production/ Diverted irrigation supply | |
| ▪ Output per unit water consumed (birr/m3) = Production/Volume of water consumed by ET | |
| **3. Financial Performance Indicators** | |
| ▪ Cost of repairs and servicing of equipment, canals and structures (operation & maintenance cost per ha) | |
| ▪ Cost of inputs, for example seed, fertilizer, chemicals, transport | |
| ▪ Prices of produce [Birr/Qt] | |
| ▪ Access to credit – source, amount, grace period, interest rates, etc | |
| ▪ Gross return on investment (%) = Production/Cost of infrastructure | |
| ▪ Financial self-sufficiency (%) = Revenue from irrigation service fees/Total O&M expenditure | |

# 2 COMMUNITY CONSULTATION

## 2.1 PURPOSE AND PRECONDITION OF CONSULTATION

**Consultation is one of the data collection tools and decision making processes.** The main purpose of consultation is to identify the views or opinions, willingness, threats, their roles, responsibilities, their traditions, values, customs and suggestions on the proposed irrigation projects. Prior to any consultation process the following preconditions are necessary,

### a. Pre-informing administration and communities

In reference with the project request or initiation taken during site identification stage pre-informing administration bodies and communities are mandatory tasks. In the actual and practical cases the purpose of consultation is numerous, which is that the people do not feel happy and could also be reluctant to allow studies to be executed over their lands, locality and homesteads. They may feel that their lands will be taken and given to others (private investors) leading to losing their livelihoods. This directly affects surveying works like geological, soil and topographic and socio-economic studies. Thus, experts involved in different engineering related and non-engineering surveying works have to make sure that the people are informed and are volunteer the work to proceed. In order to avoid confusion and make them understand, every expert participating in the study of SSIPs has first to be **certain that the people are consulted** before entering into the study areas. This awareness is to be given formally by wereda level officials, kebele level administration and development workers. On top of these, the expert involved in the study of organization and management has to explain to the concerned bodies in order to get people's support and involvement. Similarly, the study crew should have clear picture and conduct insight introduction, consultation and communication with Region, zone, wereda and kebele administration council, sub-village level, DA's and individual farmers in the project area as well as other up and down stream users of the water users'.

Community awareness campaign or awareness creation, brief description about project idea, its plan, project rationale, scope, future direction & the objectives of the study crew shall be given to wereda and kebele administration council, DA's, individual farmers and others in & around the project area. The community awareness campaign at different level will assist to describe the project in detail and create a ground for discussion with the general project beneficiaries and to reach consensus on the basic and critical issues which should get solution at feasibility stage.

### b. Verification of existing administrative structure and project components

Prior to any data collection the socio-economist together with the study crew and project beneficiaries should clearly verify the administrative location and accessibility of the project area that are identified in the identification stage. The administrative location will included the administrative setup of project kebeles, villages and sub-villages, which includes the location of the head work or pump station kebele, command area kebele, up and down stream kebeles, sub-villages, growing towns and settlement patterns of the people in the villages. Similarly, the socio-economist in collaboration with the study crew member and the communities should clearly verify /or confirm the permanent and temporary irrigation infrastructure components, which was identified during identification stage.

### c. Identifying the affected people for consultation

The precondition for consultation with affected people is that they should be identified after finalizing the recommendation of location of quarry site, night storage, water distribution network, headwork site, access road and other components of the project. This consultation might be conducted at the middle of the study period depends on the availability of the information from engineering, soil and engineering study team.

The communities of the project are usually divided into two major classifications and these are negatively affected community and positively affected communities. Negatively affected people are found mainly within the places of quarry sites, camp sites, access roads, main canals, headwork, and other water using places while project beneficiary are largely found within the project command area. These two groups of people have to be consulted for major project related points which bring changes upon their livelihoods. The points that would be forwarded for discussion could be similar or different. It is advisable to have commonly held consultative meetings with these two different groups in order to share their views and concerns of both of the groups. For example, a solution for the potential negative impacts within the places of quarry sites could be given by the people of the command area.

### d. Registration of existing project beneficiaries

In order to conduct beneficiaries' consultation, identification of beneficiary households' heads through registration of household would the basic tasks of the Socio-economists. At this stage, the primary task of the expert is to register beneficiary household heads name, kebele, sub-villages and other important profile in consultation with kebele administration office, sub-village, development team leaders and development workers. The team leaders will register the number of available household heads and provide their names with breakdowns into gender compositions (male & female). The beneficiary households of the project areas could live within and/or outside the project areas as well as at distant places while they have landholdings situated within the command area. These people can either have their total or partial land landholdings within the stated places. In this step, all the names of households who have got land within the project components will be identified closely with the stated partners. The list of registration helps as a major data source to conduct successive studies.

**Registration procedures and format:-** A given household could be registered more than once if he/she has got lands in different project components. Under this condition, a person will be registered for all of the lands under his/her possession whereas will be counted only once for determining the number of households. The names of the households will be collected through prepared formats shown inAppendix-1. The items that will be included in the data collection format (registration format) are 1) S/N 2) title 3) full name 4) sex, 5) project component and 6) kebele. The name of the household head should include grandfather's name in order to distinguish different persons having similar names in the project area.

Community consultations, household survey and focus group discussions data will be collected from registration of household name or lists of the project area. The existing administrative organizational set-up (kebele administration, development zone and 1 to 5) also have to made significant contribution in finding the exact project beneficiary communities. Accordingly, the list of the beneficiary farmers together with their area of land holdings will be collected by the enumerators, sub-village team leaders, 1 to 5 leaders and DAs of the kebele. Similarly, the list of

the beneficiary communities, land size, family size, signature and others data collection checklists are attached in the **Appendix-1** of this guideline.

## 2.2 COMMUNITY CONSULTATION

### *2.2.1 Type of community consultation in SSIP feasibility study*

The community consultation in SSI project could be general community consultation, youth groups, and women groups, up, middle and tail end irrigation users; focus group and key informant consultations.

### *2.2.2 Purpose of community consultation*

Community is the point of entry and primary resource users of the project and they are the most valuable and significant information source for SSIP feasibility study. The main purpose of community consultation is to collect primary data, identify the views or opinions, willingness, threats, their roles, responsibilities, their traditions, values, customs and suggestions on the proposed irrigation projects. Prior to any consultation process the following preconditions are necessary and should be respected:

### *2.2.3 Location/Venue for consultation/ meeting place*

The place for the consultation should be in the kebele administration office, FTCs or in the commonly accepted traditional community meeting place (under the big trees or Mora or Church or Mosque compound or meeting hall (if any).

### *2.2.4 Schedule for community consultation*

Once the project beneficiaries are known (identified), the general public meeting will be arranged in consultation with wereda, kebele administration councils and sub-village team leaders from different parts of the command area. The meeting day should be the most acceptable day by the communities considering their religion, holiday, critical working days. Usually Friday and Sunday are the most preferable for Muslims and Christians, respectively. However, the socio-economist should come in consensus through discussion with the kebele administration council. The time will be in the morning time and consultation process should take 1:30 to 2:00 hours.

The agenda of consultation should be first informed to kebele administration, sub-village leaders and their representatives and if condition assists the agenda should be written and posted in the kebele Office, FTC centres, cooperative offices, churches, mosques, Iddir meeting places and other average distance community meeting places before the start of public consultation meeting. **(Appendix-2).**

### *2.2.5 Participants and consultation minutes*

**Participants for general meeting:** It is advisable to make the consultative meetings with the presence of all households, elders, women, youth and spouses (male, female households and youth groups). The call for the meeting should be made by names of the persons since they are already known at this stage. Similarly, representatives of wereda administration and sector offices, kebele administration officials, development workers, funding organization representatives/ focal and all the study crew members should participate the public consultation meeting. Generally, the people found within the project boundaries would be called for the meeting through the kebele

administration office. If the project covers more than one kebele, separate consultative meetings could be held or if it is convenient, they could be gathered into one common meeting place. However, the preferred idea is to have common meeting so that both kebeles could get an opportunity of discussing and solving their common interests together.

**Consultation minutes:-**The meeting is better to be chaired by wereda level officials. The advantage of the presence of the officials and sectors representatives is that the community could feel confidence about the importance of the project. Secondly, issues that could be explained by these bodies could get immediate responses.

The names of the participants, signature and address occupy one part of the meeting minutes. Minutes of meeting should be recorded by either of wereda level participants, or by kebele development workers. The minutes of meetings can be recorded either using prepared format or in a free plain paper. However, the use of free paper is recommended since the participant may not strictly follow the sequences of the agendas which create difficulties upon the reporter to record the results of the discussions using the prepared format. The minutes of meeting would be signed by every participant and delivered to the consultant through a covering letter signed and stamped by the kebele office. The minutes will be copied by 4 copies and 1 each will be given to the kebele administration office, the wereda administration office / funding organization coordinator and the consultant/client. The meeting would be held by the local language of the project area with frequent translation to the language spoken by the consultant if required. Typical example for points of discussions that could be forwarded for the meeting is given in the Appendix-2**.**

**Figure 2-1: Community consultative meeting, SNNP (left) and Amhara (right) Region**

### *2.2.6 Consultation process*

The chairperson will make an introduction on every point of discussion and lead the consultation session. However, the participants may not keep the order of discussion points and may forward all the points at a time. Under this condition, it is preferred to keep their discussion preferences and lead in accordance to the flow of the discussions instead of interrupting them. The **points of discussion** could be varied depending on the purpose of the project components and make sure that each points of discussion should get decision through the consultation process. Some of the basic **issues to be covered and get consensuses in the community consultation** include the following points:

### 2.2.7 Issues to be covered during community consultation

**a. Consensus building and attitudes**

During the process of general community consultation the Socio-economist first has to get general consensus on the project idea, plan, purpose, objective and scope of the study. In the discussion the project beneficiaries could mention their aspiration, threats and problems on the implementation of the project. In this case, the facilitators should collect issues, take minutes and summarize focusing on the main target of the study. Under such situation, the important issues that beneficiaries feel necessary and important to improve their economic conditions and in particular their understanding and desire for the introduction of irrigated agriculture will be identified.

Assessments of different attitudes, views and opinions of the community towards the new project (Based on the meeting and discussion) would be captured and obtained. In this regard, the attitudes, views and opinions could be positive, negative and/or indifferent attitudes of the beneficiaries and other water users of upstream, downstream and nearby residents would be summarized and finally general conclusions will be reached. Once general consensus reached on the plan, purpose and objectives of the project, some significant agenda and discussion point should be raised and get decision.

**b. Consensus on forms of community participation**

Consensus is required on the forms of community participation in the construction stage of the project. The communities at all level might have different interest and amount of contribution for the project implementation. At the feasibility stage the Socio-economist first should assess the existing tradition and practices of the community participation and contribution in their kebele level developments such as in the opening of new access roads, construction of community bridges, soil and watershed development activities, FTCs, health centres construction, schools class expansion, water supply development tasks and other similar works, which will have significant inputs for the proposed forms of community participation. Discussion agenda will be presented to the community what types or modes of contribution they will provide during project construction stage? Consensuses should be reached with the community on the modes, quantity and schedule of community contribution and they should confirm their participation during the consultative meetings. The beneficiaries' labor contribution schedule will be done on the basis of the community slack period and the community shall approve the schedule. The community work share items and implementation schedule could be prepared as indicated in Table12-1

**Table 2-1: Example for community work share and schedule**

| Description | Unit | Qty | Schedule | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ja | Fe. | Mar. | Apr. | May | Ju | July | Ag. | Sep | Oct | Nov | Dec. |
| **Turnouts (of concrete pipes)** | **Nr** | **116** | | | | | | | | | | | | |
| Site Clearing | m2 | 655.98 | | | | | | | | | | | | |
| Soil Excavation | m3 | 754.38 | | | | | | | | | | | | |
| Backfill and compaction | m3 | 377.19 | | | | | | | | | | | | |
| Compacted selected mat'l for embankment | m3 | 110.84 | | | | | | | | | | | | |

### c. Irrigable land use and re-allocation issues

According to the existing legislation in the regions, the minimum and maximum size of landholdings in the command area of a SSI scheme is known. Therefore, this command area might not be distributed equally among project beneficiaries and during general community consultation irrigation land re-distribution issues were one of the debating agenda. Accordingly, the beneficiaries shall be consulted in detail on the irrigation land use, re-distribution issues and confirm their consensus by the agreement signed by all beneficiary communities, wereda and kebele administration council of the project area. The community consensus might not be re-allocation of irrigation land; however, the possession of irrigation land above the maximum size by a certain group of farmers who have the access should get solution through rigorous discussion. The role of the Socio-economist under such situation will be facilitating the discussion, taking minutes and clarification of the existing experiences in other parts of the country.

Similarly, in the consultation process the views of landholders having more land than the legal maximum size within the command area of the SSI scheme are important and they have to give suggestions. Exchange of land-for land is the most common form of management whereby the landholders is given another plot of arable land outside the command area of the SSI scheme by the land administration committee at kebele level using communal land. The Socio-economist must ensure through consultation that landless households, female-headed landless households and landless youth should benefit from the SSI development.

### d. Consultation on cost share and cost recovery

The socio-economist has to clearly discuss with the community the idea, advantage and disadvantages of the cost sharing and cost recovery issues. The opinion of the beneficiaries towards the investment cost sharing, operation and maintenance cost, investment cost recovery and irrigation water delivery service charge shall be identified and consultation should be conducted in detail. The existing experience of cost share and recovery in the regions, methods and procedures of fee collection and the responsible institution for these matters should be discussed and consensuses should be necessary with community.

### e. Consensus on adverse impact of the project

The part of the projects which results displacement and negative impacts have to be assessed and identified during the feasibility study stage in collaboration with the study crew. The socio-economist has to make detail consultation with the displacement and negative impact caused as a result of the project. Project components that affect properties such as headwork (pump station), quarry sites, camp sites and main access roads as well as places that benefits the people which are the command area should be clearly distinguished by the study crew and beneficiary communities.

To the extent possible, the socio-economist in collaboration with the socio economist has to advice or provides inputs to project designers to select suitable or fitting camp sites to the project beneficiary communities. Besides, the expert has to make consultative meetings with the beneficiaries and kebele administration council to secure land in these places if such places are available at common places. The places could also be located within the kebele administration office if sufficient space is available and agreement could be obtained from responsible bodies of the kebele and wereda. For securing the place, the expert has to play important and leading role in making the responsible bodies to agree on the idea. It has to explain to community that the

place will be used as an office for the water user association after the construction of the project is completed.

Similar advice and suggestion has also to be provided for project engineers that access roads and main canals shouldn't affect permanent assets specifically residential houses found along the routes. It should advise that the design should change its route wherever there are assets to be affected. If not however possible to change the route, full inventory in collaboration with beneficiaries have to be recorded.

The purpose of registering the assets is not necessary to provide cash compensation for all of the lost assets. The issues of compensation are to be settled through the legal aspects of the region under consideration. The beneficiaries could also have self-compensating mechanisms in order to implement the project within their places and this has to be accounted as one part of people's contribution in covering part of initial investment costs. The other similar mechanism is that people could forgo their assets for the project without asking compensation for the damage by considering benefits which very much exceeds the level of the existing forgone benefit. However, careful review of prevailing laws as well as consultation with the people of the command area, the affected people and the kebele administration office including wereda level officials is crucial.

With this understanding, the socio economist, organization and management study have to register all assets and properties that could be affected. The expert should define the purpose of registration from taking legal background and community & partners' perceptions into consideration. The purpose could be to estimate the extent of people's contribution in covering initial investment costs or providing cash compensation to project affected properties. Therefore, the displacement, compensation and negative impact issues as a result of the project should be well assessed and discussed by socio economist, organization and management study in a clear and understandable ways. Clear consultation on the issue of compensation of affected properties and assets will be mandatory tasks of social experts. The existing experience of compensation in the regions, methods and procedures of compensation and the responsible institution for this matter should be discussed and consensuses should be necessary with community.

**f. Selection of future proposed crops**

Consultation of beneficiaries on their crops preference or future proposed crops are important. Based on the existing crops productivity constraints and existing market potentials farmers might have different crop preferences. They can list different cash and food crops and in the process of consultation getting their consensuses will be necessary.

**g. Community petition and confirmation**

At the end of beneficiaries consultation community petition and confirmation is mandatory tasks in SSIP. Under the feasibility study and design stage the organization and management study should attach a copy of a written application presented by the beneficiaries or development of the scheme and their commitment to participate in the whole project cycle. A written agreement attachment indicating that communities will contribute their project cost share in kind or cash is required. Moreover, the study should contain writing confirmation letter that Kebele Administration council are consulted and certify the needs for the project and community willingness to participate in the project implementation. To this end, the organization and management study is expected to bring the following certificates to ensure that adequate consultations have been made:

- Certificate from the respective Woreda Administration council about acknowledgement and request made by the beneficiaries;
- Beneficiary willingness to contribute 5-10% of the project civil works investment cost either in the form of cash, labor and/or supplying construction materials with detail action plan indicating what, when, where and how to implement.
- Certificate from the respective Woreda Office of Irrigation/ Water Resources/ Office of Agriculture about agreement made between the study and design farmers representative and the Woreda Administration. (A scheme development agreement must be entered into between the respective IWUA and Woreda Administration).
- Certificate from the respective Woreda or Regional Bureau of Environment Protection, Land Use Planning and Administration environmental and social screening and land holding certificates; (or Realistic arrangements must be put into place for the issuance of land certificates to beneficiaries of the respective command area).
- Certificate from the respective Woreda Office or Regional Bureau of Agriculture stating that, the respective watershed has been treated or that realistic arrangements (including finance) have been made for its treatment.

Similarly the following essential points also get decision on the general community consultation processes

- Acceptance for proposed command area
- Acceptance of water resource abstraction
- Willing to accommodate land loss for irrigation infrastructure and access road
- Providing land for camp site
- Providing land for night storage
- Establishment of IWUA
- Others

### *2.2.8 Focus groups consultation*

A focus group is a qualitative data collection method in which beneficiary communities, expert (s) and other participants meet in one place (command area) as a group to discuss a given issue, in which the participants responding to open-ended questions. The number of focus group required for data collection depends on the size of the command area; however, this can be ranging from 3-5 groups. The groups should be organized from different parts of the command area (middle-tail or head-middle, head-tail of the command area). If the command area is located in different kebeles the focus group discussion shall be undertaken in each project kebele, villages and sub-villages. Particularly, the focus groups are to be selected in consultation with kebele administration office as well as development workers. Special group's consultation such as youth, women groups and model farmers can be organized independently. Its more helpful to discuss with youth, women groups and model farmers independently to acquire better and detail information on their problems and irrigation experiences.

In this respect, quality data is emerging from the group members' diversity because of difference in age, gender, farming experiences, technology exposure, access to resources and other factors. Different views will likely be expressed by participants own diversified socio-economic and cultural backgrounds. The number of households participating in focus group session shall be ranging from 10 – 15 households or beneficiaries representing different socio-economic groups like women headed households, elders, youth group, model farmers and traditional irrigation users (if any). The facilitator has to be recruited from the project wereda or kebele those are fluent in their local language.

Focus group sessions usually last from 1:00 to 2:00 hours and should include time for participants to take break. As you begin the discussion, consider how much time you are likely to have and set realistic goals for covering all the questions in the checklists. Allocating time frame for each discussion point is necessary.

These groups of households are required as a source of information for the history of settlement and permanency, availability of other water users in the up and down stream, availability of historical, archaeological and important places within the project area, the willingness of the community, the overall livelihood status of the community and the importance of irrigation project, negative and positive factors which the project has to consider in planning the project and related issues. Moreover, the consultation point could be existing community organization, traditional institutions, conflict resolution mechanism, resource use and management practices, community participation experience in the local level development, development constraints, and possible recommendation for the improvements of community livelihoods. Debriefing session should take place immediately after the completion of focus group session to summarize the findings to develop common understanding and their acceptance. The checklists available in the Appendix-8..

### *2.2.9 Up and downstream water users' groups consultation*

Apart from the proposed irrigation, there could be up and downstream water users that use the water resources of the proposed project. There could also be other water users that could come in the future when their needs and capacities get matured. In this case, the project would affect those places by reducing their water supplies. In additions, the project itself could also be affected by the existence of those water uses located at the upper stream. There could also be people to either side of the project which can cause effects. The socio-economist and hydrologist study should asses the availability of other water users and transfers the issue to the design team for evaluating the water balance and to decide either to implement or terminate the project. The sources of information for other water users are wereda administration council, the people, kebele administration office, development workers, focus group discussants and key informants. Once the places are identified, consultation is required to be undertaken with those water users by the help of the tentative discussion points provided in the Appendix-3.

### *2.2.10 Women groups consultation*

Women are the main actors in irrigation developments activities and consultative meeting should be held with women in the command area and in the kebele administration compound or inside the available women association office.

**Issues to be addressed**:- The major point which is discussed during consultative meeting will focus on the current access to land and asset holding, access to other social services, the way that SSIP benefit women, the role of women in agricultural practices, the practices that harm women, their willingness towards the proposed project, the involvement of women in different decision making process. Particularly women headed household should be consulted independently to assess their critical issues faced in their livelihood, the consultation agenda is attached in the Appendix-4.

### 2.2.11 Youth groups consultation

Youth groups are the main actors and sources of labour in irrigation developments and irrigated agricultural activities. As a result consultative meeting should be held with youth and particularly land less youth of the command area in the kebele administration compound or inside the available youth association office.

The major point which is discussed during consultative meeting will focus on the current access to land and asset holding, the way that SSIP benefit youth, the role of youth in agricultural practices, the practices that harm youth, their willingness towards the proposed project, the involvement of youth in different decision making process. Particularly women headed household should be consulted independently to assess their critical issues faced in their livelihood፡ the consultation agenda is attached in the Appendix-5.

### 2.2.12 Consultation with community key informants

Community key informant consultation will be carried out with selected knowledgeable, informative and innovative model farmers (male/female), elders and religious leaders to capture very important innovate information and on the best agricultural practices and experiences.

Key informant consultations are qualitative and in-depth interviews with purposely selected farmers and it allows a free flow of ideas and information. This method is useful to collect mainly qualitative data or information in identification and feasibility study phases of SSIP. The key informant interview could enrich and support the information obtained from farmers during focus group discussion and can fill the data gap which supposed to be difficult to get by other data collection tools. The number of participants at project site should not exceed more than 3key informants. Time is recommended to spend 25 minutes with each participant.

The points of consultation will be on the best practices or best results, on the existing irrigation practices (if any), village and sub-village arrangement in the kebele, traditional conflict management practices, values and cultures of the people, social constraints and proposed recommendations.

# 3 STAKEHOLDERSIDENTIFICATION AND CONSULTATIONS

## 3.1 STAKEHOLDERS IDENTIFICATION

Stakeholders are persons, groups or institutions who have an interest or stake in the project under consideration. Stakeholders may not necessarily involve or included in the decision process and they should be identified in terms of their roles and responsibilities towards irrigated agricultures. Stakeholders' analysis is the identification of a project's key stakeholders, an assessment of their interests and the ways in which these interests affect the project and its viability. Therefore, the process of stakeholders' consultation first begins with identification of primary, secondary and tertiary stakeholders. In small-scale irrigation project feasibility study process the identification of stakeholders and community consultation will concentrate around the project and in the administrative location of the project area. The socio-economist should first identify key stakeholders as described in the Table below.

**Table 3-1: Stakeholders identification, power and interest matrix**

| No. | Major Stakehold | Interest | Roles and Responsibilities in respect to SSIP study and | Strategies to get and keep their commitment |
|---|---|---|---|---|
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The stakeholders' assessment and consultation basically focuses on the implementation institutions arrangements at Regional level; zone, wereda and kebele level administration councils, private sectors and funding organizations. The purpose of stakeholders' consultation is to get their views towards different kinds of project issues, to get their cooperation and support in different types of project activities and to facilitate the collection of data and information.

The consultation process has to follow systematic procedures of hierarchy orders in order to optimize the results that could be obtained from the consultation. It should begin from higher bodies and then proceed to the respective lower levels. The procedure to be followed for informing and making consultation is to start at regional office, and then to proceed to wereda level office, kebele level office and then finally to the community. Not only consultation, but all of project engineering and non-engineering activities which are initiated at different phases should begin by informing and consulting higher bodies. In return, lower bodies are to be informed through their higher bodies. Similarly, the final targets which are the community shouldn't be contacted without following this procedure. Besides, entering into their fields is not recommended prior to notifying them and obtaining their permits through appropriate governmental body. The attempt to directly consult and to collect data and information from lower bodies could either fail or may result in poor quality results unless instruction is given from the respective higher administration bodies. The reason for keeping these procedures is that the target groups found at different levels can easily grasp and build their confidence over the project from their higher officials instead of hearing from outsider project staffs who are strange to them.

In this respect, official letter or notification should be transmitted to wereda level officials by the region. The contents of the letter are objective of the assignment, name of the consulting institution, participation expected from the wereda (cooperation, assignment of counter staffs, providing data and information by the different wereda level offices, coordinating and participating wereda and kebele level offices and the community, selection and providing data collectors and enumerators, etc.). The expert who conducts the community participation study and others too should have copy of the letter. Similarly, introducing and instructing the kebele and the community would be made through wereda level officials. The wereda will assign assistants that can explain and discuss the project issues with the kebele and community. It also notifies them to cooperate with the study team through its own administrative structures and official letters.

Attitudes could be reflected either through discussion on different discussion topics or by asking them simply to express their views towards the project. Out of these two, the first option which is discussion on different consultative points in the form of agenda enables participants to forward more ideas which are focusing at the required points of the project. The points of discussion and consultations at different levels are as follows.

## 3.2 STAKEHOLDERS CONSULTATION

### *3.2.1 Regional level consultation*

Prior to conducting any field works in detail, the higher level Regional consultation has to be made with the offices mandated for project planning, implementation and operation. The points of discussions will be with regard to directions and instructions that have to be followed by the study and design team. Specially consultation at regional level will be conducted with Bureau heads, deputy heads, process owners, senior technical experts and staffs, the consultation points will also includes the project planning and prioritization approach, project profile in the region, previously conducted study documents, existing regional experiences and issues that needs focus areas. During consultation the Socio-economist should take the names of participants, their professions, telephone address, their departments/process, signatures and similarly the specialist should also take different pictures in the discussion.

### *3.2.2 Wereda level administration offices consultation*

**The procedure of consultation at wereda level is as follows**: -The Socio-economist submit regional official letter addressed to the wereda administration office and held preliminary discussion with the office head. The points of discussions would be explaining about the purpose of the study, explaining different study components and their tentative execution schedules, introducing different team members of the study, requesting the office to arrange discussion with the rest wereda level administration councils and to write letter to project kebeles and also to pass the information to kebeles and communities through their formal ways of communications.

The lists of wereda level participants would be selected together with the wereda administration office. Tentative list of participants includes:

- Wereda Agriculture and Natural Resource office
- Women & children office,
- Youth and sport,
- Water resource development office,
- Trade and industry office

- Cooperatives and marketing office
- Economic and finance cooperation office
- Investment office
- Health office
- Education office
- Rural road and communication
- Livestock and fishery office
- Rural land administration office
- Environment and Forestry and
- Others which are found relevant at the project area.

The above indicated Wereda level offices preferably will be represented by head of the offices. Notes on preliminary discussion with wereda administration head and participants list would be recorded by the expert.

**Consultation process:-** Wereda level discussions would be held and chaired by the wereda administrator. Before starting the discussion, rapporteur preferably from the Agriculture or Water Resource Development office which is responsible for the development of small scale irrigation would be assigned. Written points of discussions would be given both to the rapporteur as well as for the rest of meeting participants. After the end of the meeting, the participants would sign at every page of the minutes of discussions and then would be stamped and covering letter would be arranged by wereda administrator. The main copy will be given to the expert while copies would be given to all participant offices. In the meeting, photographs that can show meeting participants would be taken and attached as part of the sector feasibility report. The tentative points of discussions and recoding formats are provided in the Appendix-7.

### *3.2.3 Consultation with kebele administration council*

Consultation with kebele administration council is the next form of meeting that comes next to the consultation with wereda administration councils. The appropriate meeting time and place would be arranged by the kebele administration council head and committee members. The recommended meeting participants are kebele administration head, kebele administration council members, different kebele level committee members, kebele level development zone team leaders, women committee members, kebele development workers, kebele level social service provider representatives (health extension worker, school directors, credit institution representative &etc)and kebele level traditional courts committee members. The kebele administration head would lead the discussion whereas development workers would be responsible for recording the meeting. The results of the discussion would be provided to the study team after being stamped and covering letter is attached by the kebele administration office. Photographs will be taken in the meeting and the picture will be included in the report. The format and point of discussion are given in the Appendix II.

### 3.2.4 Private sectors consultation

Conducting consultation with the existing private sectors around the project area have a significant advantage and private sectors task is the main driving force of development of the area and could provide important services. The private sectors are important data and information sources, the time, place and points of consultation should be arranged by the Socio-economist through discussion of private sector prior to the consultation. Basically, the consultation of the private sector could involve and should target to high value horticultural product producer, agricultural production, agro-processing sectors and a wide range of service provision. Private actors could have the opportunity to produce high value and export crops and improved seed production. Agricultural service provision such as renting agricultural machinery and implements, renting cool storage and transport facilities for vegetable and fruits, exporting products of smallholding farmers, health, education, rural credit provision, rural transport, maintenance of water and irrigation water supply schemes, input supply and marketing will be among the opportunities for private actors involvement. In line with these, the government should also support and encourage the private sector through research and extension, financial support, land acquisition and by implementing laws and regulations that do not act as a barrier to private investment. Assessment and consultation of such private sector development in small towns and its surroundings are necessary for iirrigation developments and have a multiplier effect that promotes small and medium sized employment creation, income generation, alternative livelihood creation, value adding opportunities and quality service provision.

### 3.2.5 Consultation with NGOs and development partners

There are indigenous, international NGOs, religious self-help organizations and development partners operating within the project area. The majority of them have agriculture activities, irrigation, health, education, water supply, women, children and youth development components. Therefore, consultation of these Non-governments and development partners' organization will be necessary and the basic point of consultation will focus on their integrated development plan, implementation period, budget allocated for their plan, area of service delivery, their support towards the realization of the proposed irrigation project. Similarly, their support towards physical and human capacity building, community assistance and organization, their assistance to women, youth and marginalized groups needs discussion with these NGOs and development partners. The location of their office might not be necessary around the project area and it might be at Region, Zone or wereda towns. The place, time and participants of the consultation process will be arranged by the socio-economist and at the end of the consultation the participants' name, their organization name, telephone address and signature is necessary and managed by the specialist.

### 3.2.6 Consultation with key informants

Key informant consultation is suggested to carrying out with selected knowledgeable and informative experts in irrigation, development workers, health extension workers, traders (whole sellers, retailer and agro-processers), innovative or/and knowledgeable farmers to capture very important information on critical points.

Key informant consultations are qualitative and in-depth interviews purposely selected individuals. It allows a free flow of ideas and information. This method is useful to collect mainly qualitative data or information in identification, and feasibility study phases of SSIP. The key informant interview could enrich and support the information obtained from farmers during focus group

discussion and can fill the data gap which supposed to be difficult to get by other data collection tools. The number of participants at project site should not exceed more than 3-5 informants. Time is recommended to spend 20 minutes with each participant.

The points of consultation is on the existing irrigation practices (if any), village and sub-village arrangement in the kebele, traditional conflict management practices, values and cultures of the people, social constraints and proposed recommendations.

Content of the checklist: Name of key informant, his/her position, main points raised and discussed, summary of important points and recommendations are very important tasks. The checklist for interview is available in the Appendix II

# 4 ORGANIZATION AND MANAGEMENT OF SMALL SCALE IRRIGATION PROJECTS

## 4.1 ASSESSMENT OF EXISTING TRADITIONAL AND COMMUNITY BASED ORGANIZATION

Assessment of existing traditional and community based organization during feasibility study assists to get primary and secondary data focusing on the types of the existing organization, their role and responsibilities, institutional capabilities, financial mobilization and utilization. Moreover, the assessments of these organizations assist to see their rules, regulation and management strength of these traditional institutions, which have significant inputs for future recommendation and adaptation. The assessment methods could be through consultation of their committee members, their financial accountants, observation of their offices arrangements and documentations, consultation of individual association members.

## 4.2 TRADITIONAL INSTITUTIONS AND COOPERATION

Cooperation and mutual assistance or traditional social institutions such as ‘’Debo or Jigi’’, "Wonfel", "Iddir", "Iqub", "Mahiber", "Sembete" and other association, are common in the rural area of the respective regions. Such home-grown institutions are very common among men and women’s household groups. The type, role and responsibilities of such institutions should be assessed based on the respective project location. The experience and contribution of such traditional cooperation towards the proposed project should be assessed and evaluated in detail. There are many practices and experiences to learn from this traditional institution for the current resources utilization and management.

The assessment should be conducted with the members and committee members of such mutual cooperation, regarding with traditional community organizations 'objectives and purpose of association, organizational setup, financial mobilization and management experience, mutual labour cooperation and materials contribution. Moreover, the assessments of the rules, regulation and management strength of these traditional institutions have significant inputs for future recommendation. The possible involvement of the traditional CBO in supporting the anticipated irrigation project should be assessed and recommended for planning (for instance in availing credit for irrigators, facilitate exchange of labour for elders, searching additional market outlet) and others.

## 4.3 FARMERS ASSOCIATION

Farmers association is the most significant and the lowest level institution in the formal administrative and political structure of the government. It is the point of entry into the government administration and most regularly approached by the inhabitants for most social, economic and political affairs. Villages, sub-villages, development zone and households with their family composition should be assessed during the study and detail design period of an irrigation project.

**The Organizational setup of kebele administration**:- the number of households at different kebele structure, the type and number of committees in the kebele, their role, responsibilities and existing gaps needs assessment. Some of the committees include kebele cabinet members, kebele court committee or traditional judiciary, security and peace affairs, women and youth associations, land use and administration affairs, water supply and sanitation affairs, education,

forest conservation and control committee, health affairs, watershed management committee and others. The kebele has council members with five year terms of office. Mostly members of the various management committees of the kebele are elected from members of the kebele council which should be assessed in the study and design process which will have significant contribution for project management.

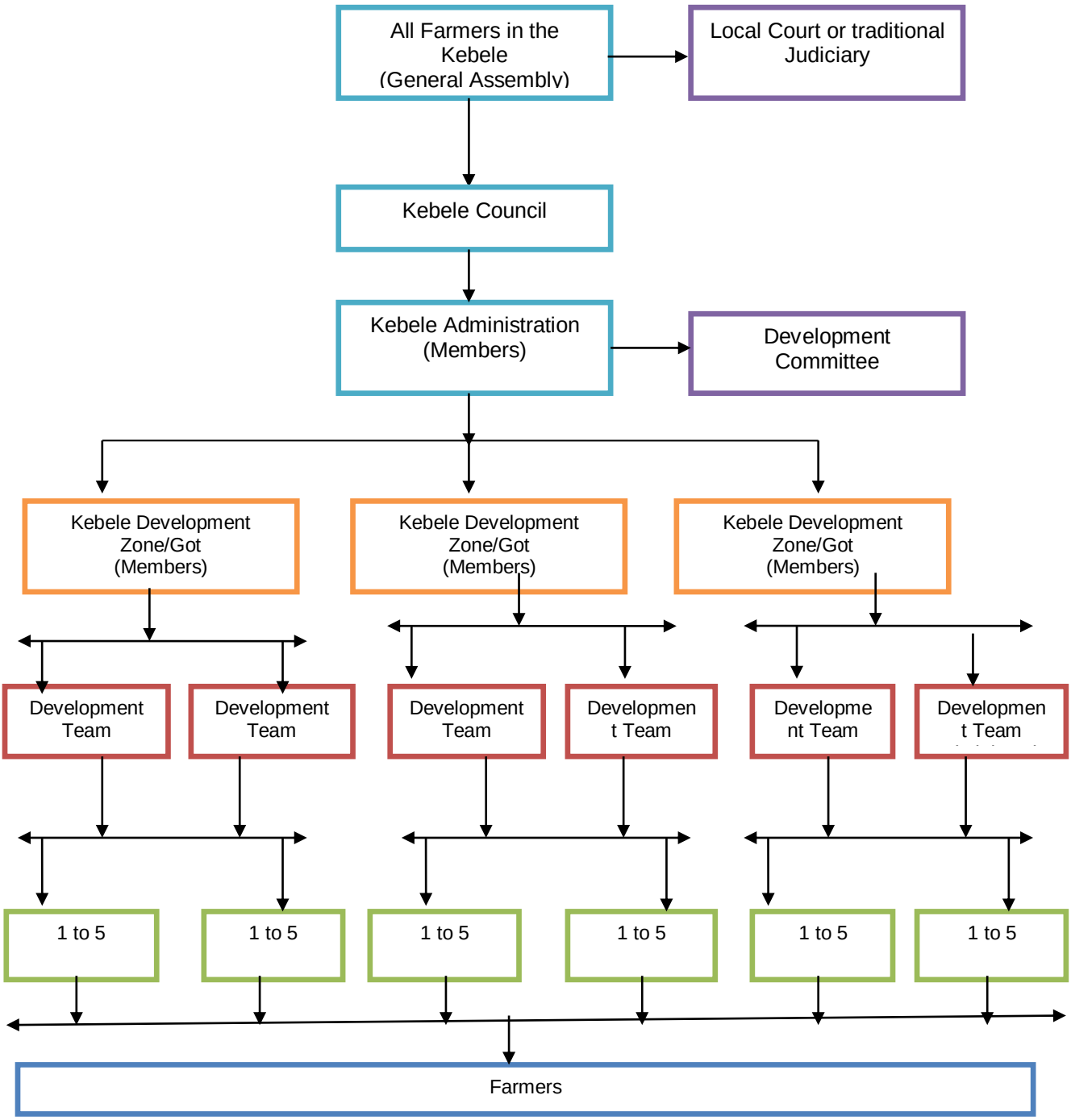


**Figure 4-1: Organizational setup and responsibilities of the farmers' association**

Moreover, the role of the kebele in the development of planning, budget appraisal, monitoring and evaluation of on-going activities should be assessed. Specially the role with respect to ensuring peace and security, administer and conserve any public property within the area such as land, water, forests and communal grazing areas, conflict resolutions and with respect of take peoples' opinion to the government and processing people's applications needs detail assessments in the study and design process.

## 4.4 PRIMARY COOPERATIVE SOCIETIES

Primary cooperatives were established based on volunteer bases of individual farmers within the kebele administration to resolve the social and economic problems. In the study and design stage of an irrigation project, the following data should be collected from primary cooperative office:

- types and number of primary cooperatives,
- Role and responsibilities of the association
- Number of male and female members,
- Organizational set-up,
- Fixed assets, financial resource mobilization and management experience
- Type and number of committee members, legality issues,
- Banking systems and financial accounts should be assessed in detail.
- Major challenges of the primary cooperatives

Particularly, the role and responsibilities of primary cooperatives with respect of the supply of agricultural inputs such as fertilizer, seed, chemicals, farm tools and irrigation equipment (pumps, sprayers) and outputs marketing should be assessed in detail. These issues need to be assessed in consultation with the management committee and employed staffs of primary cooperatives.

## 4.5 COOPERATIVES' UNION

Unions were established based on the cooperation of primary cooperatives located in similar area having better financial and technical capacities to resolve the social and economic problems of primary cooperatives. In the study and design stage of an irrigation project, the existing type and number of unions, number of primary cooperatives in the unions, role and responsibilities, number of male and female members, their organizational set-up, their current and fixed assets, number of board members, financial resource mobilization and management experience, legality issues, banking systems and financial accounts should be assessed in detail. Particularly, the role and responsibilities of unions with respect of the supply of agricultural inputs such as fertilizer, seed, chemicals, farm tools and irrigation equipment (pumps, sprayers), outputs marketing, agro-processing, import and export capabilities information should be collected through discussion with Union manager, employed staffs and/or board members. Similarly, the major challenges of the union also assessed in consultation with the management body and employed staffs of the union.

## 4.6 IRRIGATION WATER USERS' ASSOCIATIONS FOR SMALL SCALE IRRIGATION

### *4.6.1 Background information of irrigation water users' associations in Ethiopia*

Some evidences have shown that traditional irrigated agricultural started in Ethiopia many year ago. The main sources of irrigation were rivers and government has encouraged and assisted the farmers in a formal way to strengthen the traditional effort since 1985 due to the occurrence of drought in the country.

Traditional irrigated agriculture practicing famers have organized themselves as an informal association/group called traditional water user groups that based the traditional irrigation scheme. The traditional irrigation schemes were constructed using local available materials like gravel, packed sacks mud, grass, stones, wood and unlined canals conveying water to the command area.

The water management of traditional irrigation associations/groups has been dealt by Water a master or group of water masters. These Water masters have different local names in different regions. The associations/groups have oral, customary laws pertaining to water allocation, operations and maintenance and also provisions for penalties for water theft, non-participation in maintenance work etc.

Nowadays for the formal and modern irrigated agriculture irrigation water users associations become the formal responsible body in managing and administering irrigation schemes. An Irrigation water users association may be established as a self-governing, non-profit legal entity that shall, in the public interest, manage a canal network, wholly or in part, in order to provide water to its members for agricultural purposes.

The irrigation water user association/organization (IWUA) is not a new concept. However, in a number of countries legislation regulating the establishment and operation of IWUAs has been on the statute books for hundreds of years. Indeed, they are often so well established that their role is scarcely noticed within the societies that they serve, simply and efficiently undertaking the tasks for which they were created.

Sustainable development of farmers-managed irrigation systems implies the establishment of a legally recognized Irrigation Water Users Association (IWUA) having the capacities for sustainably managing, operating and maintaining an irrigation scheme in a democratic manner and to the satisfaction of water users. It is the first time that irrigation water users association are encouraged to establish based on the legal background in Ethiopia, which has been enacted in 2014 as Irrigation water users' association proclamation 841/2014.

The focus of the Proclamation is on the establishment and operation of IWUAs as a specific and new type of legal entity in Ethiopia. This part of the document refers to the establishment and operation of IWUAs in Ethiopia according to the Proclamation. It duly takes into account the specific features of IWUAs provided by the Proclamation that make IWUAs different of other forms of farmers' organizations such as associations and cooperatives. The focus of this part of the document is on IWUAs, not the irrigation sector *per se*.

Apart from the irrigation water management, operation and maintenance of irrigation systems, such tasks in many countries can include the management of canals and land drainage schemes, the maintenance of dykes and flood-defense structures, the removal and treatment of wastewater, the supply of water for domestic consumption and other uses, and the management of groundwater resources. In addition, IWUA are increasingly becoming involved in water shade, water resource management and conservation of their locality. Therefore, proper lines of organization and management of the beneficiaries will prolong the life of an irrigation scheme, brings sustainable return and the revenue they get from the production, which attracts the farmers for further effective works.

The IWUA proclamation creates a specific legal basis for the establishment of Irrigation Water Users' Associations (IWUAs) as a particular type of legal entity for operation and management of irrigation and drainage systems, particularly for large scale irrigation scheme, which can be easily adopted for small scale irrigation schemes/projects. The proclamation No 841/2014 is a new legal base for the establishment and management of irrigation water users associations in the country for large scale and modern irrigation schemes. As elsewhere in the world, the pre-existing legal

framework in Ethiopia (i.e. cooperatives and associations proclamations) does not provide an appropriate legal basis for IWUA establishment given that:

- IWUAs are public law organizations and their mandate is of a public interest nature;
- Membership is compulsory (all irrigation land holders have to properly manage and use irrigation and drainage systems and produce the relevant crops which are important to the household and the community)
- IWUAs operate on a non-profit/noncommercial basis but they will nevertheless provide services to their members, namely the provision of irrigation water, on a paid basis;
- IWUAs are self-managed organizations governed by their members but due to the public interest nature of their tasks, they are subject to some form of supervision by the State.

### *4.6.2 Definition of irrigation water users association*

An Irrigation Water Users Association (IWUA) is a non-profit organization that is initiated and managed by the group of irrigation water users along one or more hydrological sub-systems (distributary canals which are the higher level than a watercourse) regardless of the type of farms involved. An Irrigation Water Users' Association (IWUA), on the other hand, is a WUA whose main goal isto develop, utilize and manage water resources for irrigation and/or drainage. The IWUA members make joint efforts to install, operate, maintain and manage the irrigation or drainage facility for the benefit of all the members. By irrigation water users we mean the ordinary cultivators of land, individual members of lease-holding farms; owners of private farms, owners of home garden plots, etc.

These are the potential members of the IWUA, who pool financial, material, technical and human resources for the operation and maintenance of the irrigation and drainage system within their jurisdiction for the benefit of all the members. The membership in the IWUA is based on contracts and/or agreements between the members and the IWUA.

### *4.6.3 Roles and responsibilities of irrigation water users association*

Some of the common roles and responsibilities of Irrigation water users association are:

- Manage an irrigation and drainage system wholly in its service area and provide fair water to its members for agricultural purposes
- Manage and operate the irrigation and drainage system within its service area in order to supply irrigation water and drainage services to its members
- Maintain, rejuvenate and improve the irrigation and drainage system within its service area and to undertake construction and reconstruction works as may be necessary
- Take measures to combat erosion, pollution, salinity and flooding
- Issue internal rules for consumption of irrigation water and collect fees from its members for the services provided
- Procure, substitute, maintain and operate irrigation equipment
- Train its members in irrigation techniques, irrigation farming methods, water saving methods and new technologies of irrigation
- Collect different types of fees from members and allocate and use the resource properly

In general the tasks of an IWUA are all related to operation and maintenance of the irrigation and drainage system located within its service area. IWUAs cannot engage in any other activity such as marketing services or the provision of agricultural inputs.In more details, tasks of IWUAs can be sort into three categories: (1) governance, (2) operation and maintenance, and (3) management:

1. **Governance (or social management):** This task relates to the role and responsibilities of the General Assembly: election of members of governing bodies, approval of budget, action plan and annual reports as well as the adoption and amendment of regulations that govern day to day activities of an IWUA. Rules related to water distribution, maintenance of irrigation infrastructures, type and level of sanctions for people breaching the rules or defaults of payment of the irrigation service fee are examples of operational rules.
2. **Operation and maintenance** (O&M): This task includes all activities that deal with planning, implementation and monitoring of water distribution and maintenance works; controlling soil erosion and soil fertility and training IWUA members in irrigation techniques or water saving methods.
3. **Management** relates to the administration of the IWUA and the financial management.

### *4.6.4 Organization process of irrigation water users association*

#### 4.6.4.1 Guiding principles of IWUAs

The IWUA Proclamation provides for guiding principles of operation of IWUAs. They are clearly less than binding rules but they are more than vacuous policy statements or politically correct platitudes as each IWUA is legally bound to put these principles into practice.

The guiding principles are:

1. **Non-discrimination**: Meaning that an IWUA shall not discriminate against its members or categories of its members on any basis, including gender, religion, political opinion or ethnicity;
2. **Transparency and participation**: Meaning that an IWUA shall operate in a transparent manner and shall promote members' participation through its General Assembly and elected committees;
3. **Fairness and equity**: Meaning that an IWUA shall ensure fairness and equity in decision making and the allocation and use of resources, including irrigation water, having regard to the needs of its members;
4. **Rational use of natural resources**: Meaning that an IWUA shall manage the irrigation and drainage system within its Service Area in a rational manner so as to prevent waste of water, erosion, soil and water salinization and pollution, as well as to promote the protection of the environment;
5. **Cost recovery and financial sustainability**: Meaning that an IWUA shall set fees at a level that ensures that it has adequate resources to cover all the costs of its activities and take all reasonable efforts to ensure that such fees are collected.

#### 4.6.4.2 Membership criteria of IWUA and termination of membership

Membership in each IWUA is mandatory. Every person using land that lies within the "service area" of an IWUA (i.e., the land capable of being supplied with irrigation water from the irrigation system operated by the IWUA) is required to be a member of that IWUA. The membership obligation is not personal to the farmer as such; rather it is linked to the land which he/she uses.

Compulsory membership is essential to ensure IWUA sustainability. With surface irrigation it would in practice be difficult to prevent non-members from free-riding: benefiting from irrigation water (and even more so as regards drainage or watershed management benefits) without paying.

- Any person who possess and uses land in accordance with the appropriate land holding system which is located within the service area of an association shall be a member of the association
- Any person who acquires use right of the land located within the service area of an association by succession or any other legal method shall become a member of that association upon payment of any outstanding contributions and fees due to the association from the previous user of that land that have not been collected
- The rights and duties derive from the formation of an association are inseparable to the plots located within the service area of an association and shall be transferred with those plots while the association is alive or until such plots no longer lie within the service area following an amendment to the by-laws of that association
- A person who uses land located within the service area of an association on the basis of lease contract for more than three years shall be considered as a member of the association throughout the term of that lease
- A person who leases his land possession located within the service area of an association for three and less than three years shall continue as member of that association; provided, however, that the lessee:
  - Shall comply with the by-laws and regulations of the association;
  - May exercise the membership rights of lesser in the association by written authorization of the latter

**Conditions for termination of membership of the IWUA**

- Any member who has ceased his use right over the land located within the service area of an association may terminate his membership, in writing, upon notifying to the association.
- Any member shall be liable for the outstanding fees due to the association at the date on which his membership terminates

### *4.6.5 Procedures for the establishment of IWUA*

The proposed procedure for the establishment of an IWUA includes 9 steps and involve potential members and the IWUA promoters; the team that will work with farmers during the whole process. Note that IWUA establishment is the responsibility of the supervisory body (Ministry of Water, Irrigation and energy and any designated government organization in the respective regions) in charge of IWUA. Of course, the IWUA promoters should adapt the procedure to the social and economic specificities of each site, previous experience of farmers with irrigation management, size and features of the irrigation system, etc. In order to properly manage and use the irrigation schemes at small scale level, all potential beneficiary farmers need to participate from the very beginning of the project. Unless land redistribution is required it is advisable to establish IWUA before construction of the irrigation schemes.

**Step One: reconnaissance visit**

The objective of the reconnaissance visit is to rapidly assess with farmers the performance of O&M and identify major technical and organizational constraints for carrying out adequately irrigation water distribution/allocation and maintenance of irrigation infrastructures and equipment.

It is highly recommended that prior to the reconnaissance visit, the IWUA promoters collect information about the villages and the irrigation system from secondary sources such as maps, reports, and census data. Information to collect should include: (a) names and location of villages, (b) main characteristics of the irrigation system, (c) number of farmers / households in the irrigation system, (d) command area and irrigated area, (e) cropping patterns and average yields of main crops and (f) relevant hydrological data on water availability and water use.

During the reconnaissance visit the following activities can be carried out:

- Short visit of the irrigation system by the IWUA promoters accompanied by a group of farmers
- Focus group discussion with farmers and assessment of farmers' interest for a better organization of O&M of their irrigation system.

After the reconnaissance visit, the IWUA promoters will prepare a short report for giving a feed-back to farmers at step two. The IWUA promoters agree with farmers on the date of step two.

**Step Two: Awareness creation meeting(s)**

The objectives of the awareness creation meeting(s) are:

- To raise farmers' awareness of the constraints related to irrigation water management and maintenance in their irrigation system,
- To inform farmers on what is (and what is not) an IWUA, and
- To assess farmers' interest for establishing an IWUA in their irrigation system.

Depending on the size of the irrigation system and number of farmers, one or several meeting(s) will be conducted. Each meeting should not last longer than 2 hours, whereby the duration of the presentations should not be longer than 30 minutes giving the attending farmers sufficient time to ask questions following the presentations. It is crucial that a convenient location is selected, where all farmers can come easily and where the meeting could be conducted quietly and undisturbed manner.

During the meeting the IWUAs promoters will make two presentations followed by discussion with farmers:

1. Feed-back of the reconnaissance visit and discussions about the constraints of O&M and the need for improving farmers' organization for managing their irrigation system, and
2. Introduction to the IWUA principles, contextualized to the specific situation of the farmers and their irrigation system and the advantages to be a member of a well-organized IWUA. The most important notions to be introduced during the presentation and discussed with farmers are:

    - Mandate of IWUAs;
    - Membership: the reasons for compulsory membership, rights and duties of members;
    - Internal structures of IWUAs
    - Tasks of IWUAs: governance (social management), O&M and management
    - Tasks that are not permitted to IWUAs (procurement of inputs, marketing of products, etc.) and reasons why.
    - Financing of IWUAs: payment of the irrigation service fee in cash and in kind, necessity for constituting a reserve fund for emergency repair and replacement costs.
    - Relationships of IWUA with the supervising body and the local government

At the end of awareness meeting(s), the IWUA promoters must assess if the farmers, who attend the meeting(s), show a real interest in the establishment of an IWUA in their irrigation system.

The IWUA promoters must ensure women farmers attend the awareness meetings. If it is obvious that women farmers cannot attend or participate actively in the awareness meeting(s) due to the presence of men, the IWUA promoters must arrange a separate meeting for the female farmers

**Step Three: Formation of the IWUA establishment committee**

The objectives of step 3 are:

1. To present the procedure of IWUA establishment to farmers
2. To form the IWUA establishment committee/ad hoc committee

During a half day meeting with farmers, the IWUA promoters will present the procedure for establishing an IWUA. At the end of the meeting, the IWUA promoters will request farmers to appoint the member of the IWUA establishment committee. The role of this committee is to carry out the review of by-laws, prepare the action plan and budget for the first year of operation and organize the meeting of the constitutive general assembly. Moreover, members of the establishment committee have to report back to all farmers the outcomes of their doings.

The establishment committee must include farmers having a land right in the command area and be representative of the different parts of the command area (head, middle, tail). It is strongly recommended that women farmers are included in the establishment committee.

**Step Four: Registration of IWUA potential members**

The majority of farmers must formally agree to the establishment of an IWUA. Otherwise the IWUA would lack of legitimacy to carry out its tasks and enforce its rules and regulations. To this end, the establishment committee in collaboration with IWUA promoters shall ask all farmers whether or not they want to sign the establishment petition. The IWUA proclamation provides that a majority of farmers (at least 50% of farmers + 1) must have signed before the date of constitutive general assembly.

**Step Five: Identifying and forming irrigation water users units**

Based on the organizational guideline of IWUAs, the number users units per association and the number of individual per users unit will be identified. The IWUA establishment committee in collaboration with IWUA will facilitate the identification and formation of irrigation water users unit.

- Unit leaders and deputy leader will be elected
- Representative of the unit for the GA of the association will be elected (if necessary)

**Step Six: Preparation of draft by-laws, annual operation plan along action plan and budget**

The establishment committee has to prepare the IWUA draft by-laws by reviewing and discussing all articles of the model by-laws with the support of the IWUA promoter during a one day meeting. During this exercise, the establishment committee has to decide on: (1) the general assembly members (all farmers or unit representatives), (2) the number of members of the IWUA governance bodies, and (3) a number of other options proposed in the models of by-laws.

After the meeting, the members of the establishment committee shall inform all farmers of their decision and collect proposition for change/amendments to the draft by-laws. The draft by-laws remain amendable till they are approved at the meeting of the constitutive general assembly.
The draft action plan should also include the activities to be carried out by the IWUA during the first year of operation. It should be prepared by the IWUA establishment committee with the

support of the IWUA promoter. Activities can be sort in three categories: (1) governance, (2) operation and maintenance, and (3) management.
Furthermore, the IWUAs budget needs to be prepared and the purpose of this sub-step is to prepare the IWUA draft budget and assess the level of the irrigation service fee for the first year of operation. But perhaps more importantly, this sub-step is an opportunity to discuss with farmers about cost recovery principles, namely:

1. The IWUA must finance recurrent costs for the O&M of the irrigation system and other costs related to the management of the IWUA itself.
2. The IWUA must establish a reserve funds in order to finance emergency repair works, rehabilitation or modernization of the irrigation system, replacement of worn out equipment such as the irrigation pump.
3. To finance all recurrent costs and establish a reserve funds, the IWUA must set the irrigation service fee based on sound estimates of those costs incorporated in its budget

In this sub-step, the IWUA promoter will first provide establishment committee members with elementary general information on budget. In a second time the IWUA promoters will introduce a proposition of budget based on the IWUA action plan done at step 5 for discussion with the establishment committee.

**Step Seven: Preparation of the constitutive general assembly meeting**

The establishment committee members will lead the activities of this step with the support of the IWUA promoters. Prepare the meeting of the Constitutive General Assembly that will:

- Elect the members of the bodies of the IWUA
- Approve the draft by-laws
- Approve the draft action plan and the draft budget of first year operation

**Activities**

- Activities to be carried out by the establishment committee include:
- Organize the election of the unit representatives if the future IWUA members have agreed on this option in the draft by-laws and write the list of unit representatives.
- Collect the names of the candidates who want to run for election at the Management Committee, the Control Committee and the Dispute Resolution Committee (if any)
- Check the documents to be approved by the General assembly (draft by-laws, draft letter of intent, draft action plan and budget of first year of operation)
- Prepare logistic details: place of the meeting of the General Assembly, ballot papers, etc.
- Fix the date of the constitutive general assembly and inform members of the future IWUA and invite local government, public entity in charge of irrigation, etc.

**Step Eight: Conducting constitutive general assembly meeting**

The main assignments to be carried out during Constitutive General Assembly meeting are:

- Approve the draft by-laws
- Approve the draft action plan and budget for the first year of operation
- Elect members of the Management Committee, the Control Committee and the Dispute Resolution Committee (if any).

After the meeting, the members of the Management Committee will select among themselves the Chairperson, the Vice Chairperson, the Secretary and the Treasurer.

**Step Nine: registration of the IWUA**

Registration allows the IWUA to formally obtain legal personality. This would be done by regional supervising bodies which are the entities that maintain the register of IWUAs in their respective regions.

For registration, the Chair Person of the IWUA submits an application letter for registration to the Supervising body together with:

- The minutes of the Constitutive General Assembly;
- Three copies of memorandum and article of association;
- Three copies of the by-laws of the IWUA;
- The plan of the proposed service area and the location of the units, if any
- A copy of the work plan and budget of the first year of operation;
- The list and detail addresses of the committee members
- The list of members.

### *4.6.6 Formation of IWUA and federation*

The numbers of IWUA to be established per an irrigation scheme depends on number of beneficiaries, land size and topography. In small and medium irrigation schemes where farmers could get and communicate easily, it is advisable to establish one IWUA per scheme (regardless that beneficiaries are located either in one kebele or more than one kebeles). In medium irrigation schemes where land topography is a bit scattered and wide, it is possible to establish more than one IWUA.

According to the proclamation 841/2014, at irrigation scheme where there are more than one IWUAs, it is important to establish Irrigation users Federation to play a coordination role among IWUAs and to manage and administer the head work of the irrigation scheme and other parts of the scheme which are not belonged and are beyond the capacity of the individual IWUA.

The practical experiences of IWUAs have shown that the membership size per IWUA from 200 to 500 is manageable to execute its duties and responsibilities. The optimum size of an irrigation association is neither too large nor too small. This should be matched with the criterion that each Irrigation Water Users' Associations should operate within the command area of hydraulically independent canals, as far as possible.

### *4.6.7 Management of irrigation water users association*

The success and sustainability of an IWUA highly depend on the commitment of members and complying status of them on the working arrangement of the association. The governing body which is the supreme body of the association and the managing body which is the executive body of the decisions made by governing body of the association are both integral bodies of the association whether to meet or not the mission of the association.

### *4.6.8 The governing and managing bodies of IWUAs*

IWUAs are self-managed organizations and governed by their members through the General Assembly. In addition to the General Assembly, Each IWUA has a Management Committee, a Control Committee, and Dispute Resolution Committee. As necessary other sub-committees can be established depending on the organizational guideline and model by law of the association.

**a. The general assembly**

The General Assembly is the sovereign, or main decision making body of each IWUA. Since in small scale irrigation schemes, the number of beneficiary farmers will not exceed from manageable size, all members of the association are expected to participate in the meetings of the general assembly.

The tasks of General assembly are essentially decision making tasks undertaken at General Assembly meetings. Key tasks in this respect are the election of different committee members, the approval of the level of the irrigation service fee, as well as the approval of a range of documents including the draft budget and any regulations. In practice these documents and draft decisions will be prepared by the management committee which will recommend their approval to the General Assembly. The members of the General Assembly have the right to question the management committee but they will likely agree to the proposals of the latter: after all they elected them. Each IWUA must hold a meeting of its General Assembly at least once a year. The chairperson of an IWUA may call emergency meetings as necessary at his/her discretion or on the request of one third of the members of the IWUA. Detail powers and duties of the General Assembly are:

- Approve the annual work plan and budget of the association;
- Elect and dismiss the members of the management body, the control committee, the dispute settlement committee and members of other subcommittees;
- Approve or amend the by-laws and internal regulations of the Association;
- set the amount of fees and fines payable by the members;
- Approve the annual income and expenditure statement and balance sheet and the annual report of the management bodies;
- Make decisions on the re-organization or liquidation of the association;
- Set limitation on the sale, purchase, mortgaging or pledging of any assets owned by the association, investment or conclusion of loans, overdrafts or other financial liabilities of the association;
- Approve contracts above a certain value or of high significance to the association as may be specified in the by-laws the right to attend meetings of the general assembly without having the right to vote
- Decide on any issue submitted to it by the management bodies or other committees

**b. Management committee**

Every association shall have a management committee to be elected in accordance with the by-laws of the association, which is accountable to the general assembly and whose members shall not exceed 11 and not be less than five. The term of office of the management committee shall be five years; provided, however, that not to expire the terms of committee members elected at the same time at once, the stagger for three of them shall be specified in the bylaws of the association.

A member of the management committee shall not be elected for more than two consecutive terms. The by-laws of the association may provide that members of the management committee

shall be represented from one or more than one units within the service area and to be elected from among those represented.

Any member of the management committee shall declare and cease his participation in the discussions and decisions of the management committee when there is conflict of interest. No member shall have the right to stand for election to the management committee when he is subject to outstanding liabilities including fines to the association. Those members elected for management committee shall elect chairperson, vice chairperson, secretary and treasurer from among themselves. Some of the common powers and duties of the management committee are:

- Implement decisions given by the general assembly;
- Prepare the annual work program and budget of the association and implement same upon approval;
- Prepare agenda for the meeting of the general assembly;
- Call the general assembly in accordance with the by-laws of the association;
- Maintain the minutes of meetings of the general assembly in writing;
- Submit reports to the general assembly on the activities and budget of the association;
- Maintain the documents and books of accounts of the association;
- Implement such other activities specified in this Proclamation or in the by-laws or determined by the general assembly

The management committee shall convene its ordinary meeting once in every month; provided, however, that it may hold extraordinary meeting sat any time as may be necessary. The quorum for the meeting of the management committee shall be as specified in the by-laws of the association. The decisions of the management committee shall be passed by consensus; incase of lack of consensus, the by-laws may authorized the passing of decision by majority vote.

**Control committee**

Every Association will have a control committee composed of not less than three members elected by the general assembly. The terms of the members of the control committee shall be staggered in the bylaws not to expire the terms of all members elected at one time. A member of the control committee may not at the same time serve as a member of the management committee. The control committee is accountable to the general assembly. Some of the common powers and duties of the control committee are:

- To follow up that the management committee is discharging its responsibility properly;
- To follow up that the funds and property of the association are properly utilized;
- To follow up that the financial and other activities of the association are undertaken in accordance with the by-laws and internal regulations; and carry out audit at least once in a year;
- To submit an annual audit report to the general assembly

**c. Dispute settlement committee**

Each IWUA can establish a 3-5 persons Dispute Settlement Committee to resolve disputes between IWUA members. The by-laws specify the procedures to be followed by such a body. Members of a dispute settlement committee elected by the general assembly shall elect one of them to be the chairperson of the committee. The common powers and duties of Dispute settlement committee are:

The dispute settlement committee shall have the powers and duties to hear and determine:

- Disputes on water use and distribution between members of the association;
- Disagreements related to the violation of the association's by-laws, or internal regulation;
- Matters related to non-observance of watering schedule and appeals lodged against the decision of the management committee

It is important to stress that its mandate is restricted to the resolution of disputes between IWUA members and not disputes between members and the IWUA itself as that would undermine the authority of both the management committee and the General Assembly.

**d. Water users' unit leaders**

Depending the total number irrigation beneficiaries and area coverage of an IWUA, in an IWUA there might be a number of Irrigation Water Users' Units. Each unit will be leaded and coordinated by two unit leaders (Unit leader and vice unit leader). Main Duties and Responsibilities of the unit leaders are:

- According to the schedule of the association distribute water to the members of the unit
- Make care and protect the scheme bodies found both within the operation area and outside the operation area of the unit
- Maintain and clean the schemes regularly
- Solve and manage conflicts that arise among unit members
- Facilitate and coordinate annual membership fees and water delivery fee of the unit members
- Manage and properly use farm tools and facilities of the association
- Organize and facilitate the regular meetings of the unit members
- Monthly submit reports to the office of the association
- Coordinate and facilitate the implementation of the plans of the association
- In consultation with the management bodies of association, timely address the issues of the unit members

**e. Employees of IWUAs**

As a legal organization, IWUA can hire employees. They will be appointed by the Management Committee within the agreed budget of the IWUA and accountable to the Management Committee for their performance. An association may employ a Manager and other administrative supporting staff. Subject to specific regulations to be issued in the by-laws of the association an employee manager shall be a person with suitable qualifications and relevant experience of irrigation management and shall not be member of that association.

IWUA employees may be IWUA members but, to avoid any possible conflict of interest, they may not be elected officers or users groups representatives. In practice some of these employees will be permanent, although they may not need to be employed full time. Others may be employed on a seasonal basis.

**Option one**

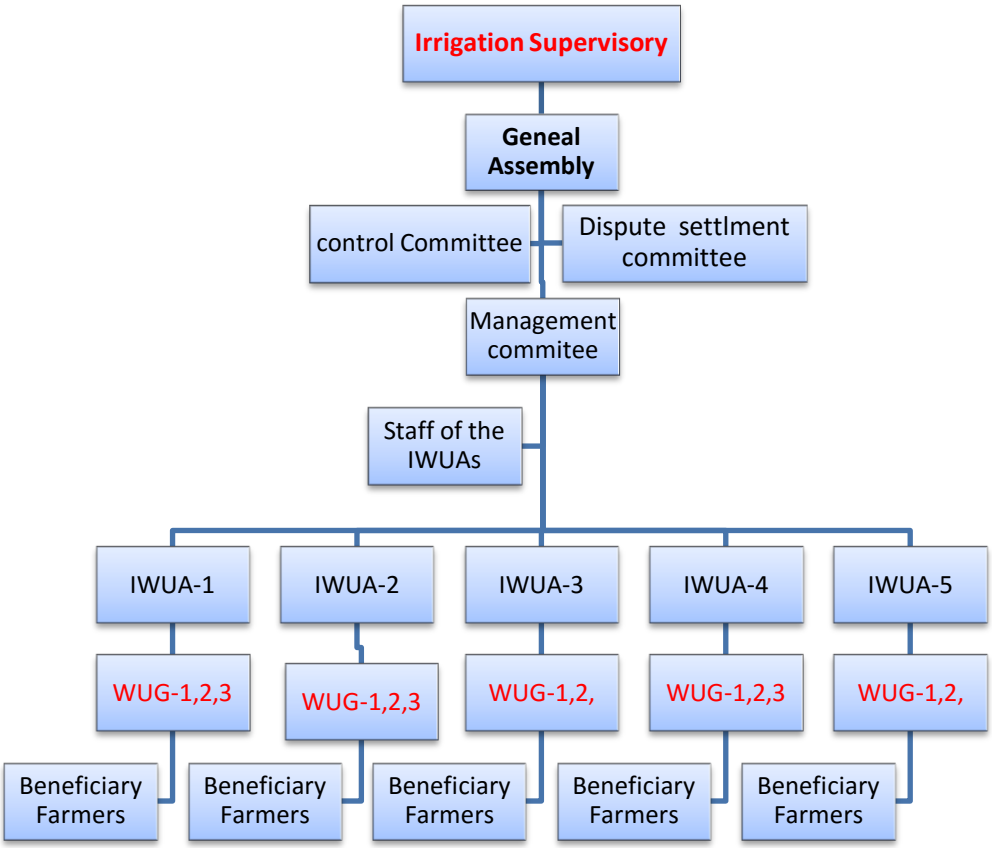


**Figure 4-2: Organizational set up IWUA**

This option is preferable when the number of irrigation water users' units is limited and can be easily coordinated by the management committee members of the association.

**Option two:**

If the number of beneficiaries and IWU unit is high to be managed by the management committee of the IWUA, it is preferable to add one ladder that could facilitate and coordinate the interrelationship of IWU units naming as IWU units coordinators.

### *4.6.9 Bylaw and other implementation tools of the association*

Each IWUA must have its own by-laws. The by-laws constitute the identity of the IWUA in terms of name and address, service area, its organization and functions *vis à vis* external actors. The by-laws are also the primary source of internal regulations that regulate its activities. In other words, the by-laws are the constitutional rules of each IWUA. Like the constitution of a country they should not be amended frequently in order to promote stability and only if strictly necessary.

The day to day activities of the associations need to be well recorded and circulated for both internal and external bodies. Some of the important manuals, registry and formats that should be available and use properly for the purposes of the association are: internal regulation/bylaws, Members registry and files, letters incoming and outgoing registry, minutes registry for GA and different committees of the association, property registry, manpower policy, finance manual, commentarial registry, vehicle millage, different financial formants and documents (vouchers, Journals, Ledgers) and audit reports, cropping calendars, planning and reporting documents, etc.

### *4.6.10 The need for long term technical and managerial support to IWUA*

Past experiences in Ethiopia and in many other countries indicate that the performance of irrigation schemes managed by users' organizations remain generally poor. Some studies have shown that in Ethiopia many irrigation schemes operate significantly under their design capacity. The tasks of IWUAs as indicated above imply technical and managerial knowledge and skills. Believing that farmers, many of them often illiterate, can acquire these knowledge and skills simply through occasional training or capacity building activities, is a pure illusion whatever are their number and quality. Adequate utilization of the main management tools (plans and budgets) require knowledge and skills that farmers cannot acquire through training.

Leaders of farmers' organizations and IWUAs will not make an exception, are first and above all farmers. The work and time they dedicate to irrigation management don't provide them any income and compete with work on their own farms. Furthermore, leaders like any other farmers tend to privilege the short term profitability of their farming activities rather than long term sustainability of irrigation infrastructures.

As only very large IWUAs would have the financial capacities to employ qualified personals, the only left option for most IWUAs in Ethiopia is to establish strong public or private entities that will provide IWUAs with the services of qualified professionals which should include:

- Institutional services, namely to establish sound operational rules adapted to the characteristics of their irrigation systems and to the local social context;
- Technical support for organizing water distribution as well as planning, implementing and monitoring maintenance works;
- Providing IWUAs with managerial services for preparation of budgets, accounting and preparation of financial statements and reports.

Therefore, any government organization that has been assigned to guide and give technical support should exert unlimited efforts to establish strong IWUA management system within the association

### *4.6.11 Strengthening of IWUAs*

Establishing IWUAs is not an end rather it is a mean for the collective engagement of the irrigation beneficiaries to properly operate and manage any given irrigation scheme. According to the IWUA proclamation, both the supervisory body and other key stakeholders like Ministry of Agriculture, Cooperative Promotion Agency, and other development partners in the sector are expected to give a continues and regular technical support, advice and follow up to IWUAs. To provide need and gap based supports to IWUAs conducting assessment and problem identification is a very important step to go ahead and address the problems and gaps of the respective associations. Although they would be identified through conducting assessment to prioritize the intervention, some of the possible strengthening thematic areas for IWUA are discussed and presented below:

#### 4.6.11.1 Membership Development

It is believed that all farmers who have irrigable land in the command area are expected to join the IWUA and is a must to join the IWUA through conducting continuous awareness creation and then convincing them. In practice due to different reasons some farmers may not join the respective IWUA as the IWUAs are being established. Therefore, it is the assignment of the management committee of IWUAs and technical support providers to convince the non-members farmers to join the association as early as possible. Since free riders are really dangerous for the sustainability of

the associations and proper utilization of the resources, due attention need to be given by the concerned bodies.

#### 4.6.11.2 Improving and Enhancing the Awareness Level of IWUA Members

Each and every activities of IWUA are highly dependent on participation and belongingness of members of the respective IWUAs. Both to improve the participation of members of the associations and to introduce new irrigation practice and technologies, members of the associations always should be updated and pre-formed in practicing irrigated agriculture, So, in addition to the regular GA meetings of the association, each association need to organize consultative and discussion meeting with members and stakeholders repeatedly before the starting, during and after ending of irrigation practices. Depending on the discussion agenda, the meeting can be held at association level or at irrigation water users' unit level.

#### 4.6.11.3 Improving the management skill and replacing the committee members

Since decision makers and executors of planned activities of the associations are farmers, they need continues follow up and support from the concerned bodies. To properly implement the activities, to check and balance the operation system of the associations, to provide good services to members and manage and use the properties of the association, the different committees of the association need to properly execute the respective duties and responsibilities. This again demands to organize and offer need and gap based coaching and training service to the different committee members.

Moreover, through continues evaluation and assessment weak performer of the committee members and those who have finished their service years should be replaced by active and energetic committee members

Furthermore, committee members should properly understand and implement the different implementation tools of IWUA like bylaw, internal bylaw, operation and maintenance manual, finance management manual, human resources management manuals, etc. It is believed that through strengthening the management practices of the association, utilization of the irrigation scheme and other resources would be improved and enhanced significantly.

#### 4.6.11.4 Hiring professionals and improving the service delivery of the associations

Routine and day to day activities of the association that demands professional skill and competency should be implemented by hired professionals. Both in the process of hiring, guiding and building the capacity of professionals the contribution of technical support providers is significant. Due to misunderstanding and considering only the expense they are going to made, sometime farmers may resist hiring professionals. In this case it is the responsibility of the supervisory body to make clear the need for hiring professional to IWUAs. Although the number of professionals to be hired by an IWUA depends on the size the association, professionals like a manager, accountant, scheme maintenance technician, agronomist etc., are quite important.

Moreover, to provide good service to members and stakeholders the office of the association need to be organized with the necessary office furniture, facilities and technologies.

#### 4.6.11.5 Improving operation and maintenance of activities of the associations

The main intention of the existence of IWUA is to properly manage and use the irrigation scheme and water in a sustainable manner. One of the missions of the association is to properly operate, use and maintain the scheme. This again needs exposure, experience and commitment of the committee members in particular and beneficiary farmers in general. Therefore, the concerned technical support provider is expected to provide continuously both theoretical and practical trainings, coaching and follow up service to the farmers and committee members to enable them to properly manage and use the irrigation scheme.

#### 4.6.11.6 Encouraging and convincing farmers to pay the required amount fee timely

To use and manage the irrigation scheme in a sustainable manner, all irrigation beneficiary farmers are expected pay different fees that are related to irrigation use. The three main types of fees are membership registration fee, annual maintenance and working capital fee and water fee. Membership registration fee is onetime fee to be made by each beneficiary farmer when they join the association.

Annual maintenance and working capital fee is one of the main fees that is expected to be paid every year by all farmers depending the farm size and the type of crop to be grown. As the name indicates the cash collected through this fee used to cover: annual administrative costs of the association, operation and maintenance costs of the association and used to accumulate reserve funds that is going to be used during unexpected damage of canals or any parts of the scheme. Regarding to implementation of water charge fee, detail explanation and direction is expected from government offices.

Therefore, technical support providers need to give due attention particularly to the payment and collection of annual maintenance and working capital fee of the respective associations to ensure the mobilization of the required amount of financial resources to IWUAs from beneficiary members. The payment modality could be arranged to be made two times per year (before planting of crops and after harvesting of crops).

## 4.7 IWUA AND STAKEHOLDERS

Irrigated agriculture in general and IWUA in particular need to work closely in collaboration with the relevant stakeholders and partners organizations. Starting from the early stage of planning, land preparation and inputs supply to marketing of products, a number of institutions and partner organization are expected to support IWUA, involve and play their strong role.

Some of the main institution/ stakeholders and partner organizations are: Beneficiary farmers; Water, Irrigation, and Electricity Office; agriculture and natural resources development office; cooperatives' Unions; agricultural inputs and technologies suppliers; trade, industry and marketing development; private service providers; financial institutions; Agricultural research institute/Universities; private investors, agro-processors and other development partner organizations. The operational relationship of IWUA with the different stakeholders and partner organization is summarized in the table below:

**Table 4-1: Stakeholders and partner organizations of IWUAs**

| SN | Name of Institution/ stakeholders/partners | Expected service to be delivered to IWUA | Expected collaboration and service expected from IWUA |
|---|---|---|---|
| 1 | Farmers | • Respecting and implementing the operation and management system of the IWUA<br>• Respecting and implementing the by-law, irrigation water delivery schedule and similar rules and regulations<br>• Keeping and maintaining the irrigation scheme<br>• Paying necessary fees in time<br>• Producing high value crops according to the cropping pattern<br>• Participate in the O & M of the scheme | • Supplying and distributing irrigation water<br>• Organizing and offering different trainings and awareness creation sessions<br>• Introducing and promoting new irrigation practices and technologies |
| 2 | Water, Irrigation and Electricity Office/ Agency/ Authority | • Formation and continuous strengthening of IWUAs<br>• Regulating and controlling the operation system of the IWUAs<br>• Technical support on maintenance of scheme and financial management<br>• Organizing and providing trainings on different topics<br>• Organizing and providing experience sharing tours | • Properly administering, maintaining and using irrigation scheme<br>• Operating and managing according to the approved guideline and manuals<br>• Maintain the quality of water and fairly distributing the water to farmers |
| 3 | Agriculture and Natural Resource | • Knowledge and skill on irrigated agriculture managements<br>• Regular agricultural extension services from land preparation to harvesting and post-harvest handling<br>• Supplying and promoting new technologies and crop varies | • Maintaining and implementing the approved cropping calendar and schedule<br>• Facilitating sites/plots for demonstrations<br>• facilitating and follow up the practical implementation of advices of experts |
| 4 | Agricultural research institute and Universities | • Knowledge and skill on irrigated crops<br>• Trials and demonstrations on water management and utilization technologies and crop varieties<br>• Supplying relevant and affordable inputs and technologies<br>• conducting trials and demonstrations on new inputs and technologies<br>• Technical support and coaching services | • Facilitating the implementation processes of advices and recommendations<br>• Facilitating sites/plots for trails and demonstrations<br>• Convincing and closely working with the famers<br>• Making functional the organization structure and implementation tools of the IWUAs<br>• Hiring and offering the required staff to proper use and administer different technologies<br>• Mobilizing resources to buy and use new technologies |
| 5 | Agricultural inputs and technology suppliers | • Maintenance and out of sales services<br>• Conducting continuous assessments and considering comments and feedbacks of the IWUA | |
| 6 | Fruits and vegetable marketing cooperatives and Union | • Organizing and conducting consultative meeting on the trend of the market and what to produce in the coming crop season | • Improving the awareness level of farmers to produce market oriented crops<br>• Making contractual agreement with the farmers to |

| SN | Name of Institution/ stakeholders/partners | Expected service to be delivered to IWUA | Expected collaboration and service expected from IWUA |
|---|---|---|---|
| | | • Making collaboration in every aspect<br>• Making contractual agreements before producing crops<br>• Collaboration in making available infrastructure and facilities for product marketing | produce the crops types that the IWUA promised to supply to the marketing actors<br>• Facilitating cluster farming and timing issues of plantation |
| 7 | Private service providers | • Training and coaching farmers on operation and maintenance activities<br>• Respecting agreements and maintaining canals<br>• Collecting water fees<br>• Timely and fairly distributing irrigation water | • Hiring the required staff members for the properly implementation of O and M activities<br>• Paying fees in time<br>• Timely responding and giving the required data both from the IWUA and individual farmers<br>• Keeping and maintaining canals<br>• Submitting regular and occasional reports timely to service providers |
| 8 | Financial institutions | • Introducing and promoting financial services and products to the IWUAs and farmers<br>• Assisting and coaching the IWUAs to have access to credit services for huge maintenance or expansion plans | • Properly using and repaying any loan that are related to maintenance activities<br>• Encouraging farmers to mobilize savings and use financial intermediaries |
| 9 | Trade, industry and marketing development | • Training on both domestic and international marketing<br>• Facilitating the marketing linkage of the respective IWUAs | • Offering the required data and information in time<br>• Making smooth and maintaining the established marketing linkages |
| 10 | Agro-Processors/investors | • Skill training on production and management of the required products<br>• Introducing and promoting new technologies and inputs | • Respecting contractual agreements and producing the agreed upon crops<br>• Maintaining the quality of the products<br>• Making the contractual agreement with the farmers and coaching regularly |

## 4.8 SOURCE OF IRRIGATION WATER USERS' ASSOCIATION (IIWUA) FINANCE

Irrigation Water Users' Association (IWUAs) are the responsible institution for water management, operation and maintenance of an irrigation scheme and can operate solely on the basis of contributions in cash or kind from scheme beneficiaries; thus IWUAs consistently need to secure funding in order to cover their costs.

According to the current country water policy the irrigation water supply should cover operation and maintenance costs. To achieve this objective one of the key important issue is to properly manage the finance of the irrigation water supply service. The IWUA as an irrigation water supply system managing body, one of the most important tasks is making sure that the irrigation water supply system or canal network brings enough money to cover the costs of operation and maintenance now and in the future.

### *4.8.1 Source of income*

The income of the Irrigation Water Users' Association shall include:

a) Registration fee
b) Annual Membership fees
c) A water delivery fees
d) The proceeds of fines and other sanctions
e) Loans from banks and other lending institutions
f) Gift or Grants or donations or Support from government and non-government organization in cases of a considerable problem encountered to run the activity.
g) Volunteer contribution from beneficiary community or outsiders in the form of cash and/or kind for emergencies.
h) Fund raising events: The IWUA committee shall arrange fund raising activity to collect money. In this case different systems for special contribution shall be arranged including labour and locally available material that could be converted to money.
i) Interest made on deposits made by the Association
j) Income from any investment
k) Revolving fund for materials/spare parts which shall be availed from donor or government agencies.

Generally, prior to fee collection from irrigation users the following pre-condition should be considered clearly:

- Lists of total member of the association and electing/assigning/ Team leaders at each Tertiary Unit Groups (TUG)
- Awareness creation of users-considering irrigation as an economic enterprise and business entity
- Try to show irrigation work as profitable through crop budget or through preparation of business plan with different cropping pattern
- Publishing necessary IWUA records (fee collection documents and financial receipts) and the most fee collection mechanism and income.
- Opening bank account with the name of the association.

The basic sources of finance for IWUA are clearly described in the following way:

### 4.8.2 Registration fee

Membership registration fee is onetime fee to be made by each beneficiary farmer when they join the association. A fee collected from members to cover IWUA establishment costs and limited in its amount. Such fee will be used for purchasing records, publishing receipts, IWUA stamp preparation, purchasing stationery, also purchasing limited number of office equipments and others.

### 4.8.3 Annual membership fees

Every Association shall levy an annual membership fee to cover its fixed costs. The amount of the annual membership fee payable by each member shall be calculated by reference to the size of the land plot of that member in proportion to the total size of the service Area as a fraction of:

- The cost of undertaking annual maintenances of the canal network and preparing it for the forthcoming irrigation season, including the cost of cleaning any drainage ditches
- The association's obligation to pay charges to any other person in respect of the operation of the canal network and/or the abstraction of water
- Salaries of permanent staffs and other fixed costs of the association
- The need to make provision to the association's reserve fund
- An Association that has limited financial cost may provide that some or all of the annual membership fee is to be paid in kind including through an agreed contribution of labour

### 4.8.4 Water delivery fees

There are various methods for collecting irrigation water delivery fees:

- By the size of the irrigated area;
- By a share of the harvested crop
- By the irrigation volume;

In some countries, the state recovers irrigation costs through taxes:

- By a tax on irrigated land;
- By a sales tax on crops that are usually produced with irrigation;
- By personal income tax.

Imposing and collecting these taxes are responsibilities of the state and not of the irrigation scheme managers or the farmers' organization.

### 4.8.5 Fines and sanctions

In this case as much as possible members are advised to respect the regulations stated in the by-laws, if not, water users may have face fines and sanction based on the amount stated in the by-laws and these can be an income source for IIWUA. For example, some of the violations that result in punishments are not attending meeting or canal clearing, using water out of turn, livestock damage on structures or crops etc.

### 4.8.6 Bank loans

IIWUA can also receive or get loans from banks and other lending institutions. Especially currently the need for finance to implement O & M activities on an irrigation project is increasing and the government now also looking irrigation project as an economic enterprise which has an income and expenses. As a result government is encouraging IIWUA to get sufficient finance and manage their scheme sustainability. In this respect, IIWUA after receiving their legality from concerned body, receive loan especially from Bank and other micro-finance institutions.

### 4.8.7 Support or gift or grants

Similarly IIWUA also get gift or grant or donation from government or nongovernment organization. or international organizations. These also an important source of finance in running the scheme management or in case of a considerable problem encountered to run the scheme activities. However, the IIWUA should not totally rely on the support or gift or grant, rather it can be an initial sources of finance for IIWUA.

### 4.8.8 Volunteer contribution

Beneficiary communities or outsider can make voluntary contribution in the form of cash or kind for running or strengthening the IIWUA. These voluntary contributions in most case conducted during emergencies or when the big hydraulic structure is broken or non-functional.

### 4.8.9 Fund Raising Events

The IIWUA committee shall arrange fund raising activity to collect fund sources. In this case different systems for special contribution shall be arranged including labour and locally available material that could be converted in to money. These events are very important sources of finance, if it is conducted during general meeting one or two times per year.

### 4.8.10 Bank interest

IIWUA can open bank account and deposit a certain amount of money. The account may be current account or deposit account, if it is current account IIWUA will not get interest, but if the account is deposit account IIWUA will get interest on deposits made by the Association. Similarly income from any investment made by IIWUA and revolving fund for materials/spare parts which shall be availed from donor or government agencies also important sources of finance for IIWUA. Therefore, the IIWUA management committee and Wereda irrigation office has to work strongly in building the financial capacity of IIWUA for sustainable scheme management and IIWUA can use different finance source collection mechanisms and these has to be clearly discussed during the general meeting.

## 4.9 APPLICATION AND FUNCTIONS OF IWUA'S FUNDS

Funds derived by the Association in the form of required fees, dues and other contributions considered legal for the purpose, shall be part of the general fund and may be used for:

a) Cost of operation and maintenance of the irrigation facilities including head works, canals, structures and equipment;
b) Purchase and replacement of capital equipment;
c) Payment of discharges and obligations of the Association;

d) Funding of relevant training for committee, members and staffs of the Association;
e) Payment of employees and contractors employed by the Association;
f) Payment of other administrative costs

### *4.9.1 IWUA's financial accounts*

The Water Users' Association shall keep accurate accounting records of all transactions. For these purpose the association shall maintain the following basic IWUA accounts and records.

a) Asset (fixed and current asset)
b) Liabilities
c) Capital
d) Expenditures
e) Revenue/Income

The detail descriptions of each accounts and records in the respective associations are described in the following way.

**a) Asset (fixed Asset)**

Assets are the basic properties of the association which includes fixed and current assets. **Fixed assets** are assets which can be movable or non-movable and used for the association day-to-day activities or fixed time rents and not for sale. Fixed assets stay for a long time services and the service period of each fixed asset varies. Some of the fixed asset includes: Buildings, office, store, shop, Dam, Reservoirs, Weir, Canals, tractors, fixed pumps, generators, portable pumps, furniture and fittings, motor vehicles, computers, office equipment, hand tools and small equipment.

On the other hand **current assets** are asset which stays for a short period and used in the day-today transactions of the association. The current asset in the Irrigation Water Uses' Association include: Cash in hand, cash in bank (current and saving account), stock in store and pre-payment for asset or services. Some current asset such as traditional farm tools and small harvests are recorded in the association's current asset accounts. Similarly, in the meantime and at the end of the year bank reconciliation statement and asset inventory should be carried out to know the status of fixed and current asset of the associations. Balance sheet, income statement and profit and loss statement should also be performed in every year as in any institutions.

**b) Liabilities**

Liabilities are loans (in cash or in kind) taken from private or government banks or other lending institutions by the IWUA's for different uses or activities (purchase of tractors, equipments, etc.). These liabilities or loans are short or long term liabilities which will be payable after a certain agreed period including its interest.

**c) Capital**

Irrigation Water Users Association capital is annual membership fees, gift or grants or donations or Support from government and non-government organization in cases of a considerable problem encountered to run the activity. Moreover, profit which comes at the end of the financial year also considered as associations capital.

**d) Expenditures**

Expenses are decreases in capital due to outflow of resources for the purpose of schemes operation. In order to carry out its day-to-day tasks or deliver its services Irrigation Water Users' Association lay out some expenses. Such expenses include payment for maintenance, purchases for equipments, spare part, gasoil, staff salary, insurance, office stationery and depreciation expenses

**e) Income/Revenue**

Incomes are increases in capital due to inflow of resources from member's annual fees, water delivery fee, fines and other sanctions, loans from banks and other lending institutions and provision of services to the project beneficiaries.

### *4.9.2 IWUA's accounting records and documents*

To carry out the day-to-day transaction of the IIWUA, the association must have its own basic accounting records, documents and reports. The types and number of accounting records and documents an association has depends on the size of the association and size of its day-to-day transactions.

**i. Income Receipt/ Cash Receiving Voucher/**

**Format-1**

Ref. No_____

Date: ------- Month -------- Year

IWUA Name: _____

**Cash Receiving Voucher**

Paid By: _____

Payment in figure: ETB _____

Payment in words: _____

Reason for paying: _____

_____

Payment type: in cash _____in check _____

Received By: _____ Signature: _____

Approved by: Signature:

**a) Purpose**

- To collect any form of income from members and non-members
- To collect income or loan from bank or any institutions
- To collect and register any financial returns to the association

**b) How to fill the Receipt/Voucher**

- First write the date, month and year of the payment
- Write the name of payer, payment amount in figure and word, reason for payment and name and signature of the receiver/casher.
- On the reason of payment some reference number or minute of the IWUA committee for the payment should be clearly attached or written
- During writing on the voucher care is very necessary not to cancel or write bold

**c) Distribution**

The voucher should be prepared in two copies and its distribution will be:

- Original copy to the payer
- Second copy to the casher
- Third copy should remain on the pad

**ii. Cash Sale Invoice**

**Format-2**

Ref. No._____

Date: ----Month ----Year……

IWUA Name: _____

**Cash Sale Invoice**

To: _____

| | Description of items | Unit | Quantity | Unit Price | | Total Price | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
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| | | | | | | | |

Prepared By: _____ Signature: _____

Received by: _____ Signature: _____

Ref. No._____

**a) Purpose**

- This invoice will help to collect income from direct sale of different items of the Water Users Association

**b) How to fill the Invoice**

No Description of items Unit Quantity Unit Price Total Price

- When the cash invoice are prepared, the date, month, year, types of items sold, unit (number, kg, meter,…), unit price and total price should be clearly written
- At the end the one who prepared the invoice and the receiver of the cash should sign in their proper place
- During writing on the invoice care should be necessary not to cancel or write bold

**c) Distribution**

The invoice should be prepared in four copies and its distribution will be:

- Original copy to the payer person or organization
- Second copy to the casher or accounting section
- Third copy to the store man to control the stock card
- Fourth copy should remain on the pad

### iii. Credit Sale Invoice

Format-3

**Ref. No**_____

Date: ------- Month -------- Year

IWUA Name: _____

**Credit Sales Invoice**

To: _____Ref. No_____

Address: Town _____Kebele _____Tel._____ House No._____

| No | Description of items | Unit | Quantity | Unit Price | | Total Price | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
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Prepared By: _____ Signature: _____

Received by: _____ Signature: _____

**a) Purpose**

- Credit sales invoice will help to sale any kind of associations product or services to members or non-members or any organizations on credit basis

**b) How to fill the Invoice**

- When the credit sales invoice is prepared, the date, month, year, types of items sold in credit, unit (number, kg, meter,…), unit price and total price should be written clearly
- At the end the of the format one who prepared the invoice and the receiver of the item sold in credit should sign in their proper place
- During writing on the invoice some care is very necessary not to cancel or write bold

No. Description of items Unit Quantity Unit Price Total Price

**c) Distribution**

The invoice should be prepared in three copies and its distribution will be:

- Original copy to the casher or accounting section
- Second copy to the store man to control the stock card
- Fourth copy should remain on the pad

### iv. Expense Receipt/Cash Payment Voucher/ Format-4

Date: ------- Month -------- Year

IWUA Name: _____

**Cash Payment Voucher**

Paid to: _____

Payment in figure: ETB _____
Payment in words: _____

Reason for paying: _____
_____

Payment type: in cash _____in check _____

Prepared by: _____Signature_____
Approved by: _____ Signature: _____
Received By: _____ Signature: _____

**a) Purpose**

- The cash payment voucher will use to pay cash from hand or bank for any types of service the association received from any organization or institution or supplier or contractor/consultant

**b) How to fill the Receipt/Voucher**

- First write the date, month and year of the expense
- Write the name to be paid, payment amount in figure and word, reason for payment (purchase of spare part or raw materials, salary, and etc…) and name and signature of the receiver.
- On the reason of payment some reference number or minute of the IWUA committee for the payment should be clearly attached or written
- The payment voucher should be supported by purchase invoice and good-receiving note of the association
- During writing on the voucher some care is very necessary not to cancel or write bold

**c) Distribution**

The voucher should be prepared in two copies and its distribution will be:

- Original copy to the casher/accounting
- Second copy should remain on the pad

### v. Advance Payment Note

**Formate-5**

Date: ------- Month -------- Year

IWUA Name: _____

**Advance Payment Note**

Requested by: _____

Place of Travel: _____
Departure Time: _____
Departure Date: _____

Arrival Date: _____

Payment in figure: ETB _____
Payment in words: _____

Received By: _____ Signature: _____
Prepared by: _____Signature_____
Approved by: _____ Signature: _____

**a) Purpose**

- The advance payment note will use to pay cash in advance for the purchaser or members of the IWUA committee or advance payment for any organization or institution or supplier or contractor/consultant

**b) How to fill the Receipt/Voucher**

- First write the date, month and year of the advance payment
- Write the name to be paid, place of travel, departure date and time, arrival time payment amount in figure and word, name and signature of the receiver.
- The advanced payment note should be supported by purchase invoice or receipt and good-receiving note of the association
- During writing on the voucher care should be necessary not to cancel or write bold

**c) Distribution**

The advance payment note should be prepared in two copies and its distribution will be:

- Original copy to the casher
- Second copy should be given to accounting section

### vi. Payment Note for No-Receipt Agents

**Formate-6**

Date: ------- Month -------- Year

IWUA Name: _____

**Payment Note for No-Receipt Agents**

Received by: _____

Payment in figure: ETB _____

Payment in words: _____

Reason for paying: _____

_____

Received By: _____ Signature: _____
Accountant: _____Signature_____
Approved by: _____ Signature: _____

**a) Purpose**

- When the purchaser or committee members are purchasing goods or some services outside the project area from those agents who do not have receipts, they use such payment notes but this payment not will get an acceptant if and only if it gets approval by concerned committee members.

**b) How to fill the Receipt/Voucher**

- First write the date, month and year of the advance payment
- Write the name of the receiver, payment amount in figure and word, reason of payment name and signature of the receiver, accountant and the official who approved the payment.
- During writing on the voucher care should be necessary not to cancel or write bold

**c) Distribution**

This format will be duplicated and will be available in the office of the association

### vii. Payroll

**Formate-7**

| **Name of IWUA**……Date: ------- Month -------- Year---------- | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Name** | **Salary** | | **Overtime** | | **Gross Payment** | | **Deduction** | | | **Net Payment** | **Receiver Signature** |
| | | | | | | | | **Tax** | **Credit** | **Total deduction** | | |
| **a** | **b** | **c** | | **d** | | **e** | | **f** | **g** | **h =f + g** | **=e-h** | |
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| **Prepared by:** _____ **Cheeked by:** _____ **Approved by:** _____ **Paid by:** _____ | | | | | | | | | | | | |

#### a) Purpose

- Payroll sheet is used to pay the salary of the employed staffs of the Water User Association and the sheet will be prepared by the accountant of the association in each month and approved by the concerned body of the association

#### b) How to fill the Receipt/Voucher

- First write the date, month and year of the payment
- Write the name of the receiver, gross salary and overtime payment, deduction from the salary, net payment and signature of the receiver, accountant and the official who approved the payment.
- During writing on the voucher care should be necessary not to cancel or write bold

#### c) Distribution

The payroll sheet should be prepared in two copies and its distribution will be:

- Original copy to the casher or accounting section
- Second copy should be given to the Wereda Finance Office

### viii. Income Journal

**Formate-8**

**Name of IWUA……**
**Date……Month……Year……**

| Date | Items | Income Voucher Si. No | Cash | | | | Registration fee | | Water Fee | | OM Fee | | Loan Repayment | | Penalty | | Sales | | Loan | | Grant | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | In hand | | In Bank | | | | | | | | | | | | | | | | | |
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| Sum | | | | | | | | | | | | | | | | | | | | | | |

#### a) Purpose

- Income Journal will use to register all income received by the association based on the income receipt serial number and types of income

#### b) How to fill the Journal

- Write the date, month and year of the income, receipt number and reason of income
- Write the source of income on the column provided
- At the end of each month it will be summed and it should be equal with the total income collected
- During writing on the voucher care should be necessary not to cancel or write bold

### ix. Expense Journal

**Formate-9**

**Name of IWUA……**
**Date……Month……Year……**

| Date | Items | Payment Voucher Si. No | Expenses | | | | Purchase of spare part | | Salary | | Maintenance cost | | Gas oil | | House Rent | | Light | | Credit provided | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | from cash in hand | | from Bank | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | |
| Sum | | | | | | | | | | | | | | | | | | | | | | |

**a) Purpose**

- Expense Journal will use to register all-expense paid by the association based on the payment receipt serial number and types of expenses

**b) How to fill the Journal**

- Write the date, month and year of the expense, receipt number and reason of payment
- Write the reason of payment on the column provided
- At the end of each month it will be summed and it should be equal with the total expense paid
- During writing on the voucher care should be necessary not to cancel or write bold

❖ NB: Similarly there are also Sales and Purchase Journal

### *4.9.3 IWUA's banking system*

a) The Association shall deposit its funds in a bank account opened with the commercial bank of Ethiopia or private banks nearest to the Association
b) All money paid to the treasurer must be deposited in a bank account with pay-in slip taken to show payment.
c) The Treasurer of the Association shall be allowed to keep petty cash not exceeding the amount of ETB 3,000 in a safe for emergencies and operating costs.

### *4.9.4 Signatories of the association*

There will be three signatories of the Association. These will be the Chairman, the Treasurer and the Secretary. For any withdrawal of cash and for writing of cheques, at least two signatories are required, one of which shall always be the treasurer.

### *4.9.5 Loans*

The Association can apply for loans from Banking, MFI or other financial institutions in the area. These loans may only be used for services provided to all members of the Water Users Association.

### *4.9.6 Daily allowance and transportation*

#### 4.9.6.1 Daily Allowance

The Irrigation Water Users Association Committee members shall be paid a daily allowance from the scheme revenue if and only if engaged in the scheme activity at Wereda Office or some other areas outside the village or the project area. The payment could be detailed as indicated hereunder which is based on the existing government per-diem payment procedures and endorsed by the general assembly of the associations.

Breakfast ----------%,
Lunch ----------%
Dinner ----------%, and
For bed ----------%

This shall not be effective for training or workshop that might be arranged by the government or non-government organization.

### 4.9.7 Transportation

Similarly, the Irrigation Water Users Association Committee member shall be paid for transportation when engaged in irrigation water supply activities outside the village and the expense shall be settled when and only legally accepted payment receipt presented.

### 4.9.8 Award

The committee members and individuals among the community who shall contribute a considerable work towards the success of the scheme sustainability shall be awarded. In this respect every year three persons including the committee members shall be awarded. The award may include:

a) Certificate
b) Cash
c) Material of different form

### 4.9.9 Appointment of auditors

The Executive Committee shall employ an independent auditor whose duties shall include:

a) Review and examine the financial records of the Association and recommend measures for their improvement
b) Submit audited reports to the Executive Committee
c) Advice the Executive Committee on the use of Association funds, assets and equipments
d) Present the audit report to the Annual General Meeting

### 4.9.10 Profit and loss statement

**Table 4-2: Profit and loss statement of …… IWUA for the Month ……. Date……**

| Items | Amount | |
|---|---|---|
| **1. Cost** | | |
| 1.1 Variable Cost | | |
| | xxxx | 00 |
| | xxxx | 00 |
| **Sub-Total** | **xxxxx** | **00** |
| 1.2 Fixed Cost | | |
| | xxxx | 00 |
| | xxxx | 00 |
| **Sub-Total** | **xxxxxx** | 00 |
| **2.Benefit/Sales** | | |
| | **xxxx** | 00 |
| | **xxxxx** | 00 |
| **Net Profit Before Tax** | **xxxx** | **00** |
| Tax (-----%) | | 00 |
| **Net Profit After Tax** | **xxxxx** | **00** |

### *4.9.11 Balance sheet*

**Table 4-3: Balance sheet of …… IWUA form……to…….Month Date……..**

| Items | Amount (ETB) | | Items | Amount (ETB) | |
|---|---|---|---|---|---|
| **Asset** | | | **Liabilities** | | |
| **Fixed Assets** | | | Current Liabilities | | |
| | xxxx | 00 | | xxxx | 00 |
| | xxxx | | Long Term Liabilities | | |
| | xxxx | 00 | | xxxx | 00 |
| **Total Fixed asset** | xxxxxx | 00 | Total Liabilities | xxxxx | 00 |
| **Current Asset** | | | **Capital** | | |
| | xxxx | 00 | | xxxx | 00 |
| | xxxx | 00 | | xxxx | 00 |
| Total Current Asset | xxxx | 00 | Total Capital | xxxxx | 00 |
| Total Assets | xxxxxx | 00 | Liabilities + Capital | xxxxxx | 00 |

**NB. Asset= Liabilities + Capital**

# 5 CAPACITY BUILDING OF IWUAS

Since IWUAs are farmers owned organizations and have a number of important duties and responsibilities for the development of irrigated agriculture, they need capacity building supports and services from direct supervisory body and other development partners and stakeholders

## 5.1 WHAT IS CAPACITY BUILDING?

In general, capacity building refers to long-term investment in people and their institutions to enable them to effectively and efficiently carry out specific activities to achieve specific development objectives. It is much more than the narrow perspective of training which merely concerns impartation of knowledge, skills and attitude change. With respect to IWUAs, due to the many roles and functions expected of them, the concept of capacity building takes a broader context to encompass the following aspects:

- Building of social capital
- Improved access to production resources (capital)
- Strengthening IWUAs' capacity to determine their own values and priorities
- Strengthening IWUAs' capacity for decision making
- Attitude change
- Enhanced access to information and services

## 5.2 PURPOSE OF CAPACITY BUILDING

Capacity building is an essential input towards people-centered and sustainable development. This concept is based on the recognition of the importance of social structures and institutions (like IWUAs) in development work. Capacity building in IWUAs is necessary because the trend in policy orientation in smallholder Irrigation and Drainage development is devolution of responsibilities for planning, implementation, operation & Management to the farmers. IWUAs operate in a dynamic, social, economic, political and technological environment hence the need to update their capacities in response to these changes.

## 5.3 AREAS OF CAPACITY BUILDING

Local community members have various capacities that should be identified and built upon when implementing capacity building programs. These include access to information and services; Financial Empowerment; Networking with interest groups; and legalization.

**a. Access to information and services**

To facilitate informed decision making by IWUAs, the following information and services should be availed:

- Technical information through extension services, farmer field schools
- Information on policy issues
- Marketing information
- Meteorological information and early warning systems.

**b. Financial empowerment**

This includes the mobilization of the IWUA's own financial resources e.g. through Group savings or through establishing rural savings and credit cooperatives at nearby areas to their irrigated agriculture. It may also entail improving access to credit and other financial services e.g. through micro-finance institutions/formal commercial banks, loans and guarantees. Offering scheduled and continues training on financial management to office bearers of IWUAs could improve the financial management knowledge and skill of IWUAs members.

Through time at IWUAs level there will be the possibility to have access to different financial services and products from financial intermediaries. IWUA could pledge their irrigation scheme and certificate of land ownership as guarantee to the credit fund requirements.

**c. Networking with interested groups**

IWUAs should explore new horizons by finding out how other groups operate. They should alsobe familiar with other institutions that bear impact on their activities including production, sales,legal and regulatory institutions. It is therefore necessary for IWUAs to know the physical addresses activities and resources of institutions that impact on their performance. These institutions include:

- Input suppliers
- Extension service providers
- Marketing organizations
- Other WUAs (Basin/ Catchment, Regional etc.)
- Government Institutions
- Financiers
- NGOs,
- Consumers,
- transporters and
- all on the value chain

**d. Legalisation**

This involves creation of an enabling legal environment for official recognition and effective execution of IWUAs' mandate. Legalisation of the Framework is effected through registration of the IWUA as per proclamation and related laws and policies. It may also entail holding of elections for office bearers and keeping books of records and accounts.

## 5.4 BASIC TRAINING PROGRAMMES FOR IWUAS

Training is aimed at imparting knowledge and skills for effective planning, implementation, operation, maintenance, monitoring and evaluation. Training can be implemented in a classroom setting or through seminars, workshops, exposure visits, or video conferencing. The main topics relevant to IWUAs in irrigation schemes include the following:

**a. Introduction to participatory development:**

In this topic the main sub-topics to be included are: Irrigation stakeholders and their roles; Project Cycle and community roles in each phase of the cycle; Community participation and Gender issues in smallholder irrigation.

**b. Scheme Leadership and management:**

The main sub-topics, among others are: Roles of scheme leaders; Management and leadership styles; Resource mobilization; Management of scheme meetings; Decision-making methods; Networking/ information sourcing; Scheme Reports; Sharing of responsibilities.

**c. Scheme operation, maintenance and water management:**

Sub-topics to be covered in this topic are: Irrigation schedules and water allocation/distribution; Irrigation/water application methods and determining factors; Irrigation efficiencies and water conservation techniques; Watering depth and frequencies; Drainage requirements; System maintenance; Irrigation equipment and Maintenance

**d. Financial Management**

Farm records; Budgeting/financial plans; Credit sourcing and management Fundraising; and organizing for repayment of loans

**e. Monitoring & Evaluation skills**

Sub-topics to be covered in this topic are: selection of capacity & performance indicators; record keeping and observations; and progress reporting

Each WUA should put in place a monitoring and evaluation system to facilitate assessment of the impacts of the various capacity building interventions on the realisation of the WUA objectives.

## 5.5 PARTICIPATORY MONITORING AND EVALUATION SYSTEM OF IWUAS

Participatory monitoring and evaluation (PM&E) is the processes of community self-assessment whereby local people are involved in programme planning, implementation, monitoring and evaluation as the main actors. The process utilizes three principles of (i) Participation, (ii) negotiation and (iii) learning.

Monitoring is a systematic and continuous collection and analysis of information about the progress of a piece of work over time, to identify strengths and weaknesses and for providing the IWUAs with sufficient information to make the decisions at the right time to improve its quality.

Evaluation, on the other hand, is a systematic process which objectively determines the relevance, effectiveness, efficiency, sustainability and impact of activities in the light of specified objectives in the project-planning matrix. Evaluations are usually based on general questions such as: What activities took place? Did the activities achieve objectives? How can future efforts be improved? When the IWUAs are fully involved in the project monitoring and evaluation they are able to chart there way forward and be responsible for their success. It is important for WUAs to have an inbuilt system for monitoring and evaluation where all the members are involved. This provides feedback regularly to all stakeholders.

## 5.6 IMPORTANCE OF PM&E

Participatory monitoring and evaluation creates ownership of the whole process. Monitoring and evaluation are improved through participation in the following ways: Achieves a more rounded perspective; Derives support from a broader base of Knowledge, expertise and resources; Validity is enhanced through its multiple sources; Accommodates the diverse interest of those involved; Becomes ethically sound since it involves those affected by its outcomes; Supports and extends participatory models of development initiatives; Empowers communities, organizations and individuals to analyse and solve their own problems; Values the knowledge and experience of local communities; Promotes reflection and critical analysis by all stakeholders; Promotes ownership by stakeholders (mainly beneficiaries);Improving the quality of the current project through proper operation and management; Improves the quality of the other projects by utilization of the experience gained in ongoing projects by drawing lessons from them; Improves transparency through clarification of the outcome of fund injection to fund providers and supporters of the funding organizations and contributions.

## 5.7 STEPS IN PARTICIPATORY MONITORING AND EVALUATION

A sound monitoring system has to be established as the IWUAs established, taking the following into account: Information to be collected (compare plan of operations and project design matrix); Information collectors, times of collection and collection methods, e.g. through questionnaires, interviews or observations; Information aggregator, times of aggregation and aggregation methods; Decision maker and times of decision making; and Methods and times of decision notification and feedback.

## 5.8 STEPS IN MONITORING

The following are the procedures that should be used: Identify all stakeholders that are to participate; Draw terms of reference and discuss criteria to be used; Formulate indicators; Formulate data collection sheets; Collect data; Analyse and aggregate data; Participate in report writing and Give feedback to all stakeholders

## 5.9 STEPS IN EVALUATION

The following are the steps in planning and conducting an evaluation. Prepare product data management and narrative summary for evaluation; Design evaluation questionnaire, select data collection methods etc.; Collect and sort results; Draw conclusions and lessons learnt from evaluation and Give feed- back to stakeholders.

# 6 IRRIGATION CHARGES AND COST RECOVERY

## 6.1 CURRENT PRACTICES

There is no fixed and practiced irrigation charge rates and cost recovery mechanism in small scale irrigation development in Ethiopia. It is however required that, the beneficiaries cover annual operation and maintenance cost. Lack of system for collecting irrigation charges at least to cover annual O & M costs lead a number of schemes to be non-functional. A few WUA have tried to collect annual fees from the beneficiaries to cover annual O & M cost. Therefore the discussion below is to instigate the need to include charges and cost recovery in study and implementation of SSI schemes.

## 6.2 POLICY RELATED TO IRRIGATION CHARGES AND COST RECOVERY

The national irrigation policy states the development of appropriate cost recovery system and mechanism for all irrigation schemes. In addition, considering the importance of Institutional set up and capacity, the policy emphasizes the importance of promotion and development of appropriate institutional structure for the management of irrigated agriculture, and the development of capacity in human resources, and new technologies, engineering and financial management.

The policy of funding water resources states that all funding agencies, the Government and private sectors, shall include in their funding provisions for water conservation and protection, operation and maintenance, rehabilitation and replacement costs, training and human resources development, adequate information and documentation as well as other means that enhance and ensure sustainability of systems. Similarly, the water pricing policy stated that:

- Recognizing water as a natural resource with an economic value and ensure that fees are paid for services rendered.
- Recognizing water as a vulnerable and scarce natural resource and ensure and promote that all pricing systems and mechanisms should be geared towards conservation, protection and efficient use of water as well as promote equity of access.
- Ensuring that management of water resources shall be always addressed in conjunction with basic social equity norms.
- Ensuring that the price for water should be neither too high (and discourage water use) nor too low (and encourage abuses and over use of water).
- Promoting that tariff setting shall be site specific, depending on the particulars of the project, location, the users, the cost and other characteristics of the schemes.
- As willingness to pay by users of water systems is a powerful impetus for financial sustainability of water resources systems, willingness to pay shall be promoted by, interalia stating the main objectives, instituting fairness in water systems, promoting transparency and communications.

The water sector strategy also states to fully integrate irrigation with the overall framework of the country's socio-economic development planning as an integral part of the water sector. Farmers' participation will be promoted at all stages, taking into account the needs of rural women. Small, medium, and large-scale irrigation will be promoted and cost recovery models will be developed to ensure sustainability.

Considering the technical aspect as the base for the cost recovery, the strategy has set clearly the ways to achieve the cost recovery under Financial and Economic aspects, Institutional aspects, Capacity building aspects and social aspects.

The Irrigation development strategy also states the establishment of users' fee according to the related level of cropping patterns and farm level profits, scheme efficiency, and in a simple and clear cost recovery system. It also ensures that the water charges and fees are to be collected on time for efficient operation of the service rendering institution.

## 6.3 COST RECOVERY STAGES

The minimum requirement for sustainable operation of the farm demands that the entire annual variable operational and working capital costs be covered by the beneficiary farmers. This implies that farmers should cover 100% of their own annual farm operating expenses which otherwise would be difficult to run the farm. The 2nd requirement would be to cover annual fixed operational costs by the farmers. The 3rd level would be covering part or all of the established investment costs including operating capitals as discussed above. The last one would be covering replacement costs by their own. Such cost recovery mechanisms are to be determined based on the income and expenditure of the farmers.

## 6.4 PRINCIPLES IN DETERMINING CHARGES/ COST RECOVERY

Water charging or irrigation cost recovery is an inclusive term embracing all of the policies, practical actions and mechanisms required to set a price for water, decide the basis on which a charge will be levied, levy the charge and collect the revenue.

Water charges can either be calculated or collected on the basis of:-

- The cost of the irrigation scheme (Cost Principles)
- The benefits of the farmers (Benefit Principles)
- The payment capacity of the beneficiaries (Ability to pay Principles)

### *6.4.1 Cost principles*

When applying the cost principle to determine charges it should be recognized that the risk of the investment is shifted to the beneficiaries. For the beneficiaries, however, the scheme cost is not decisive but those potentials created by the investment and the attainable productivity increases. Ideally, water charges should cover the entire cost of water delivery. These costs include capital costs, operation and maintenance and revenue collection costs. To determine 'the absolute level of water charges it is relevant to know which type of costs are considered in the calculation.

A strict application of the cost principle is often not possible due to the extremely low incomes of the participating farmers and intending at the same time to make an irrigation scheme accessible to as many beneficiaries as possible. In addition, it should be secured that only those costs which could be directly attributed to the project form the basis to charge the beneficiaries.

### *6.4.2 Benefit principle*

In this case it must be the intention of the project executing agency to assist the water users to increase their productivity. This requires that apart from water, additional resources (agricultural inputs) and services (extension, marketing, and credit) have to be made available.

If the potential returns achievable at a given technological level, farming system and cropping intensity are selected as criteria to determine water charges, the beneficiaries are forced to obtain these returns in order to avoid income losses. Furthermore, there exists the possibility to

differentiate these charges according to criteria such as soil quality, location, cultivated crop etc. A review of the potential returns can be carried out in the longer term in order to modify or adjust the charges.

When applying the benefit principle it should be understood that irrigation water represents only one of several production factors (soil, water, rainfall, cropping pattern, cropping intensity, labour input etc.) leading to difficulties in allocating the individual benefit to each factor. The incremental benefit generated by irrigation water alone (after deducting benefits created by the remaining factors) should ideally form the basis of charging. Benefits are, however, a variable figure, which may differ with changes in cropping pattern, price variations, technological changes etc. Therefore, a continuous adjustment of water charges is required within the scope of this charging approach.

### *6.4.3 Ability to pay principle*

The application of the 'ability to pay'-principle requires the calculation of the net incomes of the beneficiaries. It is necessary to define a minimum income level, which should be guaranteed and not fall below due to the payment of water charges. Only then it can be decided which part of the incremental benefits, attributed to the provision of irrigation water, will be recovered by charges. The critical percentage for the ability to pay ranges about one third of the incremental net cash income. A multi-country study of the World Bank showed that the absolute amount of water charges seldom exceeds 30 35 % of the incremental net cash incomes of the farmers. Higher financial contributions may cause counterproductive effects and should be based on a comprehensive socioeconomic survey.

### *6.4.4 Farmers' willingness to pay*

Very close to the ability to pay is the farmers 'willingness to pay'. Generally it refers to the amount of charges which are accepted by the future beneficiaries. The willingness of irrigation water users to pay for water services depends on many factors among which prior experience in paying for water, strength of farmers' organization, significance of irrigation water in the production system, yield expectation, external support, and culture etc. are few to mention

## 6.5 METHODS OF CHARGING

Methods of charging, level of cost recovery and amount of fees levied; collection efficiency, fee retaining body and time of fee collection are the core elements of irrigation cost recovery.

Irrigation services can be charged for in various ways. Sometimes a combination of charges is applied. Cornish and Perry (2004) have identified four basic categorizes of irrigation water charging system and described below in order of complexity.

- Area Based System
- Crop-Based System
- Volumetric System
- Tradable Water Rights System: the entitled users in an irrigation project, are allowed to buy or sell rights in accordance with specified rules designed and authorization by a licensing authority

## 6.6 BILLING, COLLECTION MECHANISMS AND FINANCIAL MANAGEMENT

Once the methods and amounts of charges are fixed the socio-economist has to develop billing methods, billing procedures and timing, bill preparations, bill distribution, bill summary sheets, mode of payments, exemption, collection systems, collection efficiencies, collection summaries, cash management, closing books, reporting & auditing, capacity building requirements and enforcement of penalties.

Generally, International experiences showed that cost recovery on irrigation vary across countries and determined by many factors among which farmers ability to pay, willingness to pay, legal and political decisions are the prominent ones. The levels of cost recovery and collection rates are low in many developing countries. Assessment of the local experience shows that lack of capacity, much less awareness on national water policy, problems on marketing and support packages, low farmers awareness on the concept of cost recovery remain the major obstacles for creating self-sufficient irrigation entities which are readily available to work along this thinking.

# 7 GRIEVANCE REDRESSAL MECHANISM (GRM)

Grievances Redressing Mechanism (GRM) is a system of identifying problems or complains arises in the implementation process an irrigation projects, these problems are communicated, tracked and are resolved in the most efficient manner. It is a system by which stakeholders of a project or a program can seek information and clarifications about the project and are responded in a timely manner. Grievance redress systems can be designed to function at the project, sector and country levels.

In the course of irrigation project implementation concerns, complaints and disputes will arise. Project related disputes maybe deep-rooted. Complaint disputes are likely to arise locally in the form of grievances. So, if and when projects begin implementation and several issue hits the ground, disputes are likely to arise in the form of grievances. Users/ people or communities may start questioning: “Where are the benefits we were supposed to get? Why are others getting more than us? Our land and forests are being taken away from us, our properties or assets or perennial crops are affected or taken from us and so on”.

Redressing grievances of affected people should be an integral part of a project’s study, design, plan and management. Setting up appropriate mechanisms to address community concerns, prevent adverse consequences and risks, and bring about positive changes in people’s lives and relationships is increasingly important in development projects. Resolving grievances of project-affected people at the lowest level, without allowing them to intensify into unmanageable levels, equally benefits both the aggrieved parties and the project implementers. In the study and design of small-scale irrigation project the Grievance Redressing Mechanism (GRM) will focuses on:-

- The need for Grievance Redressing Mechanism and Its Causes
- The stage and Types of grievances
- Timing of Grievance Redressing Mechanisms
- Establishment of Grievance Redressing Committee (GRC) at different level

Similarly in the Grievances Redress Process will involves the following steps

- Uptake (Location and Channels)
- Sorting and Processing
- Acknowledgment and Follow-up
- Verification, investigation and action
- Monitoring and evaluation
- Provide Feedback

At the end of the assessment of the grievance or complains of the communities, the GRM should be designed and established in a clear and defined way. Therefore, after assessment of existing and future project beneficiaries complains, designing an effective DRM should follow the following steps.

- Survey existing formal and informal GRMs
- Estimate users and assess available resources for GRM
- Develop standard operating procedures/ flow charts
- Develop and publicize GR policies
- Assign GR tasks and train staffs
- Stimulate external Demand for GRM

# 8 INSTITUTIONAL RESPONSIBILITIES & LINKAGES IN SSIP IMPLEMENTATION

## 8.1 GENERAL

Small-scale irrigation schemes are facing multifaceted problems during establishment and implementation phases. As noted in many studies and formal reports, poor institutional support and limited linkages identified as major bottleneck of irrigated agriculture development in the country. Sustainable and consistent integrated supports of all stakeholders ensure the development of irrigated agriculture.

With regard to small-scale irrigation schemes, the stakeholders in all administrative levels should focus on knowledge and skill transfer, effective agricultural inputs supply such as seed, fertilizer, agro-chemicals and irrigation water; improved market network and facilities; and financial availability

Despite most of the supporting institutions are common for all irrigation schemes, the socio-economist expected to develop and propose appropriate and site specific institutional linkage during feasibility study. This guideline identifies list of supporting institutions at different levels and their possible responsibilities in implementation of small-scale irrigation project(s). The indicated responsibilities are not binding and not limited and these can be enriched based on the actual institutional capacity, strategies and goals.

## 8.2 OWNER AND BENEFICIARIES OF THE SSI SCHEME

- Direct beneficiaries
- Indirect Beneficiaries

## 8.3 FEDERAL LEVEL SUPPORTING AND PARTNERS OF SSID

**Ministry of agriculture & natural resources**

- Develop policy, national small-scale irrigation development strategies
- Capacity building support to technical staff on small-scale irrigation study, design, scheme Monitoring & Evaluation
- Coordinate funding agencies to support Investment and sustainability of the interventions;

**Federal cooperative agency**

- Develop policy and national cooperative promotion strategies
- Support Irrigation Users' cooperatives and UNIONs in creating local and International market linkages
- Organize trainings for cooperative promoters on development planning, irrigated crops marketing, input supply network and other relevant subjects
- Support cooperatives and unions in administrative and financial management

**Ethiopian agricultural research institution**

- Generate and release suitable irrigated crops and varieties
- Conduct on-farm researches in collaboration with research centers for improvement of irrigated agriculture
- Disseminate updated information on irrigation application and management technologies

## 8.4 REGIONAL AND ZONAL SUPPORTING INSTITUTION

**Bureau of agriculture & natural resources & agencies**

- Technical support to wereda and kebele professionals
- Provide regular agricultural extension services on Irrigated agriculture
- Organize and conduct trainings on improved irrigated agriculture managements
- Follow up the agricultural input distribution and their quality
- Coordinate the scheme watershed conservation activities

**Bureau of water, irrigation & energy/irrigation agencies**

- Implement SSIP and support IWU in O & M
- Provide technical support for technical staff on irrigation agronomy, scheme management, operation and M & E;
- Support establishment of irrigation water users' association and primary cooperatives in collaboration with regional cooperative agency
- Follow up IWUA in collaboration with Community Promotion Office

**Bureau of livestock and fishery / bureau of pastoral community development office**

- Support integration of livestock development activities in SSID
- Provide animal health extension and treatments
- Organise and conduct relevant trainings on integrated livestock production
- Technical support to wereda and kebele extension experts

**Regional cooperative agency**

- Establish and strengthening the Irrigation Water Users' association
- Support input supply system and marketing
- Provide technical support to IWUA management bodies and wereda and kebele technical staff

**Marketing and input supply agency**

- Coordinate the input producers, supplier and IWUA to facilitate input distribution network
- Identify and create reliable linkage with potential market centres for agricultural commodities produced in SSI scheme
- Carrying out periodical market and input demand assessment
- Follow up the on-time distribution, quality, and appropriateness of agricultural inputs supplied to SSI project

**Regional agricultural research organization**

- Generate and/or maintain irrigated agriculture technologies
- Conduct applied research on irrigated agriculture for

**Regional improved seed agency**

- Establish reliable outsourcing contractual agreement with Irrigation water users' Association
- Technical support on improved seed multiplication and post-harvest technologies
- Intensive supervision of farmers' improved seed multiplication activities
- Improved seed certification

**Agro-processing centers**

- Establishing strong and reliable business network with farmers
- Establish out growers system with IWUA and private framers

## 8.5 WEREDA SUPPORTING INSTITUTIONS AND PARTNERS

**Wereda council and administration office**

- Implement SSIP and support in O & M
- Incorporate and compile small-scale irrigation development plan
- Administrative support to IWUAs through kebele administration
- Facilitate irrigation water use conflict management intervention
- Supervise relevant wereda offices in realizing the sustainable management and development of small-scale irrigations

**Wereda agricultural & natural resource office**

- Technical support in irrigated agriculture planning, implementation and monitoring to development agents and model farmers
- Organize in-service trainings such as on improved farm management, scheme operation and maintenance; irrigation agronomy, watershed conservation; irrigation water management,
- Extension service in irrigation agronomy and post-harvest technologies

**Wereda water resource, irrigation and energy office/irrigation development agency**

Woreda Water, Irrigation and Energy office; and Irrigation Development Agencies in Oromia and SNNPR are independently or jointly responsible for the following irrigation development activities to support the established SSI schemes.

- Planning, Implementation and support in Scheme O & M
- Technical support scheme maintenance and operation
- Inspect water quality in collaboration with environmental protection office
- Regulate and supervise the irrigation water supply
- Plan and undertake overall scheme rehabilitation work
- Provide trainings for grass root level technicians, farmers and IWUA management bodies

**Wereda cooperative promotion office**

- Close technical support to kebele cooperative promoters, development agents, credit providers
- Capacity building intervention and Strengthening the IWUAs and primary Cooperatives
- Technical support in amendments of the IWUA rules and regulation in collaboration with kebele promoters
- Facilitate the input supply activities in collaboration with input suppliers, credit providers and other relevant institutions
- Develop and strengthen the market network and potential value chain alternatives

**Wereda livestock and fishery office**

- Promote install feeding system for sustainable irrigation development
- Conduct in-service trainings on improved forage management and seed production
- Introduce and provide extension support on improved livestock production and by-product value-chain
- Technical support for irrigated forage development

**Wereda environmental and land administration office**

- Involve in Periodical inspection on SSIP effects on human and natural resources
- Inspect the recommendations given in SSIP Management Plan in collaboration with communities and development agents

- Conduct the monitoring activities according to SSIP Monitoring Plan in collaboration with communities and development agents

**Wereda trade, industry and market development (input supply office)**

- Create attractive market linkages for irrigation scheme agricultural products
- Identify potential market centers and traders for mass production selling
- Technical support for beneficiaries in input-output marketing

**Wereda small and micro enterprise coordination office**

- Organize interested youths and women group to involve in agricultural production value chain in consultation with IWUAs
- Promote cottage and medium scale agro-processing centre establishment creating reliable partner for IWUAs

**MFI, saving and credit cooperatives/institutions**

- Provide credits for agricultural inputs
- Follow up the effectiveness of the financial resource
- Conduct trainings on agro-business and financial management

**Primary cooperatives and cooperatives'' UNION**

- Organize and facilitate the input demand and distribution system in the scheme in collaboration extension agents and input suppliers
- Involve in annual production planning and implementation
- Provide various services to beneficiaries and IWUAs
- Facilitate the scheme outputs marketing
- Develop and strengthen linkages with UNION

**Private sectors, traders and agro-processing centres**

- Establish formal business partnership with IWUA/primary cooperatives/ UNION
- Involve in production planning to secure the sub-contract production
- Agro-processing centres might require to supply specific inputs to sustain the production and required quality standard

## 8.6 KEBELE SUPPORTING INSTITUTIONS

**Kebele council and administration office**

- Provide administrative support to SSI scheme manager or IWUAs
- Provide required instructions to kebele level implementing offices for sustainability development of irrigation projects
- Play leading role in resource use and conflict management

**Kebele agriculture & natural resource office**

- Provide extension service on irrigated agronomy, soil and water conservation, watershed management and plant protection
- Technical support in irrigated agriculture planning and implementation
- Input demand compiling and request in collaboration with beneficiaries, IWUA and wereda marketing and input supply office
- Inspect and support for better water use efficiency, optimum irrigated land utilization
- Follow up the operation and maintenance activities according to the recommended manual

- Conduct trainings on efficient water utilization, agricultural input application, improved farm practices, pest scouting and integrated pest management, post-harvest technologies

**Kebele cooperative promotion office**

- Organizing and conducting consultative meetings
- Carryout demand based input distribution
- Facilitate input and production marketing in collaboration with other stakeholders
- Provide technical support in financial management and bookkeeping

**Kebele health post (office)**

- Provide health extension services on prevention of water borne diseases
- Distribute mosquito net for vulnerable or exposed families
- Provide trainings on nutrition and family planning

**Kebele education office**

- Provide formal education for school age family members and promoting irrigated agriculture and marketing
- Undertake informal education relevant to irrigation scheme management and household financial management
- Organize campaigns during the occurrence of human and environmental sever crop damage

**Grass root micro-finance institutions**

At grass root level or kebele level the credit and saving services are providing by different stakeholders and beneficiaries by themselves. Rural Saving and Credit Cooperatives have critical role in availing financial resource for irrigation water users and traders. The RUSACCO institutional structure extends from regional level to kebele level to address the financial problem of the farmers and other rural communities.

RUSACCO is one of the rural micro-finance institution can be established by volunteer farmers, public organization, government and NGOs by providing seed money. Currently in all regions there are rural micro-finance institution operating with revolving funds other credit alternative system. In general the rural micro-finance institutions provide the following services for irrigation water users' farmers

- Provide credits for inputs and oxen purchasing with reasonable interest rate
- Encourage the farmers in rural investment and saving
- Provide technical advice in financial management and marketing
- Support primary cooperatives in supplying agricultural inputs and other household commodities

# APPENDICES

## APPENDIX I: Sampling framework & worked examples

### Appendix I a: Sampling Frame for Kunzila SSIP for simple random sampling

| S/N | Name of Household head | Village | Remark |
|---|---|---|---|
| 01 | Demeke Melese | Cheba | Selected |
| 02 | Chalie Yalew | Sanqeta | |
| 03 | Fentabil Kassahun | Cheba | |
| 04 | Jember Abera | Sanqeta | |
| 05 | Chiyew Kassie | Sanqeta | |
| 06 | Gebrie Melese | Sanqeta | |
| 07 | Alelign Chanie | Cheba | |
| 08 | Abich Yeshwas | Cheba | |
| 09 | Nigusse Terefe | Cheba | |
| 10 | Adisu Tebik | Sanqeta | |
| 11 | Aleme Abu | Mehalzegie | |
| 12 | Feleke Lakew | Mehalzegie | |
| 13 | Masresha Abie | Mehalzegie | |
| 14 | Wasie Tesfa | Mehalzegie | |
| 15 | Mazengia Chanie | Cheba | |
| 16 | Smachew Demissie | Sanqeta | Selected |
| 17 | Tayachew Yalew | Sanqeta | |
| 18 | Girum Bayih | Cheba | |
| 19 | Tesfie Alem | Cheba | |
| 20 | Degu Abie | Cheba | |
| 21 | Dilmeta Tebebal | Sanqeta | Selected |
| 22 | Mequanint Demeke | Sanqeta | |
| 23 | Teseru Eristu | Sanqeta | |
| 24 | Edimieale Yazie | Sanqeta | |
| 25 | Alem Meles | Cheba | |
| 26 | Emakonech Minale | Sanqeta | |
| 27 | Tebeje Mola | Cheba | |
| 28 | Sisay Mengistu | Sanqeta | |
| 29 | Tizaz Kebede | Sanqeta | |
| 30 | Abich Tihayneh | Sanqeta | Selected |
| 31 | Woretaw Kassahun | Mehalzegie | |
| 32 | Kassa Mengist | Mehalzegie | |
| 33 | Babey Worku | Mehalzegie | |
| 34 | Nigatu Ayichew | Mehalzegie | |
| 35 | Abunie Belete | Mehalzegie | |
| 36 | Demas Abiye | Mehalzegie | |
| 37 | Simachew Yeshambel | Mehalzegie | |
| 38 | Ayitenew Fentabil | Mehalzegie | |
| 39 | Bazezew Alebel | Mehalzegie | |
| 40 | Alene Abiye | Mehalzegie | Selected |
| 41 | Girmaw Amsalu | Mehalzegie | |
| 42 | Beregnaw Abie | Mehalzegie | |
| 43 | Birhanu Yihun | Mehalzegie | |
| 44 | Bayu Fentabil | Mehalzegie | |

| S/N | Name of Household head | Village | Remark |
|---|---|---|---|
| 45 | Belayneh Gesese | Mehalzegie | |
| 46 | Derebe Mengistu | Mehalzegie | |
| 47 | Ademe Demissie | Mehalzegie | |
| 48 | Adalu Moges | Mehalzegie | |
| 49 | Damtew Tadesse | Mehalzegie | |
| 50 | Yeshambel Gelagay | Mehalzegie | |
| 51 | Yekoye Maleda | Cheba | |
| 52 | Melaku Tesfaye | Cheba | |
| 53 | Adugna Degu | Cheba | |
| 54 | Aderajew Melku | Cheba | |
| 55 | Sewbihon Achenef | Cheba | |
| 56 | Muluken Abie | Cheba | |
| 57 | Adnew Yeshwas | Cheba | |
| 58 | Tayachew Yalew | Cheba | |
| 59 | Melese Kebede | Cheba | Selected |
| 60 | Adane Kebede | Cheba | |

## Appendix I b: Sampling Frame for Kunzila SSIP for Stratified Random Sampling

| S/N | Name of Household head | Village | Remark |
|---|---|---|---|
| | **Cheba Village** | | |
| 01 | Fentabil Kassahun | Cheba | |
| 02 | Alelign Chanie | Cheba | |
| 03 | Abich Yeshwas | Cheba | |
| 04 | Nigusse Terefe | Cheba | |
| 05 | Mazengia Chanie | Cheba | |
| 06 | Girum Bayih | Cheba | |
| 07 | Tesfie Alem | Cheba | |
| 08 | Degu Abie | Cheba | |
| 09 | Alem Meles | Cheba | |
| 10 | Yekoye Maleda | Cheba | |
| 11 | Melaku Tesfaye | Cheba | |
| 12 | Adugna Degu | Cheba | |
| 13 | Aderajew Melku | Cheba | |
| 14 | Adnew Yeshwas | Cheba | |
| 15 | Tayachew Yalew | Cheba | |
| 16 | Melese Kebede | Cheba | Selected |
| 17 | Demeke Melese | Cheba | |
| 18 | Tebeje Mola | Cheba | |
| 19 | Sewbihon Achenef | Cheba | Selected |
| 20 | Muluken Abie | Cheba | |
| 21 | Adane Kebede | Cheba | |
| | **Mehalzegie Village** | | |
| 01 | Aleme Abu | Mehalzegie | |
| 02 | Feleke Lakew | Mehalzegie | |
| 03 | Masresha Abie | Mehalzegie | |
| 04 | Wasie Tesfa | Mehalzegie | |
| 05 | Woretaw Kassahun | Mehalzegie | |
| 06 | Kassa Mengist | Mehalzegie | |
| 07 | Babey Worku | Mehalzegie | |
| 08 | Nigatu Ayichew | Mehalzegie | |
| 09 | Abunie Belete | Mehalzegie | |
| 10 | Demas Abiye | Mehalzegie | |
| 11 | Simachew Yeshambel | Mehalzegie | |
| 12 | Ayitenew Fentabil | Mehalzegie | |
| 13 | Bazezew Alebel | Mehalzegie | |
| 14 | Alene Abiye | Mehalzegie | |
| 15 | Girmaw Amsalu | Mehalzegie | |
| 16 | Beregnaw Abie | Mehalzegie | Selected |
| 17 | Birhanu Yihun | Mehalzegie | |
| 18 | Bayu Fentabil | Mehalzegie | |
| 19 | Belayneh Gesese | Mehalzegie | |
| 20 | Derebe Mengistu | Mehalzegie | |
| 21 | Ademe Demissie | Mehalzegie | |
| 22 | Adalu Moges | Mehalzegie | |
| 23 | Damtew Tadesse | Mehalzegie | Selected |
| 24 | Yeshambel Gelagay | Mehalzegie | |
| | **Sanqeta Village** | | |

| S/N | Name of Household head | Village | Remark |
|---|---|---|---|
| 01 | Chalie Yalew | Sanqeta | |
| 02 | Jember Abera | Sanqeta | |
| 03 | Chiyew Kassie | Sanqeta | |
| 04 | Gebrie Melese | Sanqeta | |
| 05 | Adisu Tebik | Sanqeta | |
| 06 | Smachew Demissie | Sanqeta | Selected |
| 07 | Tayachew Yalew | Sanqeta | |
| 08 | Dilmeta Tebebal | Sanqeta | Selected |
| 09 | Mequanint Demeke | Sanqeta | |
| 10 | Teseru Eristu | Sanqeta | |
| 11 | Edimieale Yazie | Sanqeta | |
| 12 | Emakonech Minale | Sanqeta | |
| 13 | Sisay Mengistu | Sanqeta | |
| 14 | Tizaz Kebede | Sanqeta | |
| 15 | Abich Tihayneh | Sanqeta | |

**Appendix I c: Sampling Frame for Kunzila SSIP for Systematic Random Sampling**

| S/N | Name of Household head | Village | Remark |
|---|---|---|---|
| 1 | Fentabil Kassahun | Cheba | |
| 2 | Alelign Chanie | Cheba | |
| 3 | Abich Yeshwas | Cheba | |
| 4 | Nigusse Terefe | Cheba | Selected |
| 5 | Mazengia Chanie | Cheba | |
| 6 | Girum Bayih | Cheba | |
| 7 | Tesfie Alem | Cheba | |
| 8 | Degu Abie | Cheba | |
| 9 | Alem Meles | Cheba | |
| 10 | Yekoye Maleda | Cheba | |
| 11 | Melaku Tesfaye | Cheba | |
| 12 | Adugna Degu | Cheba | |
| 13 | Aderajew Melku | Cheba | |
| 14 | Adnew Yeshwas | Cheba | Selected |
| 15 | Tayachew Yalew | Cheba | |
| 16 | Melese Kebede | Cheba | |
| 17 | Demeke Melese | Cheba | |
| 18 | Tebeje Mola | Cheba | |
| 19 | Sewbihon Achenef | Cheba | |
| 20 | Muluken Abie | Cheba | |
| 21 | Adane Kebede | Cheba | |
| 22 | Aleme Abu | Mehalzegie | |
| 23 | Feleke Lakew | Mehalzegie | |
| 24 | Masresha Abie | Mehalzegie | Selected |
| 25 | Wasie Tesfa | Mehalzegie | |
| 26 | Woretaw Kassahun | Mehalzegie | |
| 27 | Kassa Mengist | Mehalzegie | |
| 28 | Babey Worku | Mehalzegie | |
| 29 | Nigatu Ayichew | Mehalzegie | |
| 30 | Abunie Belete | Mehalzegie | |
| 31 | Demas Abiye | Mehalzegie | |
| 32 | Simachew Yeshambel | Mehalzegie | |
| 33 | Ayitenew Fentabil | Mehalzegie | |
| 34 | Bazezew Alebel | Mehalzegie | Selected |
| 35 | Alene Abiye | Mehalzegie | |
| 36 | Girmaw Amsalu | Mehalzegie | |
| 37 | Beregnaw Abie | Mehalzegie | |
| 38 | Birhanu Yihun | Mehalzegie | |
| 39 | Bayu Fentabil | Mehalzegie | |
| 40 | Belayneh Gesese | Mehalzegie | |
| 41 | Derebe Mengistu | Mehalzegie | |
| 42 | Ademe Demissie | Mehalzegie | |
| 43 | Adalu Moges | Mehalzegie | |
| 44 | Damtew Tadesse | Mehalzegie | Selected |
| 45 | Yeshambel Gelagay | Mehalzegie | |
| 46 | Chalie Yalew | Sanqeta | |
| 47 | Jember Abera | Sanqeta | |

| S/N | Name of Household head | Village | Remark |
|---|---|---|---|
| 48 | Chiyew Kassie | Sanqeta | |
| 49 | Gebrie Melese | Sanqeta | |
| 50 | Adisu Tebik | Sanqeta | |
| 51 | Smachew Demissie | Sanqeta | |
| 52 | Tayachew Yalew | Sanqeta | |
| 53 | Dilmeta Tebebal | Sanqeta | |
| 54 | Mequanint Demeke | Sanqeta | Selected |
| 55 | Teseru Eristu | Sanqeta | |
| 56 | Edimieale Yazie | Sanqeta | |
| 57 | Emakonech Minale | Sanqeta | |
| 58 | Sisay Mengistu | Sanqeta | |
| 59 | Tizaz Kebede | Sanqeta | |
| 60 | Abich Tihayneh | Sanqeta | |

**Appendix ID: worked examples in SPSS (Soft copy)**

**APPENDIX II: Typical Format of Primary & Secondary Data Collection (Soft copy)**

**APPENDIX III: Irrigation Management Transfer Agreement (Soft copy)**

**APPENDIX IV: Irrigation Scheme Development Agreement (Soft copy)**


Prepared by

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