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MINISTRY OF AGRICULTURE

Training Manual

For Community Trainers On Community-based Land Management (Approaches and Technical Interventions)

INTRODUCTION TO THIS MANUAL: BACKGROUND AND CONTEXT

The Ethiopian government has been implementing a country-wide Sustainable Land Management (SLM) programme since 2008, using community-owned resources and technical and financial support from development partners. The programme aims to reverse land degradation and to improve agricultural productivity in the highland regions of the country, through a community-based watershed development approach. The Kebele level “development agents” and Woreda level “extension workers” are the frontline providers of advisory and facilitation services to communities in the planning and implementation of sustainable land management measures.

Despite the availability of diverse national guidelines, sector-specific training manuals and directives that help to capacitate extension workers on watershed development, use and management, there is no tailor-made standard and comprehensive training material that extension workers can easily adopt for community trainings. Consequently, the level of understanding on the mandates, roles and responsibilities of community-based institutions in SLM varies from community to community.

This manual has been developed by the GIZ-Climate Senstive Innovations for Land Management (CLM) project in collaboration with the Ministry of Agriculture (MoA) to train extension workers from different educational backgrounds and bring them to the same level of understanding on community-based land management approaches and practices, so that they will be capable to adequately provide technical/advisory support and on-the-job training to the community, on planning and implementation of integrated community-based land management interventions.

STRUCTURE AND COMPOSITION OF THE COMMUNITY-BASED LAND MANAGEMENT MANUAL

The Community-based Land Management Manual is divided into two main parts: The Technical Manual and the Trainers' Guide.

The **Technical Manual** outlines the technical content of the training course. It provides the trainer with background information on the training topic, with the aim of increasing his/her understanding of the topic, with the help of definitions, illustrations and references to further reading. The Technical Manual, thereby, provides the trainer with all relevant technical details, as well as the knowledge and skills to be passed on to the training participants.

The **Trainers' Guide** contains all material needed to deliver the course. This material is structured in a modular way as follows:

Each module is described in a so-called *Module Outline*.

Each Module is divided into didactical units, called *sessions*. These are described in *Session Outlines* and contain detailed trainer instructions.

Each Session Outline illustrates the intended learning objective of the session and indicates the average time required to conduct its exercises. It also provides information on the training methods to be applied, the "difficulty level" and the materials required. The main part of the Session Outline is a step-by-step guide for the session, including hints and tips for the trainer, as well as suggestions for variations.

Where necessary, further information is provided on "tailor-made tasks", special arrangements needed for guest speakers or field visits, model answers (where suitable), lists, factsheets or graphs to be transferred to flipcharts, and instructions for group work during case studies.

Additional materials relate to tasks, pictures or posters required for group work, brainstorming, discussions or other purposes. These are, usually, not given to every participant, nor handed out directly to participants. Handouts are usually distributed to participants after each session. They contain the key information relating to the current topic. Certain materials are also presented in poster format and made visible during training.

This manual is supplemented with an Annex. The Annex has a collection of pre- and post-training questions. The questions cover the content of all the sessions and have been developed in order to assess the participants' learning progress. The trainer, therefore, selects 20-25 questions from the collection and distributes them to the participants at the beginning, and again at the end, of the training course. By analysing the difference between the answers given in the pre- and post-seminar tests, the learning progress can be gauged.

HINTS FOR PREPARING AND IMPLEMENTING THE TRAINING COURSE

The training package is based on the experiential learning method, with active involvement of the trainees. This implies that at least two trainers are required to prepare and conduct a seminar. For particular topics where specialized knowledge is required, experts can be invited.

Despite the detailed, structured information given in the training material, organisational and technical problems may still surface and have to be resolved ahead of the training. The following hints can help trainers to anticipate and, hence, avoid some of the potential difficulties.

Training Venue Specifications

The training venue for the seminars should meet the following specifications:

- The venue should be in a safe location and easily accessible for participants, in terms of transport;
- The main training room should allow free movement, and should accommodate up to 30 participants sitting in a circle; it should be possible and convenient to move chairs and tables; (conventional conference facilities do not, normally, permit these interactions);
- There should be enough wall space to mount big (e.g. flip chart size) sheets of paper that display the results of group work;
- The room should allow space for group work, or additional break-out rooms should be available;
- Training rooms should be available throughout the entire training session;
- Convenient access to photocopy and printing facilities is extremely useful.

Organization During the Training Course

Different situations in class may force you to change the schedule, to insert other exercises, or to alter the duration of certain sessions, according to the learning requirements of the participants. Thus, “fine-tuning” during the seminar is essential.

In order to respond adequately to the seminar dynamics, you should consider the following hints:

- A daily meeting of the trainers is encouraged - at the end of the training day - with the objective of reviewing the day’s activities, including the daily evaluation results, and for finalizing or adjusting the next day’s activities to match the actual class situation: (additional training needs may have been identified; group dynamics may not have developed as intended or any other unforeseen circumstances may arise that may necessitate flexibility and a change from the planned schedule).
- Make sure that all the needed materials - handouts, metaplan cards, flipcharts, etc. - are ready by the evening before you conduct the training.
- Sessions that involve practical or field exercises or presentations by guest speakers have to be especially well prepared, (including necessary equipment, transport, briefing of guest speakers, etc.)

Cultural Aspects

Being culturally sensitive is one of the success factors for conducting a good training course. Here are some hints:

- When planning the training course, try to understand the preferences of women and men participants with regard to training times, (e.g. weekends vs. weekdays, start and end times), location,

training content and methods. Make training schedules and their duration flexible enough to suit the participants' needs.

- Be aware that participants may have different learning needs, interests and capacities. Try to find out about their prior knowledge ahead of the course and ask participants about their expectations at the beginning of the course in order to adapt the training content, where necessary (and if possible).
- Take into account the socio-cultural context of participants (religion, culture, language and other social norms), when selecting "energizers", examples and case studies.
- Use gender-sensitive language-terms during the training and display pictures, diagrams or illustrations that display both women and men as key players in the sector.
- Create an enabling training environment for all participants. Encourage all participants to engage, speak, ask questions and share their experience; while avoiding situations where a few vocal participants dominate during the duration of the seminar.

Standard Daily Activities (whenever the course lasts longer than one day)

There are standard daily activities, which are not explicitly mentioned in the session outlines. The following routines should be introduced at the beginning of the course:

Beginning of the day (starting on day 2):

- Spokesperson's report / Daily News: summary or recap of the previous day's activities, covering the key content and important messages from the previous day of training.
- Nomination of next day's spokesperson.
- Presentation of previous day's evaluation results.
- Administrative announcements (if any).

End of the day:

- Administrative announcements (if any).
- Daily evaluation.

Evaluations

Always conduct a final written evaluation among the course participants at the end of the course. The final evaluation comprises a standardized questionnaire and several open questions on key topics.

The evaluation should capture content-related information as well as logistics and the overall mood of the seminar. Please note that the evaluation results have to be carefully analyzed and discussed among trainers and with involved stakeholders in order to form relevant conclusions.

If the course lasts longer than one day, it is strongly recommended that daily evaluations are conducted at the end of each day (apart from the last day).

Equipment and Material

This training has been conceptualized for farmers in rural areas and can be conducted in locations without electricity: therefore, the training material does not include videos or PowerPoint presentations.

When you arrive at the training location, inspect the training venue at least one day ahead of the course check that a) all required equipment is available and functional b) tables and chairs are appropriately arranged?

In case an official opening ceremony is planned; the guests of honour should be formally invited well in advance and logistical arrangements should be completed. The latter contains the booking of a suitable hall; decorations; arrangement of refreshments; preparation of information material for the guests of honour; and, occasionally, invitation of the media.

The aforementioned applies for the official closing ceremony. In addition to the above, printed certificates need to be prepared.

COURSE PROGRAMME

This training course contains 7 modules and has been designed to cover 8 training days. The course programme below presents the course as outlined in the Trainers' Guide of the manual.

Day	Time	Programme
Day 1	9:00-12:30	Opening and Introduction
		Adult learning: principles and the experiential learning cycle
		Pre-Test
	12:30-13:30	Lunch Break
	13:30-17:30	**Module I: Basics of Community-based Land Management**
		Session 1: Basics of community-based land management (120 minutes)
		Module II: Community Resource Governance
		Session 1: Concepts, principles and rationale of land resources governance (90 minutes)
		Daily Evaluation
Day 2	8:30-12:30	Daily News (what did we learn yesterday?)
		Presentation of Results of Daily Evaluation
		Session 2: Legal provisions and experiences (90 minutes)
		Session 3: Instruments used to implement land resource governance (120 minutes)
	12:00-13:30	Lunch Break
	13:30-17:30	**Module III: Community-based Institutions for Land Management**
		Session 1: Community-based institutions and their role in land management (90 minutes)
		Session 2: Establishment of community watershed user cooperatives (120 minutes)
		Daily Evaluation
Day 3	8:30-12:30	Daily News (what did we learn yesterday?)
		Presentation of Results of Daily Evaluation
		Module IV: Community Land Resource Management Planning
		Session 1: Rationale, objectives and principles of community-based planning approaches (90 minutes)
		Session 2: Context Analysis (90 minutes)
	12:30-13:30	Lunch Break
	13:30-17:00	Session 3: Participatory planning approaches under implementation in Ethiopia (150 minutes)
		Daily Evaluation
Day 4	7:30-13:00	Field visit and Field Report Preparation
Day 5	8:30-13:00	Presentation of field observation report
		Module V: Interventions of Community-based Land Management
		Session 1: Communal resources management and utilization (120 minutes)
		Session 2: Rehabilitation of degraded lands (120 minutes)
	13:00-14:00	Lunch Break
	14:00-17:30	Session 3: Promotion of agroforestry practices (90 minutes)
		Session 4: Establishment of plantation forests (90 minutes)
		Daily Evaluation

Day	Time	Programme
Day 6	8:30-13:00	Daily News (what did we learn yesterday?)
		Presentation of Results of Daily Evaluation
		Session 5: Promotion of energy saving and alternative rural energy sources (120 minutes)
		Session 6: Promotion of crop production (120 minutes)
	13:00-14:00	Lunch Break
	14:00-18:30	Session 7: Promotion of climate-smart technologies (120 minutes)
		Session 8: Managing livestock to secure sustainable use of natural resources (120 minutes)
		Daily Evaluation
Day 7	8:30-13:00	Daily News (what did we learn yesterday?)
		Presentation of Results of Daily Evaluation
		Module VI: Financial Mechanisms for Community-based Land Management
		Session 1: Sustainable financing and financing mechanisms (60 minutes)
		Session 2: Cost-benefit Analysis (90 minutes)
		Session 3: Business planning in community-based land management (90 minutes)
	13:00-14:00	Lunch Break
	14:00-17:30	Session 4: Management of Financial Resources in Community-based Land Management (100 minutes)
		Module VII: Community-based Knowledge Generation and Learning
		Session 1: Concepts of monitoring and evaluation (90 minutes)
		Daily Evaluation
Day 8	8:30-13:00	Daily News (what did we learn yesterday?)
		Presentation of Results of Daily Evaluation
		Session 2: Monitoring and evaluation framework (150 minutes)
		Session 3: Learning and knowledge sharing (90 minutes)
	13:00-14:00	Lunch Break
	14:00-16:30	Pre- and post-test
		Final course Evaluation and Feedback of trainees and closure

PART I
TRAINERS' GUIDE

PART II
TECHNICAL MANUAL

PART I
TRAINERS' GUIDE

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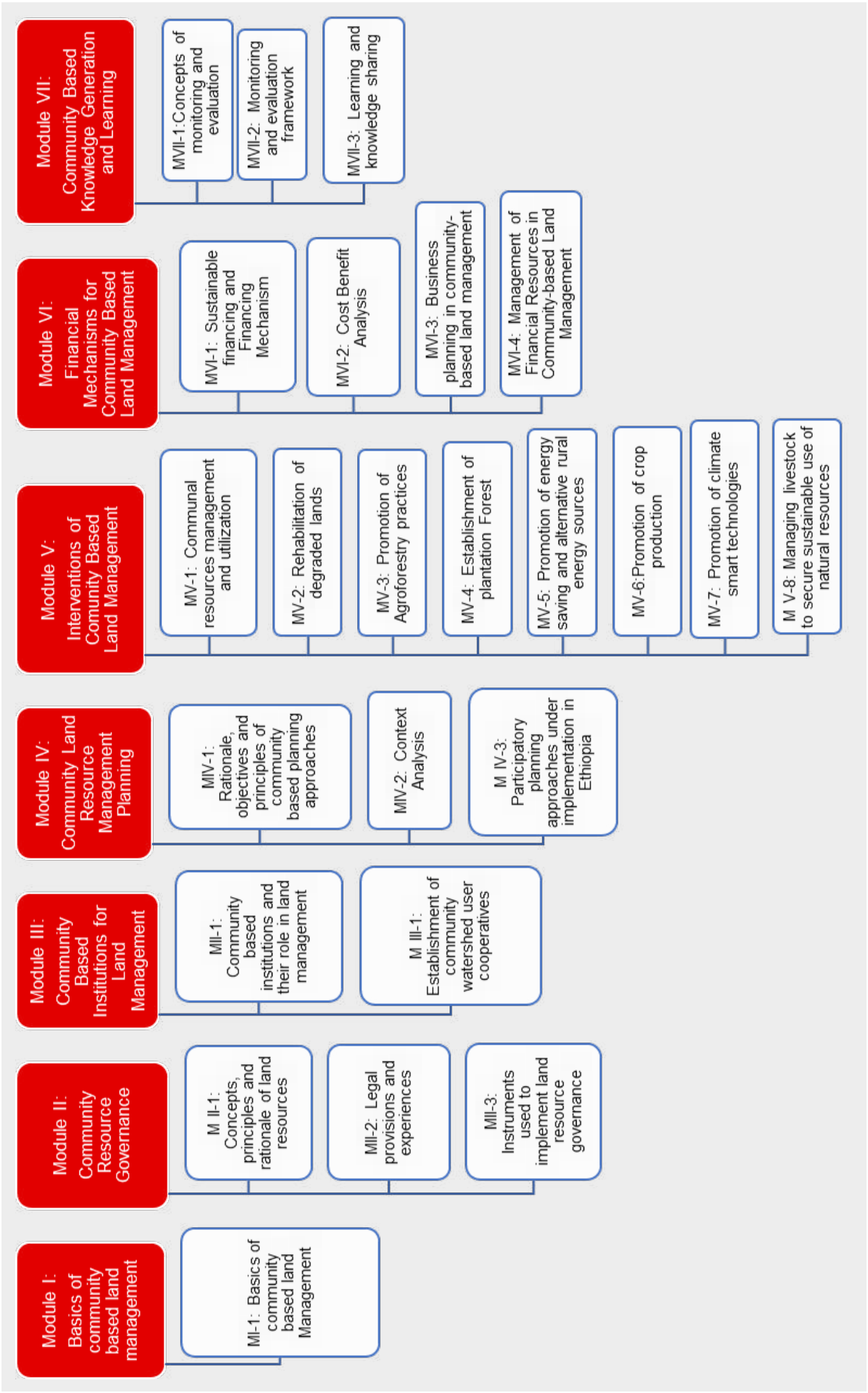
MODULAR FRAMEWORK: LEARNING UNITS



MODULE I: BASICS OF COMMUNITY-BASED LAND MANAGEMENT

Module outline

Learning Objectives:	Participants shall be able to: - Define and explain communities and land resources in the context of land management in Ethiopia. - Explain the basic concepts and principles of community-based land management. - Describe the needs for implementing land management and explain why it should be community based. - Explain why shifting towards community-based land management approaches is required and describe the challenges of shifting towards community based land management.
Duration: Preparation:	Duration: Preparation: 120 minutes Color print A-4 laminated pictures, notebooks, pens, flipchart paper, markers, if a blackboard is available: chalk, cloth/sponge.

This module contains one session titled:

Basics of Community-based Land Management (120 minutes)

Overview

In this module, participants will be introduced to the definitions of community and resource management in the context of CBLM and Ethiopia, followed by basic concepts and principles of community-based land management, while the need for implementing community-based land management will be explained.

Finally, participants will be able to explain why shifting towards community-based land management approaches is required and to describe the challenges involved in shifting towards community-based land management.

Session 1: Basics of Community-based Land Management

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE I: BASICS OF COMMUNITY-BASED LAND MANAGEMENT	**M I-1**
Session 1: Basics of Community-based Land Management	**Session 1**

Specific Information

Learning objective	Participants shall be able to: As summarised in the overall module outline above (noting that Module I "Basics of Community-based Land Management" consists of a single training session.
Duration	120 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of Session

Step	Time	Most important content	Required material	Hints
Introduction	30 min	Facilitator briefly introduces the session and asks participants to brainstorm on: - What is a community? - What is community in the context of CBLM? - What is Land? - What is a Land Resource in the context of CBLM? - What is sustainable land resource management? - What is Land and land management in the Ethiopian context? - The facilitator assesses participant´s knowledge level and discusses the concept in detail.	Flipchart, markers, pens	- Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level and discusses the concept in detail - Key discussion points are noted down on a flipchart
Action	30 min	Facilitator divides participants into four groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 min	Group members present summary of their discussion points on a flipchart.	Flipchart, markers, pens	The facilitator notes down key points from the group's presentation on flipchart
Processing	10 min	The Facilitator compares and assesses group results in plenary: - Did the group present any points that were not clear to the rest or that they did not agree with? - Are there any differences between the presentations? - How are they justified?	Flipchart, metaplan cards, markers, pens and notebooks	
Generalization	20 min	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on: - The need for land management and why it should be community-based - Why shifting towards community-based land management approaches is required and the major and the sub-steps to be implemented to achieve community-based land management - The challenges involved in shifting to CBLM?	Flipchart, paper, markers	The Facilitator enriches the discussion whenever needed; visualises important points and adds information from the background material where needed
Application	10 min	The Facilitator leads a discussion on the following questions: - Is the the need for land management and why it should be community-based understood? - Why is shifting towards a community-based land management approach required and what are the major steps and sub-steps to be implemented for achieving community-based land management? - What are the challenges in shifting towards CBLM? Are they important? How can they be achieved? - How is it relevant for your work (the work of the trainee)? - How can you apply what has been learnt during this training in your area?		

Hints for preparation, typical situations and dangers

The following explanations shall remind Facilitators of the different steps of the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;

- **Generalization** - Connecting the results to everyday life experience, thereby abstracting from the active engagement / experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Please refer to Module 1 of the Technical Manual.

Additional Material

Tasks for the group work: Please discuss in your group and present:

- What is there a need for land management and why should it be community-based?
- Why is a shift towards a community-based land management approach required and what are the major steps and sub-steps to be implemented to achieve community-based land management?
- What are the challenges experienced in shifting towards community based land management?

Time for discussion and preparation: 30 minutes.

Time for presentation: 5 minutes per group.

Handouts

What is a community?

Community can be described as a group of people that recognizes itself, or is recognized by outsiders, as sharing common cultural, religious or other social features, backgrounds and interests, that forms a collective identity with shared goals.

What is Community in the context of CBLM?

- In the context of CBLM, a community is usually defined as a group 300 - 500 farmer households, with an average 5 family members per household, who live, or have landholdings, in a micro-watershed of 750 ha to 1000 ha in the highlands. In the case of pastoralist areas, or the Ethiopian lowlands, a community could cover beyond 1000 ha.
- A community in a watershed could share forest, bush/woodland, pasture, grazing land, water bodies, marketplaces and infrastructures, such as irrigation, water points and plant material production centres.

Figure 1: A community in a watershed (Photo from Tigray Northern Ethiopia)

A community in a watershed usually comprises various social groups such as women and men, youth and elderly, able and disabled people, religious leaders and ordinary farmers, landholders and the landless. These social groups in a community have diverse and dynamic priorities, interests and perspectives on the short- and long-term management and use of watershed resources, depending on their location, exposure/experience, access to land, livestock holding, level of education and family composition and size.

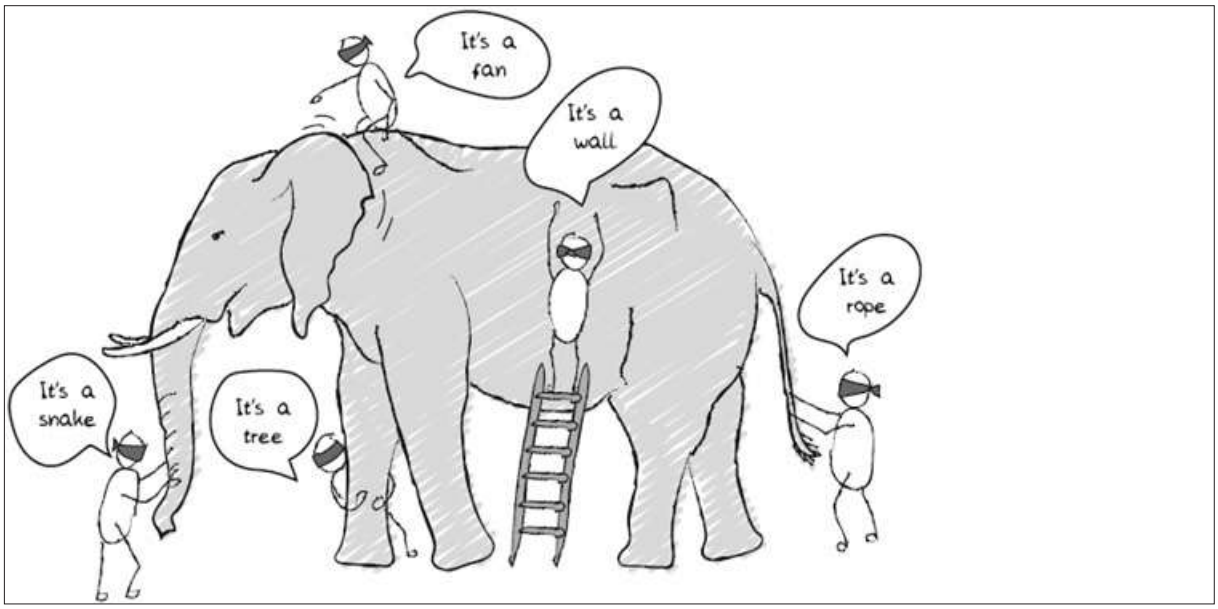


Figure 2: The different perspectives of community members

Figure 3: Community mobilization for soil and water conservation

Figure 4: Community discussing the work plans and priorities for development interventions

What is land?

FAO/UNEP (1997), define "land" as a delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface, including those of the near-surface climate, soil and terrain forms, the surface hydrology (including shallow lakes, rivers, marshes, and swamps), the near-surface sedimentary layers and associated groundwater reserve, the plant and animal populations, the human settlement pattern and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.).

What is a Land Resource in the context of CBLM?

In the context of CBLM, land resources refer to: soils, land forms, water, wetlands, the climate, the flora and fauna in a watershed. The land resources in a micro-watershed are used by the relevant communities for different purposes, to meet the diverse needs and priorities, such as food, livestock feed, firewood production and water supply, of the different social groups in the watershed,.

A watershed is covered by different vegetation, such as forest, bush/shrubs, crops, pasture/ grasses, water bodies and settlement areas. The proportion of the various different land covers in a watershed varies from place to place. The SLMP experience indicated that, on average, 50% of watershed areas in the highlands and midlands are cultivated lands; 30% are bush-lands/ woodlands; 5% are pasture lands; 10% are forest lands and 5% are settlements and miscellaneous.

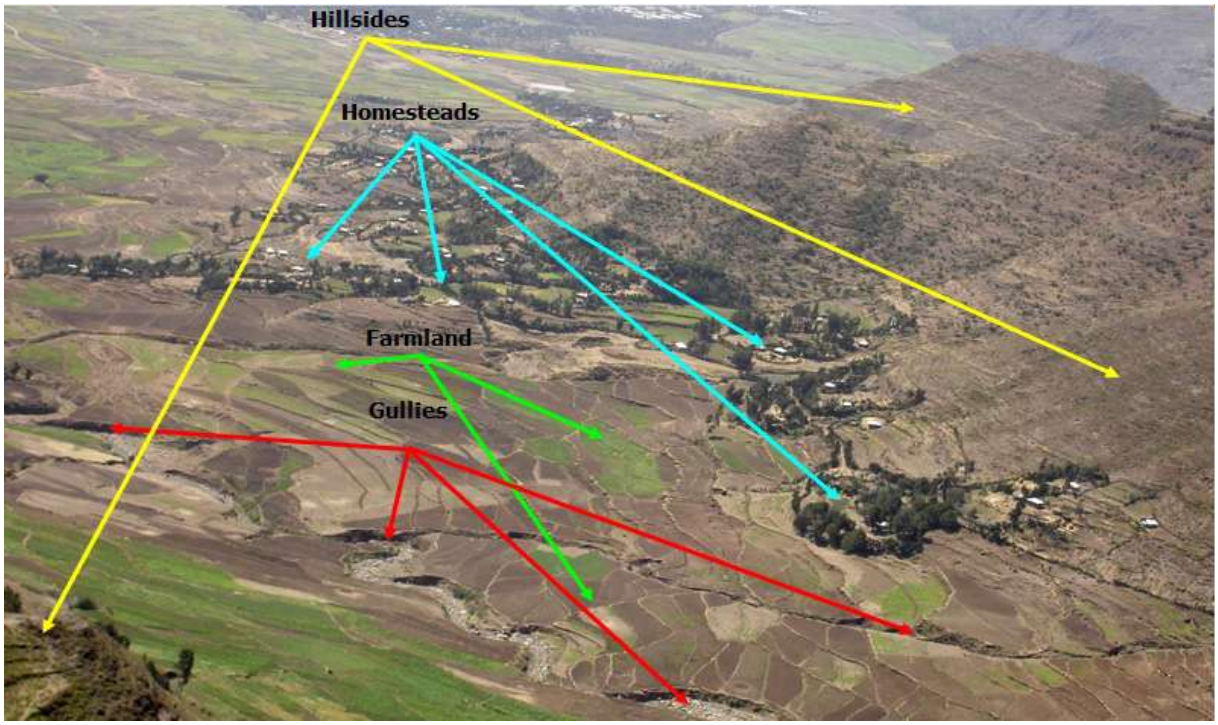


Figure 3: The different land units of a watershed

Table 1: Benefits or services from land

Provisioning	To produce food, timber, fibre, water, fuel, minerals, building materials and shelter, biodiversity and genetic resources, or other 'provisioning' benefits.
Supporting	Primary production, soil formation, nutrient cycling, species habitat, maintenance of genetic diversity
Regulating	Climate regulation, moderation of extreme events, pollution purification, nutrient cycling, erosion prevention, maintenance of soil fertility, pollination
Cultural	Spiritual and aesthetic benefits, educational opportunities, recreation, tourism, hunting

What is Sustainable Land Resource Management?

Sustainable land management refers to optimum use of the multiple functions of land resources to meet the diverse human needs (agriculture, forestry, water, conservation), without compromising the long-term socio-economic and ecological functions of the land.

Sustainable Land management, in general, aims at simultaneously addressing the triple benefits of land

- Maintaining and enhancing crop and livestock production and productivity (Economic);
- Reducing the level of production risk, increasing resilience to shocks, and assuring a socially acceptable level of security over the use of resources by the wider community (Social);
- Protecting the potential of natural resources; preventing degradation of soil and water quality and enhancing soil capacity as a buffer against degradation processes (Ecological).

What is Land and Land Management in the Ethiopian context?

Community-based land management (CBLM) is an approach to land resource management that considers the active participation and ownership of community members and resource users in the planning and implementation of land management measures and in the decision-making related to the use and management of land resources.

What are the Important Principles to be Taken into Account in Community-based Land Management?

- Community empowerment
- People-focused
- Genuinely participatory
- Holistic
- Building on strengths
- Use of a partnership approach
- Sustainable
- Dynamic (recognizing that change is unavoidable).

What is the Need for Land Management and Why Should it be Community-based?

The land resources in a watershed are finite and can be depleted when excessively used by the community

Figure 4: Misuse, mismanagement and overexploitation of land resources in Ethiopia

Recent MoA reports indicate that more than 43% of Ethiopian soils are affected by soil acidity and nearly 50% of arable lands are moderately or severely degraded (MoA, 2010). The same report indicates that 30,000 hectares of fertile land are lost each year due to erosion.

Figure 5: Massive soil losses in agricultural lands in Tigray, Northen Ethiopia

Climate change is expected to further aggravate land degradation and to reduce the productive capacity of land resources. As a result, food self-sufficiency and the ability of the nation to feed the growing population is unlikely to occur and the number of food insecure people and related social crises are likely to increase.

As the drivers of land degradation are diverse and dynamic, reversing degradation and enhancing the productive capacity of the land will require local solutions, through partnership, ownership, and active engagement of local communities.

Successful restoration and sustainable management of land resources requires local leadership, local knowledge and innovations, commitment, and an input of labour and materials from the community, in the planning, implementation and monitoring and evaluation of measures.

Community-based land management solutions generally last longer, as compared to expert-driven interventions, because the community have better understanding and experience of the causes and effects of land degradation.

Why is shifting towards a Community-based Land Management Approach required and what are the major steps and sub-steps that need to be implemented to achieve Community-based Land Management?

Community-based land management is an interactive process which requires a paradigm shift from the conventional "expert-driven" "top-down" approach on land management to community-owned and initiated, localized development.

The transition from the current, passive participation of the community in planning, implementation and decision making in land management, to active, pragmatic and inclusive participation and ownership by the communities, requires the adoption of well thought out and well-designed approaches and steps and the engagement of trained facilitators. The following steps need to be implemented for achievement of community-based land management.

Step 1: Self-organization

- Step 1.1: Forming NRM common interest groups.
- Step 1.2: Identify and select leaders and develop rules/bylaws (Norming).
- Step 1.3: Obtaining legal watershed resources user status.

Step 2: Exploration

- Step 2.1: Understanding the causes of land degradation challenges.
- Step 2.2: Analyze and map the current condition of the watershed.
- Step 2.3: Identify and prioritize development interventions and develop work plans.

Step 3: Mobilization (performing)

- Step 3.1: Assess and organize own resources.
- Step 3.2: Organize NRM campaigns.
- Step 3.3: Apply for external funding and establish networking and partnerships.

Step 4: Review and consolidation of experience for further up-scaling

- Step 4.1: Document/organize community performances and land management outcomes.
- Step 4.2: Document and validate successful experience and success factors.
- Step 4.3: Celebrating successes.

Figure 6: Steps in the community-based approach

What are the challenges in shifting towards Community-based Land Management (CBLM)?

Though community-based land management seeks a bottom-up approach, there are some challenges associated with the processes and actual operations.

1. As community development activities are carried out by communities themselves, there should be trusted, committed and strong leaders to lead and mobilize communities for collective action.
2. Communities need to be organized and to collaborate to achieve their common goals and interests. However, all these processes are lengthy and time consuming. This needs well designed support and frequent facilitation from external parties (government and projects).
3. Developing credibility and mutual trust among communities, community leaders and the government extension service is also time consuming. The extension service and the community should develop a tracking and regulatory system to monitor and evaluate the progress of community development activities and to ensure communities participate democratically and enjoy the benefits of development on an equitable basis.
4. Most communities (mainly those familiar with income generating activities from a CBLM project) want to start projects in haste, overlooking other important factors, such as setting a community vision; the need for developing long-term and short-term plans; capacity building; strengthening the natural resource base and developing management and use plans.
5. Problems of maladministration, mismanagement, improper running of day-to-day affairs, lack of accountability and project domination by a few people can also hamper community management.

MODULE II: COMMUNITY RESOURCE GOVERNANCE

Module outline

Learning Objectives:	Participants shall be able to: - Describe and use land resource governance concepts. - Describe the legal provisions in land resource governance, including , property and user rights. - Explain the role of community leadership in resource governance. - Explain the drawbacks / limitations in implementing legal provisions. - Explain the role of community bylaws for management and sustainable use of land resources and management of conflicts. - Identify conflict management / resolution / grievance systems.
Duration: Preparation:	Duration: Preparation: 300 minutes Color print A-4 laminated pictures, notebooks, pens, flipchart paper, A-4 papers, Metaplan-cards, markers, rulers, pins for soft boards, whiteboard, cloth/sponge.

This module contains three sessions:

Session 1: Concepts, principles and rationale of land resources governance (90 minutes).

Session 2: Legal provisions and experiences (90 minutes).

Session 3: Instruments used to implement land resource governance (120 minutes).

Overview

The module will teach participants the basic concepts of resource governance, from a community land management perspective. Trainers will also learn the legal provisions of land resource governance and the roles and importance of community leadership, local bylaws and conflict resolution mechanisms in community resource governance.

Session 1: Concepts, Principles and Rationale of Land Resources Governance

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE II: COMMUNITY RESOURCE GOVERNANCE	**MII-1**
Session 1: Concepts, principles and rationale of land resources governance	**Session 1**

Specific Information

Learning objective	Participants shall be able to: - Define and describe governance, land governance, property right and user right - Explain the principles of land resource governance - Explain the rationale for land resource governance
Duration	90 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	Facilitator briefly introduces the session and asks participants to brainstorm on the following: - What is governance? - What is land governance? - What is a property right? - What is a user right? Then the Facilitator discusses and provides an input on each question.	Flipchart, markers, pens	Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level and discusses the concept in detail Key discussion points are noted down on flipchart.
Action	30 min	Facilitator divides participants into four groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	Facilitator writes the task on a flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 min	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation from the flipchart
Processing	10 min	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear or that other participants did not agree with? - Are there any differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	15 min	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on the principles of land resource governance and the rationale for land resource governance	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	5 min	The Facilitator leads discussion on the questions: - Is knowing the principles of land resource governance and the rationale for land resource governance important to you? If so, how? - How is it relevant to your work? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation, typical situations and dangers

The following are the different steps of the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;
- **Generalization** - Connecting the results to everyday life experiences, thereby abstracting from the active engagement / experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Refer to Module 2 of the Technical Manual.

Additional Material

Task for group work

Please discuss in your group and present on the following questions:

- What is the rationale for Land Resource Governance?
- What are the principles of land resource governance?

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What is Governance?

Governance is the processes by which communities participate in decision-making and how society accommodates the participation of its members in formulating, reviewing, approving and implementing its laws and rules.

What is Land Governance?

Land governance involves procedures, policies, processes and institutions by which land, property and other natural resources are managed. This includes decisions on access to land, land rights, land use and land development.

To be specific, land governance includes the way in which:

- Property rights for land (for groups or individuals) are defined, exchanged and transformed.
- Public (mis)understanding over land use, land management and taxation is managed.
- How land is managed and used, based on statutory and customary rights.
- The nature and quality of land ownership information available to the public and the ease with which it can be accessed or modified; and
- How disputes are resolved, and how conflict is managed.

What is a Property Right?

Property rights are the rules that define an owner's rights and duties in the use of a particular resource. Property rights to man-made goods and services are usually well-defined and well enforced. However, many environmental problems are the result of weak or poorly defined property rights over land and natural resources. This leads to the problem of over-exploitation and degradation of natural resources, because there is no incentive on the part of the user to manage or protect those resources. Without a clear definition of property rights, it is not possible to assign responsibilities, and the system will drift into open access as a consequence.

What is a User Right?

User rights, or "usufruct rights", mean that control, by group or individuals, over natural resources, is officially recognized. Clearer, stronger user rights may enable communities to use natural resources better and more innovatively. If a community has user rights, they have an incentive to use and conserve those resources in a sustainable way. It is, therefore, necessary to make them confident that investing time and effort to improve those resources is worthwhile.

What are the Principles of Land Resource Governance?

Application of a number of property right principles is recommended to minimize undesirable and unexpected outcomes to land resource initiatives. These principles are identified as follows:

1. **Understand existing property rights systems before launching a natural resource programme.** Wherever natural resources exist, some type of property rights system (that governs or attempts to govern access, use, management and transfer of natural resources) also, always exists. Information regarding local property rights rules and their enforcement is important and should be collected.
2. **Recognize and build on customary property rights.** Customary property rights systems are durable and exhibit desirable characteristics of flexibility and adaptability, as they evolve in the face of changing economic, social and political environments.
3. **Provide incentives to user groups for sustainable management, by securing property rights.** An appropriate property rights regulatory system channels and enhances positive incentives for sustainable governance and management of resources. Access to, and use of, the resources should be clearly defined and rights-based, but will, most appropriately, be derived from - rather than a replacement of - existing property rights rules and institutions.
4. **Where possible, clarify property rights, reducing (potential) conflict over land and natural resources**. Identify and address existing conflicts due to overlapping claims.
5. **Pay particular attention to the duration of property rights.** Secure, long-term property rights are needed to create and consolidate local incentives for making long-term investments. Short-term property rights are not conducive to long-term investments.
6. **Avoid displacement (reduction or elimination of property rights)** wherever possible. Reduction or elimination of property rights should be avoided.
7. **Recognize diversity among solutions.** No single model is appropriate or applicable in all situations and places.
8. **Strengthen local institutions.** Where possible, strengthen local institutions concerned with natural resource governance.
9. **Promote property rights regimes that allow for equity as well as efficiency**. Care must be taken to ensure that securing the rights of one group does not serve to marginalize others.
10. **Where possible, promote solutions that go beyond efficiency and equity.** Empowerment of the rural poor can bring many long-term benefits. While efficiency and equity are important dimensions of good property rights regimes, regimes should also consider rural empowerment and moving communities beyond dependency and a pervasive sense of helplessness. Such solutions bring enormous social and economic benefits. In addition, long-term sustainability (rather than short-term gains) should be considered important variables in the equation.

What is the Rationale for Land Resource Governance?

The relevance of having adequate knowledge and an understanding about land resource governance, and giving adequate consideration for it in community-based land management, can be justified because of several reasons:

A. As competition for land and natural resources continues to escalate, it is vital that inclusive land governance policies and practices are developed, implemented and strengthened.

B. Land governance is a means for inclusive management of land and its resources. When land is governed in an inclusive manner, it increases the likelihood of sustainable management and equitable access, by the community, to the subsequent benefits. Inclusive land governance frameworks and their benefits for local communities can also provide opportunities to challenge wider communal or societal issues, such as cultural conflict, political and economic marginalization, corruption and gender inequality.

C. Strong land governance is crucial in managing land in a just, conflict-free and sustainable manner.

D. It provides an opportunity to consider property rights and use rights issues, as land governance is guided by community by-laws and government legal provisions

Session 2: Legal Provisions and Experiences

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE II: COMMUNITY RESOURCE GOVERNANCE	**MII-2**
Session 2: Legal provisions and experiences	**Session 2**

Specific Information

Learning objective	Participants shall be able to: - Describe the legal provisions and experiences so far enacted - Explain the drawbacks/limitations in implementing those legal provisions
Duration	90 minutes
Training methods	Group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Action	30 min	The Facilitator divides participants into two groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 min	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The facilitator notes down key points from the group's presentation on flipchart
Processing	10 min	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Were there any differences between the presentations? - How were they explained and justified?	Flipchart, metaplan cards, markers, pens and notebook	
Generalization	20 min	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on the legal provisions (articles of the constitution, policies, proclamations and regulations) related to Land Resource Governance and highlights drawbacks/limitations in implementing legal provisions?	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed, and visualises important points
Application	10 min	The Facilitator leads discussion on the questions: - Is knowing about the legal provisions (articles of the constitution, policies, proclamations, and regulations) related to Land Resource Governance and knowledge about the drawbacks/limitations in implementing those legal provisions important to you in your work and, if so, how? - How is it relevant for your work? - How can you apply what has been learnt during this session in your home area?		

Hints for Preparation: Typical Situations and Dangers

The following explanations shall remind Facilitators of the different steps in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation.
- **Publishing** - Presenting results.

- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase.
- **Generalization** - Connecting the results to everyday life experiences, thereby abstracting from the active engagement / experience in the Action Phase and discussing generally applicable concepts and theories.
- **Application** - Applying what has been learnt in new situations.

Variations

Background Material

Refer to Module 2 of the Technical Manual.

Additional Material

Task for group work

Please discuss in your group and present:

- Identify the legal provisions (articles of the constitution, policies, proclamations, regulations) related to Land Resource Governance.
- Identify and list the drawbacks/limitations in implementing the identified legal provisions.

Time for discussion and preparation: 30 minutes. Time for presentation: 10 minutes per group.

Handouts

What are the legal provisions and experiences related to CBLM so far enacted?

Constitution of the Federal Democratic Republic of Ethiopia

The Constitution specifies the concepts of sustainable development and environment rights that are entrenched in the rights of the people of Ethiopia through Articles 43 and 44, which state, among other things, the right to development and the right to live in a clean and healthy environment. Other important provisions of the Constitution include the following Articles:

Table 2: Brief description of some articles of the Ethiopian constitution related to resource governance

No	Articles	Article Description
1	Article 40(3)	The right to ownership of rural, urban land and natural resources.
2	Article 40(4)	The rights of farmers to obtain the land without payment and protection against eviction from their land possessions.
3	Article 40(5)	The rights of pastoralists to free land for grazing and cultivation.
4	Article 40(7)	Emphasizes the right to acquire property for the purpose of overriding national interest. It empowers the government to expropriate private property for public purposes, subject to payment, in advance, of compensation, commensurate with the value of the property.
5	Article 41(9)	Deals with economic, social and cultural rights and sets out State responsibilities to protect and preserve historical and cultural legacies.
6	Article 43(2)	The rights of the people to be consulted, with respect to policies and projects affecting their community.
7	Article 92	Affirms the commitment of the government to ensure that all Ethiopians live in a clean and healthy environment, and promotes the principle that design and implementation of development programmes and projects should not damage the environment and that there is need to conduct consultation and collect the views of communities and stakeholders.

A. Ethiopian Policy Provisions

The most relevant and important policy provisions that can be used for promotion and implementation of community-based land management interventions are presented in Table 3 below.

For detailed information on specific issues, it is advisable to read the relevant policy document issued by the government. These documents can be accessed from concerned government offices at woreda and kebele level.

Table 3: Brief description of policy provisions related to resource governance

No	Policy	Description of the policy and main content
1	Environmental Policy of Ethiopia	The policy provides the main environmental guiding principles to be adopted in order to harmonize environmental elements in sectoral, cross-sectoral and other policies. It also clearly identified deforestation, land degradation and declining agricultural productivity as key problems for environmental deterioration in Ethiopia.
2	Energy Policy of Ethiopia	The objective of the energy policy is to increase energy utilization efficiency and reduce energy wastage and to ensure that the development and utilization of energy is not harmful to the environment. The policy highlights the different energy resources development options, among which are traditional fuels. In this context, the policy emphasizes two important energy sources to which the national government gives due consideration (with respect to developing and the efficient use of such energy sources).
3	Ethiopian Wildlife Policy	The Wildlife Policy was developed in 2006 by the Ministry of Agriculture and Rural Development. The prime objective of the policy is to create a conducive environment for the preservation, development and sustainable use of Ethiopia's wildlife resources, for social and economic development and for the integrity of ecosystems and for biodiversity.
4	National Policy on Women	This policy was issued in March 1993, emphasizing that all economic and social programmes and activities should ensure equal access of men and women to the country's resources and to decision-making processes, so that they can benefit equally from all activities carried out by the federal and regional institutions, as well as in implementation and operation of private establishments.

Table 4: Provisions and regulations related to land resource governance Issues

No	Proclamation	Description
1	Proclamation on Rural Land Administration and Land Use	The main aim of the Proclamation (Proc. No. 456/2005) is to conserve and develop natural resources in rural areas by promoting sustainable land use practices. In order to encourage farmers and pastoralists to implement measures to guard against soil erosion, the Proclamation introduces a Rural Land Holding Certificate, which provides a level of security of tenure.
2	Proclamation on Environmental Impact Assessments	The Environmental Impact Assessment Proclamation (Proc. No. 299/2002) was decreed in order to make ESIA a mandatory procedure for projects to be undertaken by the government, public or private entities that require an environmental impact analysis. It elaborates on considerations with respect to the assessment of positive and negative impacts on the basis of size, location, nature, cumulative effects, etc.
3	Environmental Pollution Control Proclamation	Environmental Pollution Control Proclamation (Proclamation, No. 300/2002) was declared to control and manage the possible causes of environmental pollution from hazardous substances, waste and any other forms of pollutants that pose serious environmental, social and health threats.
4	Forest Development, Conservation and Utilization Proclamation	This Proclamation (No. 1065/2018) involves the designation of various forest types by the concerned government organs, signifying the importance of allocating a necessary proportion of land for forestry. Designation of land for forest development, or maintaining existing forests as forest covered lands and giving the necessary protection to them, can be taken as a sub-section of a comprehensive land use planning.
5	Proclamation on Wildlife Development, Conservation and Utilization	This Proclamation (Proc. No. 541/2007) has the following three objectives: 1) Conserve, manage, develop and properly utilize the wildlife resources of Ethiopia; 2) Create conditions necessary for discharging government obligations, assumed under treaties regarding the conservation, development, and utilization of wildlife; and 3) Promote wildlife-based tourism and encourage private investment.
6	Wildlife Development, Conservation and Utilization Regulation	The Regulation (No. 163/2008) provides rules for the management of wildlife conservation areas (National Parks, Wildlife Sanctuaries and Wildlife Reserves) and the administration of these areas. It also details the rules concerning the lawful and unlawful possession and trade of wildlife products.
7	Proclamation on Expropriation of Land Holdings and Payment of Compensation	As per the Proclamation, a woreda or an urban administration shall, upon payment in advance of compensation in accordance with the Proclamation, have the power to expropriate rural or urban landholdings for public purposes, where it believes the land should be used for development to be carried out by public entities, private investors, cooperative societies or other organs, or where such expropriation has been decided by an appropriate higher regional or federal government organ for the same purpose. A land holder whose land has been expropriated for public use by the concerned government authorities is entitled to compensation for his / her property, situated on the land and for the permanent improvements he /she made on the land.

8	Payment of Compensation for Property Situated on Landholdings Expropriated under Public Purposes Regulations	This Regulation (No. 135/2007) provides detailed directives regarding the payment of compensation for property situated on land holdings expropriated for public purposes specific to Proclamation No. 455/2005. The regulation recognizes that land replacement should be made for urban and rural lands. In rural areas, if land replacement is not possible for permanently affected land, project affected persons (PAPs) will be compensated for the affected perennial crops, ten times the value of annual production.
9	Proclamations on Cultural Heritage (the relevance/ importance has to be discussed)	The Proclamation (Proclamation No. 374/2003) defines "cultural heritage", broadly, as "anything tangible or intangible which is the product of creativity and labour of man in the pre-history and history times, that describes and witnesses to the evolution of nature and which has a major value in its scientific, historical, cultural, artistic and handcraft content".
10	Ethiopian Water Resources Management Proclamation No. 197/2000	The Proclamation is decreed to ensure that the water resources of the country are protected and utilized for the highest social and economic benefit of the people of Ethiopia; to provide follow up and supervision, to ensure that they are duly conserved and to ensure that harmful effects of water are prevented, and that management of water resources is carried out properly.
11	Apiculture Resources Development and Protection Proclamation No. 660/2009	The objective of the Proclamation is to promote household and commercial beekeeping development in areas of high apiculture resource potential, to realize an appropriate contribution of the sub-sector in the process of rapid economic development.

What are the drawbacks/limitations in implementing legal provisions?

- Overlap of institutional mandates and frequent reshuffling and restructuring of responsibilities.
- Lack of coordination: extension providers or officers sometimes provide services that are contradictory or not within their mandate.
- Legislative gaps: shortfall to integrate indigenous resource governance mechanism.
- Weak enforcement of legislation, regulations and standards / inability to bring offenders to court, compounded by the small penalties imposed (lack of enforcement may be due to limited resources - both people and equipment - and lack of commitment on the part of the authorities with regard to conservation).
- In many instances, the laws that have been enacted are not effectively implemented (for example, there is no culture of environmental compliance and a lack of political will, coupled with a perception that environmental rules will slow down or impede development).
- Laws are developed without considering the local context, which makes it difficult to enact implementation and enforce compliance with environmental legislation.
- Lack of awareness of and availability of information on relevant environmental laws, their functions and benefits, and their overall contribution to environmental justice.
- There is no land use policy. Absence of a policy creates a problem for the enforcement of land rights.
- Weak institutional capacity and corruption.

Session 3: Instruments Used to Implement Land Resource Governance

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE II: COMMUNITY RESOURCE GOVERNANCE	**MII-3**
Session 3: Instruments used to implement land resource governance	**Session 3**

Specific Information

Learning objective	Participants shall be able to: - Explain the role of community leadership in resource governance. - Identify and explain benefit sharing mechanisms. - Explain the role of community by-laws in management and sustainable use of land resources and management of conflicts. - Describe conflict the management/resolution/grievance system and explain its role in resource governance.
Duration	120 minutes
Training methods	Group work and structured discussions

Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of the session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	The Facilitator briefly introduces the session and asks participants to brainstorm on the following: The instruments used to implement land resource governance. The Facilitator then discusses and provides an input on the question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart, assesses the participant´s knowledge level and discusses the concept in detail Key discussion points are noted down on a flipchart
Action	50 min	The Facilitator divides participants into two groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 min	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 min	The Facilitator compares and assesses group results in plenary: Did the groups present any points that were not clear to other participants or that they did not agree with? Are there any differences between the different presentations? How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	20 min	Together with the participants, the Facilitator elaborates, in plenary, and gives conclusions on the following: The role of community leadership in implementation of resource governance. How the presence of benefit-sharing mechanisms helps in implementation of resource governance? How the presence of agreed by-laws helps in implementation of resource governance? How the presence of a conflict management/ resolution/ grievance system helps in implementation of resource governance? Techniques and procedures of conflict resolution management and grievance management. Disputes settlement methods.	Flipchart paper, markers	The Facilitator enriches the discussion, whenever needed, and visualises important points
Application	10 min	The Facilitator leads discussion on the following questions: Is knowing about the role of community leadership a help in implementation of resource governance activities? How does the presence of benefit sharing mechanisms help in the implementation of resource governance? How do agreed by-laws help in the implementation of resource governance? How does conflict management / resolution / grievance systems help the implementation of resource governance? What are techniques and procedures of conflict management and disputes settlement? How is this Important (to you and how is it relevant for your work?). How can you apply what you have learnt during this session in your home area?		

Hints for preparation, typical situations and dangers

The following explanations shall remind Facilitators of the different steps in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation.
- **Publishing** - Presenting results.
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase.
- **Generalization** - Connecting the results to everyday life experiences, thereby abstracting from the active engagement/experience in the Action Phase and discussing generally applicable concepts and theories.
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Refer to Module 2 of the Technical Manual.

Additional Material

Task for group work

Please discuss in groups and present:

- How does enhancing the role of community leadership help in implementation of resource Governance?
- How do benefit sharing mechanisms help in implementation of resource governance?
- How does the presence of agreed by-laws help in implementation of resource governance?
- How does the presence of a conflict management/resolution/grievance system help in implementation of resource governance?
- What are the techniques and procedures of conflict management, resolution and grievance management?
- How are disputes settled?

Time for discussion and preparation: 50 minutes. Time for presentation: 10 minutes per group.

Handouts

What are the instruments used to implement land resource governance?

There are four main instruments used for the implementation of land resource governance:

- Enhancing the role of community leadership in resource governance;
- Benefit sharing mechanisms;
- Community by-laws;
- Conflict management/resolution/grievance systems?

How does enhancing the role of community leadership help in implementation of resource governance?

Community leaders play a key role in resource governance and is highly desirable for organizing people, in mobilization of resources, nurturing and sustaining organizations, establishing liaison with external support (e.g. project sponsoring agencies) and enforcing rules and regulations.

Community leadership plays an important role in the following areas:

- Mobilization of community labour and local resources;
- Proper targeting of needy beneficiary households for development project support;
- Creating strong partnerships and linkage with different institutions;
- Lead planning and implementation of community-based projects;
- Facilitating knowledge sharing events among different actors, including other communities;
- Playing a key role in identification and provision of new community technologies and practices;
- Playing a leading role in development of community by-laws and in their implementation;
- Leading the development of appropriate mechanisms for communal resource management and equitable use of resources.

How do benefit sharing mechanisms help in implementation of resource governance?

In general, people will not participate in the collective management of resources unless they are assured of their exclusive right to the benefits to be gained from those resources.

Current Ethiopian policies and laws recognize the importance of equitable benefit-sharing mechanisms for natural resource management. Government policies on benefit sharing are pro-poor with an emphasis on legal and customary rights, since benefits-sharing, as well as governance issues, are crucial for natural resource management projects to succeed. As a cornerstone for success, the mechanism for benefit sharing should be:

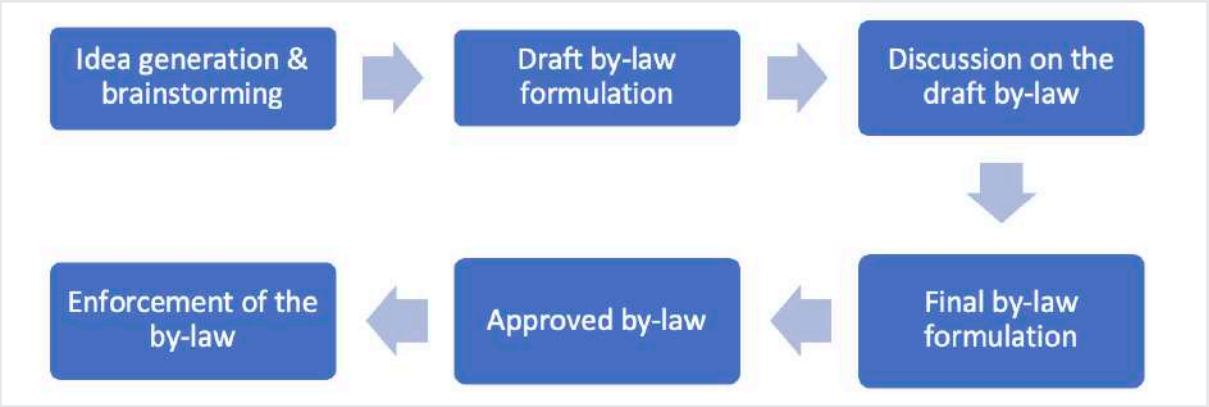
- Benefits should be shared according to efforts made in reducing environmental/land degradation problems.
- Any benefit sharing arrangement at the community level should take into consideration the size and state of the resource managed properly in each village.
- In deciding who should benefit, decisions needs to be based on participatory decision-making processes, which take into account different actors' voices, concerns and interests.

How does the presence of agreed bylaw help in implementation of resource governance?

For natural resources to be developed, managed and equitably and sutaibably used, communities should agree by-laws that are developed and agreed by the general community.

Communiuty by-laws can be drafted by a team of community representatives who have adequate knowledge about the specific resource and the community. By-laws have to be prepared in close consultation and after frequent discussions with different segments of the community, including women, youth and marginalized communities. At the end of the process - before implementation - by-laws have to be discussed and approved by the general community. Unless a by-law is approved by majorty vote of the community it should not become functional. Moreover, a by-law has to be submitted to concerned government bodies for consideration and approval. A by-law should not contain statements that contradict government laws.

For general information, the steps to be followed in developing a WUC by-law are indicated in the following diagram:



How does the presence of conflict management/resolution/grievance system help in implementation of resource governance?

In natural resource management, conflicts are disagreements and disputes over access to, and control and use of, natural resources.

These conflicts often emerge because people have different uses for resources such as forests, water, pastures, rangeland and others, or want to manage them in different ways.

Disagreements also arise when these interests and needs are incompatible with each other, or when the priorities of a user group or groups are not considered in policies, programmes and projects. Such conflicts are an inevitable feature in all societies.

In recent years, the scope and magnitude of natural resource conflicts have increased and intensified, due to scarcity of resources, aggravated by population growth and vested interests.

These conflicts, if not addressed, can escalate into violence; can cause environmental degradation; disrupt projects and undermine livelihoods. Therefore, extension workers, or facilitating teams, in conflict management should analyse natural resources conflicts and come up with the best way to address them, together with community planning teams.

The nature of the measures to be applied will depend, to a large extent, on the nature of the conflict, the interests, powers and relationships of the parties involved, as well as on outcomes of previous attempts to solve the conflict.

How is conflict analysed?

There are many different tools for conducting conflict analysis. One approach consists of determining the profile and context, causes, actors and dynamics of conflicts (Table 5). This is a generic approach that can be applied to land issues. The most prominent dimensions are land tenure, institutions and political economy (interests, constraints and incentives). By asking questions related to context, causes, actors and conflict dynamics, the different dimensions and root causes of conflicts can be analysed.

Structural causes: Pervasive factors that have been built into policies, structures and the fabric of a society and may create the preconditions for violent conflict.

Proximate causes: Factors contributing to a climate conducive to violent conflict or its further escalation (sometimes, apparently, symptomatic of a deeper problem); and,

Triggers: Single key events, or their anticipation, that will set off or escalate violent conflict.

As a simple approach, conflict can be briefly analysed to know what the conflict is about, what the causes of the conflict are, who the main actors are, and how the conflict is dynamic. Before further analysis, one can easily analyse a conflict using the information in the table below.

Table 5: Conflict analysis

Context	Causes	Actors	Dynamics
Where? Timeline? What is the conflict about?	Why is there a conflict? What are the root causes? What are the triggers of the conflict?	Who is involved? Who will benefit from the conflict?	How did or will the conflict change over time? What are the power relations? What are the incentives and constraints?

Conflict Matrix

A conflict matrix permits the exploration of issues related to a conflict and how they are dealt with in a community.

Table 6: Conflict matrix

Resources	Conflict Matrix				
	Within the household	Within the village	With neighbouring village	With strangers	With state
Forest					
Pastures					
Cropland					
Water					

One way to set up a conflict matrix is to put the resources that might cause conflict on the vertical axis. On the horizontal axis place the different groups that might be involved in the conflict. Decide, at this point, whether the matrix will show the frequency of conflicts or whether the number of beans will reflect the severity of the conflict. Be sure that everybody understands what is being ranked before the counters are placed in each square.

In this matrix it makes more sense to complete the analysis horizontally: that is to say, ask first about all natural resources conflicts in the village. Are there many or few conflicts concerning natural resources, e.g. forests, within families? What about among villagers? With neighbouring villages? And so on. As the beans are placed in each square, ask what the nature of each conflict is. When the first row is completed, move to the second row and ask the same question about pastureland. When the entire matrix has been completed, seize the occasion to ask more questions about conflicts and institutional issues. How are various types of conflicts resolved? What are the procedures? When do the various conflicts take place and what causes them? Etc.

Techniques and Procedures of Conflict Resolution Management and Grievance Management

The ways in which people (even those from the same community) respond to natural resource conflicts vary considerably. All communities have their own ways of handling conflict. These mechanisms may be formal or informal, violent or peaceful, equitable or not. Although the specific strategies may vary, people generally rely on the same basic procedural modes to handle conflict: these may be avoidance, coercion/intimidation, negotiation, mediation, arbitration and adjudication (FAO, 2000).

How are disputes settled?

In conflict or dispute resolution:

- The nature and scope of conflict must be analysed before intervention occurs;
- Decisions must be enforceable; and
- Adjudication must be provided;
- Resolution mechanisms must be viewed by citizens as legitimate;
- A means of accommodating the “losers” of the dispute or conflict must also be provided.

Appropriate conflict resolution or management mechanisms have to be identified and applied timely, as conflicts arise more frequently due to differing uses of land and its natural resources. In the Ethiopian context, the following are major areas of conflict that are happening within households and communities and among communities, that need appropriate conflict resolution mechanisms.

- Expansion of urban areas into other land use systems, such as crop lands, forest lands, grazing areas and rural villages.
- Land grabbing, because of investment projects.
- High population growth and the need for land (a main cause of conflict among household members is inheritance disputes within a family).
- Construction of infrastructure, such as roads, nursery sites, irrigation canals, etc.
- Conflicts related to distribution of agricultural inputs and management of revolving funds.

Cognizant of the above challenges, according to Proclamation number 1223/2020 (Development, Management and Utilization of Community Watersheds), any dispute arising in a micro-watershed can be handled by the Watershed Users Cooperative.

Smallholder farmers are required to establish temporary dispute settlement committees: temporary because those who reconcile cases of Mister X and Y probably cannot resolve cases of Mister Y and Mister Z.

Similar cases are dealt with by permanent committees in Proclamation number 985/2016 (Cooperatives Societies Proclamation).

Methods of conflict resolution

1. Litigation

The formal and ultimate mechanism for conflict resolution is taking it to the courts/ legal system.

2. Alternative Dispute Resolution (ADR)

2.1 Negotiation

This is a process where the parties to the dispute meet to reach a mutually acceptable solution.

- Parties meet (usually without the help of a 3rd party) to resolve differences.
- Direct exchange of proposals.

2.2 Facilitation

- Is a process in which an impartial individual participates in the design and conduct of problem-solving meetings to help the parties jointly diagnose their issues and create and implement jointly owned solutions?
- The role of the facilitator is to provide a medium for negotiation.
- The Facilitator is not involved directly in negotiations.

2.3 Mediation

- Is a process of settling conflicts, in which an outside party oversees the negotiation between the two disputing parties.
- It requires a neutral/impartial person or persons to facilitate negotiation between the parties.
- The introduction of a 3rd party makes it different from an “eye-to-eye” negotiation.
- The Mediator’s role is to:
  - Help the parties think in new and innovative ways.
  - Enable parties avoid rigid positions and instead focus on their shared interests.
  - Facilitate a conducive environment for discussions, by focusing on positives, and joint gains.

2.4 Arbitration

- Is usually used as a less formal alternative to litigation. It is a process in which a neutral outside party, or a panel, meets with the parties in a dispute; hear presentations from each side and make an award.
- Has defined rules and procedure that are explained to and accepted by the parties before the process starts.
- The Third party decision is binding, but subject to appeal.
- Settlement is made outside the court process, hence is not determined by legal procedures (except basic ground rules).

MODULE III: COMMUNITY-BASED INSTITUTIONS FOR LAND MANAGEMENT

Module outline

Learning Objectives:	Participants shall be able to: - Describe community-based institutions and explain the role of community based institutions in land management. - Explain the importance of establishing community-based watershed users cooperatives. - Explain the basic provisions and applicability of Proclamation 1223/2020. - Explain the basic steps and procedures to establish community-based watershed user's cooperatives.
Duration: Preparation:	Duration: 210 minutes Color print A-4 laminated pictures, notebooks, pens, flipchart paper, markers, tape, if a blackboard is available: chalk, cloth/ sponge.

This module contains two sessions:

Session 1: Community-based institutions and their role in land management (90 minutes).

Session 2: Establishment of community Watershed User Cooperatives (120 minutes).

Overview

In this module, participants will learn about the role of communities and community-based institutions in land management, how to establish them (basic steps) and required actions to build appropriate community-based institutions that can take over the management responsibility of land and its resources.

Session 1: Community- based institutions and their role in land management

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE Iii: COMMUNITY-BASED INSTITUTIONS FOR LAND MANAGEMENT	**M III-1**
Session 1: Community-based institutions and their role in land management	**Session 1**

Specific Information

Learning objective	Participants shall be able to: - Describe communities based institutions - Explain the role of community based institutions on land management - Explain the importance of community-based watershed users cooperatives
Duration	90 minutes
Training methods	Brainstorming, group work and structured discussions
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	The Facilitator briefly introduces the session and asks participants to brainstorm on the following What are community-based institutions/ organizations? What is a formal community-based institution? What is an informal community-based institution? The Facilitator then provides comment and input on each question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart, assesses participant´s knowledge level and discusses the concept, or concepts, in detail. Key discussion points are noted down on a flipchart.
Action	30 min	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 min	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The facilitator notes down key points from the group's presentation on a flipchart
Processing	10 min	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	15 min	Together with the participants, the Facilitator elaborates in plenary and draws conclusions on the role of community-based institutions.	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed, and visualises important points
Application	5 min	The Facilitator leads discussion on the following questions: - Is knowing about the role of community- based institutions in land management important to your work and, if so, how? - How can you apply what has been learnt during the session in your home area?		

Hints for preparation: typical situations and dangers

The following explanations shall remind Facilitators of the different steps in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;

- **Generalization** - Connecting the results to everyday life experiences, thereby, abstracting from the active engagement/experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt in a new situation.

Variations

Background Material

Please refer to Module 3 in the Technical Manual.

Additional Material

Task for group work

Please discuss in groups and present:

- Formal and informal institutions in your kebele and their role in community-based land management?
- The importance of community-based Watershed Users' Cooperatives.

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What are community-based institutions?

- Community-based institutions/organizations are non-profit making organizations, which exist at local level, that are intended to facilitate social, economic and environmental activities within the community.
- Community-based institutions/organizations can be formal or informal/traditional.
- Formal community-based institutions refer to state bodies. At the community level, they are, for example, kebele administrations, kebele-level offices of agriculture and cooperatives and community watershed users' cooperatives, which are recently recognized, based on Proclamation 1223/2020. Additionally, "gotts" development teams ('Limat Budins') are CBOs under the government structures which are responsible for their surrounding human and natural resources mobilization and management.
- Informal, community-based institutions are systems of rules and decision-making procedures which evolved from endogenous socio-cultural codes and give rise to social practices, assign roles to participants and guide interactions. In Ethiopia "idir", "equb", "senbete", "jige", "wonfel", "mahiber" and "dado" are common community-based institutions.

What is the role of community-based institutions in community-based land management?

- Institutions encourage people to take a longer-term view, by creating common expectations and a basis for cooperation that goes beyond individual interests. To the extent institutions are regarded as legitimate, people comply with their rules without (or with fewer) inducements and sanctions.
- CBIs enable communities to solve their common problems and reach a common goal – such as an improved livelihood, assured environmental security, reduced poverty, etc.
- CBIs are community structures, whereby communities can build their development capacity.
- People's behaviour is conditioned and governed by community norms and consensus, so preserving or institutionalising practices that are environmentally sound requires more than just individual incentives and persuasion. CBIs provide this.

- CBIs are good for mobilizing resources and regulating their use, with a view to maintaining a long-term foundation for productive activity.
- Monitoring changes in the status of resources' can be quicker and less costly where local people are involved: making adaptive changes in resource use is speeded up where local decision-making has become institutionalized.
- While local institutions are not always able to resolve resource management conflicts, if they are absent, all conflicts must be dealt with at a higher level, yielding slower and, often, less appropriate outcomes.
- Local institutions help minimize transaction costs; control the opportunistic behaviour of some members of the community and enhance the capacity of farmers to adapt to major drivers of change, such as population pressure, climatic change and market signals.

What is the importance of community-based Watershed Users' Cooperatives?

- Establishing a system which enables community watershed users to protect, develop, administer and use natural resources with a sense of ownership, with a view to increasing the community watershed users' capacity.
- To reduce the vulnerability of the community to drought and to enhance their resilience capacity, by preventing environmental and natural resource degradation, protecting biodiversity, developing water resources and reducing greenhouse gas emissions.
- To enhance land productivity (increasing the products and productivity of peasants and pastoralists; ensuring food security and job creation through sustainable community watershed protection, development and utilization).

Session 2: Establishment of community watershed user cooperatives

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE Iii: COMMUNITY-BASED INSTITUTIONS FOR LAND MANAGEMENT	**M III-1**
Session 2: Establishment of community watershed user cooperatives	**Session 2**

Specific Information

Learning objective	Participants shall be able to: - Explain the applicability and the basic provisions of Proclamation 1223/2020 - Explain the basic steps and procedures needed to establish community-based watershed users' cooperatives
Duration	120 minutes
Training methods	Basic explanation and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	The Facilitator briefly introduces the session and asks the participants to brainstorm on the importance of establishing community-based watershed users' cooperatives.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level and discusses the concept in detail Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas

Step	Time	Most important content	Required material	Hints
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points from the group's presentation on a flipchart
Processing	20 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, metaplan cards, markers, pens and notebook	
Generalization	30 min	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on the following: - The steps to be taken to establish a community--based watershed users' cooperative - The requirements to become members of a watershed user's cooperative, in accordance with Proclamation 1223/2020 on watershed user's cooperatives. - The legalization of community-based watershed user's cooperatives. - The importance of legalization. - Legalization procedures. - The requirements for legalization.	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed, and visualises important points
Application	10 min	The Facilitator leads discussion on the following questions: - Is knowing about the establishment and legalization of watershed users cooperatives important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

The following explanations shall remind facilitators of the different steps in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;
- **Generalization** - Connecting the results to everyday life experiences, thereby, abstracting from the active engagement/experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Please refer to Module 3 of the Technical Manual.

Additional Material

Task for group work

Please discuss in groups and present.

Basic case

Community members of a community watershed you know have, actively, participated in the implementation of soil and water conservation practices for rehabilitation of the watershed. They are also, now, protecting the watershed from free grazing.

200 households living in the watershed now want to establish a community watershed users' cooperative, so that they can administer and use the natural resources within the watershed with a sense of ownership, but they have no information or experience on how they can do it.

You are an experienced advisor on establishment and legalization of watershed users' cooperatives. Can you help the members to establish a community watershed users' cooperative?

Please discuss the following questions in groups and present your solutions to the community.

- What are the steps to be taken to establish a community-based watershed users' cooperative?
- What are the requirements needed to become members of a watershed users' cooperative in accordance with Proclamation 1223/2020 on formation of watershed users' cooperatives?

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group

Session Handouts

Applicability of the proclamation (Proclamation 1223/2020)

- The Proclamation is applicable to all community watersheds found in the country.
- A community watershed is a geographical area, defined by the watershed limits of a water system, including surface and underground water flowing into a common terminus, and with an average size of about 500 hectares.

What are the provisions of Proclamation 1223/2020?

- Provides the principle conditions for participation (for example, adherence to the land use plan shall be applied in the preparation of community watershed plans).
- Advocates for the establishment of cooperative societies among community watershed users.
- Advocates for ensuring gender balance in any watershed management and utilization process.
- Stipulates that private or communal land holders within a watershed shall have the duty to undertake soil and water conservation works; rehabilitation and maintenance, to prevent soil erosion and to maintain soil fertility, as well as control and prevention of animals from roaming, in order to prevent any harm to watershed development works that may have been undertaken; maintain fertility and soil health, by planting and protecting forests, forage trees and plant species which enhance soil fertility on the boundaries of farmlands, on the farmlands themselves, and on the side of walkways within the watershed.

What are the requirements needed to become members of a watershed users' cooperative, in accordance with Proclamation 1223/2020 on watershed user's cooperatives?

- Persons who have landholdings in the community watershed and earn their livelihood therefrom.
- Persons who - even if they do not have landholding in the watershed - use its natural resources because they live in or around the watershed.
- Persons who do not live in the watershed area but who are connected to the watershed through land rental or other lawful means.

- Persons who have landholdings in the watershed who are less than eighteen years of age may be registered as members through their guardians.
- All people with special needs in the society, who meet the criteria set out in Proclamation 1223/2020, shall have a full right to become members of a cooperative and be beneficiaries thereof.

What are the basic steps and procedures needed to establish a community-based watershed users' cooperative?

Step1: Sensitization of community watershed members and key/relevant woreda experts and kebele development agents.

Step 2: Call for a general assembly and conduct the selection of election committees.

Step 3: Election of watershed users' cooperative executive, control and sub-committee members.

Step 4: Developing a multi-year and annual land use and watershed development plan.

Step 5: Development of general and internal by-laws.

Step 6: Legalization of community-based watershed users' cooperative.

MODULE IV: COMMUNITY-BASED LAND RESOURCE PLANNING

Module outline

Learning Objectives:	Participants shall be able to: - Describe participatory planning and the rationale for participatory planning. - List and describe the basic principles of participatory planning approaches. - Explain the bio-physical and social elements of a community watershed. - Explain the importance of context analysis and identify and explain the purpose of the participatory tools used for characterization of community watershed and climate risk assessment. - Define a watershed, local-level land use planning and participatory forest management. - Explain the rational for using integrated local-level participatory land use planning (ILLPLUP), community-based watershed development planning (CBWDP) and participatory forest management (PFM). - Identify the planning steps and key activities in each steps for ILLPLUP, CBWDP and PFM.
Duration: Preparation:	Duration: 330 minutes Color print A-4 laminated pictures, notebooks, pens, flipchart paper, markers, tape, and, if a blackboard is available: chalk, cloth/sponge.

This module contains three sessions:

Session 1: Rationale, objectives and principles of community-based planning approaches (90 minutes).

Session 2: Context analysis (90 minutes).

Session 3: Participatory planning approaches under implementation in Ethiopia (150 minutes).

Overview

This module will teach participants about participatory planning, participatory planning approaches and the rationale of participatory planning. By the end of the training, participants will be able to describe the purpose and objectives of community-based planning approaches and to list the basic principles of participatory planning approaches. In addition, trainers will learn about context analysis and its importance in community-based land resource planning.

Finally, participants will be able to identify and explain the three mainly used participatory planning approaches under implementation in Ethiopia.

Session 1: Rationale, objectives and principles of community-based planning approaches

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE Iv: Community-based land Resource planning	**M IV-1**
Session 1: Rationale, objectives and principles of community-based planning approaches	**Session 1**

Specific Information

Learning objective	Participants shall be able to: - Describe participatory planning, participatory planning approaches and rationale of participatory planning - Describe the purposes and objectives of community based planning approaches - List and describe the basic principles of participatory planning approaches.
Duration	90 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	The Facilitator briefly introduces the session and asks participants to brainstorm on the following: Participatory planning; participatory planning approaches; rationale of participatory planning and objectives of community-based planning approaches.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level and discusses the concept in detail Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 min	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points from the group's presentation on a flipchart
Processing	10 min	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	15 min	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on the basic principles of participatory planning approaches.	Flipchart, paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	5 min	The Facilitator leads discussion on the following questions: - Is knowing about the basic principles of participatory planning approaches important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

The following explanations shall remind Facilitators of the different steps to be followed in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;
- **Generalization** - Connecting the results to everyday life experiences, thereby abstracting from the active engagement/experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Refer to Module 4 of the Technical Manual.

Additional Material

Task for group work

Please discuss in groups and present:

- The basic principles of the participatory planning approach.

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What is participatory planning?

It is a process by which a community undertakes to reach a given socio-economic goal by consciously diagnosing its problems and charting a course of action to resolve those problems.

What are participatory planning approaches?

They are people-centered planning approaches, aiming to meet the interests of different end users, such as households, communities and the society/public at large.

What is the rationale for participatory planning?

Planning is always contextual, it cannot be done at a distance or in the abstract. Local people always know the local context better than outsiders. Thus, in many respects, local people are better equipped to undertake planning than professionals who have come in from the outside.

Broad participation in planning expedites the implementation of plans. When plans are generated by the people who are to act on them, so that the goals and the motivation for action are wholly internalized, implementation becomes much less problematic.

There is the issue of justice. Oppression and other kinds of injustice arise out of displaced decision making situations, in which one group makes decisions affecting others. When people plan for themselves, they may make mistakes and may harm themselves, but they will not, normally, be unjust to themselves. Thus, community-based planning has the quality of ensuring that decisions will, at least, in this sense, be just. Community-based planning does not risk creating injustice, which can arise from displaced decision-making.

What is the purpose/objective of community based planning approaches?

- Helps to identify real problems and their root causes from the perspective of different stakeholders (mainly the beneficiaries of development interventions);
- Creates opportunity to exploit local knowledge and experiences that could be valuable when making development recommendations;
- Helps to develop ownership and to transfer management responsibilities to local communities or end users;
- Used as a mechanism to develop conflict resolution mechanisms from the beginning, i.e., during the planning stage;
- Provides opportunity to negotiate and optimize benefits among different users;
- Helps to identify factors for sustainability during planning and when developing a sustainability plan;
- Gives opportunity to build local capacity: management/leadership, institutional and resources.

What are the principles of participatory planning approaches?

Participatory planning approaches have basic principles that should be properly considered and respected at all stages of planning. The most important principles are the following:

Participatory: Communities need to be involved in all stages of planning, implementation and management of development activities. It is a continuous process and not a one-time exercise. Different participatory techniques are used, based on existing and innovative experience.

Gender sensitive: Women are most affected by environmental challenges. For example, they need to walk long hours to fetch increasingly scarce water, firewood and animal dung, in addition to attending to livestock, to name a few. Their involvement in watershed development planning, implementation and management is the key to ensuring that they benefit equally from planned measures.

Building upon local experience, strength and what works: Local knowledge is essential to improve existing technologies, to adopt and adapt new ones and to manage natural resources and other measures, once they are introduced and established.

Realistic, integrated, productive and manageable: Community-based resource development planning should be realistic, based on local capacity, locally available resources and other forms of government and partners' support.

Adequate consideration for potential and real problems: In a participatory, community-based planning approach, potential should be identified and properly considered. It is the potential for positive change that will motivate communities, develop interest and encourage them to participate. Problems are equally important in making communities participate, as they need to see problems resolved and to see a less challenging livelihood engagement situation for individuals, community and the public in general.

The need for flexibility at different levels: Flexibility is a key criterion required in participatory planning. The ability to adapt to local conditions. Flexibility is needed during selection of interventions, technologies and beneficiary targeting.

Cost-sharing and empowerment/ownership building: Cost-sharing by stakeholders, mainly from the local community, contributes to the sustainability of a project, by establishing the responsibility of different stakeholders in the management of resources.

Complementary to food security and rural development: To the extent possible, community-based development planning needs to incorporate additional elements related to basic human needs, social services and infrastructure, for sustainable development.

Environmental and social sustainability: Community-based development planning should be designed according to the required environmental and social sustainability standards and should incorporate mitigation measures.

Session 2: Context Analysis

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE IV: Community-based land Resource planning	**M IV-2**
Session 2: Context Analysis	**Session 2**

Specific Information

Learning objective	Participants shall be able to: - Define context analysis. - Explain the importance of context analysis. - Explain the bio-physical and social elements of a community watershed. - Identify and explain the purpose of the participatory tools used for characterization of a community watershed and climate risk assessment.
Duration	90 minutes
Training methods	Brainstorming, group work and structured discussions

Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	The Facilitator introduces the topic by asking participants the following: - What is context analysis? - What are the bio-physical and socio-economic elements of a community watershed? - What is the importance of context analysis? - What are the most important climate hazards that need to be explored during the context analysis? - What are the steps to be followed for proper assessment of climate risks? The Facilitator assesses participant´s knowledge levels and discusses each question in detail.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level and discusses the concept in detail Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points from the group's presentation on a flipchart
Processing	5 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	20 minutes	Together with the participants the facilitator elaborates in plenary and gives conclusions on participatory tools used for characterization of a community watershed	Flipchart, paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	5 minutes	The Facilitator leads discussion on the following questions: - Is knowing about the use of PRA tools for characterization of community watersheds important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

The following explanations shall remind facilitators of the different steps in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;
- **Generalization** - Connecting the results to everyday life experience, thereby abstracting from the active engagement / experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Refer to Module 4 of the Technical Manual.

Additional Material

Task for group work

Discuss in groups and present:

1. The Common PRA tools used for characterization of watersheds and their purpose.
2. The Common PRA tools used for climate risk assessment and their purpose.

Time for discussion and preparation: 30 minutes Time for presentation: 5 minutes per group

Handouts

What is context analysis?

Context analysis is the systematic analysis (identification, sorting, organization, interpretation, consolidation and communication) of the contextual, user, work activity data gathered in contextual inquiry, for the purpose of understanding the work context, for a new system to be designed.

From the watershed development and land use planning point of view, context analysis is the characterization, analysis and development of a clear understanding about the bio-physical and socio-economic elements of a community watershed.

What are the bio-physical and socio-economic elements of a community watershed?

The bio-physical characteristics of a watershed include climate (rainfall, temperature, humidity, altitude, winds), drainage and water, soil, vegetation, specific topographic features (gradient - steepness and length of slope - curvature, shape and direction) and past/current erosion features (rills, gullies, landslides).

Land use includes homesteads, cultivated land, grazing land, forest (natural and artificial) and degraded areas used for various purposes. The socio-economic elements and characteristics of a watershed include population (human and livestock), farming systems, social setups, economic activities, vulnerability profile and gender.

What is the importance of context analysis?

In order to prepare good watershed development and land use plans, it very important to adequately characterize a community watershed and properly analyse the existing context. Characterizing a community watershed, its problems and potential, provides the basis for developing effective management strategies to meet intended goals.

What are the most important climate hazards that need to be well explored during the context analysis?

- Drought, flooding, landslides and soil erosion.

What are the steps to be followed for proper assessment of climate risks?

- Risk identification.
- Risk analysis.

Table 7: The PRA tools commonly used for characterizing community watersheds

PRA Tools		Purposes
Mapping Tools	Resource mapping	Shows resources of the area, like soil, water, minerals etc. It increases the knowhow of residents about their surroundings and the physical features of the area. Villagers prepare a map showing resources (forest land, agricultural land, grazing land, degraded and gully areas, water resources, roads etc.) as well as problems and management issues.
	Social mapping	Consists of household information such as population density, social classes, land use, etc. It increases the knowhow of residents about their surroundings. A Social Map is useful for displaying the existing social situation/condition of the community, in visual form. The map shows the social structures and services of the community, such as schools, health posts, cooperative banks, NGOs, CBOs, religious centres, parks, roads and canals. Villagers prepare maps by using locally available materials.
Diagramming Tools	Transect Walks	Transects are observatory walks to study natural resources, topography, indigenous technology, soils and vegetation, farming practices, problems and opportunities. These are done with a group of villagers - either following a particular course, cross country or covering an area.
	Trend Analysis	It is helpful to understand residents' perceptions of significant changes in the community, over time. It provides local perspective on changes over time in natural resources. It is used to analyze the past and present situation regarding resources, issues and village initiatives.
	Seasonal Calendar	Seasonal Diagrams can be used for obtaining seasonal patterns of rainfall, employment, income/expenditure, diseases, livestock populations, production, workforce availability, crop patterns, etc. It helps to identify lean periods for resources and timing of supply of key farm inputs.
	Venn diagram	It is used to depict key institutions, organizations and individuals and their relationship with the local community or others. Key players in decision making are shown. On the Venn diagram, each institution is represented by a circle. The size of the circle represents the importance, significance or power of that institution.
Problem Identification tool	Problem tree	A problem tree or causal diagram enables farmers to identify the root causes of the problems they face and to assess the relative importance of each cause.
Ranking tools	Preference ranking	Is a method to rank the problems afflicting agricultural production. The preferences are identified by assigning scores to different problems. The scores range from 5 - most important to 1 - least important. Each individual, or the group as a whole, decides the rankings.
	Pair-wise ranking	Each individual item is compared directly against the others so as to emerge with a ranking from highest (Most Preferred) to lowest (Least Preferred). It is a decision tool to help the community discuss and agree on the most important problems they want to address in development activities.
	Matrix ranking	Used to compare several items against a set of different indicators of preference.
	Wealth/Well-being ranking	Is used to rank differences in the standard of living, as perceived by the people. It helps to gain insight into relative social stratification.
	Proportional piling	Proportional piling is a technique that allows farmers/respondents to give relative scores to a number of different items or categories according to one criteria.
Interviewing	Semi-Structured	SSI is a tool that can be used any time. SSI is guided interviewing, where only some of the questions are predetermined and new questions come up during the interview. The interviewer prepares a list of topics and questions, rather than a fixed questionnaire. SSI could be used for i). individual interviews, ii). group Interviews, iii). key Informant Interviews and iv). focus group discussions.

Table 8: PRA tools commonly used for climate risk assessment

PRA Tool	Purpose
Climatic Hazard Mapping	Helps to identify areas at risk and vulnerable members of the community..
Climatic risk-hazard trend analysis or community history (time line):	Identifies frequency of shocks and local coping mechanisms.
Climatic risk-hazard ranking:	Analyses problems in order to rate community priorities or the significant problems faced by the community.
Focus Group Discussions (FGD)	Brings together community residents, farmers' groups and associations, formal and informal village cooperatives, landless labourers, fishers, livestock farmers, etc., to discuss specific issues. This tool helps to gain information about the locality, people, their livelihoods, local risk environment (hazards) and local/traditional preparedness and coping strategies.

PRA Tool	Purpose
Timeline	Narrates the history of climate risks and significant events that happened in the community. Helps a community to get an insight into past hazards, changes in their nature, intensity and behavior, to make people aware of trends and changes over time and to evaluate extent of risk, planning and investment needed for the future.
Hazard Venn diagram	Helps communities to identify and analyze the common hazards that take place locally, their magnitude and likelihood. Using this tool we can identify and analyse the common hazards in the locality, their magnitude and likelihood.
Seasonal calendar	Tracks seasonal changes, climate-related hazards, community events and other activities related to a specific month. In the agricultural sector, this is used primarily to plot seasonal farming activities. Using this tool we can identify periods of stress, hazards, diseases, hunger, debt, vulnerability, etc.

Session 3: Participatory Planning Approaches Under Implementation in Ethiopia

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE IV: Community-based land Resource planning	**M IV-3**
Session 3: Participatory planning approaches under implementation in Ethiopia	**Session 3**

Specific Information

Learning objective	Participants shall be able to: - Define what a watershed is, local level land use planning and participatory forest management; - Explain the rational of using integrated local level land use planning (ILLPLUP), community-based watershed development planning (CBWDP) and participatory forest management (PFM) - Identify the planning steps and key activities in each phase of ILLPLUP, CBWDP and PFM
Duration	150 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	15 min	The Facilitator introduces the topic by asking participants the following questions: - What is a watershed? - What are watershed degradation features? - What is land use and integrated, local land use planning? - What is participatory forest management? - What is the rationale for using integrated, local level land use planning, community-based watershed development planning and participatory forest management? The Facilitator directs the participants to engage in group work and splits participants into at least 3 groups.	Meta plan cards, flipchart paper, markers and tape or blackboard and chalk	The Facilitator assesses participant's knowledge level and discusses concepts in detail Key discussion points are noted down on flipchart Groups are expected to be well mixed in terms of knowledge level and experience
Action	60 min	Groups independently work out their solutions for the given task.	Flipchart paper and markers, task sheet with instructions for group work	Prepare all material needed for group work (satellite images, scaled paper, pencils, rulers, erasers, etc.) Participants are instructed to actively take part in the discussion and visualize the important points for presentation in plenary
Publishing	30 min	Groups present their results.		The Facilitator carefully follows presentations and takes note of issues that need further explanation

Step	Time	Most important content	Required material	Hints
Processing	10 min	Group results are discussed.		Encourage participants to freely reflect on the presentations of the other groups. Facilitator notes down key issues on flipchart
Generalization	30 min	The Facilitator summarizes key conclusions reached and discusses the following: - The planning steps in ILLPLUP, CBWDP and PFM - The key activities in ILLPLUP, CBWDP and PFM	Flipchart / meta-plan cards, markers	The Facilitator refers to hand outs
Application	5 min	The Facilitator encourages the participants to reflect on: - Is knowing the planning steps of ILLPLUP, CBWDP and PFM relevant for your context? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 4 of the Technical Manual.

Additional Material

Tasks for group work

Please discuss and visualise in groups:

Group 1: The planning steps of Local Level Participatory Land Use Planning and the key activities performed in each step.

Group 2: The planning steps of Participatory Watershed Development and key activities performed in each step.

Group 3: The planning steps for Participatory Forest Management and key activities performed in each step.

Time for discussion and preparation: 60 minutes. Time for presentation: 10 minutes per group.

Handouts

What is Land-use planning?

Land-use planning is the systematic assessment of land and water potential; alternatives for land use, and economic and social conditions, in order to select and adopt the best land-use options. It is a process of decision-making on the use of the resources of a certain unit of land, to find its most productive, environmentally sound and sustainable economic uses

What is Local-level Participatory Land Use Planning?

It is a bottom-up land-use planning approach, carried out with the active participation of the concerned community.

Why is land-use planning important?

Land is a fundamental material resource and the primary platform for economic and other social activities. Human pressure results in land degradation and loss of biodiversity, leading

to poverty and conflict over land resources. At the same time, changes in livelihoods demand adjustments to current land use practice in many places.

Land resource degradation, through improper management and utilisation of land, should be regulated by preparing acceptable and implementable land-use plans at grass-roots level.

What are the Local-level Participatory Land Use Planning steps and the key activities performed in each step?

Table 9 (below): Local-level Participatory Land Use Planning steps and the key activities performed in each step.

Planning Phase	Planning steps	Key activities
Preparatory Phase	Step 1: Initiation and organizing the task	- Organizing woreda ILLPLUP team - Agree criteria for prioritization and selection of kebeles - Defining planning area - Community awareness creation (at woreda and Kebele level) - Call general assembly and organizing kebele ILLPLUP team - Base map preparation - Identifying stakeholders, land use problems and setting objectives
	Step 2: Office work	- Provision of training - Budgeting /financial planning - Preparing preliminary mapping units (capacity gap analysis and training on mapping techniques, map and scale enlargement, identification of temporary mapping units) - Action plan preparation - Preparing field data collection sheets/forms (bio-physical data collection forms, socio-economic data collection forms, human population data collection forms) - Farming systems study (cropping system, study of livestock types and population) - Wealth ranking
Field Work Phase	Step 3: Bio-physical data collection	- Defining scope of data collection - Data collection
	Step 4: Socio-economic survey	- Defining scope of data collection - Socio-economic data collection - Identifying land use problems
	Step 5: Data analysis	- Bio-physical data analysis - Socio-economic data analysis
Planning Phase	Step 6: Conduct land evaluation	- Conduct physical land evaluation and determine land capability classes - Preparing land capability map - Identification of opportunities for change
	Step 7: Environmental and social impact assessment	- Impact identification, prediction and evaluation - Impact mitigation and adaptation
	Step 8: Choose the best land use options	- Choose the best land use options
	Step 9: Prepare the final land use plan	- Prepare Final Land Use Plan
	Step 10: Plan presentation and technical report to general assembly	- Presentation of the Plan and Technical Report to General Assembly for public consultation
	Step 11: Endorsement of the plan	- Endorsement of the Plan at woreda level after approval at kebele level
	Step 12: Handing over the final plan and report to land users	- Official hand-over of the final plan and report to land users before the implementation process starts
	Step 13: Enforcement mechanisms for implementation	- Participatory by-law development - Awareness of legal and binding rules (based on Land Use Proclamation No 456 / 2005 Article 13) for implementation
	Step 14: Participatory monitoring and evaluation	- Participatory monitoring - Participatory evaluation
	Step 15: Plan updating and revision	- Plan updating and review (plan updating and revision needs to be done regularly, at five years interval)

What is a Watershed?

A watershed is defined as any surface area from which runoff, resulting from rainfall, is collected and drained through a common confluence point.

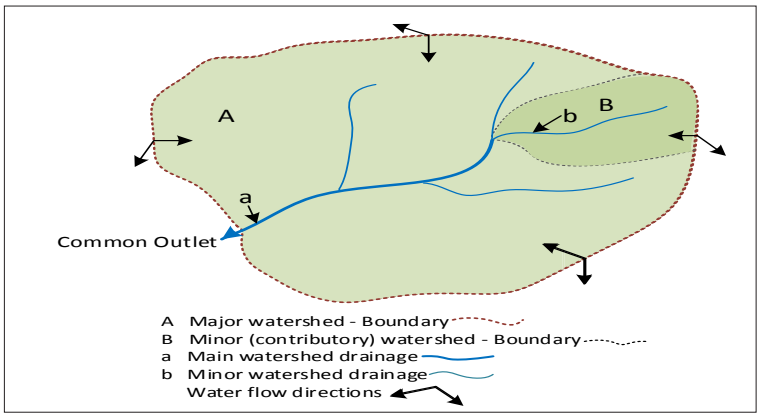


Figure 7: A watershed unit

What are the Watershed degradation features?

Soil degradation, vegetative degradation and Water resources degradation.

What is the importance of community-based watershed development planning?

Interactions between and within communities, in these landscapes, depend on what happens at the different levels of the watershed. The people living in a watershed have varying needs, demands and aspirations, as well as activities, which interact differently with the resources of the land. The inter-relationship of the many resources in the watershed, such as water, soil and biomass, makes it an effective unit for resource management. Participatory watershed planning is, therefore, recognized as a holistic approach to understanding what needs to be done at various levels of the watershed, to sustain, improve and diversify production, while developing and managing the natural resource base, promoting income-generation opportunities and making livelihood systems more resilient to shocks.

What are the community-based watershed development planning steps and key activities performed in each step?

Table 10: Community based watershed development planning steps and key activities performed in each steps

Planning steps	Key activities
Step 1: Getting started at woreda level	- Stakeholders identification and analysis - Establishing a Woreda Watershed Team (WWT) - Undertake woreda level preparatory activities - Establishing a Kebele Watershed Team (KWT) and - Undertake initial visit to communities
Step 2: Getting started at community level	- Call for a general assembly - Establish Community Watershed Team (CWT) - Agree on timing for planning

Planning steps	Key activities
Step3: Socio-economic and bio-physical survey	- Bio-physical and socio-economic survey - Problem identification and ranking - Collection of additional/secondary data - Analysis of survey results - Watershed resource inventory and assessment, including current land uses and any associated risks and problems - Definition of the socio-economic situation of the community - Definition of watershed potential, opportunities and limitations - Prioritization of core problems and solutions
Step 4: Identification and prioritization of interventions that bring change	- Identification of interventions - Sequencing of interventions following watershed logic - Climate change mainstreaming or matching interventions to the watershed climate analysis
Step 5: Mainstreaming of gender and social development (GSD), nutrition, and environmental & social screening of interventions	- Mainstreaming of Gender, Social Development(GSD) and Nutrition - Environmental and social screenings
Step 6: Achieving approval by the general assembly	- Approval by the General Assembly - Discussion with the community - Discussion with other communities
Step 7: Development of a watershed intervention plan	- Development map preparation - Inputs for planned interventions - Action plan preparation - Define interim milestones - Submit the prepared plan for approval
Step 8: Implementation strategies	- Organizational management - Decision-making and role of women and other vulnerable social groups and households - Link with different projects and programmes - Capacity building - Community Watershed Users Cooperatives - Sequencing of activity implementation - Establishing economic user groups
Step 9: Participatory and result-based monitoring and evaluation	- Design a log frame - Design a Performance Monitoring Framework - Setting baselines and targets - Data collection - Evaluation - Reporting

What is Participatory Forest Management?

- It is a system through which a partnership or coalition of individuals, communities and organisations (including the Forestry Department) is developed to manage a forest area.
- It a process through which local stakeholders, mainly communities adjacent to forests, influence and share control over development initiatives, decisions and resources that affect them.

What is the importance of Participatory Forest Management?

- There is recognition that government has limited capacity to manage forest resources in a sustainable way, without the support of the community. The capacity of the local community is also too limited to manage forests by themselves. The PFM approach is, therefore, a creative and potentially optimal arrangement combining the separate strengths of both parties.
- The presence of an unfair resource utilization division among and between the community and the government is another important issue that requires attention; to develop fair benefit sharing mechanisms through the PFM approach.

- The presence of a growing political commitment among nations to decentralize government functions to the lowest level of government is another opportunity to promote the PFM approach. It is a major shift towards a more decentralized, people-oriented forestry system (devolution of management responsibilities to the community).
- It is a means to capacitate local community and government institutions. The whole process of PFM is participatory, through which the local community can share experiences among themselves and explore additional knowledge and skills from professionals.
- A PFM system enhances, significantly, the contribution of forests/woodlands/closure areas for the improvement of household livelihoods. Therefore, local (forest-adjacent) communities have a strong incentive to manage resources on a sustainable basis.
- It provides opportunity for resource users to manage forests, through defined rules and by-laws developed by them, but with genuine consultation among all stakeholders.
- It provides equal emphasis for both livelihood improvement and environmental security.
- It develops a real sense of ownership and responsibility among the community.

What are the planning steps and key activities in PFM?

Table 11: Planning steps and key activities in PFM

Phase/steps	Steps	Key activities
Phase I. Mobilization Phase	**Step One:** Getting started	- Selection of forest site - Formation of PFM implementation team - Orientation of stakeholders - Meeting and briefing of the kebele leadership - Meeting and briefing the kebele assembly/community members
	Step Two: Familiarization of PFM purposes and processes	- Identifying primary and secondary forest users with proper definition of community groups - Identifying forest uses, users and gender issues - Introductory PFM training to woreda PFM facilitation team - Introductory PFM training to community level planning team
Phase II: Planning Phase	**Step Three:** Participatory forest resource assessment & management planning	- Participatory forest boundary demarcation, mapping with blocks and sub-blocks - Conducting Participatory Forest Resource Assessment (PFRA) - PFM plan development
	Step Four: Organizing & legalizing community institution(s) & signing FMA	- Awareness rising of community groups and CBOs, on identifying appropriate community-based initiatives (CBI) for participatory forest management (PFM) - Establishment of forest cooperative and ensuring legal support - Develop/design PFM agreement - Approval and signing of the PFM agreement
Phase III: Implementation Phase	**Step Five:** Capacity building and skill development for PFM plan implementation	- Institutional capacity development - Technical skill development - Provision of administrative support
	Step Six: Participatory monitoring and evaluation and revision	- Participatory monitoring and evaluation

MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT

Module outline

Session	Learning objectives
Session 1: Communal resources management and utilization	- Define communal resources and communal resource management - Explain the benefits and principles of communal resource management - Explain the strategic actions for proper management of communal resources - Explain the management practices/interventions of communal resources
Session 2: Rehabilitation of degraded lands	- Define land degradation, degraded land and land rehabilitation - Identify and explain the technological packages and technologies/practices for land rehabilitation
Session 3: Promotion of Agroforestry practices	- Define agroforestry and agroforestry systems in Ethiopia - Explain the rationale and benefits of agro-forestry - Explain the major/potential agroforestry practices and their main characteristics that exist in most parts of Ethiopia - Explain the key steps followed to select the best agroforestry practices and describe the characteristics preferred in selection of agroforestry species
Session 4: Establishment of plantation forests	- Define plantation forestry - Explain the importance of a plantation forest - Describe the Important attributes of a site for plantation purposes - Explain the major operations in establishment of a plantation
Session 5: Promotion of energy saving and alternative rural energy sources	- Define alternative energy, energy efficiency, biomass energy and energy conservation - Describe the impact of fuel wood collection and use of cow dung on land degradation - Describe renewable energy and renewable energy resources - Explain the rational and benefits of promoting alternative energy sources - Identify and describe the main types of feasible technologies that save energy or improve energy efficiency in rural Ethiopia - Explain the alternative approaches available for financing small-scale rural energy technologies
Session 5: Promotion of crop production	- Explain the contribution of crop production in land degradation and conservation and management of natural resource - Explain the concepts of crop specialization, crop diversification, subsistence farming and commercial farming - Explain the benefits and limitations of subsistence and commercial farming - Explain how crop diversification, specialization and the commercialization of subsistence farmers should be considered in CBLM - Explain ISFM, ISFM interventions and the benefits of ISFM in sustainable agricultural intensification
Session 7: Promotion of climate-smart technologies	- Describe climate-smart agriculture (CSA) and explain the characteristic features of climate-smart agriculture - Explain the main benefits of promoting climate-smart agriculture - Describe climate-smart agriculture technologies and practices - Describe mainstreaming of CSA - Apply the integration of CSA plans into the overall watershed plan
Session 8: Managing livestock to secure sustainable use of natural resources	- Describe the current livestock management system in Ethiopia? - Explain the negative impact of free grazing on sustainable use of natural resources - Describe "backyard livestock farming" and explain the major activities implemented by different stakeholders for the adoption of backyard livestock farming - Explain the socio-economic, environmental and social benefits gained from adoption of backyard livestock farming - Explain the key lessons gained from adopting livestock farming

Duration:	900 minutes (15 hours)
Preparation:	Notes for guest speaker; pre-arranged field visit; color print A-4 laminated pictures; notebooks, pens, flipchart paper, markers, tape; if a blackboard is available: chalk, cloth/sponge.

This module contains eight sessions:

Session 1: Communal resources management and utilization (120 minutes)

Session 2: Rehabilitation of degraded lands (120 minutes)

Session 3: Promotion of agroforestry practices (90 minutes)

Session 4: Establishment of plantation forests (90 minutes)

Session 5: Promotion of energy saving and alternative rural energy sources (120 minutes)

Session 6: Promotion of crop production (120 minutes)

Session 7: Promotion of climate-smart technologies (120 minutes)

Session 8: Managing livestock, to secure sustainable use of natural resources (120 minutes)

Overview

In this module, participants learn and are able to explain the major interventions of community-based land management, implemented in different land use systems. They will also learn the benefit of interventions and the common approaches and processes followed in the selection and prioritization of land management interventions.

Session 1:Communal Resources Management and Utilization

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT	**M V-1**
Session 1: Communal Resources Management and Utilization	**Session 1**

Specific Information

Learning objective	Participants shall be able to: - Define communal resources and communal resource management - Explain the benefits and principles of communal resource management - Explain the strategic actions for proper management of communal resources - Explain the management practices/interventions of communal resources
Duration	120 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	20 min	The Facilitator brainstorms on the session by asking the following questions: - What are communal resources? - What is communal resource management? - What are benefits and the principles of communal resource management? The Facilitator provides an input on each question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level and discusses each concept in detail. Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart

Step	Time	Most important content	Required material	Hints
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	30 min	Together with the participants, the Facilitator elaborates, in plenary, and provides conclusions on the strategic actions needed for proper management of communal resources and the management practices/interventions of communal resources	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	10 min	The Facilitator leads discussion on the following questions: - Is knowing about the strategic actions for proper management of communal resources and management practices/ interventions of communal resources important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

The following explanations shall remind Facilitators of the different steps in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;
- **Generalization** - Connecting the results to everyday life experiences, thereby abstracting from the active engagement/experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Please refer to Module 5 of the Technical Manual.

Additional Material

Tasks for group work

Please discuss in groups and present:

- The strategic actions for proper management of communal resources.
- The management practices/interventions of communal resources.

Time for discussion and preparation: 30 minutes, Time for presentation: 5 minutes per group.

Handouts

What are communal resources?

In the context of CBLM, communal resources are scarce resources, such as water, forests, pasture, wetlands and others, that provides users with tangible benefits, but which nobody in particular owns or has exclusive claim to.

What is communal resources management?

It is protection/conservation, development and utilization of communal resources for maximized and diversified benefits for the local community and for the environment.

What are the principles of communal resources management?

The following are the key principles that are crucial for success in managing communal resources sustainably, and for the benefit of the society and the environment:

- User rights and tenure security: To take management decisions, communities require rights over their land and resources, so that they can control access to resources and how they can be used. They also need security of tenure.
- Relevance of appropriate community-based institutions: To manage the distribution of benefits, communities need strong representative and accountable institutions.
- Access to benefits: Communities must be able to derive appropriate benefits from the resources that they manage. It is unlikely they will invest time, effort, and finances into managing a resource if the benefits of management do not exceed the costs.

What is the rationale for strategic approach for management of communal resources?

- Users of the resource aren't well defined or clearly known;
- Resources are highly exposed to over exploitation; due to the "tragedy of the commons";
- In many cases, resources are degraded and production and productivity is declining due to over-exploitation and overuse of resources;
- Resources are used inequitably and unsustainably;
- Resources do not give adequate benefit to the community and don't support rural livelihoods.

What are the benefits gained by managing communal resources?

- Generating new and additional income at community level for social welfare;
- Providing jobs and additional income for some residents;
- Increasing household assets, if equitably used;
- Providing land use diversification options in semi-arid and arid areas;
- Providing livelihood diversification options for some residents;
- Gives opportunity to promote eco-tourism and biodiversity conservation;
- Plays a key role in mitigation and adaptation to climate change.

What are the strategic actions for proper management of communal resources?

A. Building the management capacity of user communities: Communities shall have strong and appropriately structured institutions that can legally takeover the overall management responsibility of resources, and that can collaborate and establish partnerships with different stakeholders, including the government.

B. Optimization of community benefits: Natural resources can provide various benefits, be it social, economic or environmental. However, there are always trade-offs between these benefits among different resource users and stakeholders. Conflicts may arise due to these trade-offs. Therefore, optimization of uses could be taken as a mitigation option, to tackle the trade-offs and the conflicts that may arise.

C. Consideration of indigenous knowledge of the local community: Local knowledge integration must be properly considered in the development of resource management strategies, in promoting new and existing best practices, and mitigating negative impacts on resources and livelihoods.

D. Legal provisions: Community-based institutions managing communal resources should be supported with legal provisions and community agreements or by-laws.

What are the management practices/interventions of communal resources?

1. Characterization of resources and resource users;
2. Resource identification, characterization and mapping;
3. Identification of resource users (identification of primary and secondary users);
4. Conducting stakeholder analysis – to know who will be a primary, secondary and key stakeholder;
5. Identify/establish the institutional set up (either a user group or general community under a watershed user cooperative;
6. The institution can be established in either of the following: kebele, watershed, or got level, depending on the traditional or legal user rights being exercised;
7. When the users are watershed communities, the watershed user cooperative will take the responsibility. If not, a new user group or institution has to be established;
8. Defining the management objective, based on the potential of the resource and the interest of the community/users. After the resource is properly characterized and the primary and secondary users of the resource are identified, the management objective has to be defined. The key considerations to define the management objectives are the following:
   - The potential of the resources – the potential in providing social, economic and environmental services.
   - The interest of the users (mainly the primary users).
   - The capacity of the community to manage the resource (the technical and management capacity).
   - The required cost to implement the management plan to attain its objective.
9. Development of a community-based management plan;
10. Identify appropriate management interventions and prepare a yearly plan;
11. Develop a resource utilization plan;
12. Prepare a conflict resolution plan;
13. Prepare by-laws to enforce agreed actions;
14. Transferring user rights for established groups (user groups, WUCs, or others, as may be appropriate). This may include:
    - Developing an agreement document that defines the roles and responsibilities of the users, the government body and other stakeholders, and the potential benefits to be shared by the users, including secondary users.
    - Signing the agreement document that defines the user rights and management responsibilities.
15. Follow up monitoring and evaluation. This will include:
    - Technical support during planning and implementation by extension workers.
    - Monitoring activities and results achieved and the possible change after implementation, based on predefined result indicators.
    - Evaluating impact, in terms of social, economic and environmental changes seen.

Session 2: Rehabilitation of Degraded Lands

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT	**M V-2**
Session 2: Rehabilitation of degraded lands	**Session 2**

Specific Information

Learning objective	Participants shall be able to: - Define land degradation, degraded land and land rehabilitation - Identify and explain the technological packages and technologies/practices for land rehabilitation
Duration	120 minutes
Training methods	Brainstorming, basic case study, discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	The Facilitator brainstorms on the session by asking the following questions: - What is land degradation? - What is degraded land? - What is land rehabilitation? The Facilitator then provides his own input on each question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart, assesses participant´s knowledge level and discusses concepts in detail. Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides participants into two-four groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	30 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, metaplan cards, markers, pens and notebook	
Generalization	30 minutes	Together with the participants the Facilitator elaborates in plenary and gives conclusions on the technological packages and technologies/practices for land rehabilitation	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	10 minutes	The Facilitator leads a discussion on the following questions: - Is knowing about the technological packages and technologies/practices for land rehabilitation important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 5 of the Technical Manual.

Additional Material

Task for group work

A degraded community watershed located in one of your woreda's has the following degraded land uses.

Land use	Total area	Average slope	Agro-climate		Major crop grown in the area
			Rainfall	Altitude	Maize
Degraded hillside	100 hectares	15%	1000 mm	1900 m.a.s.l	
Farmland	200 hectares	8%			
Homesteads (200 HHs)	50 hectares	10%			

1. Identify and explain the possible technological packages and technologies/practices for land rehabilitation.
2. Identify the list of technologies and practices that can be used for rehabilitating degraded lands, located in the three land use systems shown below:

Time for discussion and preparation: 30 minutes. Time for presentation: 7.5 minutes per group.

Handouts

What is Land degradation?

Land degradation is the temporary or permanent decline in the productive capacity of the land, and reduction of its productive potential. It is a process in which the value of the biophysical environment is affected. It is caused by natural and anthropogenic factors.

What is degraded land?

It is land that has lost some degree of its natural productivity due to human-caused processes. In this context, the degraded land deals with hillsides, farmlands, gullies and grazing areas.

What is Land Rehabilitation?

It is a process of restoration, to bring an area of land back to its natural state after it has been damaged or degraded, making it safe for wildlife and flora as well as humans. In most contexts, this involves the mitigation or reversal of land degradation, caused by poor land husbandry practices, especially agricultural practices.

What are the technological packages for land rehabilitation?

There are a range of technological options and methodological approaches for the rehabilitation of degraded lands that have been adopted in the country. Users can select from the available technological options/practices and approaches that are within the reach of the community, in terms of their technical simplicity, low investment costs, suitability for specific conditions, e.g. climate, soil, slope, land use and easy adaptability to the prevailing farming system(s).

The list of measures for rehabilitating degraded forests, grazing and farm lands are;

- Physical soil and water conservation measures
- Biological soil and water conservation measures

- Drainage management
- In-Situ moisture harvesting measures
- Gully reclamation technologies
- Restoration of degraded forest land
- Area closure of pastureland/grazing land and
- Rangeland rehabilitation and wind erosion control.

What are physical Soil and Water Conservation measures?

Physical soil and water conservation measures are also known as structural or engineering measures. They are usually needed to reduce the velocity of runoff, and retain moisture to assist infiltration into the soil and/or to dispose of surplus storm water (runoff) safely.

Physical conservation measures are applied as secondary measures when the erosion problem is not mitigated by land use and vegetation cover management measures. In other words, physical measures are applied when biological and vegetative measures are not sufficient to control erosion.

Physical or mechanical protection works are expensive, time consuming and dangerous at times of failure. Thus, they should be considered only where other conservation practices cannot provide adequate control.

The main functions of physical soil and water conservation measures can be summarized as follows:

- To modify the landscape slope - slope correction and ultimately achieve benching.
- To safely evacuate excess water/runoff.
- To reduce runoff impact and increase soil infiltration and conserve moisture.
- To ease cultivation operations, as it is easier to cultivate on level rather than steep slopes.
- To reduce runoff volume and velocity, by increasing surface roughness and act as barriers to soil transport by erosion agents, i.e. runoff water.

The major types of physical soil and water conservation measures are: Level Soil Bund, Level Fanya Juu, Stone Faced Soil Bund, Stone Bund, Bench Terracing and Hillside Terracing.

The selection of a technology is made, based on: Agro-climate conditions; land use type; landscape/ topography; soil type and depth; degradation level; construction materials availability and labour availability; cost effectiveness; the interest of the land users.

Simplicity of implementation and adaptability are factors that should be addressed with care in selection of appropriate physical SWC technologies for specific sites.

Figure 8: Bench terrace on hillside area

What are biological soil and water conservation measures?

Biological soil and water conservation measures can be defined as a conservation measure designed to prevent the loss of soil and moisture, through improved soil management and farming practices that can maintain/restore agricultural productivity and agro-ecosystem stability. The underlying factor for the effectiveness of biological soil conservation is the application of land husbandry techniques that guarantee adequate ground cover in space and time, and the recycling of organic matter and nutrients in the agro-ecosystem.

In general, biological soil and water conservation is a rational land use system, using proper land and crop management practices to increase agricultural productivity and ecological stability. Thus, the objective of soil conservation is primarily achieved as a result of better land husbandry practices.

In summary, there are three basic principles through which biological soil conservation prevents soil erosion:

- The first principle is prevention of the direct impact of raindrops through provision of adequate vegetation cover. Vegetation cover is a barrier to both the mass and velocity of the raindrop and kills the kinetic energy of the raindrop and its erosivity.
- The second principle is the prevention of concentration of surface flow of water that causes runoff.
- The third principle is increasing the resistance of the soil to erosion, by improving soil aggregates through soil organic matter management.

The range of technologies used under biological soil and water conservation measures are:

- Contour cultivation and planting
- Crop rotation
- Inter cropping
- Strip cropping
- Ley cropping
- Integration of forage production into farming systems
- Grass strips along contours
- Hedgerows of shrubs/grasses
- Stabilization of physical structures
- Compost making
- Fertilization and manuring
- Mulching and crop residue management
- Cover/green manure crops
- Acid soil management/liming and management of salt affected soils
- Conservation Tillage.

Technologies selection is made based on: agro-ecological adaptability; land use type; landscape/ topography; soil type and its potential benefits (environmental and economic benefits), and farmers preferences.

What are drainage management technologies?

Agricultural drainage is a system by which the water level, on or in the soil, is controlled or regulated before frequent waterlogging occurs on the soil surface, so that agriculture can benefit from the subsequently reduced water levels.

The most commonly used drainage management structures which have received attention by concerned professionals and farmers are:

- Waterways
- Cut off drains
- Graded soil bunds
- Graded Fanya Juu and Broad Bed Maker (BBM).

Selection of the appropriate technology is made based on agro-climate conditions (rainfall), land use type, landscape/topography, construction materials availability, labour availability, cost effectiveness, landowner interest.

As above, simplicity for implementation and adaptability are also factors that should be addressed in the selection of a technology.

Cut-off drains and waterways are commonly applied drainage structures that have to be implemented after detailed assessment of the site (slope, soil type, land use, etc.) and rainfall (amount and duration, etc.) before construction.

Any fault in the design and structural quality of the measure will have a devastating impact on land and land resources, to the extent that the solution may be more severe than the identified problem.

Figure 9: Artificial waterway

What are In-Situ Moisture Harvesting measures?

In-situ moisture harvesting is harvesting of water/moisture within a site, mainly from rainfall as a primary source.

Rainwater harvesting describes methods of collecting, storing and spreading various forms of runoff, from different sources, for domestic, agricultural, etc. uses. It is the deliberate collection of rainwater from a surface (roof/ground catchment) and its storage (soil and structural) to provide a supply of water.

The purpose of implementing moisture harvesting technologies are:

- Increased soil moisture content and water availability
- Reduced soil loss
- Reduced downstream flooding and siltation
- Increased crop yield and farm income
- Improved food security
- Improved moisture infiltration and groundwater recharge
- Improved soil fertility and restoring the productivity of crop/range land which suffers from inadequate rainfall
- Increased yields from rain-fed farming, minimizing risk in drought prone areas, and
- Increased adaptation to climate change, for example by combating desertification by increased tree cultivation.

The major in-Situ Moisture Harvesting technologies are:

- Ridges and tie ridging
- Micro trenches, deep trenches, micro basins and eyebrow basins
- Herring bones
- Semi-circular bunds, runoff/run-on area bunds, barrier lines, runoff/run-on strips, and percolation pits.

Selection of appropriate technologies should take place after considering factors such as agro-climatic conditions (rainfall); land use type (mostly applicable on grazing and rangelands); topography; soil type and depth; availability of construction materials and labour; cost effectiveness; interest of the land users and adaptability and simplicity of implementation.

Figure 10: Micro basin integrated with hillside terrace

What are Gully Reclamation Measures?

Gully erosion is an erosion process whereby water concentrates in narrow channels and, over a short period of time, removes the soil.

Gullies are established by the deepening of rills and collapsing of side slopes, through the shearing effect of concentrated overland flows. Once gullies are established, they form permanent locations for discharging concentrated overland flows. Consequently, progressive deepening and widening of the gully continues until the gully has adjusted to a new set of equilibrium conditions.

As gully control can be an expensive undertaking, prevention is always better than cure. In gully control, the following three methods must be applied in order of priority:

A. Improvement of gully catchments to reduce and regulate the run-off volume and peak rates.
B. Diversion of runoff water upstream of the gully area, where conditions permit.
C. Stabilization of gullies by structural measures and accompanying re-vegetation.

The most common bio-physical gully treatment measures that have been proven to be effective includes:

- Loose-stone check dams
- Gabion check-dams
- Arc-weir check-dams
- Brushwood check-dams and bamboo-mat check-dams
- Sandbag check-dams
- Gully wall reshaping
- Sediment storage dams (SSD) and subsurface dams in gullies
- Gully re-vegetation, and
- Riverbank stabilization.

Technologies applicable for gully rehabilitation, are selected with consideration of different factors such as the size of the formed gully (small, medium, large); flooding status; the slope of the gully formed land; availability of construction materials and labor; cost effectiveness and adaptability and simplicity for implementation.

Figure 11: Re-vegetated (by grasses and shrubs) large gully

What is restoration of degraded forest land?

Restoring forest ecosystems involves returning trees to former forest land and improving the condition of degraded forests.

As well as planting native tree species, it can include conserving wild plants and animals and protecting the soils and water sources that are part of the forest ecosystem.

Highly degraded forest/bush lands can be set aside from productive use or production for several years, in order to be restored and rehabilitated through a variety of practices. Restoration of degraded forest land includes:

- **Natural regeneration**: includes managing the land to allow the natural process of restoration to occur.
- **Assisted natural regeneration** speeds up natural processes of regeneration, by planting tree seedlings and other favorable species and protecting an area from fire and exploitation.
- **Enrichment planting**: helps to restore over-exploited species and is often used with assisted natural regeneration to restore a specific area of land by directly planting certain types of tree species.
- **Afforestation**: coverage of degraded land with vegetation for different purposes.
- **Fire management techniques**: help to control fire outbreaks by burning patches of grass and undergrowth early in the dry season, when the fire will not become out of control.

The purpose of implementing forest land restoration practices is to enhance the land vegetation coverage area, to improve biomass in the area, to create better local climate regulation (improved air and water quality), to improve flood and erosion control, to increase variety and availability of (wild) food and non-food products and create economic opportunities for the local community.

Figure 12: Enrichment Plantation

What is Area Closure and Management?

"Area closure and management", in the Ethiopian context, can be defined as a degraded land area (land not suitable for agricultural purposes, such as cultivation and grazing) that has been removed from human and livestock interference, for rehabilitation, with interventions for management and utilization purposes.

The main purpose of area management are: reclamation of degraded land, improvement of vegetation/biomass coverage, recovery of indigenous plant species, reduction of runoff impact and creation of alternative income sources.

Figure 13: Regeneration of grasses on a closed area

Figure 14: Area closure to enhance natural regeneration of degraded forest cover

What is Pastureland/Grazing Land and Rangeland Rehabilitation?

Definitions are as follows:

- **Pastures**: are those lands that are primarily used for the production of adapted, domesticated forage plants for livestock.
- **Pastureland/grazing land**: is a field covered with grass or herbage and suitable for grazing by livestock. It is differentiated from "rangelands", in the narrow sense, by being managed through intensive agricultural practices. Grazing lands are lands delineated by individual households or by the community for livestock grazing.
- **Rehabilitation and conservation of grazing lands** refers to the application of appropriate technology packages to grazing lands.
- Most of the grazing land in Ethiopia is excessively overgrazed. Productivity of these lands is very low because of the replacement of productive species by poor species (due to overgrazing) and due to reduction in the percentage of ground cover.
- **Rangeland**: is land on which the native vegetation is predominantly grasses, grass-like plants, forbs, or shrubs. Rangelands include natural grasslands, shrub lands, open-canopy forests, or even closed-canopy forests, so long as they produce low-growing vegetation that is available to grazing animals.

It characterized by low and/or erratic precipitation, poor drainage, rough topography, and often low soil fertility, and is managed through extensive practices.

- Rangeland rehabilitation and improvement is the return of palatable vegetation to an area, for animal grazing.

The purpose of implementing pastureland and rangeland rehabilitation practices are:

- Improved forage yields and provide the required amount of livestock feed
- Lower feed costs and improved livestock performance
- To minimize land degradation
- Minimize overgrazing and provide enough forage
- Create a conducive environment for land management and a conducive environment for proper pastureland utilization
- Encourage palatable, productive perennials, as they are good for animal performance and to maintain a healthy environment.

Approaches

The first and most essential approach in grazing land management is the establishment of a balance between stocking rates and the carrying capacity of the grazing land.

One of the development options to restore a balance between the stocking rate and carrying capacity, is improvement of the productivity of grazing lands. However, there is a maximum limit beyond which productivity of grazing lands cannot be increased.

After increasing the productivity of grazing lands to the optimum level, if their carrying capacity is still below the stocking rates, there is a need to consider destocking or other options for increasing forage supply, from other sources. Probably, diversifying livelihood packages into non-farm activities may encourage farmers to destock.

In moisture stress areas, contour furrowing can conserve moisture and reduce runoff contributing to increasing the quality and quantity of soil and, thereby, pasture production.

The introduction of productive forage species and the application of manure or commercial fertilizers, along with improved livestock breeds and moisture conservation measures, can be beneficial in many areas.

The two feasible techniques for introducing productive forage species are over sowing and strip planting.

Figure 15: Pastureland improvement and grass harvesting

Session 3: Promotion of Agroforestry Practices

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT	**M V-3**
Session 3: Promotion of Agroforestry Practices	**Session 3**

Specific Information

Learning objective	Participants shall be able to: - Describe agroforestry and agroforestry systems in Ethiopia - Explain the rationale and benefits of agroforestry - Explain the major/potential agroforestry practices and their main characteristics (as they exist in most parts of Ethiopia) - Explain the key steps followed to select the best agroforestry practices and describe the combined characteristics used for selection of agroforestry species
Duration	90 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	The Facilitators brainstorm on the session by asking the following questions: - What is agroforestry? - What are agroforestry systems in Ethiopia The Facilitator the provides an input on each question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level then discusses objectives in detail Key discussion points are noted down on flipchart.
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on a given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	15 min	Together with the participants, the Facilitator elaborates in plenary, and gives conclusions on the major/potential agroforestry practices, the main characteristics existing in most parts of Ethiopia and the key steps followed to select the best agroforestry practices and the combined characteristics used for selection of agroforestry species	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	5 min	The Facilitator leads a discussion on the following questions: - Is knowing about major/potential agroforestry practices and their main characteristics (as they exist in most parts of Ethiopia) and the key steps to be followed to select the best agroforestry practices and the best methods to be used for selection of agroforestry species important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 5 of the Technical Manual.

Additional Material

Task for group work

Discuss in your group and present:

- The major/potential agroforestry practices and their main characteristics (as they exist in most parts of Ethiopia).
- The key steps to be followed to select the best agroforestry practices and the best methods to be used for selection of Agroforestry species.

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What is Agroforestry?

Agro-forestry is an integrated approach, using the interactive benefit of combining trees and shrubs with crops. Sometimes it includes livestock as a component.

It requires both agricultural and forestry technologies, to create more diverse, productive and sustainable land-use systems, important to secure food and nutrition availability, from local to national scale.

Agroforestry systems in Ethiopia

There are three major categories of agroforestry systems.

1. **Agri-silviculture**: is a land use system that involves the integration of trees and other large woody perennials into farming systems, through the conservation of existing trees, new planting and tending operations.
2. **Silvopastoral systems**: are those that combine tree growing with the production of livestock. These systems typically include pasture systems containing trees that are widely spaced or planted in clusters throughout the pasture.
3. **Agro-silvopastoral systems**: are land-use practices in which trees and crops are integrated into livestock production, and play an essential role in reducing vulnerability and increasing crop resilience, thus help communities better tackle climate change impact.

What is the rationale for Agroforestry?

The following are the main reasons behind adopting agroforestry practices.

- **High productivity and sustainability**. Agroforestry has the potential to improve the sustainability and productivity of agriculture and forestry. It can improve productivity (e.g. increase output of tree products, improve yields of crops and contribute to reduction of required inputs). Agroforestry has often been mentioned as a potential alternative for many current, unsustainable, forms of land use in the tropics.

- **Multiple benefits**. Trees can be used, simultaneously, for multiple benefits. They can be used on farms for shelter, shade, production of timber, fodder and other products, and for conservation of biodiversity and soil.
- **Suited to Smallholder Farmers**. Agroforestry is seen as a land use system that is attractive, well understood and easily acceptable by small farmers. In many parts of the world, agroforestry has proven to be an effective tool in rural development programmes.

What are the benefits of agroforestry?

- Contributes to climate change mitigation and adaptation
- Provides a wide range of environmental services
- Provides economic and livelihoods benefits

Figure 16: Scattered trees on crop lands (a traditional practice in many parts of Ethiopia) Photo: Getachew Tamiru 2022

What are the major/potential agroforestry practices and their main characteristics?

Commonly known (in Ethiopia) agroforestry practices are described here in the table below:

Table 12: Commonly known agroforestry practices in Ethiopia

Agroforestry practices	Brief description of arrangement of components	Agro-ecological adaptability
A. Agri-silviculture systems (crops-including shrubs/vines/tree crops and trees)		
Improved fallowing	Woody species planted and left to grow during the fallow phase	In shifting cultivation areas
Tangua	Combined stand of woody and agricultural spp. during early stages of establishment of trees	All ecological regions (where tangua is practiced)
Alley cropping (hedgerow intercropping)	Woody species in hedges, agricultural crops in alleys in between hedges	Sub-humid to humid areas with high human population pressure and fragile soils
Multi-layer tree garden	Multi-species, multi-layer, dense plant associations, with no organized planting arrangements	Areas with fertile soils, good availability of labour and high human population pressure
Multi-purpose trees on crop lands	Trees scattered haphazardly or with some systematic patterns on bunds, terraces or plot/field boundaries	In all ecological regions, especially in subsistence farming. Can also be integrated with animals
Plantation / crop combination	a. Mixture of plantation crops, in alternate or other regular arrangement b. Shade trees for plantation crops; shade trees scattered c. Intercropping with agricultural crops	In humid lowlands or tropical humid/sub-humid highlands
Home gardens	Intimate, multi-storey combination of various trees and crops around homesteads	In all ecological regions, especially in areas of high population density
Trees in soil conservation and reclamation	Trees on bunds, terraces, raisers, etc., with or without grass strips; trees for soil reclamation	In sloping areas esp. in highlands, for reclamation of degraded, acid / alkali soils, and sand-dune stabilization

Agroforestry practices	Brief description of arrangement of components	Agro-ecological adaptability
Shelterbelts and windbreaks, live hedges	Trees around farmlands/plots	In wind prone areas
Fuel wood production	Intercropping firewood species: on/around agricultural lands	In all ecological regions
B. Silvopastoral systems		
Trees on pastures land	Trees arranged irregularly or arranged according to some systematic pattern	In all ecological regions
Protein banks	Production of protein rich tree fodder on farm/ rangelands for cut-and-carry fodder production	Extensive grazing areas
C. Agri-silvopastoral systems		
Home gardens, involving animals	Intimate, multi-storey combination of various trees and crops, and animals, around homesteads	In all ecological regions with high density of human population
Multi-purpose woody hedgerows	Woody hedges or browse, mulch, green manure, soil conservation, etc.,	Humid to sub-humid areas with hilly and sloping terrain
Apiculture with trees	Trees for honey production	Depending on the feasibility of apiculture
Multi-purpose woodlots	For various purpose (wood, fodder, soil protection, soil reclamation, etc.)	Various

Figure 17: Scattered trees on crop land, for soil fertility improvement and as a source of forage for animals during the dry season (Photo: Getachew Tamiru 2013)

How are agroforestry practices selected?

In order to select the best agroforestry practices that fit a specific locality and land use type. The following are key steps to follow and properly apply:

1. Analyze the biophysical condition of the area (both at the wider level and specific to the site).

- Agro ecological conditions (amount and variability of rainfall and temperature);
- Topography (land forms, in terms of slope and other considerations);
- Soil characteristics (soil type, depth, texture, fertility, etc.);
- Biodiversity condition (natural habitats for wildlife; the role of trees in agroforestry practices for biodiversity conservation; the status of flora and fauna diversity, from a communities' point of view, etc.).

2. Analyze the socio-economic situation of the community and farmers.

- Land use type (based on land capability, socio-economic feasibility, farmers' interests and environmental issues);
- Land productivity, production and land holding size and user rights situation, etc.;
- Major/dominant crops under cultivation and why they dominate, from a farmers' perspective;
- Existing experience of agroforestry (local knowledge and introduced practices);
- Source of household income (example: crop production, livestock, forest products, etc.);
- The labour contribution commitment of community.

3. Summarize the analysis for site characteristics, and basic information for potential practices, to select the best agroforestry option.

Table 13: Summarized characterization of sites

Sites	Land use type	Agro-ecology	Annual rainfall (mm)	Average Slope (%)	Experience of soil erosion (high, medium or low erosion)	Soil depth (dominant) (cm)	Soil type	Existing agro-forestry practice
Site A								
Site B								
Site C								

Table 14: Summarized characteristics of candidate practices (indigenous and introduced)

Name of Candidate practices	Benefits (social, economic, environmental)	Recommended trees/shrub spp.	Requirements						
			Agro-ecology	Rainfall (cm)	Soil depth	Required inputs (seedlings, seeds, etc.)	Accessibility of inputs	Affordability of inputs	Required skill

1. Select the best agroforestry option based on the findings of the analysis (site characteristics, potential benefits from practices, environmental requirements, required inputs/skills, and the interest of the community or land users. Consider the summarized information using the above tables. Here the decision should be made by the community or land users, but with the advice of extension workers.
2. Proper planning: Plan for selected agroforestry practices, with required inputs, including selection of important tree species that are compatible to different agroforestry components and possible management practices, and define the concrete benefits to be gained – social, economic and environmental.
3. Monitoring and evaluation (recording changes during implementation on a regular basis).

What are the combined characteristics used for selection of species for agroforestry?

Table 15: Characteristics used for selection of species for agroforestry

Characteristics	Description
a. Adaptability	- The ability of the species to adapt to the environment (climate, altitude, soil status, management practices, existence of other plants and animals).
b. Growth rate	- Rapid growth, especially in early years, short rotation is considered a desirable requirement in agroforestry trees.
c. Palatability as fodder	- Nutritious and palatable species, due to severe foraging pressure, are the most preferred ones in agroforestry systems.

d. Ability to withstand adverse conditions	- When agroforestry is promoted in areas with high levels of degradation, and with adverse environmental factors (exposure to hot and cold winds, accidental grazing, drought, frost and shocks during planting). - Some species can overcome such conditions and exhibit incredible performance.
e. Growth habit	An agroforestry tree growth habit is depicted as its branching and rooting characteristics. Important points to be considered are: - Shape and density (for light penetration) of the crown; - Depth and spread of the root system.
f. Trees' capability to withstand management practices	- In general, many agroforestry systems demand extensive pruning and lopping to maximize harvest of tree products, therefore, tree species selected for such agroforestry practices must be able to withstand such practices.
g. Vigour and productivity	- Tree species with outstanding genotype performance to grow and perform in a certain environment are preferable.
h. Nutrient cycling and nitrogen fixation	- In areas or sites where soil is a problem, species with the potential to fix nitrogen, have easy foliage decomposition and ability to provide an overall contribution in improving soil fertility, structure, acidity, etc., should be highly considered.

Session 4: Establishment of Plantation Forests

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT	**M V-4**
Session 4: Establishment of Plantation Forests	**Session 4**

Specific Information

Learning objective	Participants shall be able to: - Describe a plantation forest - Explain the importance of a plantation forest - Describe the Important attributes of a site chosen for plantation purposes - Explain the major operations in plantation establishment
Duration	90 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 min	The Facilitators brainstorm on the session by asking the following questions: - What is a plantation forest? - What is the importance of a plantation? The Facilitator provides an input on each individual question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level then discusses the concepts in detail. Key discussion points are noted down on the flipchart.
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	

Step	Time	Most important content	Required material	Hints
Generalization	15 min	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on the Important attributes of a site for plantation purposes, and the major operations in plantation establishment	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	5 min	The Facilitator leads discussion on the following questions: - Is knowing about the Important attributes of a site for forest plantation purposes and the major operations in plantation establishment relevant to you in your work and , if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 4 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- Describe the most important attributes of a site selected for plantation purposes;
- Explain the major operations in establishing a plantation in a micro-watershed in your woreda.

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What is a plantation forest?

A plantation forest is a forest community or "stand" that is established artificially by sowing or planting. Sometimes it is referred to as a man-made forest.

Biologically, plantations are favoured when it is known that natural means would likely fail. A plantation with one species only is called a monoculture. However, mixed plantations consist of two or more species.

What is the importance of plantation forests?

Past and continuing destruction of natural forests. Natural forests have been cleared over hundreds of years, to make room for agricultural expansion; for exploitation of timber, charcoal and firewood and for settlement expansion. This has led to a severe decline in the size of natural forest cover to an extremely small proportion of land area. As a result, the surviving remnant forests can no longer satisfy the increasing demand for the various forest products.

Unsatisfactory natural regeneration and lack of management. The silvicultural interventions required to bring about adequate regeneration and growth of desirable tree species (natural forest species) are complicated tasks, as compared to plantation silviculture.

Land availability: a vast area of land that has been marginalized by poor agricultural practices is potentially suited to tree planting purposes.

Figure 18: Agriculturally marginalized mountain areas suitable for forest plantations (Protection + Production forests)

High productivity: Plantations have higher productivity than natural forests.

A plantation as a tool for development: The plantation forestry sector contributes substantially to the economic development of a country. It supplies raw material to industry, wood products for consumption and creates employment opportunities.

Figure 19 (above): Plantations established for commercial purposes / income generation (creation of community assets)

Plantations for land rehabilitation and protection purposes. Forest plantations can be established for protective purposes on problematic sites: 1) to stabilize soil by protecting it from erosion and controlling run off in catchment areas and 2) Providing shelter from wind and heat and against sand and dust storms.

Figure 20: Plantations for watershed protection on degraded mountain slopes.

What are the Important attributes of a site selected for plantation purposes?

Three important aspects of an are to be considered in site evaluation. These are: biophysical attributes, socio-economic and environmental factors.

i. Biophysical attributes of a site

Biophysical attributes of a site denote the totality of biotic and abiotic factors that can affect the survival, development and growth of a given tree species. The major factors are climate, soil and topography.

Table 16: Descriptions of biophysical attributes of a site selected for plantation purposes

Factors	Sub factors	Descriptions
Climate	Rainfall	Total amount and monthly distribution determine the performance of plant survival and growth
	Temperature	Important variables are MAT and MT of the hottest months, MT of the coldest months and the coldest or hottest temperature ever recorded
Soil	Soil depth, structure, texture, fertility, PH.	As the soil provides three basic functions for tree growth - Supplies moisture and nutrients - Provides mechanical support
Topography	Slope, aspect ground roughness, stoniness	It influences the following key environmental aspects - Moisture availability, exposure to sunlight, wind and frost, soil depth - Site preparation activity and suitability for forestry operations
Biotic factors	Includes all living organisms existing on the site	- Damaging or grazing animals, insect pests, like termites - Pathogenic fungal, bacterial or viral species - Existing vegetation, including the presence of problematic weed spp

ii. Socio-economic considerations

In any plantation intervention, due consideration has to be given to the following key socioeconomic aspects that determine the benefits to be gained from plantations and other related economic activities. Some, among many, are the following:

1. **User rights and ownership**: The user rights and ownership issue has to be properly considered and agreed on, otherwise, conflicts may arise when benefits are shared.
2. **Accessibility**: Access roads are important for both transportation of seedlings and other materials to the site, and for the extraction of forest products from the site.
3. **Optimization of uses**: Forests have diverse benefits. Social, economic and ecological benefits have to be optimized.
4. **Size of the plantation**: The size of a plantation site is an important factor with respect to the introduction of technologies and value addition practices.

iii. Environmental considerations

Assessing the site, to ensure that establishment of a forest plantation is the best land use type, is very important in appropriate decision making. Identifying its suitability, by weighing the value of the site as a nature reserve, for recreation or wildlife conservation is also worthwhile.

The role of plantations for regulation of the local climate, benefits local communities by creating a conducive environment for habitation and agricultural production. Their contribution in sequestration of atmospheric carbon and parallel contribution to mitigation of climate change is another important role of plantations, when seen from a global point of view.

What are the major practices or operations in establishment of a plantation?

The following are the most important operations that extension workers should consider, in providing technical support and advise to the community.

Table 17: Major practices or operations in plantation establishment

S/N	Practices/operations	Description of practices
1	Forest site selection	Site selection is an important kick-off task to establish a plantation. The most important factors that determine site selection are the following: - The objective of the plantation: for fuelwood/charcoal production, construction, industry, ecological services etc. - The available land in the target area: based on the availability of space, plantation sites can be very small or can be considered for large scale planting. - The suitability of the site for forestry.
2	Pre-planting survey	- To decide on areas not to be planted. - To know the required land preparation and moisture conservation measures. - To determine the appropriate species for each site type. - To decide on possible harvesting systems. - To plan the internal lay out of infrastructure, such as roads, firebreaks. - To know the exact extent of the plantation area.
3	Defining the purpose of a plantation	As a production forest, protection forest, for agroforestry, depending on the site quality and the interest of the community.
4	Species selection	Tree species should be carefully selected, according to: 1. The purpose of the intended plantation. 2. The species available for planting. 3. The site quality and adaptability: What can grow on the available site.

5	Site preparation	Need to know the benefits of site preparation (such as ground preparation and pit preparation) and to plan reasonable resource and time allocation for:
		- Removal or clearing of the existing vegetation to reduce or eliminate excessive competition for moisture, nutrients and light
		- To cultivate or prepare the ground:
		  - To facilitate planting operations
		  - To reduce the weed cover and competition
		  - To reduce erosion by providing physical barriers.
		- Construction of moisture harvesting structures in moisture deficit areas.

6	Planting	Planting can be done using different methods, depending on the site quality, species, type, objective of the plantation and other environmental factors, like temperature, frost, rainfall, pests and diseases, etc.
7	Protection of plantation site	After planting, plantations must be protected from different agents using different mechanisms, such as mulching, fire protection and protection against insect pests.
8	Other practices	- Replacement Planting - Weed Control - Thinning - Pruning

Figure 21: Moisture harvesting structures in steep slope areas for seedling planting purposes

Photo taken from ORDA Greening Programme annual report, 2005

Session 5: Promotion of Energy Saving and Alternative Rural Energy Sources

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT	**M V-5**
Session 5: Promotion of energy saving and alternative rural energy sources	**Session 5**

Specific Information

Learning objective	Participants shall be able to: - Describe alternative energy, renewable energy and renewable energy resources, energy efficiency, biomass energy and energy conservation. - Describe the impact of fuel wood collection and use of cow dung on land degradation. - Explain the rational and benefits of promoting alternative energy sources. - Identify and describe the main feasible technologies that save energy or improve energy efficiency in rural Ethiopia. - Explain the alternative approaches available for financing small-scale rural energy technologies
Duration	120 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	20 min	The Facilitators brainstorm the session by asking the following questions: - What is alternative energy? - What is energy efficiency? - What is biomass energy? - What is energy conservation? - What is the impact of fuel wood collection, use of cow dung and crop residue on land degradation? - What is renewable energy and what are renewable energy resources? - What are the rationale and benefits of choosing alternative energy options? The Facilitator then provides his own input on each question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level then discusses concepts in detail Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	30 min	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on the main feasible technologies and practices that save energy or improve efficiency and reduce dependency on wood, cow dung and crop residues in rural Ethiopia. The Facilitator also highlights alternative approaches available for financing small-scale rural energy technologies.	Flipchart paper, markers	Facilitator enriches the discussion whenever needed and visualises important points

Step	Time	Most important content	Required material	Hints
Application	10 min	The Facilitator leads discussion on the following questions: - Is knowing about the technologies and practices that save energy or improve efficiency and reduce dependency on wood, cow dung and crop residues in rural Ethiopia and the alternative approaches available for financing small-scale rural energy technologies important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 5 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- The main types of technologies and practices that save energy or improve efficiency and reduce dependency on wood, cow dung and crop residues in rural Ethiopia.
- Alternative approaches available for financing small-scale rural energy technologies?

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What is alternative energy?

Alternative energy is also referred to as an environmentally preferable source of energy and may include low impact hydro power, geothermal, biomass, solar power and wind.

What is energy efficiency?

This refers to the efficient conversion and use of energy, and is a measure of the productivity provided per unit of energy consumed.

It employs devices and practices that result in less energy being used for the same task and function. An example would be a fluorescent bulb, as opposed to an incandescent bulb. Technological advances have allowed for increases in energy efficiency, reducing energy demand while increasing economic activity.

What is biomass energy?

Biomass energy is energy that is stored in plants and other organic matter, e.g. wood and forest residues, animal manure and waste, grains and cane trash, etc.

What is energy conservation?

This is the saving of energy by any means, including energy efficiency. It may also entail being more economical, for example, turning lights off when not in use, or providing information on ways to reduce energy.

What is the impact of fuel wood collection, use of cow dung and crop residue on land and its resources (forests, soil and biodiversity)?

The current energy regime in Ethiopia is heavily reliant on the burning of biomass, which has had major implications for the environment.

The use of traditional fuels as the main source of energy in rural households (which comprise the vast majority of Ethiopia's population) is an area of special concern.

The increase in greenhouse gas emissions has resulted from these patterns of unsustainable fuel consumption worldwide and is further exacerbated, in Ethiopia, by the increased energy demand from an increasing population. The high dependency of rural and semi urban populations on natural forests as a source of fuel wood and charcoal has greatly degraded forests and biodiversity resources. Valuable tree and shrub species have become locally extinct in different agro-ecological zones, habitats/ecosystems.

Similarly, in rural areas, cow dung and crop residue collection, for cooking, have a negative impact on soil health, soil fertility and structure. A huge biomass of cow dung and crop residue has been collected, which would have been better left to help recycle basic soil nutrients and organic matter back into the soil. As a result, productivity and production of land has significantly reduced.

What is renewable energy?

Renewable energy is any form of energy that is replenished by natural processes, at a rate that equals or exceeds its rate of use. It is obtained from the continuing or repetitive flows of energy occurring in the natural environment, and includes low carbon emission technologies such as solar energy, hydropower, wind, tidal and wave power and ocean thermal energy and renewable fuels such as biomass. Renewable energy is energy generated from renewable, non-fossil-based energy sources which are replenished within a human lifetime.

What is energy efficiency?

This is the efficient conversion and use of energy and is a measure of the productivity provided per unit of energy consumed. It employs devices and practices, which result in less energy being used for the same task and function. As indicated above, an example would be a fluorescent bulb as opposed to an incandescent bulb.

What is the rationale for promotion of energy saving and alternative energy sources?

In Ethiopia, biomass is the main cooking fuel used by 99% of the rural and 80% of urban households. Specially, women and girls are burdened with its collection. Fuel wood consumption, to this degree, is a major issue, as it is associated with extensive deforestation and land degradation.

Ethiopia's dependence on traditional fuel sources has resulted in the depletion of fuel wood stocks faster than they can regenerate. This pattern, paired with the country's rate of population growth, will end in environmental disaster unless changes are made in the near future. In addition, the cost of fuel wood and charcoal is increasing such that it is now taking a significant share of household income

What are the benefits of energy saving and alternative rural energy sources? :

- They Help the environment escape from further degradation. Efficient use of conventional sources of energy, or use of renewable energy, helps save the environment from further degradation and gives it an opportunity to regenerate.

- Provide sustainable fuel systems. Afforestation and agroforestry, combined with the introduction of energy-efficient devices, can help to create a sustainable fuel-use system within the rural community and sustain the ecological balance of a region.
- Benefit women. Lower dependency on fuel wood and other household fuel sources reduces the workload of women, by shortening or eliminating, the distances they travel for fuel collection.
- Benefit human health. Use of improved cooking stoves and biogas plants, for example, help reduce, or eliminate, health problems associated with using conventional cooking stoves, including respiratory diseases and eye problems.
- Enhance income. Alternative energy sources can provide local employment opportunities, through direct use of energy in small-scale industry and agriculture, through construction, repair and maintenance of energy devices, or through the sale of energy to local utilities.
- Provide better lighting. Better lighting enables the poor to stretch their period of economic activity. Their children can also help them in daily tasks and then study in the evenings.

What are potential energy sources for rural and semi urban communities in Ethiopia?

Table 18: Potential energy sources for rural and semi urban communities in Ethiopia

Energy sources	Uses	Remarks
Solar	For cooking and lighting	Need to identify affordable and applicable technologies
Biomass (wood, and charcoal)	For cooking	Required to use improved cooking stoves
Biomass (crop residue)	Recommended only in exceptional cases, otherwise recommended only for soil fertility management	Use of improved stoves
Biomass (animal waste)	Recommended for use by biogas digester – for cooking and lighting	Recommended mainly when backyard livestock management system is applied

What are the technologies and practices that save energy or improve efficiency and reduce dependency on wood, cow dung and crop residues in Ethiopia?

Renewable energy resources: These resources and technologies include energy efficient biomass cooking stoves, biogas, solar, thermal and photovoltaic, large and small-scale hydropower, wind, and geo-thermal. The renewable energy possibilities for rural communities are shown below:

Table 19: Renewable energy possibilities for rural communities

Resource	Detail	Size	Benefits	Cost
Efficient cooking stoves	Rocket stoves	Household	Affordable to individuals	Still relies on direct combustion of biomass
Biogas	Large livestock population / cattle dung available	Household or mini grid	Not directly depleting forests	Financial limitations may encourage deforestation
Solar	Thermal or photovoltaic / strong solar regime	Household or main grid	Clean	Not affordable to individual households

What are improved/or energy efficient cooking stoves?

This technology still leaves people reliant on fuel wood, however, the amount of fuel wood needed to generate the same amount of energy should decrease, helping to alleviate pressure on forests.

Advantages of fuel-saving stoves:

- Reduce deforestation and/or reduce pressure on natural resources, which in turn contribute to decreased soil erosion and increased soil fertility.
- Increased soil fertility contributes to increased household food security.

- Reduce amount of fuel wood consumption in beneficiary households by 46.98% to 52.94% per household per year.
- Reduce the frequency of travel (especially women and children) to collect fuel wood.
- Minimize expenses incurred by households to purchase fuel wood.

Figure 22: Concrete biomass stove (left side), and biomass stove made from local material (right side)

Reduce indoor air pollution.

- Reduce risk of fire.
- Faster cooking.
- Easy to clean and maintain

What is Biogas?

Biogas is a mixture of methane, carbon dioxide and water vapour produced from animal and crop residues.

Biogas is generated through the fermentation of oxygen-deprived organic material and can be used for electricity generation, at household and mini grid levels.

Biogas can be generated from cattle dung and animal waste, and with substantially more difficulty, from some crop residues.

Ethiopia's large livestock population, and the involvement of most rural households in subsistence farming - which includes animal husbandry - makes animal dung readily available for biogas generation. The technology is technically feasible, and works at household level for households having a minimum of three (3) to four (4) cattle.

Figure 23: Biogas digester and strong flam from the biogas digester

What is Solar PV and thermal?

Solar PV: Photovoltaics involve the direct conversion of sunlight into electricity. Solar photovoltaic devices convert the sun's energy into electricity for use (PV) in lighting, refrigeration, telecommunications, etc.

Solar thermal: Thermal energy is the use of heat to run a heat engine to generate electricity. Solar thermal devices use the sun as the primary source of energy for heat appliance technologies, e.g., solar water heaters, solar dryers.

Solar energy has the potential to be used in both small and large-scale electrification schemes and can be utilized in two forms: thermal energy and photovoltaic.

On a household scale, solar thermal and PV can be used to generate electricity for cooking and lighting, while larger outputs of electricity could be produced at community level, through mini grids, and at an industrial level through grid extension.

Solar energy can be used as a main substitute for diesel in irrigation farming. Many farmers in Ethiopia are using diesel generators for irrigation water pumping, mainly in vegetable and fruit development, as solar technology is not well known or accessible (which is due to high initial cost). However, solar technologies do have various advantages over diesel generators. The following some of the advantages of solar plants over diesel generators:

- Solar is more reliable than diesel.
- Solar power requires almost no maintenance, as compared to diesel generator sets, which have lots of moving parts and maintenance costs, including spare parts.
- Solar pumping might be 10-30% higher in initial cost, but will be equal or cheaper after a year of operations.
- Solar pumping saves community/farmers' money on operation (e.g. 1mln ETB/year per 10hectar system). In addition, there is a saving from diesel pollution and C02.

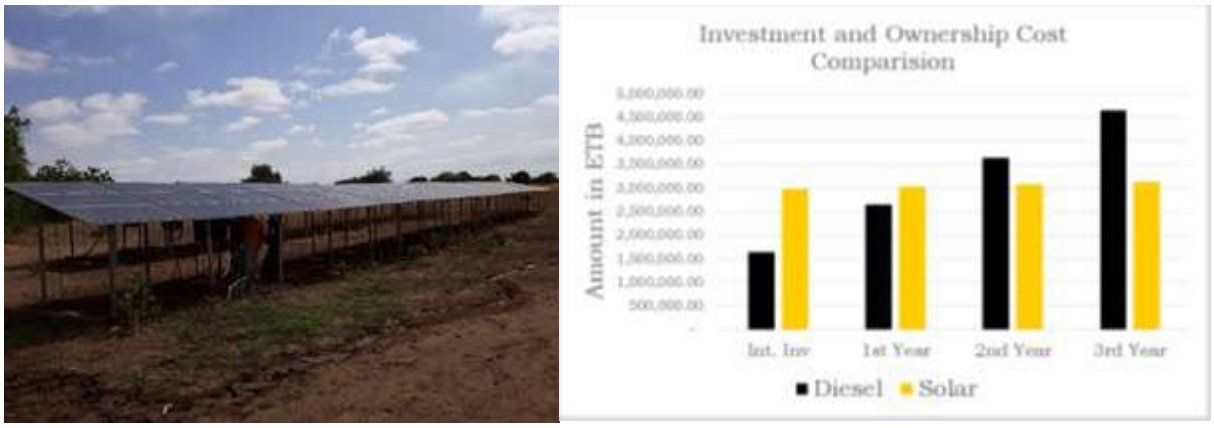


Figure 24: Solar PV and Investment and ownership cost comparison

What alternative approaches are available for financing small-scale rural energy technologies?

At the smallest scale, many sustainable energy technologies (including small-scale wind and hydropower supplies and photovoltaics for homes) cost a few hundred dollars. Buying them outright is impossible for most rural households in developing countries. But an important minority of households, communities and small businesses can afford to buy them with credit. The main obstacle to serving this crucial market is the reluctance of banks to manage numerous small loans and to lend without collateral or other guarantees against loan default. A variety of innovative approaches are being used to overcome this obstacle:

- Financing through dealers. Banks transfer the collateral problem from the end user to dealers by lending to dealers, who in turn lend to purchasers, using payment schemes compatible with their income. Dealers must bear the financial risk along with technical risks. This system is best suited to large, relatively high-income rural markets.
- Financing through energy service companies. These companies can replace dealers as the financial intermediary. Companies, typically, require greater efforts to establish higher funding levels, because they provide a more comprehensive installation and back-up service to clients.
- Revolving funds (with grant support). A bank takes on the risk of operating a revolving loan fund, usually with start-up capital provided from a grant.
- Loan aggregation through cooperatives. To avoid the high cost of servicing many small loans, prospective borrowers form a community association (or enlarge the functions of an existing village or farmer cooperative). Banks lend to the cooperative, or lease the energy systems, but retain ownership of the equipment in case of payment default.
- Concessional funding in support of public sector objectives. The government contracts and pays a local company to provide energy services that meet development objectives, such as photovoltaic lighting for schools. This provides entry capital for the company to offer credit and expand its business to other local markets, such as photovoltaics for households, health clinics, and community centers.
- Payment for energy services. Payment for outputs, such as irrigation and drinking water, has been used to fund the recurrent operation and maintenance costs of small-scale energy systems. These cost streams are usually hard to fund, or remain unfunded, when loans target the capital cost.

Session 6: Promotion of Crop Production

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT	**M V-6**
Session 6: Promotion of Crop Production	**Session 6**

Specific Information

Learning objective	Participants shall be able to: - Explain the contribution of crop production to land degradation and conservation and management of natural resources - Explain the concepts of crop specialization, crop diversification, subsistence farming and commercial farming - Explain how crop diversification versus specialization and commercialization of subsistence farmers should be considered in CBLM - Explain ISFM, ISFM interventions and the benefits of ISFM
Duration	120 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	30 minutes	The Facilitator brainstorms on the session by asking the following questions: - What is the contribution of crop production to land degradation and conservation and management of natural resources? - What is crop specialization and crop diversification? - What are the benefits and limitations of crop specialization and crop diversification? - What are subsistence farming and commercial farming? - What are the benefits and limitations of subsistence and commercial farming? - What is ISFM and ISFM interventions? The Facilitator then provides his own input on each question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level, then discusses the various concepts in detail Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	20 minutes	Together with the participants the Facilitator elaborates in plenary and discusses: - How are crop diversification and specialization best implemented? - The Crop diversification and specialization approaches that should be implemented in community-based land management. - The commercialization of subsistence farmers and how commercialization of subsistence farmers should be considered in CBLM. - How is ISFM Implemented?	Flipchart paper, markers	Facilitator enriches the discussion whenever needed and visualises important points
Application	10 minutes	The Facilitator leads discussion on the following questions: - Is knowing which crop diversification and specialization approaches should be implemented in community-based land management in Ethiopia and how the commercialization of subsistence farmers should be considered in CBLM important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 5 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- How are crop diversification and specialization implemented?
- What are the crop diversification and specialization approaches that should be implemented in community-based land management?
- What is "commercialization of subsistence farmers" and how should the commercialization of subsistence farmers be considered in CBLM?
- How is ISFM Implemented?

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What is a crop?

A crop is a plant or plant product that can be grown and harvested for profit or subsistence.

By use, crops fall into six categories: food crops, feed crops, fibre crops, oil crops, ornamental crops, and industrial crops.

What is crop production?

Crop production is the process of growing crops, such as grains, fruits, vegetables and nuts. The goal of crop production is to produce a high yield of quality crops that can be sold or used for food, feed, fuel and fibre.

Crop production involves the use of land, water, and other resources to grow crops. The process starts with land preparation, which involves clearing the land of debris, tilling and fertilizing the soil. Once the soil is prepared, the crops are planted, then tended, until they are ready for harvest.

How is crop production contributing for land degradation in Ethiopia?

Existing crop production practices in Ethiopia are, generally, not sustainable. They are characterized by excessive removal of crop residue, for feed, and diversion of organic fertilizer sources to energy use; repeated/multiple tillage; mono-cropping of cereals; burning of crop residue and continuous depletion of soil nutrients, due to inadequate fertilizer use (organic and inorganic). These unsustainable farming practices lead to severe organic matter depletion and depletion of soil fertility; hence contributing to land degradation.

What is the contribution of crop production on conservation and management of natural resource?

Crop production, as one of the interventions in community-based land management, should contribute to the conservation and management of natural resources.

Crop production contributes to the conservation and management of natural resources by following the path of sustainable intensification, by implementing improved agronomic practices (crop rotation, intercropping, strip cropping, ley cropping, intercropping, use of appropriate crop varieties, appropriate plant spacing, appropriate water management, appropriate weed

management and appropriate pest management) and improved soil fertility management practices (efficient use of inorganic fertilizers, compost making, green manure/cover crops, crop residue management, acid soil management and management of salt affected soils). If these practices are properly implemented, they can ensure sustainable crop production and ensure the protection of the soil from degradation.

Following the path of sustainable intensification is a necessity, if we are to ensure a sustainable increase in productivity and ensure environmental protection. Sustainable intensification aims to produce more food from the same piece of land, with less environmental impact. It is a profitable way of producing high-quality food and fibre that protects and renews the natural environment, builds local economies and enhances the quality of life of farmers.

Sustainable intensification also maintains soil and water quality, reduces risk, uses an integrated mix of modern and traditional strategies, utilizes ecological processes (e.g., biological nitrogen fixation, natural predators), minimizes environmental hazards and acknowledges local environmental and cultural conditions, resulting in increased productivity.

The following farming practices should be promoted for sustainable intensification of crop production:

- Use of improved crop varieties, promotion of perennials (fruits).
- Use of improved agronomic practices (crop rotation, intercropping, strip cropping, ley cropping, intercropping, appropriate plant spacing, appropriate land preparation, appropriate water management, appropriate weed management and appropriate pest management)
- Use of soil management practices (efficient use of fertilizers, vermi-composting, conventional composting, green manuring/cover cropping, crop residue management/mulching).

What is crop diversification?

Crop diversification is the growing of more than one crop in an area. It is accomplished by adding a new crop species or different variety, or by changing the cropping system currently in use (e.g., crop rotation, intercropping, strip cropping, mixed cropping, ley farming, etc.).

Diversification can also be implemented to complement low-value commodities with high-value commodities, such as fruits, vegetables and spices.

What is the need for crop diversification?

In Ethiopia, farming is particularly rain-fed and weather-dependent and farmers face price, yield and resource risks that arise from the biophysical and socio-economic environment in which they operate. Rural households in the country are exposed to a variety of risks that include harvest failure as a result of drought, frost, floods and other climatic events, and death of livestock.

In subsistence farming communities, agricultural diversification provides the following:

- **Resilience**. Farming households can spread production and economic risk over a broader range of crops, thus reducing financial risk associated with unfavourable weather or market shocks.
- **Reduced pressure from insect pests**. Mixed cropping frequently has lower pest densities, especially of insect pests. This occurs, both because the mixture confuses insects and because, if the mixture is chosen carefully, the mixture attracts beneficial predators. Pests are less damaging in fields with a mixture of crops than in fields with a single crop, also known as monocultures. This idea is based, in part, on the assumption that a given pest will find fewer acceptable hosts to feed or lay eggs on in a more diverse field.
- **Increased income on small farm holdings**. Diversification improves the economic picture of the farm by reducing production costs and increasing gross income. For example, the inclusion of legumes into a crop rotation system reduces spending on nitrogen fertilizer, while adding

crops (two or more) into the rotation, results in fewer pest problems, reducing expenditures on pesticides.

- **Increased financial inflows, by expanding market potential**. In some areas, the inclusion of a variety of crops, can lead to the development of new agriculturally-based industries, improving the economic potential of a rural community.
- **Diversification of agricultural production, which can increase natural biodiversity**, strengthening the ability of the agro-ecosystem to respond to stresses, reducing the risk of total crop failure and also providing producers with alternative means of generating income.

Diverse cropping systems generally provide more varied and healthier food for humans and livestock.

What are the limitations of crop diversification?

It may be difficult for farmers to achieve a high yield, in terms of tons per hectare, given that they have a greater range of crops to manage. Farmers also face a risk from poor economic returns if crops are not selected based on a market assessment. For example, drought tolerant crop varieties may fetch a low market price due to taste or cultural preferences.

Table 20:Crop diversification approaches

No.	Approach	Description
1	Temporal diversification	Diversifying existing crop mixes on a particular farm, over time
1.1	Crop rotation	Growing of two or more different crops in consecutive growing seasons
1.2	Double to multiple cropping	Growing of two or more different crops in one growing season
1.3	Catch crops	Minor crops planted before, between or after a major crop
1.4	Relay cropping	The seeding of one crop into another standing crop and thus growing two crops simultaneously for a certain time
2	Spatial crop diversification	Growing different crop cultivars and species in different configurations at the same time in a given field
2.1	Alley cropping	The simultaneous growing of arable and perennial crops in different border strips
2.2	Intercropping	Simultaneous growing of at least 2 crops in different yet proximate rows
2.3	Mixed cropping	Simultaneous growing of at least two crops in the same field, but not in rows
2.4	Companion crops	Special form of mixed cropping. Simultaneous sowing of at least two crops. One is used in the year(s) after sowing
2.5	Variety mixtures	Growing of two or more varieties of one species
2.6	Trap crops	Mixture of commercial and non-commercial crops on the same field to control pests or diseases

What is crop specialization?

Crop specialization can be defined as growing a single crop on a particular area. Specialization focuses on one crop type, considered best suited to a certain agro-ecological zone.

Market-oriented production forces the producer to produce the only marketable product. The crop production system is then diverted from diversification into specialization.

What are the benefits of crop specialization?

- The efficiency and skill of labour is increased. Specialization allows a farmer to become more efficient and expert at doing a few selected things.
- Intensity of production leads to a relatively large amount of output.
- Better management: fewer enterprises on the farm means that those that are practiced are liable to be less neglected, while sources of wastage can easily be detected.

What are the limitations of crop specialization?

- Applicable only for high value crops.
- Demands high fertilizer input.

- Needs a large farm size and demands market-oriented production.
- Machinery intensive.
- Needs high initial investment.
- Vulnerable to risks.
- Creates ecosystem imbalances.

How is crop specialization implemented?

Crop specialization is implemented by focusing on few crops and practices considered best suited to a certain agro-ecological zone (Stellmacher and Kelboro, 2019), and by focusing on commodities which have high market value. Through this, the crop production system is gradually diverted from diversification into specialization.

Crop diversification and specialization approaches in community-based land management.

Each production system has its own merits and demerits, with respect to the economy of farmers. Accordingly, specialized farms achieve higher economic efficiency but lower environmental sustainability of production than diversified farms. Beside this, diversification is also one of the most ecologically feasible, cost-effective and rational ways of reducing uncertainties in agriculture, especially among small-scale farmers.

UN Food and Agriculture Organization (FAO) policy supports crop diversification with the understanding that it may be an effective strategy for dealing with issues as varied as food and nutrition security (and insecurity), employment generation, sustainable agricultural development, environmental and ecological management and poverty alleviation (FAO, 2012). Similarly, recent International Food Policy Research Institute (IFPRI) publications have argued that growth in agricultural incomes will require diversification by farming households (Tadesse et al., 2011).

Crop diversification is the best alternative approach for food production: not only for food security but also for the current agenda of climate-smart agriculture and sustainable crop production systems.

In conclusion, the extension approach system should consider the preconditions that indicate an appropriate crop production system in a particular area, for improvement of crop productivity and for food security among smallholders. In addition, agricultural policy makers should further investigate the issue, from the perspective of food security, rather than money making, when amending policies.

What is Integrated Soil Fertility Management?

Integrated soil fertility management (ISFM) is defined as a set of soil fertility management practices that include the integrated use of mineral fertilizers, organic inputs and improved germplasms combined with knowledge on how to adapt these practices to local conditions, which are aimed at optimizing efficient agronomic use of applied nutrients, thereby improving crop productivity. In this definition, all inputs need to be managed following sound agronomic principles.

What are the main ISFM Interventions?

ISFM involves the combined use of appropriate interventions in soil management, fertilizer use and crop agronomy. Options include:

Soil management: Green manure/cover crops); mulching and crop residue management; acid soil management; management of salt affected soils.

Fertilizer use: Inorganic fertilizer use: use of the right fertilizer products, use of the right fertilizer rate of application, the right timing for fertilizer application and right placement of basal fertilizers.

Organic Fertilizers: preparation and use of conventional compost; preparation and use of vermi-compost

Crop Agronomy: Intercropping; crop rotation; ley cropping; use of appropriate crop varieties (e.g. planting the seeds of improved crop varieties); use of appropriate agronomic practices (plant spacing, water management, weed management, disease management and pest management).

What are the benefits and limitations of implementing ISFM?

Integrated soil fertility management (ISFM) is a means to enhance crop productivity while maximizing the agronomic efficiency (AE) of applied inputs, and can, thus, contribute to sustainable intensification.

When ISFM is introduced successfully, productivity is increased and less land is required to achieve a given level of production. The impact is the sustainable improvement of food security, increased farm incomes and lower food prices, which benefit the urban population.

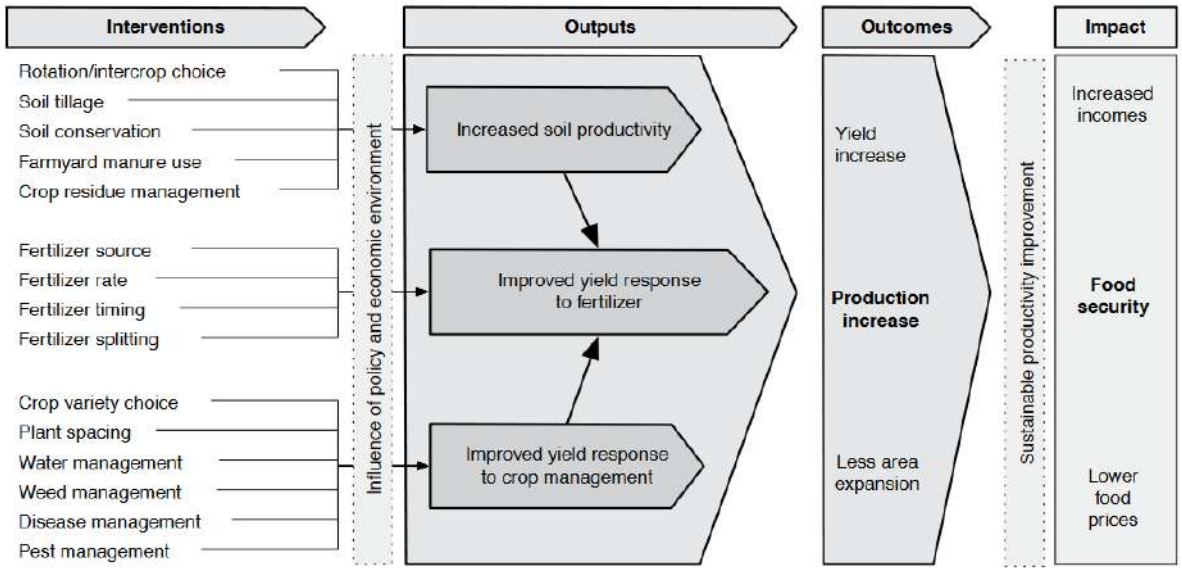


Figure 25: Impact of ISFM (the combined use of appropriate interventions) in driving the main outputs of increased yield and productivity.

Challenges to adoption of ISFM

The most important factors curtailing adoption of ISFM are related to:

- High transaction cost of input and produce trading;
- Low awareness and common disbelief about the benefits of soil fertility management;
- Shortage of credit facilities for making initial investments;
- Aversion to risks, surrounding the profitability of inputs;
- Cost and availability of labour;
- Land size and property rights;
- Weak social networks and pervasive climate of distrust;
- Lack of information about soil fertility and rainfall forecasts;
- Competition for crop residues with livestock.

How is ISFM Implemented?

ISFM intervention implementation in Ethiopia follows two participatory extension approaches (both of which are tested and proven and to be effective for implementation). These are the Farmers' Research and Extension Group (FREG) approach and Farmers' Field Schools (FFS).

What is subsistence farming?

Subsistence farming, or smallholder agriculture, is when farmers grow food for themselves and their family on a small plot of land. Unlike other types of farming, subsistence farming is focused primarily on survival. There is little or no emphasis on trading and selling goods, or on operating as a business.

In subsistence farming there is, usually, little harvest to sell or trade, and what surplus there is, tends to be stored to last the family until the next harvest. This is the most widely used method of agricultural farming in sub-Saharan Africa, and the majority of the rural poor depend on it for survival.

What is commercial farming?

Commercial farming is farming where crops are raised for sale, to make money from the market.

Whereas subsistence farmers raise crops to meet their basic needs, on the other side, in "farming as a business", farmers raise crops or livestock on a large scale to make a profit from production.

Commercial farming in Ethiopia refers to farms that include state and private commercial enterprises, mainly established for the purpose of profit making, by selling agricultural products in the local market and/or abroad. These farms are commonly owned and operated by government, private companies and non-governmental institutions, such as individual private investors, shareholders, religious and non-religious institutions, etc.

Private and state commercial farms produce just 6% of food crops and 2% of the coffee grown. These commercial farms use about 5% of the total cultivated land. Coffee, cotton, tea, fruits and vegetables, are the major crops grown by the few commercialized state farms, although with very minimal return, despite huge investments in them (MEDIC 1999).

From these statistics, it is easy to infer that small-scale farmers (who are all rural dwellers) are the key element in strengthening the effort towards agricultural growth and, consequently, overall economic growth.

What is "commercialization of subsistence farmers"? How should this issue be considered in CBLM?

Commercialization in agriculture refers to the progressive shift from household production, for household consumption, to market-oriented production.

Commercial farmers have a better living standard than subsistence farmers. This is because commercial, smallholder farmers use more advanced production systems, which are based on comparative advantage. Consequently, higher production is achieved through economies of scale, regular interaction with experts, exposure to new ideas, greater learning by doing, and better incentives, in the form of higher income, with attendant welfare gains for the smallholder.

In Ethiopia, 95% of the total cultivated area is cultivated by smallholder farmers and 90% of

total agricultural production is obtained from smallholder farms.

In the long run, subsistence agricultural production may not be a viable production system to ensure food security. Therefore, commercializing smallholder agriculture is seen as a means to bring the welfare benefits of market-based exchange economies and is central to an inclusive development process. This implies that commercializing smallholder agriculture is an indispensable pathway towards economic growth and development for most developing countries relying on the agricultural sector as an economic foundation stone and means of livelihood for a majority of the population. Development of the Ethiopian economy is especially dependent on the speed at which the subsistence production system is transformed into a market-orientated production system. This means that Ethiopia's poverty-reduction strategy should seek to achieve growth through the commercialization of smallholder agriculture. Consequently, promoting the commercialization of agricultural production is a cornerstone of rural development and poverty-reduction strategies in Ethiopia.

The concept of Agricultural Commercialization Clusters (ACC) for the commercialization of subsistence farmers

Ethiopian agriculture is dominated by smallholder farmers (over 17m) contributing about 95% of agricultural production. Smallholder agriculture is predominantly rain-fed, with limited mechanization and technology adoption.

The Agricultural Commercialization Clusters (ACC) Initiative was introduced during GTP I as a mechanism to integrate the interventions prioritized in the Transformation Agenda, within specific geographies, targeting a limited number of high-value commodities.

The Agricultural Commercialization Clusters Initiative is defined as a shift from household production for home consumption, to production for sale in the market. This shift requires that production and input use decisions are based on profit maximization, reinforcing vertical linkages between input and output markets.

ACC was formally launched in 2019 as a five-year programme with 10 commodities (wheat, maize, teff, malt barley, sesame, avocado, mango, banana, onion and tomato) across 4 regions (Amhara, Oromia, SNNPR and Tigray) in 300 woredas with about 4 million farmers.

The ACC Initiative contains clearly defined geographical clusters, specializing in priority commodities across the four major agricultural regions of the country. These ACC clusters are intended to act as Centres of Excellence (CoE), where regions will be supported to maximize production and productivity, while integrating commercialization activities. These clusters are, therefore, meant to serve as models for learning as Ethiopia intensifies the ACC approach and scales up best practices across the country.

Within the ACC, farm scale is achieved by "clustering" farmers. 30-200 farmers are grouped together on adjacent land to farm as one. These groups of farmers are required to adopt the latest full-package farm recommendations, including use of improved seeds, fertilizer application and other farming best-practices. Over time, it is expected that Farmer Production Clusters will move towards becoming established as commercial companies.

Session 7: Promotion of Climate-smart Technologies

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT	**M V-7**
Session 7: Promotion of Climate-smart Technologies	**Session 7**

Specific Information

Learning objective	Participants shall be able to: - Describe climate-smart agriculture (CSA) and explain the characteristic features of climate-smart agriculture - Explain the main benefits of promoting climate-smart agriculture - Describe climate-smart agriculture technologies and practices - Describe mainstreaming of CSA - Apply the integration of CSA plans into an overall watershed plan
Duration	120 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	20 minutes	The Facilitator brainstorms the session by asking the following questions: - What is Climate Smart Agriculture? - What are the characteristic features of CSA? - What are the main benefits of CSA? - How can climate-smart agriculture be mainstreamed? The Facilitator then provides an input on each question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level then discusses individual concepts in detail Key discussion points are noted down on a flipchart..
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material)	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	30 minutes	Together with the participants, the Facilitator elaborates in plenary and provides conclusions on the mainstreaming of climate- smart agriculture (CSA) at watershed level; integration of CSA interventions into overall Watershed development plans and the adaptation and/or mitigation benefits of CSA practices at plot, farm and watershed level.	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points

Step	Time	Most important content	Required material	Hints
Application	10 minutes	The Facilitator leads discussion on the following questions: - Is knowing about mainstreaming climate- smart agriculture (CSA) at watershed level; integration of CSA interventions into overall watershed development planning and the adaptation and/or mitigation benefits of CSA practices at different levels (plot, farm and watershed) important to you in your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 5 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- The mainstreaming of climate-smart agriculture (CSA) at watershed level.
- How CSA interventions can be integrated into overall watershed development plans?
- The adaptation and/or mitigation benefits to be derived from CSA practices on different scales (plot, farm and watershed).

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What is Climate-smart Agriculture?

Climate-smart agriculture (CSA) is an integrated approach to managing landscapes (cropland, livestock, forests and fisheries) that addresses the interlinked challenges of food security and accelerating climate change. Climate-smart agriculture (CSA) can also be defined as an approach for transforming and reorienting agricultural development under the new reality of climate change (Lipper et al. 2014).

What are characteristic features of climate smart agriculture (CSA)?

CSA integrates multiple goals and manages trade-offs. CSA, ideally, produces triple-wins of increased productivity, enhanced resilience and reduced emissions. But often it is not possible to achieve all three. Frequently, when it comes time to implement CSA, trade-offs must be made. This requires us to identify synergies and weigh the costs and benefits of different options, based on stakeholder objectives identified through participatory approaches.

CSA maintains ecosystems services. Ecosystems provide farmers with essential services, including clean air, water, food and materials. CSA interventions do not contribute to the degradation of these services, rather it maintains them.

CSA is context specific. What is climate-smart in one-place may not be climate-smart in an-

other, and no interventions are climate-smart everywhere or all the time. Interventions must take into account local specificity, in terms of agro-ecosystems, socio-economic conditions and institutional arrangements.

CSA addresses climate change. Contrary to conventional agricultural development, CSA systematically integrates climate change and environmental degradation into the planning and development of sustainable agricultural systems (Lipper et al. 2014).

CSA has multiple entry points at different levels. CSA should not be perceived as a set of practices and technologies. It has multiple entry points, ranging from the development of technologies and practices to the elaboration of climate change models and scenarios, information technologies, insurance schemes, value chains and the strengthening of institutional and political enabling environments. As such, it goes beyond single technologies at the farm level, and includes the integration of multiple interventions at the food system, landscape, and value chain or policy level.

What are the main benefits of promoting climate-smart agriculture?

Agricultural production systems need to, simultaneously, tackle three intertwined challenges: i) sustainably increasing agricultural productivity and incomes; ii) building resilience to the impact of climate change; and iii) contributing to climate change mitigation, wherever possible. Climate smart agriculture (CSA) was developed as a framework to address these three challenges.

Sustainably increasing agricultural productivity and incomes: CSA aims to sustainably increase agricultural productivity and incomes, from crops and livestock, without having a negative impact on the environment. This, in turn, will raise food and nutritional security.

A key concept related to raising productivity is sustainable intensification.

Building resilience to the impact of climate change: CSA aims to reduce the exposure of farmers to short-term risks, while also strengthening their resilience, by building their capacity to adapt and prosper in the face of shocks and longer-term stresses.

Particular attention is given to protecting ecosystem services that support farmers and others. These services are essential for maintaining productivity and community ability to adapt to climate change.

Contributing to climate change mitigation wherever possible: Wherever and whenever possible, CSA should help to reduce and/or remove greenhouse gas (GHG) emissions. This implies that we reduce emissions for each calorie or kilo of food, fibre and fuel that we produce; avoid deforestation; manage soils and trees in ways that maximizes their potential to act as carbon sinks and absorb carbon dioxide from the atmosphere.

In short, CSA aims to promote the adoption of technically, financially and environmentally sound production practices, while incorporating resilience to negative climate effects and contributing to reduced GHG emissions.

CSA integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges. Unlike conventional agricultural development approaches that only focus on income generation and food security, CSA systematically integrates climate change, in terms of adaptation and/or mitigation objectives.

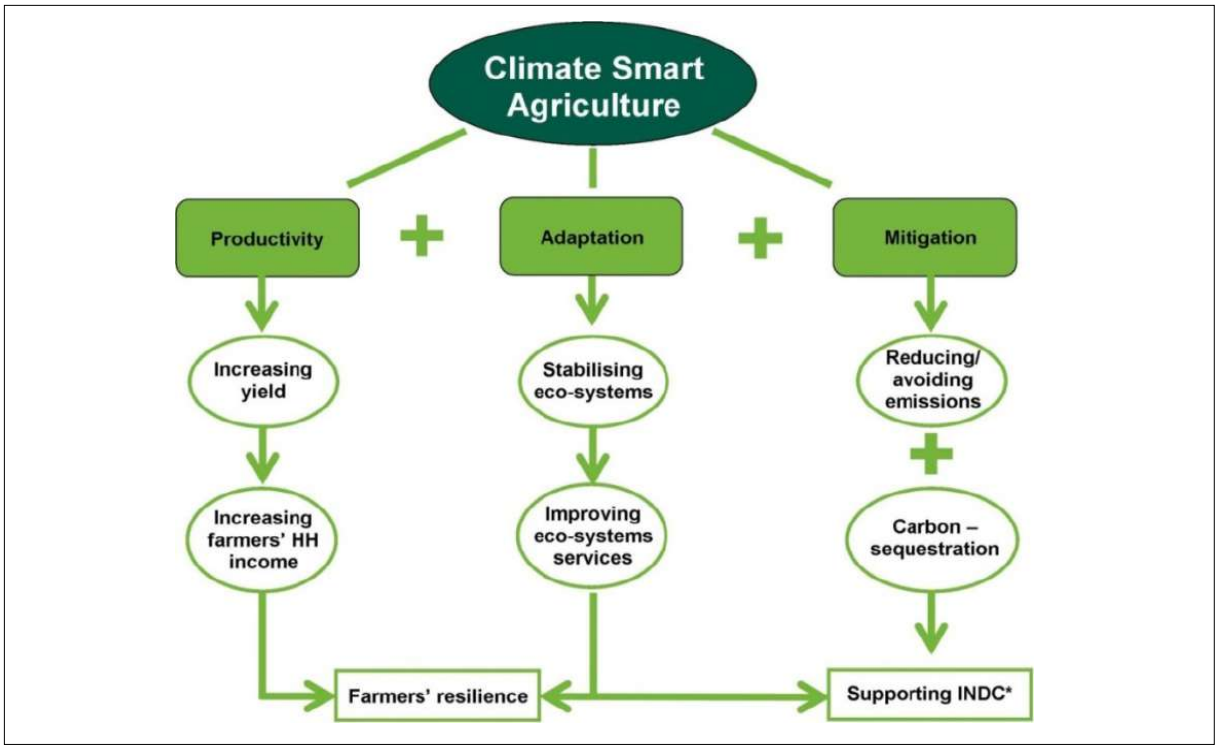


Figure 26: Dimensions of Climate-smart Agriculture (CSA). *INDC = Intended Nationally Determined Contribution (in GHG Reduction).

Source: SLM (MOA, 2019)

What are climate-smart agriculture technologies and practices?

Climate-smart agriculture practices represent opportunities for addressing climate change challenges, while simultaneously supporting economic growth and development in the agriculture sector. For this profile, practices are considered climate-smart if they maintain or achieve increases in productivity, as well as at least one of the other objectives of climate-smart agriculture (adaptation and mitigation).

Hundreds of technologies and practices around the world fall under the heading of CSA (FAO. 2013). The technologies and practices presented in the Table below are already documented CSA practices in Ethiopia and East Africa.

Table 21: Climate-smart practices/technologies

CSA practice	Benefit		
	Productivity	Adaptation	Mitigation
Physical soil and water conservation technologies and practices.	Increases productivity through improved soil fertility and water availability.	Increases soil moisture conservation, prevents erosion. Builds soil fertility.	Improves soil above and below ground carbon stocks and organic matter content.
Agronomic practices: crop rotation, intercropping, contour ploughing.	Lowers production costs, reduces financial vulnerability by diversifying production, increases yields and, hence, improved incomes.	Improves soil fertility, maximizes the use of soil nutrients, reduces pest and disease risks, improves soil moisture content and storage.	Increases soil organic matter and soil carbon stocks, reduces the need for nitrogen fertilizers application.
Soil management practices: use of compost and vermicompost, green manure, mulching and crop residue management, bio-fertilizer application, acid soil liming, efficient use of inorganic fertilizers.	Increases productivity as a result of enhanced soil health.	Improves soil structure, improves water retention capacity of the soil, reduces crop failure risk, allows the efficient use of fertilizers and Increases supply or availability of nitrogen or other primary nutrients.	Increases carbon sequestration or carbon storage in soils, reduces use of synthetic fertilizers, reduces the carbon footprint related to production, transport and application of inorganic fertilizers.
Conservation Agriculture (CA.)	Improves soil fertility and, consequently, productivity and incomes.	Conserves soil moisture levels and reduces erosion. Helps avoid crop losses during dry periods.	Increased carbon stocks in soils. Reduces nitrogen loss. Emission of GHG stored in soils can be avoided by reducing tillage.
Agroforestry.	Crop diversification improves yield with potential benefits for food and nutrition security and income diversification.	Improves soil fertility, increases soil moisture levels, regulates canopy temperature, reduces heat stress on the soil and increased soil moisture maintains yields during dry periods.	Increased carbon sequestration and carbon storage from greater tree density.
Climate information systems:(crop calendars, seasonal forecasts and early warning systems).	Contributes to efficient use of agricultural inputs. Increases product quality and/or quantity and reduces crop losses through more informed decision making.	Improves farmer's preparedness and responsiveness to unpredictable weather patterns and extreme weather events (risk management strategy).	Planning appropriately for timely fertilizer use (the right time and amount applied) can reduce nitrogen emissions.
Use of climate change adapted improved seed and planting materials.	Use of improved seed varieties increases yield and quality of harvest and reduces investment in pesticides and water use.	Increases responsiveness to unpredictable weather patterns and enhances resistance to diseases and heat stress.	Reduction in the need for pesticides reduces carbon emissions by decreasing pesticide demand, as well as the number of on-field applications.
Water harvesting and efficient water management.	Increases productivity, hence incomes, and allows continuous production throughout the year.	Prevents soil erosion, increases availability of water during dry spells and droughts, increases water use efficiency and reduces soil erosion.	Reduces loss of water as runoff and this results in reduced emissions. Reduces energy required for irrigation, hence reduced GHG emissions.
Improved livestock feeding and grazing management: e.g. improved forage production in different land uses; zero grazing; improved feeding; feed reserves for the dry season (hay, silage, etc.) and Improved pasture management.	Increases total production and productivity per unit area during the year. Increased income stability and food security.	Improves quality and quantity of feeds, decreases drought vulnerability and feed scarcity for animal production, increases preservation and retention of nutritional forage, increases productivity per unit area and promotes soil and water conservation.	Improved feed quality reduces methane emissions related to enteric fermentation. .
Improved livestock breeds and shifting towards small ruminants and chickens.	Improved productivity: rearing of different livestock species expands the sources of income and food security and high-value product with export potential.	Improved breeds have greater resistance to diseases and various abiotic stress conditions. This reduces exposure to adverse climatic conditions and diversifies production.	Reduces feed requirements, hence reduction in emissions. Greater production per unit of feed results in reduced emissions per unit of milk and provides a moderate reduction in GHG emissions per unit of output.

CSA practice	Benefit		
	Productivity	Adaptation	Mitigation
Improved livestock housing and veterinary services.	Increases meat production due to conducive environment for feeding and growth and reduces mortality and, hence, improves productivity and profitability.	Protects livestock from extreme weather conditions such as heat waves, floods or extreme cold. Healthy livestock result in improved resilience to climate hazards.	Enhances manure management, hence reduces emissions. Increased production efficiency reduces GHG emissions per unit of product.

What is mainstreaming of climate-smart agriculture?

In the climate change context, mainstreaming refers to the incorporation of climate change considerations into established or on-going development programmes, policies or management strategies, rather than developing adaptation and mitigation initiatives separately.

There are two mainstreaming levels: strategic and operational. **Strategic level** mainstreaming addresses the organizational environment or structure in which policies and programmes are developed and implemented. **Operational level** mainstreaming involves integrating climate risk assessment into plans and actions. This involves undertaking an assessment of climate risks and identifying effective, efficient and equitable adaptation and mitigation measures, to build adaptive and mitigation capacity of households and communities.

What is mainstreaming of climate-smart agriculture (CSA) at watershed level?

The main reason for applying a watershed development approach is to move away from narrow sectorial approaches with uncoordinated and competing land uses, towards integrated planning and management, where the multiple interests of stakeholders are considered, synergies are identified and trade-offs among different uses are negotiated. It is argued that only a holistic approach that integrates all sectors and stakeholders in a watershed can sustain such ecosystem services and achieve sustainable development (FAO 2013).

Climate-smart agriculture (CSA) requires actions beyond the farm scale. It goes beyond new technologies and practices, like drought resistant plant varieties or precision farming. To achieve the multiple objectives of productivity and food security, enhanced farmer resilience and reduced greenhouse gas emissions, CSA must adopt a watershed planning approach. In addition, CSA must adopt a watershed planning and implementation approach, because:

- By taking a watershed approach and applying climate-smart agricultural practices, it is possible to find ways to increase mitigation and adaptation opportunities on community lands – and the entire ecosystem – while, at the same time, sustainably increasing and intensifying productivity on farmlands.
- Operating at watershed level also helps to address trade-offs. When adaptation and mitigation goals are pursued separately in agricultural systems, trade-offs may occur on different temporal or spatial scales. For example, efforts to promote the agricultural productivity of individual farms, by increasing the use of fertilizers and agrochemicals, could maintain crop yields in the face of climate change, but could result in greater overall GHG emissions. Conversely, the promotion of fast-growing tree monocultures or biofuel crops for mitigation purposes may enhance carbon stocks, but potentially reduce water availability downstream and decrease the land available for agriculture. Potential trade-offs between adaptation and mitigation activities can often be minimized, and sometimes even avoided, through an integrated landscape level planning approach.
- Planning, implementing and evaluating CSA practices in a watershed or using a watershed approach enhances field level productivity because it maintains ecosystem services and creates synergies between differed production systems. Watersheds are natural and cultural mosaics of land and water. Watershed approaches seek to integrate sustainable management of ecosystems and natural resources with livelihood considerations, recognizing that watersheds are multi-functional, providing benefits and services for a wide range of ecosystem processes, species and social actors.

- Working at watershed level ensues inter-sectorial coordination and cooperation.
- The final objective is to create climate-smart watersheds. Climate-smart watersheds are comprised of a variety of field and farm practices, in different land and tenure types that support both adaptation and mitigation objectives (Table 22).

Table 22: CSA practices adaptation and/or mitigation benefits at different scales

Scale	CSA practices with adaptation benefits	CSA practices with adaptation and mitigation benefits	CSA practices with mitigation benefits
PLOT	- Use of new crop varieties or livestock breeds that are drought-tolerant, or bred for specific environmental stresses - Adjustments in irrigation practices and systems - Changes in the timing of planting, pruning or harvesting - Adjustments in the cropping sequence and timing of irrigation or application of fertilizers and pesticides - Changes in timing, duration, and location of animal grazing - Conservation of crop and livestock genetic diversity	- Integrated soil and water conservation efforts - Incorporation of organic fertilizers and cover crops - Reduced or zero tillage - Maintenance of crop residues - Breeding crop varieties for shade tolerance - Use of agroforestry	- Reduced or more efficient use of fertilizers and pesticides - Adjustments in the type of feed provided to cattle - Reduced frequency or extent of fires - Reduced or more efficient use of machinery and fossil fuels - Improved management of cultivated wetland rice areas, to reduce methane emissions
FARM	- Changes in rotation or production systems - Improved water harvesting and retention, through ponds, dams, etc. - Increased water use efficiency, through improved irrigation practices - Conservation of agro-biodiversity - Use of seasonal and multiyear forecasting - Farm insurance or crop or livestock insurance	- Diversification of crops and livestock systems on the farm - Soil conservation practices, including terracing and land contouring - Improved residue management and use of cover crops - Integrated nutrient management - Use of agroforestry - Use of silvo-pastoral systems (e.g., trees in pastures, live fences, fodder banks) - Appropriate animal rotation practices - Use of conservation agriculture (i.e., minimal soil disturbance, maintenance of mulches, use of crop rotation and intercropping, integrated pest management) - Use of multi-cropping, intercropping and crop rotations	- Reduced or more efficient use of agro-chemicals - Planting of biofuels and trees for fuel wood - Planting of fast-growing tree plantations - Reduced use of machinery and fossil fuels - Generation of biogas from manure - Use of improved feeding practices for livestock

Scale	CSA practices with adaptation benefits	CSA practices with adaptation and mitigation benefits	CSA practices with mitigation benefits
Watershed	- Maintenance of habitat connectivity to ensure pollination and pest control - Development of water collection systems, irrigation infrastructure, and other engineering solutions, to reduce risks from floods, water scarcity and other climate-related risks - Targeted location of intensive livestock production, within the landscape, to reduce water contamination - Diversification of farmer income options	- Land-use planning at the landscape level for multiple objectives - Maintenance of landscape diversity including a mosaic of agricultural land and natural habitat - Conservation and restoration of riparian areas within the agricultural landscape - Conservation and restoration of remaining forest habitats in the surrounding landscape, including formal and informal protected areas - Establishment of agro-forestry and silvo-pastoral systems - Sustainable intensification of livestock production and crop production in some areas, to reduce pressure on fragile land - Increases in the duration of fallow periods in shift and burn cultivation - Restoration of degraded or fragile lands - Conservation and restoration of wetlands and peat lands - Reduced expansion of cropland into remaining natural habitats	- Planting of biofuel feedstock - Careful management of fires

Source: Harvey et al., 2013

Session 8: Managing Livestock to Secure Sustainable Use of Natural Resources

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE V: MAJOR INTERVENTIONS OF COMMUNITY-BASED LAND MANAGEMENT	**M V-8**
Session 8: Managing livestock to secure sustainable use of natural resources	**Session 8**

Specific Information

Learning objective	Participants shall be able to: - Describe the current system of livestock management in Ethiopian? - Explain the negative impact of free grazing on sustainable use of natural resources - Explain the key lessons gained from adopting livestock farming - Describe backyard livestock farming and explain the major activities implemented by different stakeholders in the adoption of backyard livestock farming - Explain the socio-economic, environmental and social benefits gained from adoption of backyard livestock farming
Duration	120 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	20 minutes	The Facilitator brainstorms on the session by asking the following questions: - What is the current livestock management system in Ethiopian? - What are the negative impacts of free grazing on sustainable use of natural resources? - What are the major activities implemented by different stakeholders for the adoption of backyard livestock farming? The Facilitator then provides an input on each question.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level, then discusses the individual concepts in detail. Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides the participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	30 minutes	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on the socio-economic, environmental and social benefits gained from adoption of backyard livestock farming and highlights the key lessons gained from adopting livestock farming forage development strategies	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	10 minutes	The Facilitator leads discussion on the following questions: - Is knowing about the socio-economic, environmental and social benefits gained from adoption of backyard livestock farming, the key lessons gained from adopting livestock farming and forage development strategies important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 5 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- What are the socio-economic, environmental and social benefits to be gained from adoption of backyard livestock farming?
- What are the key lessons to be gained from adopting livestock farming?

- What are the key forage development strategies?

Time for discussion and preparation: 30 minutes. Time for presentation: 5 minutes per group.

Handouts

What is the current system of livestock management in Ethiopian?

Although mixed farming has been practiced in the Ethiopian highlands over many years, the low level of integration among the three sectors (livestock, crop and natural resources), coupled with other reasons, has severely affected productivity and has become a cause of (expanded) land degradation. In this regard, the existence of a high livestock population, managed in a free grazing system lacking any improvement intervention, is considered to be one of the fundamental causes of land degradation in Ethiopia.

What are the negative impacts of free grazing?

Table 23: The ill effects of free grazing on natural resource, crop and livestock productivity

Effects on Natural Resource / Environment	Effects on Livestock Productivity	Effects on Crop Production
Cause of destruction of constructed SWC measures	Aggravated existing feed shortage	Soil fertility loss and increases the risk of soil acidity
Major cause of gully formation	Favour disease prevalence and llivestock death due to contamination	Unable to practice agro-forestry
Loss of soil fertility and soil health [OM, ACIDITY, MN]	Heat stress: Poor/reduced reproductive performance	Traction power shortage, due to low reproduction
Significant reduction in survival of plant seedlings	Energy loss: 25-45% energy loss because of free grazing	Inappropriate use of manure for compost
Reduced infiltration and enhanced water runoff	No breed improvement under free grazing system	Limit moisture availability /content of soil
Enhances potent GHG emissions	Overall productivity of livestock is very poor	

What is "backyard livestock farming"?

Backyard livestock farming is replacing free grazing with the practice of stall feeding in the backyard. It is a livestock husbandry system that can be practiced by community members living in a defined area (for example at watershed level), who have willingly accepted to implement the system. In this system, all community members tie/keep their livestock in their backyard and, based on their land holding size, prepare hay plots and/or collect fodder from different sources. The system prohibits farmers from letting their livestock move onto communally used areas and onto any farmland.

What are the major activities implemented by different stakeholders in the adoption of backyard livestock farming?

Table 24: Major activities implemented by different stakeholders in the adoption of backyard livestock farming

S/N	Major Activities	Implementation Period	Executing Agency
1	Organize a consultative workshop and carry out a critique of the situation together with concerned government bodies, and collect ideas/ inputs to draft a policy document.	September	Bureau of Agriculture
2	Incorporating ideas or inputs that improve the draft document and prepare the final document.	October	Bureau of Agriculture, Livestock Agency and GIZ
3	Providing training of trainers	October	Bureau of Agriculture, Livestock Agency and GIZ
4	Cary out discussions with beneficiary farmers in selected watersheds and develop a common awareness	November and December	Woreda Agricultural Development Office

S/N	Major Activities	Implementation Period	Executing Agency
5	Organizing/packaging best practices in areas where there is well developed, improved livestock farming, and disseminate or make it available to beneficiary farmers	December	Bureau of Agriculture, Livestock Agency and Woreda Agricultural Development Office
6	Create favourable conditions for farmers to visit areas having the best experience in improved livestock farming systems	December	Livestock Agency and Woreda Agricultural Development Office
7	Launching backyard livestock farming/formulating by-laws and get it approved	December and January	Woreda Agricultural Development Office
8	Launching backyard livestock farming	January and February	The community and Woreda Agricultural development Office
9	Availing forage, and other inputs that are sources of better livestock feed in the crop-livestock production system	April and May	Woreda Agricultural Development Office
10	Provide advisory services to farmers, to work on selected commodities and facilitate market integration	September to December	Woreda Agricultural Development Office
11	By following up the implementation of the strategy, organize a data base supported by video and figures/statistics	All year round	Stakeholders
12	Encourage watersheds registering better accomplishments by rewarding them through motivating prizes	At the end of the year	Woreda Agricultural Development Office

What are the socio-economic and environmental benefits to be gained from adoption of backyard livestock farming?

i) Natural resources protection and development.

Reduces damage caused by free grazing on soil and water conservation structures and eases pressure on forage trees, shrubs and herbs planted to reinforce physical soil and water conservation structures, hence extending the lifespan of physical conservation structures and improving natural resources protection.

ii) Improving soil fertility and productivity.

In the Ethiopian highlands, about 30-35% of arable land is affected by soil acidity, which clearly shows the severity of the problem. In addition, studies indicate that in soils affected by acidity and lacking natural organic matter, use of improved technologies, like improved seed and chemical fertilizer, that is bought with a huge financial outlay, results in no visible yield increment.

However, in areas where free grazing is stopped and backyard livestock farming is implemented, land that was out of production due to soil acidity has been returned back into productive use. Biomass from the Lucerne tree, and other green vegetation, was turned under/ploughed under, and the decomposed biomass drastically reduced soil acidity, thereby rehabilitating the land. As a result, farmers were able to grow crops on this land and the harvested yield was threefold compared to the previous productivity.

Improvements in the soil were attributed to increments in organic matter content in the soil and its capacity to retain important minerals in the soil system, enabling plants to absorb nutrients. When this method is compared with lime application that costs a lot of money and labour, it is noticed that the biological method is by far better in terms of cost and crop production effectiveness.

iii) Improving soil moisture and ground water levels.

When backyard livestock farming is carried out, it is observed that the biomass generated from crop residues, and the proliferating vegetation cover on common grazing lands and other land holdings, is incorporated in the soil. This incidence, apart from reducing opportunities for runoff water formations, also increases the capacity of the soil to absorb moisture, enhance water infiltration and, thereby, make ground water available at a shallow depth.

Improvements in soil moisture holding capacity has enabled farmers to grow chick peas, rough peas and other crops, using residual soil moisture and, thereby, to generate additional income. Moreover, prevalence of water at a shallow depth, compared to the previous situation, has given farmers the opportunity to abstract ground water easily and to use it for livestock watering and household use. This has been practically observed in many places.

iv) Improving vegetation cover and forest development.

Avoiding free grazing has drastically improved the survival percentage of fodder trees and other plants, planted on soil and water conservation areas. Likewise, it has created conducive conditions to carry out forest and fruit development on selected sites. In these activities, apart from improving biodiversity, the improvement in green vegetation cover plays an important role in curbing the challenge of climate change.

v) Improved conservation agriculture and mixed agriculture development.

Conservation agriculture is an agricultural method that conserves, improves and ensures effective use of natural resources. Conservation agriculture is practiced, based on three key principles; permanent soil cover, no tillage and crop rotation. Failure to integrate these key principles with controlled/backyard livestock farming practices makes undertaking conservation agriculture impossible. This is because in free grazing areas crop residue is consumed by livestock and no other biomass is available to serve as a permanent soil cover.

vi) Improving crop production and productivity.

In the Ethiopian highlands, crop production and livestock husbandry are highly integrated and livestock are used for animal traction/ploughing, threshing and transport. However, the current farmer-oxen ratio shows that those households having no oxen or only one ox are about 50% of the total. This is an indicator that, currently, livestock husbandry does not satisfactorily support crop production. Preliminary studies show that those community members who adopt backyard livestock farming have increased oxen availability as a result of increased livestock productivity. In addition, the system has also positively contributed by producing healthy and strong animals that can provide effective traction power for timely seed bed preparation. Furthermore, backyard livestock farming also contributes through better use of manure for soil fertility.

Improvements in soil fertility, and its capacity to retain moisture, has enabled farmers to grow additional crops such as chickpea and rough pea, using the residual moisture after harvesting the major crop, and this has increased production from each unit of farm land.

vii) Improvements in livestock resource development.

In the free grazing system, a large number of livestock are deployed on a small area of grazing land, which does not allow them to obtain adequate fodder (per animal); hence, the yield from livestock in a free grazing system is generally low. In addition, as the livestock come from different villages, the congregation of a large number of animals in a small area creates conducive conditions for the spread of livestock diseases. In this situation, apart from economic losses inflicted by livestock deaths, farmers are, potentially, exposed to high veterinary expenses. Conversely, backyard livestock farming creates possibilities to obtain a high milk and meat yield.

Currently milk productivity in the country is about 1.3 litres per cow per day and this milk yield is obtained on average for only five months per year. Although there are about 19 million cows in the country, poor home milk yield has forced Ethiopia to import a large amount of milk at high cost, in foreign exchange. Meanwhile, it has been observed that backyard livestock farming creates conditions for increasing livestock production (meat and milk).

viii) Improving forage supply.

Currently farmers that adopt backyard livestock farming have seen (practically) an increase (quantity and quality) in the amount of forage they harvest, as compared with free grazing. In general terms, free grazing cannot improve the availability of feeds but, rather, results in a significant reduction in both quality and quantity. Thus, the usual arguments that comes from both farmers and 'experts' (how can we stop free grazing without having adequate feeds?) appears empty. Such a system is believed to bring opportunities for producing additional forage from different land use, including from bunds, gullies and degraded areas, which is not the case with free grazing. On the other hand, when livestock are kept in the backyard, farmers prepare a feeding trough and feed their livestock by grouping them according to their ages and productivity, and this has enabled farmers to use forage properly and avoid wastage.

Figure 27: Control of free grazing,and cut and carry system exercised by farmers

i) Improving livestock health.

When different kinds of livestock are kept on a small grazing area, in large numbers, incidences of livestock disease are inevitable and affect the sector's productivity.

Information collected from those areas which have banned free grazing shows that disease distribution has drastically decreased. As realized from the experience of watershed communities practicing backyard livestock farming, it is possible to reduce the annual livestock death rate from the current 10% to an estimated 5%, by changing the livestock management system. In relation to current livestock populations (cattle, sheep and goats), there is possibility to save above 1.5 million heads of livestock from dying per annum.

Backyard livestock farming also helps to drastically reduce leech attack, gastrointestinal problems, physical injury, due to fighting amongst livestock, as well as losses that arise from injuries caused by livestock falling into gullies and off cliffs, and also from wildlife attacks.

ii) Improving provision/supply of water.

In backyard livestock farming, livestock are not exposed to long walks, in hot temperatures, in search of forage and water, which reduces livestock water needs because of the reduction of water loss through evapotranspiration. Moreover, if ground water abstraction is reduced it will be available at shallower depths, allowing farmers to dig water wells in their backyards and to provide clean water for livestock and household use.

iii) Improving the reproductive potential of livestock.

Backyard livestock farming creates conducive conditions in which to carry out productive livestock husbandry. The system enhances opportunities to improve and expand the livestock breed through use of genetically superior bulls and artificial insemination. It also helps to keep

a record of breeding history and to avoid the problem of traceability, particularly for livestock products supplied to the international market.

As backyard livestock farming enables livestock to access improved fodder, better veterinary services and management, their age at first calving and calving intervals become shorter. The weaning age of calves and calf mortality is also reduced. The system further allows close follow-up of the "heat" period of cows and to carry out selective breeding, which produces better animals.

iv) Destocking and creating equity in the use of grazing land.

Under a free grazing system, land is not equitably used, by being divided among community members. Rather, it is a system where those farmers having more livestock use grazing land without any restriction. The system has encouraged farmers to keep more livestock (in number) without giving due regard to livestock productivity or the environment. In those areas that have banned free grazing, poor famers, including women, are able to benefit equally from the presence of communal grazing land.

Although farmers having larger livestock numbers were initially unhappy when free grazing was stopped, eventually they were able to earn a higher income (than before), by reducing the number of livestock and keeping a few, more productive animals. Destocking is only possible if such a system is adopted (or if a degraded environment results in a collapse in livestock numbers).

v) Reducing conflict.

As current livestock management in Ethiopia is predominantly based on free grazing, free moving livestock regularly encroach on privately owned crop and grazing lands, and this intrusion causes conflict that sometimes results in loss of human life. Implementation of a backyard farming system that bans free grazing, plays a vital role in solving social problems that could arise due to the free movement of animals. As a result, there is generally reduced conflict among community members when free livestock grazing is eliminated.

vi) Improvement in children's school enrolment.

It is widely known that the labour required to keep livestock largely rests on children, as a result of which, many of them lack opportunities to go to school. However, in areas where free grazing is banned, there is no need for children's labour (looking after livestock) and it is observed that the number of children attending school is increased.

What are the social benefits of backyard livestock farming?

These include:

- Reducing conflict; and
- Improvement in child school enrolment and attendance.

Both these topics are extensively discussed in the section above.

What are the key lessons from adoption of backyard livestock farming?

A. Contribution of backyard livestock farming to overall farming system productivity.

The backyard livestock farming system is an effective method to enhance livestock sector productivity. The system focuses on millions of farmers and, if appropriately applied, the positive change experienced can be tremendous.

As can be seen in areas where the system has been adopted, the daily milk yield of local cattle breeds has increased from 1.5 to 3 litres. Likewise, calves become ready for market in two years and lambs in 4 months. This yield increment is a decisive step in value chain-based development within the sector.

In areas where the backyard farming system is implemented, farmers are highly engaged in the fattening of cattle, sheep and goats; improved forage utilization methods and better livestock health services are widely practiced and it is realized that these activities are creating better employment opportunities and improvements in the economic status of farmers.

What we can learn from other areas or countries is that expanding these kinds of activities helps the emergence of local agro-processing industries that enhance economic transition in the agricultural sector. This is important, as a 1% increase in agriculture sector activity brings a 4-5% increase in other economic sectors. This is why the strategy has multi-dimensional benefits and requires a lot of endeavor in its implementation.

B. The role of the backyard livestock farming system in the Green Economy strategy.

At national level, the contribution of livestock to polluting gas emission is estimated at 42%. Out of this, the GHGs that comes from ruminant livestock (sheep, goats and cattle) is estimated at 80%. The amount of gas released from a single head of livestock depends on its health status, the type and amount of fodder it consumes, its age, its daily movement, as well as the way in which its manure and urine is handled. In this context, research indicates that the use of improved fodder and industrial by-products drastically reduces the emission of greenhouse gases.

In addition, improvements in reproduction time and associated productivity factors, can make livestock ready for market at a younger age, thus (as the life span of an animal becomes shorter) the emission of gases from each animal also decreases. Moreover, the banning of free grazing allows the growth of plants and the recovery of soils, which reduces carbon emissions as a result of soil degradation. Backyard livestock farming also promotes mixed farming systems in which trees and shrubs and other herbs/plants grow well and sequester carbon in their branches and leaves and in the soil. All these add up to magnify the vital role that could be played by backyard livestock farming in establishing a climate change resilient economy.

What are the main forage development strategies?

The following are the major land use based approaches for forage development.

A. Backyard forage production

Backyard forage production is the growing of forage in the household compound. It is an easy and quick way of increasing forage availability.

Backyard forage is easily established and highly productive, because of the availability of more fertile soils and better protection and management. In addition, forage is produced near to where animals are usually tethered and can be utilized as a feed supplement for highly productive animals.

A small plot of 100m^2 in size can provide 150kg of dry matter per year; that is 1kg per day for 5 months, which is enough to supplement the feeds for one large animal, particularly if the forage species planted is of a high nutritive value and produces better biomass (which is advisable).

The size of the plot can be varied, depending on herd size and the land holding of the household. Key species for backyard forage in different agro-ecologies of Ethiopia include Leucaena, Sesbania, Pigeon pea, tree Lucerne, Vetch, Green-leaf, Silver-leaf, Alfalfa, oats, Rhodes grass, Elephant grass, Panicum grass and Phalaris grass.

B. Forage development in stock exclusion or closure areas

This refers to the introduction of improved forage species into areas from which livestock are permanently excluded. These are often areas that have become generally degraded with little quantity and quality forage.

The strategy is designed to prevent further soil erosion, improve soil fertility and provide forage for cut-and-carry management. Suitable species include: herb legumes (green-leaf and silver-leaf desmodium, siratro, glycine, verano stylo, seca stylo), grasses (Rhodes, buffle). tree legumes (tree lucerne, sesbania, lukina).

Area closures refer to restricted livestock and human access to an area to allow regeneration of a degraded ecosystem. This is a common practice in rural areas of Ethiopia. Herbivore animals and any human misuse, such as firewood collection, are excluded, so that the ecosystem can regenerate and increase its productivity. This land-use-based option is, therefore, more of a land rehabilitation than a feed improvement practice. However, it serves both purposes well.

Excluding livestock is an important means of protecting degraded areas of communal land. The success of this strategy mainly depends on the involvement of different actors and the introduction of appropriate technologies that may enhance productivity and natural resource rehabilitation.

C. Gully rehabilitation for forage development

Gully rehabilitation is an innovative way of producing fodder in gully areas. Forage plant species are planted along gully banks, on the gully wall and inside the gully to rehabilitate the gully and at the same time to produce forage for livestock.

D. Forage development on farmlands

The most common form of this forage development is sowing of forage species as an annual or perennial plantation crop. This strategy provides a convenient way to rapidly increase farm forage supplies for a large number of farmers and can have a major impact in the short to medium term. The use of legumes improves the fertility and structure of soils. A common example is Lablab intercropped with sorghum.

Under sowing works best with sprawling, low-growing annual legumes, but can also work well with climbing dual purpose legumes. The strategy is particularly suited to tall cereals (maize, sorghum or finger millet), but can also work with other crops, such as wheat.

E. Fodder crop system or pure stand

The fodder crop system involves the growing of high yielding, high quality, short-term forage crops for intensive livestock feeding.

Crops are cultivated in an area that is suitable for the crop and can be either irrigated or rainfed. Most selected crops have a high feed value and supply green feeds over a long period of time. Because forages have a high feed value, they are mostly given to highly productive animals such as dairy cows and finishing animals.

Some crops, such as alfalfa, oats, vetch and fodder beet, can be grown over a wide range of altitudes. The fodder crop system is promoted on fertile soils, for intensive livestock enterprises, such as dairying; where extra land is available, so that food production will not be reduced, and on sites convenient for cut-and-carry fodder utilization.

F. Forage developments on grazing land

This forage improvement strategy is applied on newly established pasture and on land adjacent to existing grazing land.

Establishing new pastures may demand a high cost and may be applicable only to high-producing enterprises with high cash returns, as it carries a high management requirement and seeding rate. In addition, some form of stock control or community by-laws need to be implemented to protect the pasture from overgrazing.

Suitable species include:

Low altitude: Rhodes grass, Green panicum, Desmodium, Siratro, Stylo.

Medium altitude: Phalaris grass, Rhodes grass, Setaria, Desmodium, Trifolium.

High altitude: Phalaris, Cocksfoot, tall fescue, Trifolium, vetch (mainly as a pioneer species).

MODULE VI: SUSTAINABLE COMMUNITY FINANCING MECHANISMS FOR COMMUNITY-BASED LAND MANAGEMENT

Module outline

Learning Objectives:	Participants shall be able to: - Explain sustainable financing and its importance. - Identify and describe the cost categories of community-based land management interventions. - Explain the benefits of community-based land management interventions and the methods for valuation of the environmental services of CBLM practices. - Explain the steps required to conduct a cost benefit analysis. - Identify and explain the four main financing mechanisms and the key providers of sustainable finance. - Describe a business, watershed management as a business, business planning and explain why farmers need a business plan. - Describe business innovation and explain why we need to innovate our businesses. - Explain the steps in farm business planning. - Describe financial resources and financial management and explain the elements of financial management. - Describe financial management at cooperative level and the objectives of financial management at cooperatives level. - Explain the different components of cooperative financial management.
Duration:	340 minutes
Preparation:	Colour print A-4 laminated pictures, notebooks, pens, flipchart paper, markers, ruler, white board, cloth/sponge.

This module contains four sessions:

Session 1: Sustainable financing and financing mechanisms (60 minutes).

Session 2: Cost benefit analysis (90 minutes).

Session 3: Business planning in community-based land management (90 minutes).

Session 4: Management of financial resources in community-based land management (100 minutes).

Overview

In this module, participants will learn about the objectives of sustainable financing of CBLM interventions and cost benefit analysis. Participants will also be able to explain management of financial resources in community-based land management and business planning in community- based land management.

Session 1: Sustainable Financing and Financing Mechanisms

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Session 1: Sustainable financing and financing mechanisms	**Session 1**

Specific Information

Learning objective	Participants shall be able to: - Define sustainable financing - Explain the importance of sustainable financing - Identify and explain the four main financing mechanisms - Identify the key providers of sustainable finance
Duration	60 minutes
Training methods	Brainstorming and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	60 min	The Facilitator briefly introduces the session and asks participants to brainstorm on the following: - Sustainable financing. - The importance of sustainable financing for sustainable land management. - Financing mechanisms for community- based land management in Ethiopia. - Finance from internal sources. - Finance from external sources and key providers of sustainable finance. - Payments for ecosystem services (PES) and types of ecosystem service buyers. - Revolving fund as a financing mechanism. The Facilitator assesses participant´s knowledge level and discusses the topic in detail.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s know-ledge level then discusses the topic in detail. Key discussion points are noted down on a flipchart

Hints for preparation, typical situations and dangers

The following explanations shall remind facilitators of the different steps in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;
- **Generalization** - Connecting the results to everyday life experience, thereby abstracting from the active engagement / experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Refer to Module 6 of the Technical Manual.

Additional Material

Handouts

What is sustainable financing?

Sustainable finance refers to an organization's ability to raise resources to fund its activities, based not only on financial criteria, but also on environmental, social and governance considerations.

Traditionally, decisions were made, based on financial considerations alone, whereas today, environmental, social and governance issues are being factored, in which are important, in order to contribute to sustainable development.

Environmental considerations include the preservation of biodiversity, pollution prevention and climate change mitigation and adaptation.

Social considerations refer to issues of inequality, inclusiveness, labour relations, investment in human capital and communities, as well as human rights issues.

Governance refers to public and private institutions that play a fundamental role in ensuring the inclusion of social and environmental considerations in the decision-making process.

What is the importance of sustainable financing for sustainable land management?

Sustainable land management is a continuous process that requires ongoing investment in the maintenance, productive use and management of natural resources.

Natural resources conservation is capital intensive and sustainable development requires sustainable financing. Currently the bulk of investment funds for sustainable land management activities come from the federal government, donors, NGOs and local communities, through community campaigns that mainly include labour mobilization.

Considering the growing demand to address land degradation challenges and to ensure the continuation of sustainable land management investment throughout the country, establishing innovative financial mechanisms that can be tapped to support the promotion and scaling-up of sustainable land management need constant attention. In consequence, sustainable development programmes and government have recently been exploring different approaches to ensure sustainable financing for the country-wide implementation of sustainable land management.

In general, development partners strongly support the transition to a climate-neutral, climate-resilient, low-carbon, more resource-efficient and sustainable economy which requires a financial system that supports sustainable growth.

What are the financing mechanisms for community-based land management in Ethiopia?

These include:

- Finance from internal source
- Finance from external source
- Payments of ecosystem services
- Revolving Fund as Financing Mechanism

What is finance from internal sources?

In recent watershed development works, business development, based on natural resources, is undertaken in consideration of two objectives: 1) optimizing economic benefits, by creating alternative livelihood options (income and jobs) for local communities; and 2) maintaining the sustainability of rehabilitated areas, through reinvestment of economic value gained from resource use. However, the key limitation, or bottleneck, is to access sustainable financial resources that support communities, primarily to increase production and productivity and income, and secondly to reinvest in resource conservation, maintenance and further development of the resource base.

The primary option to support land management interventions is mobilizing internal resources mainly from the local community and using local materials. Beyond the community, creating partnerships and development collaborations with the private sector, who are indirect beneficiaries of watershed resources, could be another option for mobilizing local resources.

Overall, the involvement of communities and the private sector in land management interventions helps to ensure sustainable engagement in developing land resources for diversified and maximized benefits, both for direct user communities and indirect users, who may be involved in supply of inputs/technologies, market products to end users, or who access environmental services from watershed development activities. Some of the benefits received by diverse actors will be:

- Local communities receive benefits from rehabilitated watersheds, in the form of sustainable resources like grass, trees and other products.
- 'Immediately' obtainable increased income for communities.
- Activities undertaken in rehabilitated watersheds must maintain and, ideally, enhance the productive capacity of those rehabilitated watersheds.
- Measures should focus on linking diversified and valuable "environmentally friendly" products to output markets.

The conventional approach of NRM is skewed towards physical and biological conservation rather than towards socio-economic elements. The concept of 'protection through production' argues that the economic value gained from the use of rehabilitated areas should be partly reinvested in the rehabilitation of natural resources, in addition to improving livelihoods of local communities.

The central tenet of the 'protection through production' framework is that the community's dependence on external resources for implementing and financing rehabilitation efforts is minimized. A sense of ownership among the ultimate beneficiaries of the natural resource is increased, as they put part of the economic value of their production into maintaining the production capacity of the natural resource. The link is shown in the schematic below.

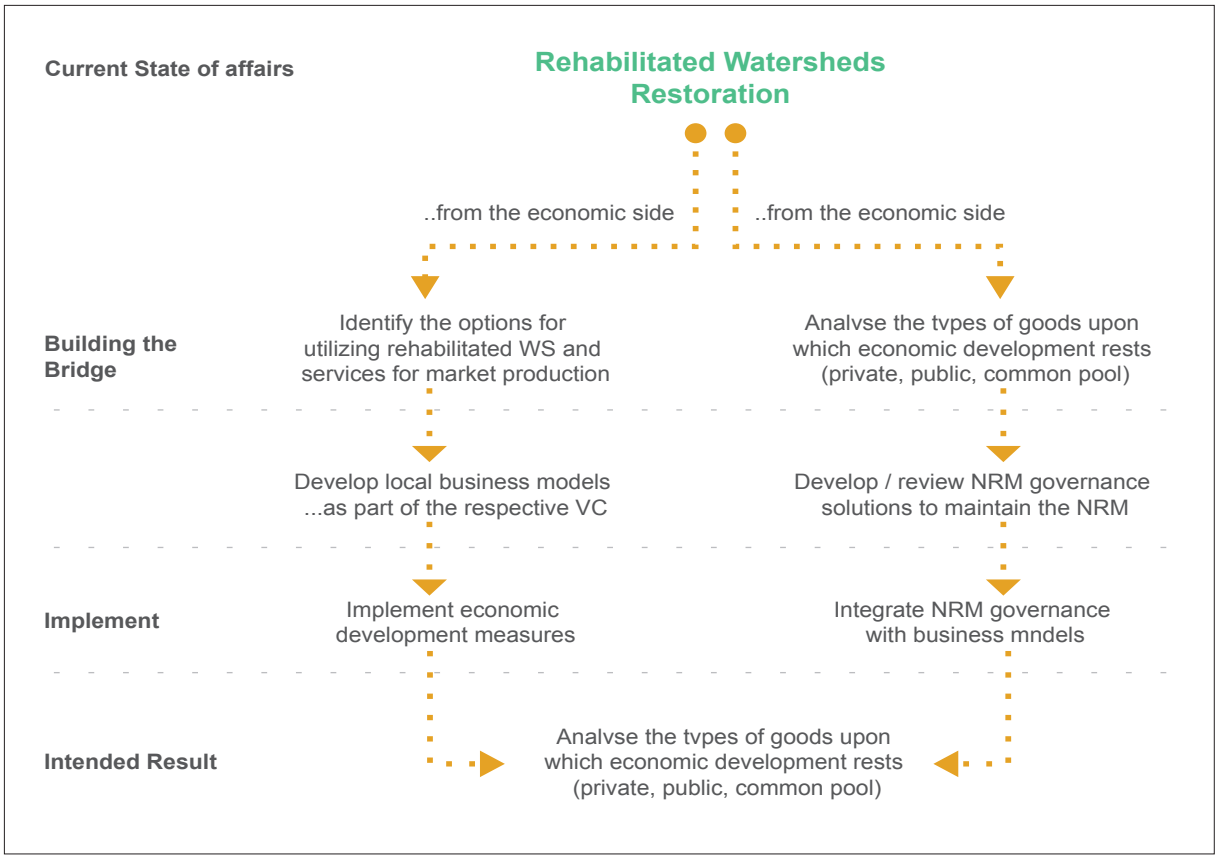

Figure 28: The concept of 'protection through production'

The above argument shows that community is one source of finance to rehabilitate, protect and sustainably use degraded lands.

Community members can pool their resources through watershed users' cooperatives, established are legal organs to collect, allocate and administer financial resources from members and other stakeholders.

They can collect money from their members as shareholder and other contributions, with different purposes.

What is finance from external sources?

These are grants and loans from donors, government and financial institutions.

Methods of accessing finance from external sources include:

- Developing a proposal, with the support of extension workers, and seeking resources from government, international and national organizations and the private sector, by showing the interest, the progress and the current management capacities of the cooperative.
- Mainstreaming natural resources conservation into any development effort undertaken by outsiders in the community and surrounding area. For example in agriculture, education, health or any other project intervention in the community.
- Requesting payments for ecosystem services being provided (section 5.7 gives details of payments for ecosystem services).

Cooperatives can also borrow money from financial institutions through their umbrella organizations or micro finance institutions / saving and credit associations, as per the regulation of financial institutions in the country.

Who are the key providers of sustainable finance?

These include:

Banks: Banks provide a significant proportion of the financial resources that can be mobilized for green investments.

International financial institutions: By testing new ways of financing and channeling funds toward sustainable development, through mechanisms such as green bonds, and influencing global financial governance to give more support to sustainable development. These include green investment banks and development banks, which provide funding for sustainability and development-related projects respectively.

International organizations: Organizations such as the UN, OECD and the G20 provide limited finance but set the agenda on sustainability issues at the international level, and help coordinate sources of funding.

Climate funds: The Green Climate Fund, Adaptation Fund, Global Environment Facility and Climate Investment Funds, are multilateral funds for climate change adaptation and mitigation projects, funded through contributions from individual countries. National governments determine the amount of public funding earmarked for green investments, as well as the extent of institutional support for them. They can also support the design of dedicated domestic investment vehicles, such as national climate and environmental funds.

Central banks and regulatory authorities: These can also steer the finance sector toward green investments, through policies and regulations.

Institutional investors: E.g. pension funds, sovereign wealth funds and insurers, are another important group of private-sector financiers.

Micro-finance institutions and saving and credit associations: At local level these institutions are accessible to watershed communities and can provide loans in the framework of general financial mobilization.

How can sustainable finance help support restoration?

FAO and UNCCD have identified several work streams that policymakers can unleash to mobilize resources to support land rehabilitation. These include:

- **Mainstreaming SLM in state budgets**: funds can be earmarked for restoration initiatives and kept in check through public expenditure reviews. SLM can be integrated into national accounting. In the field of development aid, donor countries can also provide funds specifically to support SLM.
- **Setting up appropriate funding mechanisms**: these can include national environmental or forest funds or public incentive schemes (such as payments for ecosystem services), as well as support for local approaches.
- **Engaging the private sector**: policymakers can work with companies to promote voluntary commitments, through corporate social responsibility (CSR) schemes. They can attract investors by developing marketplaces, reducing risks on investments in NR (e.g. through backing them via public institutions).
- **Building alliances and partnerships**: these can be built at the international, regional, national or local level, ranging from global partnerships to small businesses and farmers at the local level.

What are payments for ecosystem services (PES)?

PES are benefits that people obtain from ecosystems. This encompasses both goods, such as food, and services such as air purification.

Payments for ecosystem services (PES) occur when the beneficiaries or users of an ecosystem service make payments to the providers of that service.

In practice, this may take the form of a series of payments in return for receiving a flow of benefits or ecosystem services. The basic idea is that whoever provides a service should be paid for doing so.

What are the categories of ecosystem services?

Supporting services. These are services, such as nutrient cycling and soil formation, which are needed for the production of all other services.

Provisioning services. Products obtained from ecosystems, such as food or timber.

Regulating services. The benefits obtained from the regulation of ecosystems, include services such as purification of water, flood control or regulation of the climate via carbon sequestration.

Cultural services. The benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences.

Payment for ecosystem services can be based on the following:

- Carbon sequestration and storage.
- Biodiversity protection/bundled services (highly efficient but very difficult to organize and maintain).
- Watershed protection (often occurs when at least one stakeholder recognizes the need for resource protection and a willingness to pay suppliers ensues, often using intermediaries such as government or nongovernmental organizations (NGOs) to channel payments from users and suppliers).
- Landscape beauty (for example, eco-tourism).

Who are the "ecosystem service buyers"?

These can include:

Government: Public-sector agencies seeking to secure public goods on behalf of their constituencies. The buyers in these cases can be national funds, regional or local development funds or international donors.

Business: Companies may engage in these schemes for a variety of reasons. They may participate because they see a direct link between long-term profitability and conservation or restoration of ecosystem services. This may be witnessed through improved and sustainable production practices that reduce the need for inputs or the risk of ecological or social disruption to their operations (e.g. for water companies, if the cost of removing sediments from upstream soil erosion is reduced).

Philanthropic buyers: These include local, national or international conservation and development NGOs, as well as charitable foundations and individuals who recognize the importance of creating incentives for the maintenance or restoration of ecosystem services.

The best example of payment for an ecosystem initiative in Ethiopia is the Humbo Community-based Natural Regeneration Project in SNNPR.

It is the first PES project in Ethiopia (a carbon trading initiative funded by the World Bank).

It is a farmer-managed natural resource regeneration approach that was used to restore degraded natural forests, through village-level cooperatives.

The project began to receive payments for carbon credits in 2011 directly benefiting 5,000 members

What is a revolving fund as a financing mechanism?

Watershed users' cooperatives can sustainably use the funds they raise from internal sources (members contribution and sale of watershed-based resources) and funds they receive from external resources (government, private enterprises or other development organizations). One of the fund management mechanisms commonly used by cooperatives is the revolving fund method.

A revolving fund is a gap financing measure primarily used for development and expansion of small businesses. It is a self-replenishing pool of money, utilizing interest and principal payments on old loans to issue new ones.

A revolving fund is used to give loans to members, to be expended or invested on a specific purpose, with the condition that repayment or benefits, or income, from the fund may be recycled to give loans to other members of the cooperative.

The loan is given to members who have interest and are willing to use the money for the specified business or purpose and who are willing to repay the principle with interest.

The revolving fund is vital to its borrowers as they get access to easy and convenient finance. Similarly, it is essential for the owners, as they get the return on investment and borrowing option, at affordable rates, in case of need. If managed properly, revolving funds build self-sufficiency.

How does a revolving fund work?

The initial capital in a revolving fund comes from its members, donors, government, or a third party. This fund is collectively loaned to members who need money. The cooperative charges interest on the money, at a nominal rate, or lower than the market rate.

At year-end, or after a specific period, the fund is returned by the borrower to the cooperative, at which point the fund is given to another willing borrower or invested or expended.

Sustainability of revolving funds

The operations of a revolving fund are to be monitored periodically. The fund should become self-sufficient after a specific period of time, but factors responsible for its failure are:

- Inflation
- An imbalance between interest income and expenditure
- Liabilities, e.g. legal expenses, etc.
- Non-payment and default on loans.

Proper management of the fund and fast recovery of loans and costs, generates a sense of ownership and financial viability and increases sustainability and faith.

The performance of a Revolving Fund is assessed based on the number of entitled beneficiaries, the level of the repayment of loans, the recirculation of funds, and the increase in the welfare/economic capacity of beneficiaries. Based on these performance indicators, the longer the operation of a revolving fund, the more will be the people who obtain the funding facility and the more people whose welfare is improved.

Session 2: Cost-Benefit Analysis

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Session 2: Cost-Benefit Analysis	**Session 2**

Specific Information

Learning objective	Participants shall be able to: - Describe the objectives of a cost-benefit analysis - Identify and describe the costs category of community-based land management interventions - Explain the benefits of community-based land management interventions - Explain the method for valuation of environmental services of CBLM practices - Explain the steps required to undertake a cost-benefit analysis
Duration	90 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	20 minutes	The Facilitator briefly introduces the session and asks participants to brainstorm on the subject of cost-benefit analysis and asks the following questions. - What are the objectives of undertaking a cost-benefit analysis? - What are the cost categories of community-based land management interventions? The Facilitator then provides a theoretical input on each topic.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level, then discusses the individual concepts in detail. Key discussion points are noted down on a flipchart
Action	20 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	20 minutes	Together with the participants, the Facilitator elaborates in plenary and provides conclusions on the benefits derived from community-based land management interventions, the methods for valuation of environmental services in CBLM practices and the steps involved in conducting a cost- benefit analysis	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	5 minutes	The Facilitator leads discussion on the following questions: - Is knowing about the benefits of community-based land management interventions, the methods for valuation of environmental services in CBLM practices and the steps involved in conducting a cost -benefit analysis important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 6 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- What are the benefits of community-based land management interventions?
- What are the methods for valuation of environmental services in CBLM practices?

Time for discussion and preparation: 20 minutes. Time for presentation: 5 minutes per group.

Handouts

What are costs and benefits?

Benefits are defined as increases in human wellbeing (utility) and costs are a reduction in human wellbeing

What is the objective of conducting a cost-benefit analysis?

A cost-benefit analysis is mainly used to assess the monetary value of private and public investments. The eventual aim of a cost-benefit analysis is to compare the present value of a stream of benefits (positive effects) and the present value of all investments and recurrent costs (negative effects).

A cost-benefit analysis in the context of watershed management aims to evaluate the on-site losses and gains associated with adopting various technologies and practices. Hence, a cost benefit analysis can be used as a decision-making tool, after computing all costs and benefits valued in local currency. to come up with an idea of "net welfare".

Most environmental economists agree that a cost-benefit analysis (CBA) is the basic approach to be adapted for the evaluation of net welfare obtained from environmental management projects. Environmentalists justify selection of CBA by asserting that the aggregate of monetary gains and losses measure the efficiency of a project.

What are the cost categories of a community-based land management intervention?

i) Labour: This represents labour costs during establishment and maintenance of land management practices

Table 25: How to compute Labor cost in community-based land management practices

S. No	Description of Measures	Unit of Labour Required (PD) - (A)	Market Value of Labour (ETB/PD) - (B)	Cost of Labour (ETB) - (A*B)
1	Land preparation			
2	Construction/establishment of land management measures			
3	Maintenance of land management measures			

ii) Inputs/materials (tools and equipment). This represents tools and equipment costs during establishment and maintenance of land management practices.

Table 26: Estimation of input/material costs in community-based land management practices

S. No	Description of Inputs	Unit of Input Required (kg or number) - (A)	Market Price of Inputs (ETB/unit) – (B)	Cost Input (ETB) - (A*B)
1	Hand tools			
2	Survey equipment			
3	Construction materials			
4	Seeds			
5	Fertilizer			
6	Pesticides			

iii) Opportunity costs. Opportunity costs represent the benefits forgone by choosing one option over another. Recognizing opportunity costs can help land users or communities make better decisions in all aspects of land management. This cost has to be estimated and considered when cost benefits of community-based land management practices are planned and applied.

What are the benefits of community-based land management interventions?

Economic benefits. The most important benefits that have to be estimated and carefully considered during cost and benefit comparison (and for making decisions) is income.

Land management practices, directly or indirectly, aim to increase the productivity of land and its resources, and the overall production of goods and services that eventually increase income and improve livelihoods. For the estimation of benefits, in monetary terms, goods and services produced due to development/management practices must be quantified and changed into monetary values.

Products could be agricultural crops, tree and their produce, forage, meat and milk from livestock, honey and other agricultural products that have been produced in the particular area. Production of goods per unit area of land needs to be estimated and changed into monetary values.

The following table can be used to describe the possible products and services and their value in monetary terms.

Table 27: Estimation of benefits gained for increased production (gross return) due to land management practices

S/N	Products/Services	Quantity in units (kg or litter etc) (A)	Market price (ETB/ kg or litter) (B)	Value in Monetary terms (ETB) (A*B)	Remark
1	Agricultural crops in good and bad years				
	Cereal crops				
	Fruits				
	Vegetables				
	Other crop varieties				
2	Livestock production				
	Animal forage				
	Live animals				
	Milk and milk products				

S/N	Products/Services	Quantity in units (kg or litter etc) (A)	Market price (ETB/ kg or litter) (B)	Value in Monetary terms (ETB) (A*B)	Remark
	Honey				
3	Forest products				
	Wood/timber production				
	Fruit				
4	Other products				

Social benefits. Beyond economic benefits CBLM, as an approach, enables communities to build local capacity, ensure equitable use of resources and reduce conflicts among land users and external stakeholders who have a stake on the land and its resources. It creates jobs for communities and provides wider employment opportunities, which reduces labour migration from rural to urban areas.

Environmental benefits. Proper management of land and its natural resources plays a significant role in keeping the environment healthy and ensuring sustainability. Benefits include:

- Climate regulation;
- Carbon sequestration;
- Water filtration;
- Biodiversity maintenance;
- Recreation;
- Preserving cultural heritage;
- Preventing soil erosion and maintaining soil quality;
- Reducing flooding;
- Reducing air and water pollution.

What are the methods for valuation of environmental services in CBLM practices?

As most environmental services do not have market values, indirect valuation methods are normally used to assess benefits against a monetary value.

The most commonly described/used valuation methods include: contingent valuation, choice experiment, the travel cost method, the hedonic pricing method and cost-based methods (damage cost avoided, replacement cost and substitute cost).

Contingent Valuation (CV) and the **Choice Experiment (CE)**. The two are the preferred methods, and most frequently used, in valuation of non-market forest ecosystem services. They consist of the measurement of values that people attribute to environmental services that are not traded on the market: e.g. forest features related to recreation, leisure and tourism, such as species composition and age of tree stands, forms of forest protection or the availability of tourist infrastructure.

The Travel Cost Method (TCM) is applied to the valuation of components of the natural environment (forests, national parks, nature reserves), whose "consumption" is associated with the necessity of incurring expenses determined by market prices. For example, a visit to a national park embracing forest areas is associated with expenses for commuting (travel), the cost of which implicitly attests to the recreational value the tourist places on the destination. The turnover of stays and the amount of travel expenditures are, therefore, an indirect indicator of the attractiveness of the forest/national park that constitutes its value to the consumer.

The Hedonic Pricing Method (HPM) uses valuation of, e.g., a property, depending on its location in the natural environment. The basic premise for using the HPM is the fact that the price

of market goods depends on the existence of non-market (natural) goods, such as proximity to a forest, clean air, uncontaminated water or low noise. As components of the natural environment highly influence real estate prices, it is possible to estimate the value of services provided by forest ecosystems on the basis of property prices.

Cost-based methods (damage cost avoided, replacement cost, and substitute cost methods). The damage cost avoided, replacement cost and substitute cost methods are related methods that estimate the value of ecosystem services, based on either the costs of avoiding damage, due to lost services, the cost of replacing ecosystem services, or the cost of providing substitute services.

Some examples of cases where these methods might be applied include:

- Valuing improved water quality by measuring the cost of controlling effluent emissions.
- Valuing the erosion protection services provided by a forest or wetland, by measuring the cost of removing eroded sediment from downstream areas.
- Valuing the water purification services of a wetland by measuring the cost of filtering and chemically treating water.
- Valuing storm protection services of coastal wetlands by measuring the cost of building retaining walls.
- Valuing fish habitat and nursery services by measuring the cost of fish breeding and stocking Programmes.

What are the steps required to undertake a cost-benefit analysis?

CBA as a decision tool requires assessment of sustainable land management options that can reduce or remove degradation pressures, including analysis of their economic viability and identification of locations in which they are suitable. It compares the costs of adopting a sustainable land management practice against the benefits derived from it. By subtracting costs from benefits, the net economic benefit from an action in sustainable land management can be determined. Key steps in performing a cost-benefit analysis are the following:

- Defining the target group (to be guided or informed by information generated through the analysis).
- Definition of criteria. The timeframe for analysis and categories of benefits and costs must be defined in advance. A discount rate is also needed, to be able to compare the costs and benefits in time and to produce the three indicators of success, i.e., net present value, internal rate of return and benefit-to-cost ratio, to assess whether the action is financially (or economically) worth undertaking.
- Calculating economic benefits and costs under alternative scenarios (e.g.," business-as-usual" or changes in land use).
- Comparing the net benefits of action to net benefits from business-as-usual, to estimate the 'added value' of actions, compared to what is already being done.
- Defining economic indicators of viability, to assess whether an action is worth taking from an economic point of view; and;
- Undertaking a sensitivity analysis to determine the degree and impact from uncertainty.

One of the major strengths of a cost-benefit analyses is that by quantifying everything homogeneously (in monetary units), it allows for direct comparisons between costs and benefits across different scenarios. This can help provide an idea of the scale of the desired implementation, e.g., from a village market to international trade, and to identify the most economically efficient and sustainable practice for a given context.

Session 3: Business Planning in Community-based Land Management

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE VI: SUSTAINABLE COMMUNITY FINANCING MECHANISMS FOR COMMUNITY-BASED LAND MANAGEMENT	**M VI-3**
Session 3: Business planning in community-based land management	**Session 3**

Specific Information

Learning objective	Participants shall be able to: - Describe and explain watershed management as a business - Describe business planning and explain why farmers need a business plan - Describe a business idea/innovation and explain why innovation is needed in business - Explain the steps in farm business planning
Duration	90 minutes
Training methods	Brainstorming, group work and structured discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	20 minutes	The Facilitator briefly introduces the session and asks participants to brainstorm on: - What is a business? - Watershed development as a business. - What is business planning? - Why do farmers need a business plan? - What makes business idea/innovation? - Why do we need to innovate in our businesses? The Facilitator then provides a theoretical input on each topic.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level, then discusses the individual concepts in detail. Key discussion points are noted down on a flipchart
Action	20 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	15 minutes	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on the cost and benefit elements of land management interventions.	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points

Step	Time	Most important content	Required material	Hints
Application	5 minutes	The Facilitator leads discussion on the following questions: - Is knowing about the cost and benefit elements of land management interventions important to your work and, if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 6 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- The steps in farm business planning.

Time for discussion and preparation: 20 minutes. Time for presentation: 10 minutes per group.

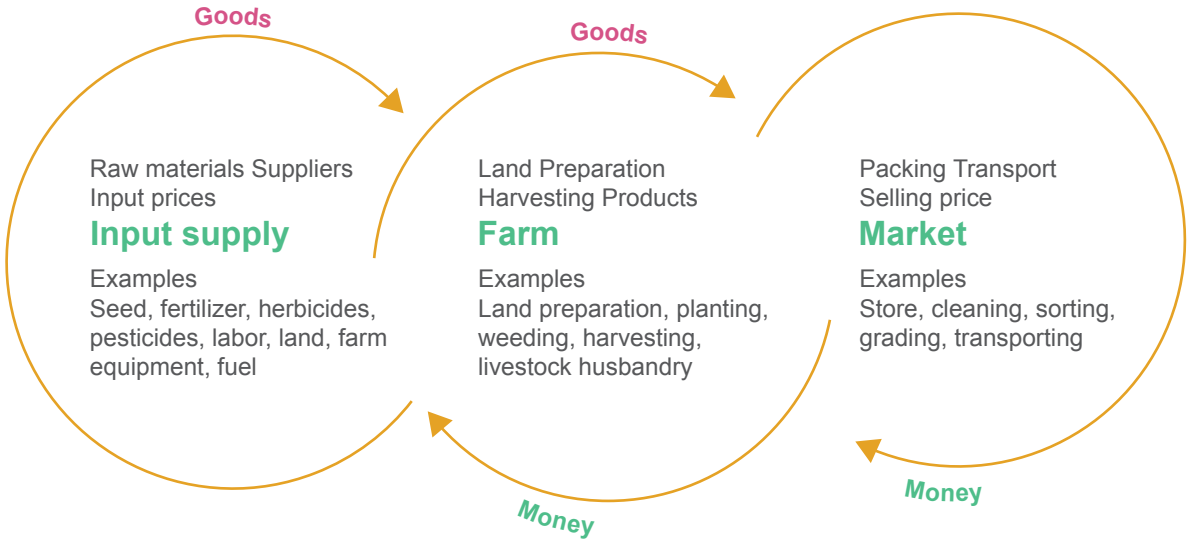

Figure 29: Illustration of Business concept

Handouts

What is a business?

A business is a commercial activity designed to supply goods and/or services, at a profit, that are demanded by the market. In a normal business set-up, a given set of inputs are processed and converted into outputs, which may be goods or services. The figure below provides an illustration of the business concept in farming.

Watershed development as a business?

Watershed development is an integrated approach that includes sustainable management of natural resources; that enhances production and productivity; improves the livelihood of the community, and ensures environmental security.

It is a dynamic and inclusive approach that attempts to address the diversified interests of the community, in terms of social, economic and environmental benefits. Therefore, it is vital to see watershed management interventions from a business development point of view, as all investments in managing resources have costs and benefits that must be evaluated to maximize gains from multidimensional aspects of the community and the watershed environment.

The watershed community (mainly the community leaders and watershed users' cooperative leaders) should have adequate understanding and knowledge about the concept of business from a development of point view: how business plans are prepared, both for communal interventions and for individual engagements in the watershed. A business plan is a requirement for the proper management of resources, especially in using limited financial resources for more profitable and environment-neutral business, and to address poverty alleviation in rural communities, through the creation of innovative jobs for youth and women.

What is farm business?

Farm business means a business that engages in agricultural production, including provision and use of agricultural inputs, tillage of the soil, livestock production (poultry, dairy, etc.), horticulture, bee keeping, forestry, fish farming, or any other activity undertaken to produce, process and market agricultural products.

Farm business is made up of three main elements: input supply, the production unit/farm and the market.

As a system or business process:

- Inputs go to production activities where products are made, and products go to the market to be sold. This is the physical flow of a farm business.
- Money is spent on inputs. Inputs are used to produce products. Products are sold on the market for money. The money returns to the farm. Some of it is used to buy more inputs. This is the financial flow of a farm business.

Table 28: Key business principles applicable to a farming business

Business Principles	Description
Investment of resources with a profit motive	All business resources are invested with a motive to make a profit.
Provision of products or services to satisfy the market	Businesses offer goods and services of value to satisfy the market, in exchange for a monetary return.
Legal and ethical activities with a defined purpose	Businesses undertake activities that conform to the laws and standards of the society in which they operate and clearly state what they exist to do for customers and stakeholders.
Plan, analyze the environment and manage risk	Businesses make plans, continuously check what happens within and outside of the business, stay alert to uncertain events, and work to reduce potential loss.
Record keeping	Businesses keep up-to-date records for reference in planning and decision making.

Relationship management and continuity	Businesses develop long-term relationships with other stakeholders and continue to operate even beyond the life of the founder.

Farming becomes a business when entrepreneurial and business principles are applied.

What is business planning?

A business plan is a document describing the status and the future intentions of a business, its products or services, strategic goals, how it earns (or will earn) money, its leadership and staffing, its financing, its operations model, and many other details essential to its success.

It also explains future goals and how it is planned to achieve these goals.

Why do farmers need a business plan?

The importance of business planning is reflected in the proverb "he/she who fails to plan, plans to fail". Business planning should, therefore, never be overlooked. Indeed, if entrepreneurs do not know where they want to go, they will not go anywhere.

Starting a business and successfully running it is a journey. It requires business planning. This process equips an entrepreneur's mind with the tools necessary to handle problems that may arise. Most businesses fail because they were not properly planned.

A business plan will serve the following purposes, amongst others:

- Enables a business manager to set objectives and guidelines down on paper.
- Identifies problems quickly, before they become unmanageable.
- Explains goals and strategies to people inside and outside of the operation.
- Creates a standard against which to compare actual results against anticipated results.
- Keeps operations on track.

What makes a business idea/innovation?

A business idea is a short and precise description of the basic operation of an intended business. Before starting a business, an entrepreneur would need to have a clear idea for the sort of business to be run.

The business idea should tell you:

- Which need will the business fulfil for its customers and what kind of customers will it attract?
- What good or service will the business sell?
- Who will the business sell to?
- How is the business going to sell its goods or services?
- How much will the business depend upon and impact on the environment?

A good business idea will be compatible with the sustainable use of natural resources and will respect the social and natural environment on which it depends.

Why do we need to innovate in our businesses?

Starting-up or "innovating" a business means creating a new product/service for the market, redesigning an existing product/service, or establishing beneficial structural changes within the production system.

The market demand for a product fluctuates frequently. One product/service may be good for a particular season but not for the next. The farmer, therefore, needs to anticipate market demand in order to insert timely innovations or improvements in their production system.

The situation in the farming system is more dynamic than might be the case in other sectors of the economy. Farmers need to regularly assess the business environment to innovate in regard to their agricultural production.

In starting-up or innovating, a business aims to:

- Attract attention towards its products, resulting in higher income and profits.
- Create products that meet market demand.
- Minimize business risks.
- Increase family income.

In order to be successful in business, the farmer needs to thoroughly think through all agricultural operations. These include:

Production

- What are the needs of the market and buyers/consumers?
- Are you likely to produce or innovate/improve products that satisfies market needs?
- What skills are required to carry out these business activities? Are they available? Who can you ask for advice or assistance?
- Do you have enough capital to invest in the business? Where can you borrow money?
- Do they have enough labour to run the business?
- Do they know whether the business will bring a profit?

Market

- Does a farmer know how to collect market information? From whom or where?
- Who are the main buyers?
- Do you have any relationship with the buyers? What do buyers demand from the agricultural products they might wish to buy (appearance, quality, price)?
- How should agricultural products be brought to the market?
- What powers does the farmer have to negotiate in the marketplace?
- Do the items produced have potential to develop a bigger market in the future? E.g. are they key products in the context of the economic development strategy of the locality?

What are the steps involved in farm business planning?

The following 6 major steps are followed by smallholder farmers in the preparation of business plans.

Step I. Situation Assessment

A farming community, be it an individual household or farmer cooperative, should understand existing situations and capacities before setting goals. It should identify strengths and weaknesses, as well as opportunities and threats, which enable it to understand the existing situation. As a result of the assessment, communities will identify applicable solutions for problems/issues in their local contexts.

Farming communities have to identify potential assets which are relevant for running the farming business. Common assets needed for farming operations are:

Human (individual capacities): skills, knowledge, health, ability to work, market information, ability to negotiate, etc.

Personal assets: land, water, ability to adapt to new demands of production, etc.

Tools and infrastructure: production tools, livestock and equipment, roads, etc.

Group capacities and relationships: membership, informal networks, relationship with traders, relationships of trust that facilitate cooperation and economic opportunities, etc.

Financial: savings, loans, income from trade, employment, and remittances, etc.

Step II. Vision and Goal Setting

A common issue for farmers is that they hardly spend time thinking about what they want in the future. A clear vision and specific objectives for the short, medium and long term, can help farmers plan their production and business activities more easily and proactively. The more specific the objectives, the better the farmers will envision their business futures.

Table 29: Questions to ask to develop clear objectives.

Objective	Questions to be answered
Production	What do you want to produce? What do you want to change, in order to improve current production? How much land area do you want to expand by?
Marketing	Which customers do you want to approach? How much volume do you want to sell?
Knowledge and skills	Which technical knowledge do you want to apply? Which business skills do you need to improve?
Tools	Which production tools will you require? Which approaches and technologies are accessible?
Role assignment	How do you assign family or group members in provision of inputs, production, and marketing of products?

With answers to each of these questions, farmers can identify pathways and solutions to achieve their goals.

A farm business plan should include what to do, how to do it, how much it will cost, and what returns to expect. The planning process involves analysing opportunities, exploring different options, selecting the best option, producing a detailed plan, and implementing and evaluating that plan.

Step III. Business Description

A business description is a detailed description of the business or business idea which includes:

- The name and location of the business.
- What the business (farm) will produce/supply?
- The origins of the business idea/innovation.
- Who is/are the owners?
- Legal status – is the business registered?
- Which business associations are owners members of?
- Current status, in terms of what the business has achieved or how far the owners have come in trying to establish the business.
- How the business has been funded to date?
- How big will the business be in the next 5 to 10 years (according to hopes and plans)?

Step VI. Marketing Plan

The marketing plan explains everything the business owners plan to do to find out who their customers are and what they want and need. It also shows how the business owner plans to satisfy needs while making benefits out of the business. Considerations include:

- Explaining why your target market needs your product?
- Describing your products and their features.
- Describe the target market.
- Estimating the number of targeted customers who will buy from the business/farm.
- Estimating how often people will buy from your business/farm?

- Defining how your products will reach the targeted customers.
- Defining how customers will know that harvested produce is available.
- Deciding how prices are going to be set?
- Assessing what customers will be able to afford to pay for your products?
- Identifying competitors and making plans to beat them?
- Preparing an advertising strategy.
- Identifying other actors in the market and assessing where you stand in relation to them?

A farmer has to identify market actors for their produce. The actors could be:

- **Direct actors**: producers, collectors, traders, processors, wholesalers, retailers, restaurants, supermarkets and consumers.
- **Indirect actors**: service providers (input suppliers, transporters, extension agents, marketing companies and financial service providers).

Step V. Description of Products and Services

What will it take to produce the products or services generated by a farming business? This should include:

- A description of what you make and/or sell or a description of the services you offer.
- What quality of products will the farm produce?
- Where will the farmer buy inputs?
- Is the input supplier reliable and able to maintain supply in the quantities required?
- Which special skills are required to produce the planned quality of products?
- Are these skills readily available within the business? If not, how will the farmer acquire the skills?
- What is the production process for each of the products produced by the farm.
- What are the maximum quantities the business can produce? How much can be produced?

Step VI. Financial Plan

A budget is a formal financial plan for carrying out business activities in the future. It demonstrates the process of carrying out an activity and the end result.

Budgeting is the planning process or the development of a plan of action (budget).

For the financial plan of a small business, two important financial planning tools are essential and need to be applied by smallholder farmers. These are the “enterprise budget” also known as “gross margin analysis” and the “cash flow budget” (for detail, refer to the financial planning manual).

The process of developing a farm budget begins with an assessment of individual enterprises on a farm. Enterprise budgeting is the estimation of costs and returns expected for each enterprise and comparison of the two.

Session 4: Management of Financial Resources in Community-based Land Management

Trainer’s Guide	
Course: Community-based land management	**T-18**
MODULE VI: SUSTAINABLE COMMUNITY FINANCING MECHANISMS FOR COMMUNITY-BASED LAND MANAGEMENT	**M VI-4**
Session 4: Management of Financial Resources in Community-based Land Management	**Session 4**

Specific Information

Learning objective	Participants shall be able to: - Describe financial resources and financial management - Explain the elements of financial management - Describe financial management at cooperative level - Explain the objective of financial management at cooperative level - Explain the components of cooperative's financial management
Duration	100 minutes
Training methods	Brainstorming, group work and structured discussions
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	10 minutes	The Facilitator briefly introduces the session and asks participants to brainstorm on the following: - What are financial resources? - What is financial management? - What are the elements of financial management? The Facilitator then provides an input on each individual; topic.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level, then discusses the individual concepts in detail. Key discussion points are noted down on a flipchart
Action	30 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present a summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	20 minutes	Together with the participants, the Facilitator elaborates in plenary and gives conclusions on: - Financial management at cooperative level. - Objectives of financial management at cooperative level. - components of cooperative financial management.	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	10 minutes	The Facilitator leads discussion on the following questions: - Is knowing about financial management at cooperative level, the objectives of financial management at cooperative level and the components of cooperative financial management important to your work and , if so, how? - How can you apply what has been learnt during this session in your home area?		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 6 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- Financial management at cooperative level.
- Objectives of financial management at cooperative level.
- Components of cooperative financial management.

Time for discussion and preparation: 30 minutes. Time for presentation: 10 minutes per group.

Handouts

What are financial resources?

Financial resources are the funds and assets that finance an organization's activities and investments. In simple terms, financial resources are the monies that keep a business operating.

Financial resources are the resource an organization needs, not only for its day-to-day operations, but also for its sustained success.

What is financial management?

Financial management is the practice of handling an organization's finances in a way that allows it to be successful and compliant with regulations. A financial management system combines several financial functions, such as accounting, fixed-asset management, revenue recognition and payment processing.

Financial management is about setting procedures with regard to how the finance team process and distribute financial data, like invoices, payments and reports, with security and accuracy.

These written procedures also outline who is responsible for making financial decisions at the company and who signs off on those decisions. The system revolves around planning and forecasting and controlling expenditures.

What are the elements of financial management?

Financial planning: A financial plan is a tool to help a business decide how to use its money to achieve its goals.

Financial plan/budget preparation will help determine future expenses, allow discipline in saving and spending, help avoid a money crisis and allow a business to feel less financially stressed.

Financial control: Financial control aims at ensuring that the business is able to meet its goals.

Financial decision-making: Is decision making on financing, investment and payment of dividends

What is financial control?

Financial controls refer to the development of policies and procedures by an organization to manage its financial resources and operate efficiently. It is essential for cash flow management, budgeting, and the prevention of fraud or theft. Thus, it enables the business to track and oversee its financial activities, to grow and prosper.

Financial controls, based on policies and procedures, are introduced and implemented to ensure the achievement of objectives or management of risks. They include: procedures for approval; procedures for the provision of power and responsibilities, separation of duties, a dual signature system; rules that ensure the protection of property information; procedures for comprehensive, accurate and proper keeping of records of all business transactions; procedures for managing human resources and more.

An organization must prepare a financial controls checklist to minimize risks, avoid future consequences of those risks, and ensure sustainability.

Main objectives are to:

- Direct, allocate, manage and employ financial resources per needs (resulting in increased performance and income).
- Improve operational efficiency by evaluating financial data (distributing resources more efficiently and controlling cash flow).
- Maintain financial accountability and communication at all levels (ensuring that all stakeholders comply with fiduciary responsibility, governance and due diligence obligations).
- Meet production targets, cut costs and prevent invoice fraud (through on-budget, on-target expenditure).

What are the key elements of financial control?

Authority: Control the Who and the How of taking and spending money. It is deciding who has the right to make payments, set up new suppliers and customers, raise invoices and so on.

Cash flow: Control How much is in the bank. Cash flow is a measurement of the amount of cash that comes into and out of a business over a particular period of time.

Margins: Control the profitability of a business. The amount of profit a business produces is a balancing act between pricing and ability to control the cost of delivery.

Balance sheet: Controls what a business is worth and tells you how much it is worth.

How to implement controls: Processes and policies are the keys to controlling business finances.

A process is simply a defined method of working.

What is financial management at cooperative level?

Cooperative financial management can be defined as managing the finances of a cooperative to provide a satisfactory service to its members, in accordance with its by-laws. Financial management for a cooperative is all about budgeting and making decisions that enable the cooperative to exist and be financially viable, while also ensuring that its money is spent efficiently.

What is the objective of financial management at cooperatives level?

Consideration include:

- Establishment of appropriate financial management structures and accounting procedures.
- Organizing accounts books and journals in a professional manner.

- Preparation of monthly, quarterly and annual budget plans and support, in compliance with and adherence to, the financial policy of the cooperative.
- Helping to follow and respect the financial policy of the cooperative.
- Recording transactions chronologically and performing a monthly, quarterly and yearly cash inventory.
- Assisting in processing payments, according to the cooperative's budget plan.
- Preparing monthly, quarterly and yearly financial reports and communicating them to the cooperative management committee.
- Submitting the audit report and findings to members at the general assembly meeting.

What are the components of cooperative financial management?

Financial statements: Financial statements are official records of a company's financial activities and status. The most important financial accounts for businesses are cash flow, income statements and balance sheets.

Cash flow statement: Is a financial statement that shows how much money has been generated and spent over a specific period of time.

Profit and loss statement: Is a financial statement that shows how much money was earned and how much money was spent over a given period of time.

Balance sheet: An annual financial statement that shows a cooperative's assets, liabilities, and equity (total value) at a specific point in time. These three statements are always required at the end of the financial year and after the audit has been completed.

Financial controls: The systems, rules and means by which a cooperative monitors and regulates management and allocation and use of funds are known as financial controls. This is done through use of internal and external controls.

Internal control: This is a process that ensures accurate financial reporting, efficient operations, and compliance with applicable rules and regulations. Operational controls, accounting and financial controls, and compliance controls are examples of internal controls.

External control: Refers to bookkeeping and financial control by an external auditor.

Financial recording: Financial accounting is the most important primary level of financial management that enables cooperatives to oversee monetary business transactions by showing the correct picture of assets, liabilities, profits and losses.

Keeping financial records is important as it enables cooperatives to:

- Prepare proper and timely financial accounts.
- Provide data for financial management and business decisions (within the cooperative).
- Allow for a quick assessment of the cooperative's financial condition at any time.
- Allow management to quickly identify places where problems may arise and recognize their potential solutions.
- Allow the cooperative to calculate the taxes to be paid and to fulfil the legal obligations of the country's tax and cooperative law.
- Assist in providing information to funding, lending or credit organizations.
- Increase the likelihood that the cooperative will function sustainably and successfully, by providing essential information and details for future financial planning.

What is record keeping and management for cooperatives?

Record keeping in a cooperative is the practice of documenting and updating different information that is relevant/crucial for its success. Keeping records is important for a cooperative business to make good decisions.

All cooperative records should be carefully kept, and books and ledgers should be archived, so that they can be inspected and checked if required and necessary.

Auditors usually recommend that financial records are kept for at least seven years.

Statutory yearly audited accounts are kept permanently (as Cooperative Proclamation 985/2016 states that audited accounts must always be available for inspection).

Cooperatives keep appropriate records and manage documentation for the following reasons:

- Assists in preparing financial statements quickly and accurately;
- Provides information to enable control of cash for the cooperative;
- Provides information on which to base business decisions;
- Enables prompt assessment of the financial situation of the cooperative, at any time;
- Keeps track of the cost of staff and their performance;
- Measures performance against projections, as originally established;
- Enables management to quickly highlight areas where problems may arise and remedies that can be put in place;
- Enables the cooperative to work out how much tax to pay;
- Fulfils the legal obligations of Ethiopian tax and cooperative law;
- Assists in providing information required by funding/lending/loan organizations;
- Helps to detect theft;
- Provides valuable information and detail for future planning;
- Increases the chance of the cooperative operating sustainably and successfully.

Types of records to be kept by a cooperative

- Basic information about the cooperative;
- Training received by staff;
- Production records (quantity of inputs used, labour costs, equipment costs etc.) yields, storage, transport, etc.
- Members participation and shareholding;
- Sales/customer information;
- Income and expenditures of the cooperative;
- Personnel information and documentation.

MODULE VII: COMMUNITY-BASED KNOWLEDGE GENERATION AND LEARNING

Module outline

Learning Objectives:	Participants shall be able to: - Define monitoring and evaluation and describe the relationship and difference between the two. - Describe the result chain and explain input, output, outcome and impact monitoring. - Explain the importance of monitoring and evaluation. - Describe a monitoring and evaluation framework. - Explain and demonstrate how a monitoring and evaluation framework is developed. - Define knowledge and knowledge sharing. - Describe the importance of knowledge sharing. - Explain how knowledge and experiences are documented.
Duration:	330 minutes
Preparation:	Color print A-4 laminated pictures, notebooks, pens, flipchart paper, moderation cards, markers, ruler, whiteboard, cloth/sponge.

This module contains three sessions:

Session 1: Concepts of monitoring and evaluation (90 minutes).

Session 2: The monitoring and evaluation framework (150 minutes).

Session 3: Learning and knowledge sharing (90 minutes).

Overview

In this module, participants will learn about monitoring and evaluation and its importance. They will learn how to set monitoring indicators and how to monitor changes. At the end of the session, they will be able develop a monitoring and evaluation framework.

The module also describes the basic concept of knowledge generation and learning, and the methods and tools of knowledge management and sharing.

Session 1: Concepts of Monitoring and Evaluation

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE VII: COMMUNITY-BASED KNOWLEDGE GENERATION AND LEARNING	**M VII-1**
Session 1: Concepts of monitoring and evaluation	**Session 1**

Specific Information

Learning objective	Participants shall be able to: - Define monitoring and evaluation and describe the relationship and difference between monitoring and evaluation. - Describe the result chain and explain input, output, outcome and impact monitoring. - Explain the importance of monitoring and evaluation.
Duration	90 minutes
Training methods	Brainstorming and discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Brainstorming	90 min	The Facilitator brainstorms the session by asking the following questions: - What is monitoring and evaluation? - What is the relationship and difference between monitoring and evaluation? - What is a result chain? - What is input, output, outcome and impact monitoring? - What is the importance of monitoring and evaluation? The Facilitator then assesses participant´s knowledge level and discusses topics in detail or provides an input on each question and topic.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level then discusses each concept in detail. Key discussion points are noted down on a flipchart

Hints for preparation: typical situations and dangers

The following explanations shall remind facilitators of the different steps in the session (in line with the 'Action Learning Cycle'):

- **Action** - Active engagement, experiencing or ´living´ a simulated situation;
- **Publishing** - Presenting results;
- **Processing** - Analyzing, reflecting on and understanding the results, as well as any decisions made, or strategies applied during the Action Phase;
- **Generalization** - Connecting the results to everyday life experience, thereby abstracting from the active engagement / experience in the Action Phase and discussing generally applicable concepts and theories;
- **Application** - Applying what has been learnt to a new situation.

Variations

Background Material

Refer to Module 7 of the Technical Manual.

Additional Material

Nil.

Handouts

What is monitoring?

Monitoring is the systematic and continual collection, analysis, interpretation and use of data, on key aspects of an intervention and/or its expected results, to inform decision making.

What is evaluation?

Evaluation is a systematic process of data collection and analysis, about activities and/or the effects of a programme, looking to provide explanations for observed levels of programme implementation, or changes in social conditions under the intervention, with the purpose of making informing decisions.

What is the relationship between monitoring and evaluation?

Table 30: Relationship between monitoring and evaluation

Characteristic	Relationship between M&E
Purpose	Both monitoring and evaluation have a primary purpose of improving the quality of decision making at different levels, by furnishing relevant information in a timely manner.
Methods	In both cases, there is a process of collecting, analysing, interpreting and using programme related data.
Complementarity	In practice, monitoring and evaluation activities are implemented in an integrated manner. Activities commonly referred to as "monitoring" usually include some explanatory components which are theoretical features of evaluation. Evidence from programme monitoring describes situations, and evaluations explain observed patterns, together providing the full picture of how a programme is functioning. Programme evaluations also use most of the data generated through routine monitoring.

What are the differences between monitoring and evaluation?

Table 31: Differences between monitoring and evaluation

Attributes	Monitoring	Evaluation
Frequency	Continuous	Episodic
Objective	Describing	Explaining
Method	Follows trends, compares actual performance with targets	Compares achievements with counterfactual
Performed by	Mostly internal	Internal and external
Uses	Alerts when to act	Provides detailed information on what types of actions to take.

What is a result chain?

Monitoring and evaluation is about measuring and tracking results. In general, a "result" is something that happens, or exists, because of something else that has happened. There are five logically connected elements in a result chain: inputs, activities, outputs, outcomes and impact.

Table 32: Result chain, descriptions and examples

Result chain	Definition	Examples
Inputs	The financial, human, and material resources used for the development intervention.	- Extension workers - Machines - Seeds, land, fertilizer
Activities	Actions taken or work performed, through which inputs are mobilized to produce outputs.	- Trainings - Distributing materials
Outputs	The products, goods or services, which result from a development intervention.	- Number of trained extension workers - Number of materials distributed
Outcomes	The likely or achieved short-term and medium-term effects of an intervention's outputs.	- Change in attitude - Resource utilization - Improved land management
Impact	Positive and negative, primary and secondary, long-term effects produced by a development intervention, directly or indirectly, intended or unintended.	- Increased production and productivity - Improved community livelihoods

What is input/output monitoring?

Input output monitoring involves the tracking of priority information about the availability and quality of resources availed, and the volume of services produced in a programme.

Monitoring of inputs and outputs is usually undertaken as part of routine programme monitoring, integrated with the implementation of routine operations and projects.

What is outcome monitoring?

Outcome monitoring is the regular tracking of information related to a programme's expected effect on targeted beneficiaries.

Expected effects of outcome monitoring are those that are considered as intermediate and expected to lead to the achievement of what is considered as "impact".

What is Impact monitoring?

Impact monitoring is a special type of outcome monitoring that focuses on the expected long-term cumulative effects of interventions, considered as "impact".

What is the importance of monitoring and evaluation?

Monitoring measures progress towards achieving a given plan. It enables the tracking of progress towards the achievement of desired results over time, and enables informed decisions to be made regarding the integrity and efficiency with which financial resources are being used, and the effectiveness with which planned activities are being implemented.

It constitutes a periodic function over the course of the implementation of planned activities, managed mainly by internal institutions and their staff. By doing so, it provides timely and accurate information for the community, government bodies, development partners, and other principal stakeholders, on the implementation status of planned activities/interventions, as well as progress achieved in relation to desired changes.

On the other side: evaluation measures the extent to which changes brought within, for example, a community watersheds are because of the plan/intervention under consideration or because of other factors.

It is used to measure how well an intervention/plan has met planned and expected objectives. In most cases, it is done by an external body with the ability to provide an objective overview of plan/project achievements. In doing so, the primary aim is to determine the relevance and fulfilment of the objectives, development efficiency, effectiveness, impact and sustainability of a given watershed development intervention.

The basic reasons for doing evaluations are to confirm that plans have been implemented and to be able to answer public accountability issues, at least in relation to the use of public finances, and also in terms of benefits accruing to the community.

An important secondary purpose is also to be able to benefit from the lessons-learned in planning and design, community involvement and implementation strategies, and resource management issues, which can then be used in planning, design and management of future initiatives.

Session 2: Monitoring and evaluation framework

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE VII: COMMUNITY-BASED KNOLEDGE GENERATION AND LEARNING	**M VII-2**
Session 2: Monitoring and evaluation frameworks	**Session 2**

Specific Information

Learning objective	Participants shall be able to: - Describe a monitoring and evaluation framework. - Explain and demonstrate how a monitoring and evaluation framework is developed.
Duration	150 minutes
Training methods	Brainstorming, group work and structured discussions
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Introduction	20 minutes	The Facilitator brainstorms on the session by asking the following questions: - What is a monitoring and evaluation framework? - What does a template for a monitoring and evaluation (M&E) framework include? The Facilitator then provides a theoretical input on each question and topic.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level, then discusses the individual concepts in detail. Key discussion points are noted down on a flipchart
Action	60 minutes	The Facilitator divides participants into groups and instructs the groups to work on the given task (refer to Additional Material).	Flipchart, markers, pens	The Facilitator writes the task on the flipchart and distributes flipchart paper and markers to members for them to respond with their ideas
Publishing	20 minutes	Group members present summary of their discussion points on a flipchart.	Flipchart, markers, pens	The Facilitator notes down key points in the group's presentation on a flipchart
Processing	10 minutes	- The Facilitator compares and assesses group results in plenary: - Did the groups present any points that were not clear to other participants or that they did not agree with? - Are there any obvious differences between the presentations? - How are they explained and justified?	Flipchart, meta plan cards, markers, pens and notebook	
Generalization	30 minutes	Together with the participants, the Facilitator elaborates in plenary and provides conclusions on the monitoring and evaluation framework	Flipchart paper, markers	The Facilitator enriches the discussion whenever needed and visualises important points
Application	10 minutes	The Facilitator encourages the participants to reflect on: - If knowing about the monitoring and evaluation framework is relevant to the context of the participant and how they intend to apply the knowledge.		

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 7 of the Technical Manual.

Additional Material

Task for group work

Discuss the following in groups and present:

- Develop a monitoring and evaluation framework for a community watershed in your kebele, using the monitoring framework included in the handout below.

Time for discussion and preparation: 40 minutes. Time for presentation: 7 minutes per group.

Handouts

What is a monitoring and evaluation framework?

A monitoring and evaluation framework is one part of the monitoring and evaluation plan, which describes how the whole monitoring and evaluation system for the programme works, including things like, who is responsible for it, what tools will be used, how the data will flow through the organization, and who will make decisions, using the data.

The monitoring and evaluation system should provide proper guidance on how to set watershed development objectives, develop indicators, determine baselines, set targets, design evaluation methods and reporting systems.

How are development objectives determined?

In the case of a watershed development plan, objectives are designed, based on the problem analysis conducted at the time of application of the participatory planning steps.

The overall objectives for implementation of a watershed development plan follow a hierarchical structure:

Impact: is the ultimate objective of the plan, i.e. the sustainable change of status among beneficiaries, such as improvement in HHs income, livelihoods and resilience to shocks in the face of climate change.

Outcomes: represent the changes directly attributable to the successful establishment of initiatives that singly or jointly contribute to impact. For example, increased production and productivity of watersheds (crop and livestock productivity) is part of an outcome.

Outputs: represent the products and services derived from the activity initiatives that contribute to the achievement of outcomes. In community watersheds these included developed water points for drinking and irrigation, areas of degraded lands rehabilitated etc.

Activities: represent specific actions in capacity building, construction, rehabilitation etc., that, singly or jointly, contribute to required outputs, for example, capacity building training on watershed management, implementation/construction of different soil and water conservation activities constitute an "activity".

How are indicators developed?

The key to monitoring is to identify the indicators that need to be monitored.

This is done through the involvement of as many people as possible, to get different perspectives. Indicators may be quantitative (measurable) or qualitative (observational), although quantitative indicators are preferable as they provide more accurate and defensible measures of change and progress.

What is the means of verification (MOV)?

For each indicator developed, a means of verification (MOV) must be identified that forms an essential element of the M&E plan (for example, in an overall watershed development plan). Means of verification includes:

- Source of data.
- The method of data analysis.
- The frequency of data collection.
- The body responsible for data collection, and
- Use of the information generated.

An example of a monitoring framework to be contextualized for a specific site

Table 33: example of monitoring framework to be contextualized for a specific site

Hierarchy of Objectives (result chain)	Indicators	Means of Verification				
		Source of Data	Methods of Analysis	Frequency	Responsible Body	Information Use
Impact Improved HHs income, livelihoods and resilience to shocks, in the face of climate change	Changes in household income and livelihoods Changes in household adaptive capacity and resilience to climate related shocks	Household survey	Use of IE methods	Two and a half Years or more after implementation	Evaluation Expert	
Outcome - Reduced carbon emissions - Increased production and productivity - Improved soil fertility	Quantity of above and below ground carbon accumulation	Field Data Collection	Soil Laboratory Analysis GIS application		Carbon Expert	To measure progress towards outcome To determine whether the watershed development is benefiting the community To take corrective action
	Changes in biomass rehabilitated watersheds	Field level measurement	Amount of rainfall modified by local topography and drainage properties (DBH measurement)		SWC Technical Expert	
	Changes in vegetation cover	Satellite images	Land use / land cover change		GIS technical Expert	
	Improved crop productivity for major cereal crops in rehabilitated watersheds Improved productivity of livestock	CSA production data household survey	Use of IE methods		Evaluation Expert	
	Amount of reduced soil erosion, in metric tonnes	Field level measurement	Revised Universal Soil Loss Equation (RUSLE)		SWC Technical Expert	
	Amount of reduced runoff	Field level measurement	Curve number hydrological model SCS-CN			
Output - Enhanced community infrastructure - Enhanced environmental rehabilitation - Improved water supply for human and livestock consumption	Land area restored or reforested; number of water points developed by types of service and number of beneficiaries, Increased area under irrigation	Monthly, quarterly and annual physical and financial reports at *Kebele*, *Woreda* and Regional levels	Compare targets against achievements and analyze relevance, effectiveness, efficiency and sustainability of activities implemented	Quarterly and annually	Das	Informed decision making about quality of implementation
Activities	Bio-physical SWC technologies, forestry and agro-Forestry activities, rangeland management, etc.		Compare target against achievements	Monthly, quarterly and annually	Das	"

Once objectives, with indictors and means of verification (MOV) are defined, it is necessary to determine baseline conditions, set targets and decide on the M&E system that should be adopted for measuring results.

Setting baselines

Baselines provide the essential quantitative or qualitative information on conditions relating to indicators, at the beginning of, or just prior to, the implementation of an intervention or watershed development plan. It involves the collection of data during or before the start of the intended intervention. The baseline requirement and data available in a community watershed should, to a large extent, be established using the data collected in a socio-economic and biophysical survey conducted during development of a watershed plan.

Setting of targets

Targets indicate the planned level of results which are to be achieved within an explicit timeframe (quarterly, annually, interim, or over a five-year period). Thus, targets consist of quantitative or qualitative indicators of results (at the level of impact, outcomes and outputs) that the community, government representatives (experts & DA) and financing organizations want to achieve in a given time.

Setting evaluation methods

The setting of evaluation methods determines how to assess the achievement of expected results, associated with watershed activities at community watershed level.

The key variables to be considered in an evaluation are relevance, efficiency, effectiveness, impact and the sustainability of development interventions.

To conduct an impact evaluation, a theory of change should be developed for a given intervention, based on expected and projected changes within the community watershed. For example, biophysical, soil and conservation measures will have a direct on-site, intermediate and long-term impact, as described in the table below:

Table 34: Sample theory of Change for Biophysical Soil and Water Conservation interventions

Watershed Development Interventions	Output	Direct On-site Impact (immediate impact)	Intermediate Impact	Long term Impact
Biophysical soil and water conservation and rangeland management	Area (ha) of land treated/ rehabilitated	- Reduced soil erosion - Reduced, excess runoff on to cropland - Improved soil fertility - Increased moisture holding capacity - Arrested loss of land - Improved/increased vegetation cover - Area reclaimed (increased total available productive land)	- Increased crop and livestock productivity - Increased availability of forage for livestock and bees	- Increased household income - Reduced malnutrition rate - Reduced vulnerability to shocks - Increased dry season stream water flows - Reduced flash flooding - Reduced sedimentation - Improved/increased biodiversity (fauna and flora)

Session 3: Learning and Knowledge Sharing

Trainer's Guide	
Course: Community-based land management	**T-18**
MODULE Vii: COMMUNITY-BASED KNOLEDGE GENERATION and sharing	**M VII-3**
Session 3: Learning and knowledge sharing	**Session 3**

Specific Information

Learning objective	Participants shall be able to: - Define knowledge and knowledge sharing - Describe the importance of knowledge sharing - Explain how knowledge and experiences are documented
Duration	90 minutes
Training methods	Brainstorming and discussion
Difficulty level	Medium
Material requirements	Posters, flipchart paper, markers and meta plan cards

Structure of session

Step	Time	Most important content	Required material	Hints
Brainstorming	90 min	The Facilitator brainstorms on the session by asking the following questions: - What is knowledge? Explicit knowledge? Implicit knowledge and tacit knowledge? - What is knowledge sharing? - What is the importance of knowledge sharing? - How is knowledge and experience documented? - What are the steps in knowledge documentation? The Facilitator then provides an input on each question and topic in turn.	Flipchart, markers, pens	The Facilitator writes the answers given by participants on a flipchart and assesses participant´s knowledge level, then discusses each concept in detail. Key discussion points are noted down on a flipchart..

Hints for preparation: typical situations and dangers

As appearing and as defined under the Session I "Hints" above.

Variations

Background Material

Please refer to Module 7 of the Technical Manual.

Handouts

What is knowledge?

Knowledge is considered to be information that is personalized and which relates to procedures, concepts, observations, facts, judgments and interpretations.

Knowledge comprises developed skills, attitude and cumulative experiences that enable the systematic, effective and reliable performance of functions by individuals.

Knowledge can be explicit, implicit or tacit.

Explicit knowledge is knowledge that is easy to articulate, write down and share. It is easy to pass along because it is written down and accessible.

Implicit knowledge is the application of explicit knowledge. Skills that are transferable from one job to another are one example of implicit knowledge.

Tacit knowledge are knowledge, skills and abilities that an individual has gained from personal experience, that is more difficult to express or to put into words or otherwise communicate. It is usually transferred through socialization and mentoring.

What is knowledge sharing?

Knowledge sharing refers to the process of exchanging information between people, teams, or organizations. Knowledge may be explicit, implicit or tacit.

What is the importance of knowledge sharing?

Knowledge sharing:

- Makes the organization's best problem-solving experiences reusable.
- Enables better and faster decision making.
- Stimulates innovation and growth.
- Improves delivery of service to customers.
- Reduces loss of know-how.

How are knowledge and experiences documented?

From the perspective of documentation, there are three types of knowledge that need to be understood, in order to develop a knowledge sharing and knowledge documentation strategy. These are, as above, explicit, implicit and tacit knowledge.

Explicit knowledge is easy to document and write down and can be easily shared. Data can be processed, organized, documented, structured, then analyzed and stored.

Implicit knowledge, by contrast, is difficult to record.

Tacit knowledge is the most difficult to transfer or document. Tacit knowledge might include knowledge such as how to ride a bicycle or how to talk; how to behave indifferent situations or how to organize a meeting.

This knowledge cannot easily or completely be explained, since it is wholly rooted in the experience of the individual and transmitted by apprenticeship and training, through watching and doing, making it difficult to transfer to another person.

Ways of transferring tacit knowledge

If it is difficult to transfer tacit knowledge through language, how can it be passed on?

Certain strategies (listed below) allow a person to infer tacit knowledge from stories, conversations and social interactions. These include through:

Collaboration and social networks: Online collaboration provides a framework for the transfer of tacit knowledge through a process of "socially constructed learning," according to Harris (2009).

Showing your Work: Showing your work is a strategy that calls for making work visible, with the intention of transferring the tacit knowledge hidden in how work gets done.

Storytelling: Stories transform information into knowledge. Stories provide context that give facts their meaning. Using structured interviews, it is possible to elicit stories from employees getting ready to retire, as well as from subject matter experts. This "best practice" should be captured, stored, analyzed and indexed as part of a knowledge management system.

What are the knowledge documentation process/steps?

- Identifying knowledge;
- Acquisition and capture of knowledge;
- Evaluating, reviewing and documenting knowledge;
- Storage and retrieving;
- Distribution, use and easy sharing;
- Evolving new knowledge;
- Maintenance and analysis.

ANNEX

Pre and post-test for: Training on community-based land management

Please answer the following questions

Time allowed: 30-40 minutes

Q1. The term “community” in a community-based land management refers to:

A. Government sector institutions that have something in common.
B. A uniform group of people have the same interest for natural resources management.
C. A diverse group of people who share a common interest or stake in the protection, restoration and development of a watershed.
D. A community in a watershed that comprises only households that have land in the watershed.

Q2. Identify the **incorrect** answer with regard to community-based land management. It:

A. Promotes sustainable use and management of natural resources.
B. Generates income, jobs and social welfare for communities.
C. Strengthens local governance and democracy by fostering accountable and representative decision-making bodies.
D. Empowers local communities to manage their own natural resources.
E. Recognizes the rights, roles and responsibilities of local institutions and stakeholders in decision-making, planning, implementation and monitoring of natural resource-use and management.
F. Does not promote collaboration and coordination among different actors and sectors at various levels.

Q3. _____is policies, laws, regulations, processes and institutions that regulate access to, use and management of land resources. Choose the missing words from the list below:

A. Land tenure.
B. Conflict resolution.
C. Stakeholder analysis.
D. Land resources governance.

Q4. Which of the following statements is not true with regard to community-based land management (CBLM)?

A. CBLM is a participatory approach that involves local people and institutions in all stages of projects.
B. CBLM is a centralized top-down approach to planning and implementation of a natural resources management project, leading to sustainable development.
C. CBLM promotes collaboration and coordination among different stakeholders.
D. CBLM recognizes the rights and responsibilities of communities to manage their natural resources.

Q5. The underlying causes of land degradation are:

1. Population growth.
2. Poverty and or lack of economic development.
3. Limited farmer awareness.
4. Deforestation, overgrazing and over-cultivation.
5. Land tenure related issues, limited alternative livelihood options.

The correct answers are:

A. 1, 2, 3 and 4
B. 2 and 3
C. 1, 2, 3 and 5
D. 2, 3 and 5

Q6. Which one is a definition of a watershed?

A. An area where any natural resource is at risk.
B. An area where all of the runoff water drains into a common outlet.
C. An area with many different species of plants, animals, or insects that are endangered.
D. An area where human agricultural activities are having a detrimental impact on the environment.

Q7. A clear understanding of the physical environment / environmental conditions in a community is sufficient for successful implementation of a natural resources management project.

A. False
B. True

Q8. Match Part I with Part II

Part I

1. Negotiation_____
2. Facilitation_____
3. Mediation_____
4. Arbitration_____

Part II

A. Neutral assistance offered by a third party; the third party oversees negotiation between two disputing parties.
B. Involves the submission of a dispute to a third party. The third party provides a binding or advisory decision after reviewing the evidence.
C. Assistance from a neutral third party in running a meeting and making it productive (only bringing parties to the table). The role of the facilitator is to provide a medium for negotiation.
D. Parties meet voluntarily to agree to an acceptable solution (usually without the help of a 3rd party) to resolve differences

Q9. What are community-based Institutions?

A. They are non-profit making organizations, at local level, that are intended to facilitate community efforts.
B. They are organizations, at local level, that are intended to facilitate social, economic and environmental activities within the community.
C. They are formal or informal organizations at community level.
D. They are kebele administration / kebele level offices of agriculture and cooperatives, including community watershed user's cooperatives, which have been recently organized based on the proclamation 1223/202.
E. They are informal institutions like "idir", "equb", "senbete", "jige", "wonfel", "mahiber", "dado", which are common community-based institutions.
F. All of the above are answers

Q10.What is the role of community-based institutions in community-based land management?

A. For creating common expectations.
B. As a basis for cooperation that goes beyond individual interests.
C. For mobilizing resources for productive activity.
D. To protect, develop, administer, and use natural resources within a watershed with a sense of ownership.
E. To penalize community members.
F. To control community members.
G. All of the above are right answers

Q11.What are the commonly known participatory planning approaches under implementation in Ethiopia?

A. Participatory Water Resource Planning; Community-based Participatory Watershed Development Planning and Participatory Forest Management.
B. Community-based Participatory Watershed Development Planning; Participatory Water Resource Planning and Local Level Participatory Land Use Planning.

C. Community-based Participatory Watershed Development Planning; Participatory Forest Management and Local Level Participatory Land Use Planning.
D. Participatory Water Resource Planning; Participatory Forest Management and Local Level Participatory Land Use Planning.

Q12. One of the following is wrong, concerning the principles of participatory planning approaches.

A. Should be gender sensitive.
B. Should be based on building local experience, strengths and what works.
C. Should be participatory.
D. Is a top-down approach.
E. Should properly identify potential and real problems.

Q13. Please match Column A with column B (13 Questions, 0.25 marks each)

A	B
1.-------Climate-smart Agriculture	a. It is stopping free grazing and practicing stall feeding
2.-------Integrated Soil Fertility Management	b. Grass strips along contours
3.-------Commercial farming	c. The growing of more than one crop in an area
4.-------Biological soil and water conservation measures	d. An approach for reorienting agricultural development under the new realities of climate change
5.-------Crop specialization	e. Integrated use of mineral fertilizers, organic inputs and improved germplasm
6.-------Plantation forests	f. Integration of trees and shrubs into crop and animal farming systems
7.-------Crop diversification	g. A forest stand established artificially by sowing or planting
8.-------Backyard livestock farming	h. Soil bund and level Fanya Juu
9.-------Drainage management technologies	i. Loose-stone check dam and Gabion check-dam
10.-----Gully rehabilitation measures	j. Crop cultivation for family consumption, on a small plot of land
11.-----Subsistence farming	k. Cut-off drains and waterways
12.-----Agro Forestry	l. Growing of a single crop on a particular area
13.-----Physical soil and water conservation measures	m. Crops cultivation for sale, in order to make money

Q14. What is sustainable financing?

A. It is an organization's ability to raise resources to fund its activities.
B. It is continuous flow finance from donors, based on demand from communities.
C. It is the regular allocation of finance by government for watershed development.
D. It is continuous financing by donors based on their interests.

Q15. What is the financing mechanism of community-based land management in Ethiopia?

A. Finance from internal sources.
B. Finance from external source (e.g. donors).
C. Payment of ecosystem services.
D. Revolving Fund as a financing mechanism.
E. All of the above are answers.

Q16. Which of the following statements is correct when monitoring a project?

A. Farmers should not be involved in monitoring, as it is important to get objective, accurate data.
B. The farmers should be involved in monitoring, as this will increase their ownership of the project.
C. Do not collect information about men and women separately, as they are all members of your target group.
D. Collect information on men and women separately, and then add them together to get a complete picture.
E. Collect information on men and women separately so you can compare them.

Q17 Match Column A with Column B (5 Questions, 0.5 marks)

A	B
1.------ Impact	a) Compares achievements with and without without intervention
2.-------Activities	b) Follows trends, compares actual performance with targets
3.-------Outcome	c) The products, goods or services, which result from a development intervention or activity
4.-------Monitoring	d) Actions / inputs implemented to produce outputs
5.-------Evaluation	e) Short-term and medium-term effects of an intervention's outputs
6.-------Outputs	f) Long-term effects produced by a development intervention

Q.18 Please match Column A with column B (5 Questions, 0.25 marks)

A	B
1.------- Implicit knowledge	a) Comprises developed skills, attitudes and cumulative experiences
2.------- Knowledge sharing	b) Knowledge that is easy to articulate, write down and share
3.------- Explicit knowledge	c) It is the practical application of explicit knowledge. d) It is difficult to reveal, but it is still possible to write it down (document)
4.------- Knowledge	e) Knowledge gained from personal experience that can be more difficult to document
5.------- Tacit knowledge	f) Process of exchanging information between people, teams, or organizations

PART II
TECHNICAL MANUAL

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INTRODUCTION

Background

The Ethiopian government has been implementing a country-wide Sustainable Land Management (SLM) Programme since 2008, using community own resources and technical and financial support from development partners such as the World Bank, the German Development copperation (KfW and GIZ) and other funding organizations.

The Programme aims at reversing land degradation and improving agricultural productivity in the highland regions of the country, through a prominent level of community participation and a bottom-up development approach. To this effect, the government has recently endorsed a community watershed use and management proclamation that empowers self-organized communities, grouped in watershed users' cooperatives, to sustainably use and manage watershed resources for economic and social development.

Kebele-level development agents and woreda-level extension workers are the front line staff mandated to provide hands on advisory and facilitation services to communities in the planning and implementation of SLM. However, the capacity of communities to implement and further scale-up sustainable land management to new areas is limited. The capacity varies from place to place, depending on practical experience and training opportunities open to agricultural extension agents. A training needs assessment of the CLM project highlighted that despite the availability of diverse national guidelines, sector specific training manuals and directives on watershed development, use and management, there is no tailor-made standard or comprehensive training material that extension workers can easily adopt for community trainings. Consequently, the level of understanding of the mandates, roles and responsibilities of community-based institutions in SLM varies from community to community. In consequence, the quality of trainings provided by extension workers is inconsistent and does not comply with adult training methodologies.

The overall performance of development programmes/projects has been constrained by lack of capacity among extension workers on community-based land management. Extension workers do not have adequate knowledge and understanding on the different components of land management and its purpose/relevance; the importance of strong sectoral integration; programme inclusiveness, to optimize different environmental and socioeconomic benefits and interests, and ensure effectiveness, efficiency and sustainability.

As a result of capacity limitations among extension workers, communities haven't received adequate technical support and advice in their locality, and can't be in a position to take the lead in planning and implementation of land management programmes/projects, in their locality in general and at micro watershed level in particular.

With this understanding, the GIZ CLM projecr has initiated and discussed, with MoA, the importance of having comprehensive CBLM training material that will help improve the knowledge, skill and attitude of extension workers and community leaders, and bring wider impact on the existing development efforts of land and natural resource management programmes/projects and community-owned initiatives.

Purpose of this Training Material

The purpose of this training manual is to transfer up to date, comprehensive knowledge and skill to communities on community-based land management approaches, practices and principles, through community trainers, for them to bring about a change of behavior in land management. It aims to transfer the required knowledge in compliance with adult training methodology standards.

The material is intended to bring all extension workers, having different educational backgrounds, to the same level of understanding on CBLM approaches, practices and techniques, including required soft skills, so that they will be capable to adequately provide technical/ advisory support and on-the-job training to the community, on planning and implementation of integrated community-based land management interventions; applying equitable and sustainable use of land resources; and provision of support for the establishment/strengthening of community-based institutions.

Unlike with thematic, area-specific training manuals, this material is comprehensive and provides an overview of all possible community-based land management approaches and interventions, including resource governance, institution building, access to finance and financial management issues, and other cross-cutting interventions.

This material doesn't describe technical issues in detail, so that it doesn't replace or substitute the training materials produced for different thematic areas. The end result will be a capacitated community that can take the lead on the preparation of integrated land management plans and effectively and sustainably implement those plans, both for the benefit of the community and the environment.

The training manual is organized in seven interlinked modules to impart the required knowledge and skill and to ensure attitudinal change on sustainable management and use of land resources at societal level. The contents of each module are structured in a way to respond to the commonly asked questions on what CBLM is, how to apply it and why to adopt CBLM. The purpose or focus area of each module is briefly described in the table that follows.

Module	Purpose and focus area
Module I. Basics of CBLM	- The purpose of this module is to enhance the general knowledge and understanding of extension workers and community leaders on the basics of CBLM (concepts, principles, relevance and key challenges). - It deals with the basics of community-based land management, which describes community and community-based institutions in the context of land management. - Furthermore, the module elaborates on the advantages/benefits for communities and development workers opting-in to community-based land management.
Module II. Community Resource Governance	- The purpose of the module is to provide an overview of basic resource governance issues from a community land management perspective, and to enhance the understanding of extension workers and community leaders about resource governance. - It discusses the concept of resource governance and its relevance to CBLM, and elaborates basic governance issues that have to be considered in CBLM. - Furthermore, the module describes the roles and importance of community leadership, local by-laws and conflict resolution mechanisms.
Module III. Community-based Institutions for Land Management	- This module discusses the role of communities and community-based institutions in land management, how to establish them (basic steps) and required actions to build appropriate community-based institutions that can take over management responsibility of land and its resources.
Module IV. Community Resources Management Planning	- The purpose of this module is to explain different participatory community-based planning approaches (the concept, the principles and relevance), and enhance the overall knowledge and understanding of extension workers and community leaders about community-based planning approaches. - It describes the benefits and processes of bottom-up planning approaches, and experiences and lessons as case studies.
Module V. CBLM Interventions	- This module aims to enhance the general understanding of extension workers and community leaders about basic land management interventions in agricultural development, and management of natural resources, including cross-cutting development interventions, such as climate change and other interventions. - The module describes the common approaches and processes followed in the selection and prioritization of land management interventions and the implications of community ownership and sustainability of interventions.
Module VI. Sustainable Financing Mechanisms for CBLM	- This module aims to enhance the understanding and knowledge of extension workers and community leaders on the concept of sustainable financing mechanisms, the rationale and benefits and potential sustainable financing mechanism for CBLM interventions. - It also intends to improve their understanding of financial management and control systems, so that community institutions can easily manage financial and material resources in implementing land management practices at grass root level.

Module	Purpose and focus area
Module VII. Community- based Knowledge Generation and Learning	- The module describes the basic concept of knowledge generation and learning, the methods and tools of knowledge management and sharing, how to set monitoring indicators and how to monitor changes (basic steps or processes of monitoring), and how to ensure and monitor quality and sustainability.

MODULE ONE: BASICS OF COMMUNITY-BASED LAND MANAGEMENT (CBLM)

1.1 Community and Community-Based Land Management in Ethiopia

1.1.1. The Community as Land Management Actors in Ethiopia

"Community" can be described as a group of people that recognizes itself, or is recognized by outsiders, as sharing common cultural, religious or other social features, and interests, and that forms a collective identity with shared goals. However, what is externally perceived as a community might, in fact, be an entity with many sub-groups or sub-communities. It might be divided into clans or by social class, language, or religion.

A community might be inclusive and protective of its members; but it might also be socially controlling, making it difficult for sub-groups, particularly minorities and marginalized groups, to express their opinions and claim their rights.

In the context of CBLM, a community is usually defined as a group 300 - 500 farmer households, with an average 5 family members each, who live or have a landholding, in the highlands, in a micro-watershed of 750 ha to 1000 ha. In the case of pastoralist areas, or the Ethiopian lowlands, a community could cover beyond 1000 ha. A community in a watershed could share forest, bush/woodland, pasture, grazing land, water bodies, marketplaces and infrastructure, such as irrigation, water points and plant material production centres.

The Ethiopian constitution provides the legal framework for community members in a community watershed to organize themselves in formal institutions, such as cooperatives and associations, for the management and use of land resources.

Figure 1. 1 A community in a watershed

A community in a watershed usually comprises various social groups, such women and men, youth and elderly, able and disabled people, religious leaders and ordinary farmers, landholders and the landless. The social groups residing in a community have diverse and dynamic priorities, interests and perspectives on the short- and long-term management and use of wa-

tershed resources, depending on their location, exposure/experience, access to land, livestock holding, level of education and family composition and size.

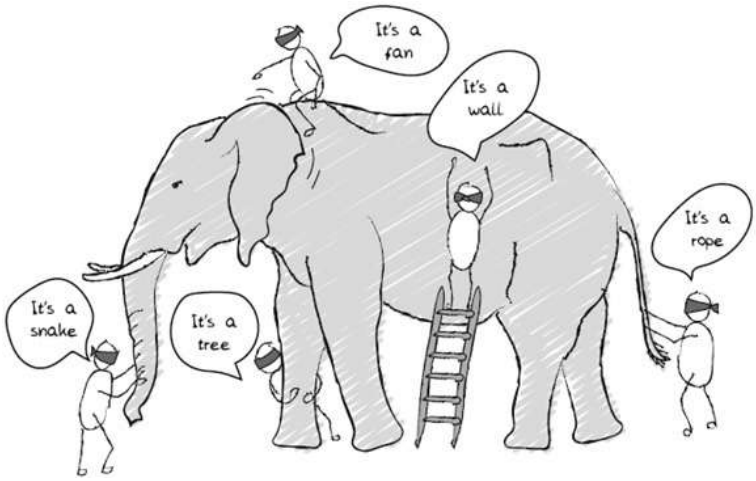


Figure 1. 2 The different understanding and perspectives of community members

For instance, community members who have land, but no, or limited, livestock could be more interested in crop production and zero grazing, while those with livestock, but without land, are interested on open grazing and livestock feed development. In the same way, farmer households in up-slope areas could be interested in soil and water/moisture conservation and harvesting, while those on the lower slopes might be interested in flood water harvesting and irrigation development. Furthermore, the interest and priorities of social groups could vary over time, depending on access to infrastructure, credit services and climate change. For instance, community demands for fruit seedlings could increase when access to markets or access to irrigation water in the watershed is increased.

Excessive use and conflict among community members over the use and management of communal land resources commonly exists in the absence of agreed local by-laws or conflict resolution mechanisms. Successful restoration and sustainable management of local resources requires a good understanding of the diverse and dynamic interests of different social groups. Hence, watershed development interventions should entertain and consider these diverse priorities and interests, and try to find win-win situations, in terms of the social and economic wellbeing of the different social groups and with respect to ecological restoration, as organized communities invest their labour, resources and knowledge in the development and sustainable management of land resources to meet their short- and long-term needs.

Figure 1. 3 Community Discussion and Mobilization for Soil and Water Conservation.

1.1.2 Land and Land Management in the Ethiopian Context

FAO/UNEP, (1997), define "land" as a "delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface, including those of the near-surface climate, soil and terrain forms, the surface hydrology (including shallow lakes, rivers, marshes, and swamps), the near-surface sedimentary layers and associated groundwater reserve, the plant and animal populations, the human settlement pattern and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.)".

Thus, in the context of CBLM, land resources refer, not only to soils, but also to the landforms, the water, the wetlands, the climate, the flora and fauna.

The land resources in a micro-watershed are used by user communities for different purposes to meet the diverse needs and priorities of the different social groups in the watershed, such as food production, livestock feeds, firewood production and water supply. A given watershed could be covered by different vegetation types, such as forest, bush/shrubs, crops, pastures/grasses, water bodies and settlement areas.

The proportion of the various land covers in a watershed varies from place to place. The SLMP experience indicated that, on average, 50% of watershed areas in the highlands and midlands are cultivated lands, 30% bushlands/woodlands, 5% pasture lands, 10% forest lands and 5% settlement and miscellaneous.

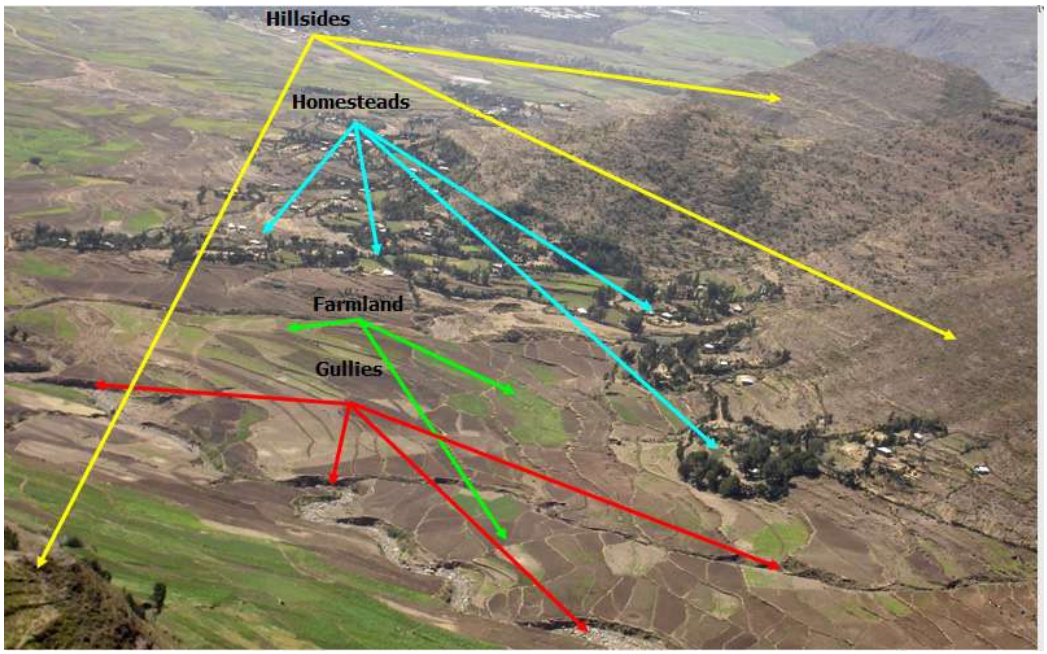


Figure 1. 4 The different land units of a watershed

The quality of the land resources in a watershed, at a given time, varies from place to place, depending on the topography (slope and aspect), rainfall amount and distribution, and the management and use practices of the community. The land resources in a watershed provide multiple interlinked benefits to individual community members and the society at large. The benefits of the land resource range from marketable outputs, such as food, feeds and fibre production, to non-marketable products and services, such as nutrient cycling, purification of contaminants, alleviation of flood, carbon sequestration and maintaining biodiversity. Therefore, maintaining the functions of land resources requires proper management and improvement.

Sustainable land management refers to the optimum use of the multiple functions of the land

resources to meet the diverse human needs (agriculture, forestry, conservation), without compromising the long-term socio-economic and ecological functions of the land.

Sustainable land management combines practices, approaches, technologies, policies, and activities aimed at integrating short and long-term social, economic and environmental benefits into the community. Sustainable land management measures are diverse, and range from simple natural regeneration, through enclosure, to complex biophysical re-engineering of landscapes. The land management measures implemented in a watershed depend on the level of degradation of the land, the purpose/use of the land, available resources and economic return expected from the land. Sustainable Land management, in general terms, aims at simultaneously addressing the triple benefits of land:

- Maintaining and enhancing crop and livestock production and productivity **(Economic).**
- Reducing the level of production risk, increasing resilience to shocks, and assuring socially acceptable and secure use of resources, with respect to the wider community **(Social).**
- Protecting the potential of natural resources and preventing degradation of soil and water quality and enhancing soil capacity as a buffer against degradation processes **(Ecological).**

Community-based land management (CBLM) is an approach to land resource management that promotes active participation and ownership of community members and resource users in the planning and implementation of land management measures and decision-making, related to the use and management of land resources. CBLM is a process by which landholders gain access to, user rights over, and ownership of, natural resources; collaboratively and transparently plan and participate in the management of resource use; and achieve financial and other benefits from “stewardship”.

At the community level, this involves community-based institutions, and the engagement of concerned local stakeholders, in the planning, implementation, monitoring and evaluation of community-based land management projects. It is a bottom-up approach that involves local resource users in the management and use of land resources. The bottom-up approach assumes that local users, if mandated for the use and management of the local resource, can utilize the resources in sustainable ways and enforce community-derived rules.

The CBLM approaches evolved in response to the failure of more centralized approaches and recognizing that local management is much more effective than a top-down approach, in terms of generating context-specific, long-lasting solutions to land degradation challenges.

In CBLM local people come together to protect against the degradation of their land resources, so that they can use these natural resources to improve their lives and the lives of their children and grandchildren. It is an approach to enable every willing member of the community to play a part in improving the quality of people’s lives, economically, culturally and spiritually.

A community-based land management approach considers local communities to be at the centre of the development partnership and builds on the resilience capacities, skills, and resources of the community to achieve the community’s own goals. The CBLM approach recognizes the role of extension workers as facilitators, and supporters of the community in the development, management and use of local resources.

CBLM takes into account the following important principles:-

- ***Community empowerment:*** Empowerment not only to rehabilitate the land resources, but also to build economically empowered communities, via use of local resources in sustainable ways and build resilience to shocks.
- ***People-focused***: Recognizing the interest and benefits of different social groups (women, elders, landless, youth, disabled, disadvantaged groups (whose livelihoods depend on the natural resource) at the centre of the management.

- ***Genuine participation:*** I.e., creating space for communities and the various social groups to lead and take part in the assessment, decision making and implementation of their own actions.
- ***Holistic***: Recognizing the holistic nature of rural people's lives, their use of multiple livelihood strategies that are risk averse, and so the need for holistic responses.
- ***Build on strengths***: Build on the indigenous technical knowledge and skills that people have and on what they can do as local organisations or as individuals, thus building on their capacities and opportunities and not just on their needs.
- ***Use of a partnership approach*** that values local communities as key partners at all tiers of government (kebele, woreda, zone, region and national), of the NGO community and the private sector.
- ***Sustainable***: In terms of economic, environmental, social and institutional sustainability (as the core yardstick for any intervention).
- ***Dynamic***: Recognizing that change is unavoidable and that change will take place in poor people's lives as well as in the policies, institutions and processes which impact on them. In consequence, interventions, such as CBLM, need to be flexible.

1.2 The Need for Land Management and the Reason for it being Community-based.

The land resources in a watershed are finite and are depleted when excessively used by the community. The deterioration of the productive potential of resources is a great concern to the economic development of the country.

Figure 1. 5 Misuse and mismanagement of land resources in Ethiopia

Recent MoA reports indicate that more than 43% of Ethiopian soils are affected by soil acidity and nearly 50% of arable lands are severely or moderately degraded (MoA, 2010). The same report indicates that 30,000 hectares of fertile land are lost each year due to erosion.

Figure 1. 6 Massive soil losses in agricultural lands in Ethiopia

If not properly managed, prevailing climate change is expected to further aggravate land degradation and reduce the productive capacity of land resources. As a result, feeding the growing population will become increasingly difficult and the number of food insecure people, and related social crises, is likely to increase.

As the drivers of land degradation are diverse and dynamic, reversing degradation and enhan-

cing the productive capacity of the land will require local solutions, through partnership, ownership and the active engagement of local communities. Successful restoration and sustainable management of land resources requires local leadership, local knowledge and innovations, commitment, and labour and material inputs from the community, in planning, implementation and monitoring and evaluation.

National and global experiences indicate that local communities assume ownership, invest their labour, knowledge and finance and maintain land management measures when they feel secure in their long- and short-term user rights over the land resource.

Community-based land management solutions last longer, as compared to expert-driven interventions, as the community have better understanding and experience of the causes and effects of land degradation.

In Ethiopia, where data and information related to specific watersheds is not documented and readily available; local knowledge and experience is critically important in designing appropriate land management projects.

CBLM ensures:-

- **Community engagement** in the identification, design and execution of initiatives that strengthen the sustainability of land management.
- **Ownership and active partnership** of community and community-based organizations in the development, use and management of land resources, with a self-defined, distinct identity, using communally owned facilities.
- **Efficient use of resource and equitable benefit sharing** among community members.
- **Sustainability of development efforts and achievement of social, economic and ecological resilience** by building on customary practices and local knowledge systems.
- **Development of institutional capacity** in the planning, implementation and monitoring of land use and management as active partners, to strengthen, motivate and maintain interest and commitment.
- **Social cohesion and partnership** among community members and with other development partners.
- **Development of context-specific solutions** for diverse local problems that help the community to recognize their problems, realize opportunities, agree and act with little external support and motivate the community to engage with the government or development partner organizations.

In the past, most land rehabilitation efforts remained unsatisfactory, mainly due to lack of community ownership and related uncertainties on the long-term use and management of the land resource, especially communal lands, and other factors, including lack of local capacities in the planning, management and use of local resources.

The CBLM approach strives for community driven initiatives, which incorporate “local institutions, customary practices and knowledge systems in the management, development and utilization of the land resources”, with benefit generating and sharing mechanisms. CBLM, therefore, provides diverse economic, social, and ecological benefits to the community.

CBLM is considered to be an important approach to enhance natural resources governance by local communities and the public, for sustainable development.

Amongst others, the CBLM approach is required to:-

- Increase a sense of ownership and foster the active cooperation and collaboration of communities in decision making and implementation of agreed actions.
- Address the diverse interests and priorities of communities and foster mosaic solutions to address complex land management problems, through local innovations and diverse knowledge

sources, to sustainable management: including local ecological knowledge and application of locally adaptable technologies/practices.

- Maximize efficient use of resources and reduce conflict over resources by setting conflict resolution mechanisms.
- Build mutual trust and partnership (social interactions) among community members within the community and with the government, on the short- and long-term management and use of resources.
- Ensure continuous NRM-based jobs creation and diversify the income of households from managed communal land resources. Landless and poor households from the community should get a chance, or access, to employment opportunities and to generate sustainable household income from managed land resources.
- Enhance the self-rule capacity of the community as an institution, in proprietorship and tenure rights; rights to make the rules and viable mechanisms to enforce them; and with respect to ongoing incentives, in the form of income benefits.
- Grant collective use-rights over resources by groups of people, who can then manage them according to their own strategies.
- Decentralize natural resources management planning, implementation and monitoring to local communities, through provision of enhanced local power and control over resources (which has the potential to improve attitudes among local communities towards sustainable natural resource utilization).

1.3 Transitioning Towards Community-Based Land Management Approaches

Community-based land management is an interactive process which requires a paradigm shift from the conventional expert-driven, top-down recommendations on land management to community owned/initiated, localized development. The transition from the current passive participation of the community in planning, implementation and decision making in land management, to active, pragmatic and inclusive participation and ownership by communities requires the adoption of well thought out and designed approaches, and steps, and the engagement of trained facilitators.

Achieving community-based land management is realised and is categorized in four major steps, with three sub steps each. These are demonstrated in the schematic that follows.

Figure 1. 7 Steps in the community-based approach

Step 1: Self-organization: Land management requires negotiation and agreement between the land users and the landowner on the use and management of resources, to effectively utilize the multiple functions of the land resource. Hence, the self-organization of a local community is an important first step to consolidate their negotiation power and to guarantee collective responsibility over the sustainable use of land resources.

Self-organization is not a one-time event or activity. It is an iterative and continuous process which requires repeated discussion and consultation among community members, through the facilitation of community workers. Self-organization comprises three important steps:

Step 1.1: Forming NRM common interest groups: This is the entry point for community-based land management, in which concerned community members take the initiative to organize like-minded people from within the community to come together for the restoration and sustainable management and use of land resources. At this stage, the community members who took the initiative require strong and continuous backup and support from the kebele administration and NRM extension, in the sensitization and awareness-raising of community members. The initiators should sensitize other members of the community in community meetings, in churches and mosques, to form a critical mass (at least 20% of community members join the groups) and create an understanding in the larger community, on the need for collective use and management of local resources.

A minimum of three to four community meeting is required to reach the community members with the message to join the watershed user group (storming). It is common that some community members could leave the group if they find it unrealistic and not as expected.

Step 1.2: Identify and select leaders and develop rules/by-laws (norming): Once critical mass

is reached with regard to the size of the watershed user group, the group should select an executive team to lead the group for a fixed term. Furthermore, the group should elaborate shared rules/by-laws and a shared vision for the restoration, management and use of watershed resources.

The group can adopt model by-laws, generated at woreda or region level, to ensure conformity with regional rules and to fulfil important human rights and ecological requirement. The shared rules must be discussed and endorsed by all group members in a general assembly. Every group member should have a copy of the agreed rules/ by-laws of the group. A newcomer should get the get the opportunity to understand the by-laws before subscribing to the group. Group by-laws can be updated at the request of a majority of group members.

Step 1.3: Obtaining legal watershed resources user status: According to the Community Watershed Use and Management Proclamation (No:1223/2020), organized communities can formally register as watershed resource users' cooperatives, to develop, manage and use watershed resources. The users group is required to compile their by-laws and a management and user plan for the watershed resources. Registration can be facilitated by community workers or district cooperatives office experts. Obtaining legal watershed user status can take 4 to 6 weeks from the date of application, depending on the number of applications and the capacity of the district cooperative agency to process applications.

Step 2: Exploration: This is an important step in the organization of community watershed user groups, to get a detailed understanding of the root cause of the social, ecological and economic challenges of the watershed and to build on the potential for sustainable development, through reconnaissance, survey and discussions among community members on the past use and management of land resources. This step comprises three important sub steps:

Step 2.1: Understanding the causes of land degradation challenges: At this stage, the elected executive team members conducts an inventory of the land degradation hotspots, such as gullies, rills, bare lands and deforested areas, through transect walks and interviews with community members, and documents the extent, duration, and the processes of the degradation. Furthermore, the team documents the available resources for the restoration of the degraded lands, such as water sources, planting materials, construction materials such as stone and soil, community roads and the available work forces.

This survey should be conducted during the different seasons of the year. For example, the team should undertake the survey during the rainy season, to understand the volume and source of runoff and flood waters, and during the dry season, to document drought tolerant plant species, the discharge capacity of water sources, etc. These activities are year-round and continuous and the team requires practical training on assessment methodologies and documentation of watershed information.

Step 2.2: Analyse and map the current condition of the watershed: Once the survey is completed, the team should be able, not only, to estimate the quantity and quality of the land degradation, such as length and width of gullies, size of bare lands, size of actively deforested lands, but also, quantify and locate the available resources in the watershed, such as the available work force, locally adaptable planting materials, construction materials, etc. This is an important step for the selection and prioritization of interventions and development of realistic work schedules.

Step 2.3: Identify and prioritize development interventions and develop work plans: As available resources (time, labour and money), to address the complex land degradation challenges of a community watershed are always limited, the executive team members must identify and prioritize appropriate land management measures, for the restoration and productive use of the watershed resources.

The team should brainstorm and list down possible measures, including land use and watershed development options based on individual farmer and community level experiences, and learning from other communities' experience with similar socio-economic and biophysical conditions.

In this regard, executive team members may request assistance from the kebele or district to learn from others, including research institutions, on effective land management technologies and practices.

Finally, the team undertakes ranking and scoring on the land management options for each land unit in the watershed, such as forest, farmland, pasture/grazing and water bodies. The proposed land management and land use option with the highest score, in terms of social benefits (to women and men, landless and landowners, youth and ordinary farmers, disadvantaged groups) acceptance, ecological benefits (enhanced soil fertility, moisture retention, biodiversity and carbon sequestration) and economic returns (enhanced crop production, enhanced livestock feed production, enhanced access to fuel wood and reduced cost of production).

Once the development and management measures are identified and prioritized by type, quantity and time, the executive team members present the proposal to the community members in a general assembly, for comments, validation and approval. At this stage the community members confirm their commitment to implementation of the development, management and use of the watershed. The required input (material, labour and finances) are estimated, based on past experiences and prepared work norms.

Step 3: Mobilization (performing): Though the returns from restoration are far higher than the costs, significant labour, materials and financial investments are required to restore and sustainably manage the land resources. Hence, the community must mobilize internal and external resources for implementation of the proposed land management measures. Mobilization of internal and external resources for land management is a continuous process with three important sub-processes. These are:

Step 3.1: Assess and organize own resources: Land management is a labour intensive engagement. Hence, effective implementation of land management requires an understanding of the available workforce and the willingness of community members to invest in land management. Available work forces within a community watershed is estimated as 30% of the watershed population. The number of working days in a year invested in land management by the work force in a community watershed varies from place to place, depending on the level of awareness of the community and the severity of land degradation. The watershed community executive team can target up to 80 days investment, in land management, from each adult community member. However, actual participation could significantly differ from the target, depending on the effort made to raise the awareness of community members.

Community members can also provide an in kind contribution, including planting materials, construction materials and pack animals to transport the input material from production centres to construction sites.

Step 3.2: Organize NRM campaigns: Understanding available community resources alone is not enough to ensure sustainable use and management of land resources. Community members must come together to implement the proposed measures. In this regard, the executive team members must motivate and inspire community members to join NRM campaigns in an organized way.

Announcements during religious holidays, in marketplaces and public meetings, are commonly used to inform community members to participate in NRM, as per the schedule. Special events are also organized to respond to emergency disasters, such as destruction of structures due to excessive rain and flooding. The engagement of influential and locally respected

people from within the community in campaigns is important, to ensure maximum attendance of community members.

Step 3.3: Apply for external funding and establish networking and partnerships: Though a large portion of the required investment is expected to be covered from the community's own resources, some required inputs could be beyond the capacity of community members, necessitating external support, in terms of financing, knowledge and technologies. Currently, there are several private companies and financing institutions committed to support community initiatives on land management, as part of their social corporate responsibility and in the form of payment for ecosystem services.

Water bottling companies, breweries and other industries are becoming aware of the need to support the land management initiatives of local communities. Furthermore, communities can gain knowledge and get access to proven land management technologies and practices by establishing linkage and partnerships with research institutions and academia. To do this, the community must properly define own capacities and gaps to implement land management measures in their watershed; develop transparent financial management systems and ensure sustainability of their engagement in order to acquire funds from external sources.

Community members must know external support is only temporary and complementary. Hence, they must develop self-reliance and capitalize on the opportunities in their local areas.

Partnership with the private sector should not be limited to funding, but should also include marketing and knowledge sharing on watershed products.

Step 4: Review and consolidation of experience for further scaling: This is an important step for the community to build confidence and identify suitable land management practices, based on their practical experience. This process comprises three interlinked sub-processes.

Step 4.1: Document/organize community performance and land management outcomes: The community watershed executive team members must document and organize achievements and identify what works well and what does not work and why. Furthermore, the outcomes of land management measures must be documented to determine whether the community is on the right track, in terms of development of the watershed. This evidence can serve as a critical input to redesign watershed development and land uses.

These facts can be collected from the daily land management performance reports and quick field surveys in the watershed.

Step 4.2: Document and validate successful experiences and success factors: Not every land management measure implemented in the watershed may be successful, in terms of addressing the multiple and dynamic needs of the community. The documentation of successful experiences/best practices is important for further scaling and prioritization of land management practices. The documentation of experiences should provide detailed information on the approach and methodology applied, resources mobilized and the unique opportunities seen to implement land management practices.

Step 4.3: Celebrating successes: Recognizing successes encourages community members to do more and better. Regardless of the level of achievement, communities must celebrate successes to motivate individuals and groups to actively participate in the development of the watershed. Such events could be organized once a year or once in six months. In this event, individuals or groups with extraordinary performance or exemplary contributions can be rewarded.

1.4 Challenges in Transitioning Towards CBLM

Though community-based land management seeks a bottom-up approach, there are some challenges associated with processes and actual operations. To begin with, as community development activities are carried out by the communities themselves, there should be trusted, committed and strong leaders to lead and mobilize communities for collective action. Moreover, communities need to be organized and to collaborate for their common goals and interests. However, all these processes require lengthy and time consuming commitment. Thus, the need for well-designed support and frequent facilitation from external parties: government and project.

Developing credibility and mutual trust among communities, community leaders and government extension service staff is time consuming, but, if effectively addressed, long lasting results and sustainability can be ensured.

All of these processes require development of a transparent system for information exchange and benefit sharing. At the same time, the extension service and the community should develop a tracking and regulatory system to monitor and evaluate the progress of community development activities and ensure communities participate democratically and enjoy the benefit of development on an equitable basis.

On another topic: most communities, mainly those familiar with income generating activities from a CBLM project, may want to start projects in haste, overlooking other important factors, such as the need to develop long-term and short-term plans, setting community visions, capacity building, strengthening the natural resource base and developing resource management and use plans. These factors should be handled smoothly and the running of projects should contribute to the community's understanding of the concepts involved.

Problems of maladministration, mismanagement, improper running of day-to-day affairs, lack of accountability and project domination by an enlightened few can all hamper community efforts and achievements. Therefore, it is necessary to maintain a balance between a community's willingness (i.e., its acceptance of the project and desire to implement it) and its readiness (its understanding of the concepts involved, and its capacity to implement the project). Sufficient trainings should be organized for elected community executive committee members, to build their capacity to mobilize communities and to handle CBLM issues.

MODULE TWO: COMMUNITY RESOURCE GOVERNANCE

2.1 Concepts and Principles of Land Resources Governance

2.1.1 Definition of Terms

Governance is concerned with the processes by which communities participate in decision-making and how society accommodates its members in formulating, reviewing, approval and implementation of its rules and laws.

Land governance: Land governance involves a procedure, policies, processes, and institutions by which land, property and other natural resources are managed. This includes decisions on access to land, land rights, land use, and land development.

To be more specific, land governance includes the way in which:

- Property rights to land (for groups or individuals) are defined, how exchanged and transformed.
- Public misunderstanding over land use, land management and taxation is managed.
- Land is managed and used, based in statutory and customary rights.
- The nature and quality of land ownership information is made available to the public, and the ease with which it can be accessed or modified; and
- Disputes are resolved, and conflict is managed.

Moreover, land governance is concerned with:

- The rules, processes and structures through which decisions are made about the use of and control over land;
- The manner in which decisions are implemented and enforced; and
- The way that competing interests in land are managed.

Land governance encompasses statutory, customary and religious institutions. It includes state structures such as land agencies, courts and ministries responsible for land, as well as non-statutory actors, such as traditional bodies and informal agents.

It covers both the legal and policy framework for land, as well as traditional and informal practices that enjoy social legitimacy.

2.1.2 Principles of Land Resources Governance

Application of a number of property rights principles is recommended to minimize undesirable and unexpected outcomes to land resource initiatives. These principles are identified as follows:

S/N	Principles	Description of the Principles
1	Understand existing property rights systems before launching a natural resource programme.	**Need to knows:** - Information regarding local property rights, rules and their enforcement. - The number of property rights systems that may be in operation on the same site, which may include seasonal rights. - The presence of overlapping, and perhaps competing, property rights systems, existing in relation to given natural resource sets.
2	Recognize and build on customary property rights.	- Customary property rights systems often retain more coherence and legitimacy than competing systems and events. - Customary property rights systems are durable, exhibiting desirable characteristics of flexibility and adaptability. as they evolve in the face of changing economic, social, and political environments.
3	Provide incentives for sustainable management to user groups, by securing property rights.	- An appropriate property rights regulatory system channels and enhances positive incentives for sustainable governance and management of resources. Access to and use of the resources should be clearly defined and rights-based.
4	Where possible, clarify property rights, reducing (potential) conflict over land and natural resources.	- Identify and address existing conflicts due to overlapping claims. - Where possible identify and acknowledge users of various resources, in particular secondary resources that are often overlooked. - Harmonize plural legal systems, such that property rights emerging from the various legal systems, lend for consistent rules.
5	Pay particular attention to the duration of property rights	- Secure long-term property rights are needed to create and consolidate local incentives for long-term investments.
6	Avoid displacement (reduction or elimination of property rights) wherever possible.	- Reduction or elimination of property rights have enormous potential for creating poverty, livelihood insecurity, and conflict. - Where such changes in rights are necessary, assess the current property rights of various primary and secondary users of land and natural resources in the area and provide meaningful compensation.
7	Recognize the diversity of solutions.	- No single model is appropriate or applicable in all situations and places. - Assess trade-offs of various property rights regimes, and associated factors such as government capacity for enforcement of laws (particularly in relation to private property), strengthening of local institutions (particularly in relation to communal lands and resources), and incentives and disincentives associated with various property rights regimes.

8	Strengthen local institutions.	- Local institutions should be assisted to become more equitable, particularly in heterogeneous communities (to prevent capture of resources by local elites).
		- To strengthen local institutions of natural resource governance, systems must:
		  - Ensure high levels of equity and sustainability;
		  - Be more transparent and need to be accountable.
		  - It is essential to be inclusive and responsive to local needs

9	Promote property rights regimes that allow for equity as well as efficiency.	- Private, state and common property regimes have their respective roles and benefits. To know the benefits of rights regime, it is good to consider:
		  - Characteristics of the resource;
		  - Range of rights holders involved, and range of potential users; and
		  - Diversity of resources derived from the region.
		  - Care must be taken to ensure that securing the rights of one group does not serve to marginalize others.

10	Where possible promote solutions that go beyond efficiency and equity; empowerment of rural poor can bring many long-term benefits	- While efficiency and equity are important dimensions of ideal property rights regimes, regimes should consider concerns for rural empowerment and moving communities beyond dependency and a pervasive sense of helplessness.

2.2 Rationale for Land Resource Governance

The relevance of having adequate knowledge and understanding about land resource governance, and giving adequate consideration to it in community-based land management can be justified because of several reasons:

A. As competition for land and natural resources continues to escalate from time to time, it is vital that inclusive land governance policies and practices are developed, implemented, and strengthened further.

B. Land governance is a means for inclusive management of land and its resources. When land is governed in an inclusive manner, it is likely to increase the sustainable management of land and equitable access to the subsequent benefits. Inclusive land governance frameworks and their benefits for local communities can also provide opportunities to challenge wider communal or societal issues such as cultural conflict, political and economic marginalization, corruption and gender inequality.

C. Strong land governance is crucial in managing land in a just, conflict-free and sustainable manner.

D. It gives opportunity to consider properly rights and user right issues, as land governance is guided by community by-laws and government legal provisions.

In community-based land management, extension workers and the community/land users need to know that effective land governance works best when:

- Local communities and rights-holders are placed at the centre of planning and decision-making,
- They define their own priorities and pursue them in meaningful and self-determined ways.

Hence, it is highly advisable to give due attention for the needs and perspectives of local communities (including indigenous peoples, women, and marginalized groups) and decision makers, as these help to actively identify, implement and advocate for inclusive land governance and sustainable land-use policies and practices that suit their local context.

In land governance the two important issues that have to be properly defined and need to be clear are property right and use right.

What is property right?	What is use right?
- Property rights are the rules that define an owner's rights and duties in the use of a particular resource. - The types of property rights, and the strength of those rights, are key factors in determining the status of land and the environment. - Many environmental problems are the result of weak or poorly defined property rights over land and natural resources. This leads to the problem of over-exploitation and degradation of natural resources because there is no incentive on behalf of the user to manage or protect those resources. - If property rights aren't clearly defined, it is not possible to assign responsibilities, and the system will drift into open access as a consequence. - Resolution of property rights is only one necessary condition for resolving natural resource management problems.	Use rights mean that the control by group or individuals over natural resources is officially recognized. Clearer, stronger user rights may enable communities to use natural resources better and more innovatively. If community have user right, they have an incentive to use and conserve the resources in a sustainable way. It is necessary to make them confident that investing time and effort to improve those resources is worthwhile. Therefore, there is a need to address the following issues for sustainably manage and govern land resources: - - Clearly defined user rights for communal or open land resources such as forest, grazing, wetland, etc. help to minimize or avoid extreme resource degradation and ensure sustainable management - Create conducive ground to involve the local people in the planning, implementation and decision making

2.3 Policy and Legal Framework of Land Resource Governance

2.3.1 Legal Provisions and Experiences

Ethiopia's legal framework comprises its constitution, federal laws (the civil code, the 1997 rural land law as amended in 2005 and regional laws and directives. These stipulate that all land is owned by the government; but use rights of holdings are recognized: private individual; communal, in rural areas. Some heterogeneity occurs across regions, which are assigned responsibility for land management and administration by the constitution. In the constitution as well as in the regional regulations, though individual rights are recognized, their transferability is restricted in a number of ways.

In Ethiopia, proclamations and laws already exist that facilitate the rights of communities to map, manage or plan their land use though they are not being implemented in practice adequately. Existing legislation or guidelines are already well formulated on paper, but the real problem lies in implementation. This can stem from a lack of political will, but also from a lack of capacity or knowledge on the part of state authorities or other actors and lack of awareness by the wider community. Empowering local communities to engage with authorities themselves by

building community capacities and knowledge, for example about their rights and government regulations, can be an effective strategy in mobilizing implementing agencies for resource governance.

The most relevant legal provisions enacted in Ethiopia are summarized below.

A. Constitution of the Federal Democratic Republic of Ethiopia

The Constitution specifies the concepts of sustainable development and environment rights that are entrenched in the rights of the people of Ethiopia through Articles 43 and 44, which state among others the right to development and the right to live in a clean and healthy environment. Other important provisions of the Constitution include the following Articles:

No	Articles	Article Description
1	Article 40(3)	The right to ownership of rural, urban land and natural resources.
2	Article 40(4)	The rights of farmers to obtain the land without payment and the protection against eviction from their possession.
3	Article 40(5)	The rights of pastoralists to free land for grazing and cultivation.
4	Article 40(7)	Emphasizes on the right to acquire property for the purpose of overriding national interest; it empowers the government to expropriate private property for public purposes subject to payment in advance of compensation commensurate to the value of the property
5	Article 41(9)	Deals with economic, social and cultural rights and sets out the State responsibilities to protect and preserve historical and cultural legacies
6	Article 43 (2)	The rights of the people to be consulted with respect to policies and projects affecting their community
7	Article 92	Affirms the commitment of the government to ensure that all Ethiopians live in a clean and healthy environment, puts the principles that designs and implementation of development Programmes and projects not to damage the environment and the need to conduct consultation and the expression of views of communities and stakeholders.

Regarding land tenure, the Constitution affirms that the right to ownership of rural and urban land, as well as natural resources, is exclusively vested in the state and the peoples of Ethiopia. Land is a common property of the Nations, Nationalities and Peoples of Ethiopia and shall not be subject to sale or other means of exchange. Ethiopian peasants have right to obtain land without payment and the protection against eviction from their possession, and pastoralists have the right to free land for grazing and cultivation as well as the right not to be displaced from their lands. Every Ethiopian has the full right to the immovable property he/she builds, and to the permanent improvements he/she brings about on the land by his labour or capital.

B. Ethiopian Policy Provisions

The most relevant policy provisions that can be used as important input for promotion and implementation of community-based land management interventions are shortly presented here below. However, for detail information on specific cases it is advisable to read the policy document issued by the government. The document can be accessed from concerned government offices at woreda and kebele level.

No	Policy	Description of the policy and main content
1	Environmental Policy of Ethiopia	The overall goal of the EPE is to improve and enhance the health and quality of life of all Ethiopians, and to promote sustainable social and economic development through the sound management and use of natural, man-made and cultural resources and the environment. The policy seeks to ensure the empowerment and participation of the people and their organizations at all levels in environmental management activities, and to raise public awareness. It supports not only constitutional rights of citizens through its guiding principles but also directing all development proposals in the country. Important principles to be considered during project development are the following: - Regular and accurate assessment and monitoring of environmental conditions shall be undertaken, and the information widely disseminated - Natural resource and environmental management activities shall be integrated laterally across all sectors and vertically among all levels of organization. - Environmental impact assessment has to be conducted, recognition and incorporation of environmental issues and mitigation plans has to be done, public participation in EIA process, development of EIA tools, and capacity building at all levels of administration.
2	Energy Policy of Ethiopia	One of the objective of the energy policy is to increase energy utilization efficiency and reduce energy wastage; and, to ensure that the development and utilization of energy is caring to the environment. The policy highlights the different energy resources development options, among which the traditional fuels. The policy in this context has taken two important energy sources on which the national government gives due consideration in developing and efficient use of such energy sources. These are: A. country wide afforestation Programme will be undertaken to enhance the supply of fuel wood to consumers. B. To reduce the negative effects of agri-residue use for energy on soil fertility measures will be taken to modernize and increase the efficiency of the utilization of agri-residue as energy sources. The policy also highlights alternative energy sources for different sectors mainly for household use and agriculture development sectors.
3	Ethiopian Wildlife Policy	The Wildlife Policy was developed in 2006 by the Ministry of Agriculture and Rural Development. The prime objective of the policy is to create conducive environment for the preservation, development and sustainable use of Ethiopia's wildlife resources for social and economic development and for the integrity of the ecosystems and biodiversity. The specific objectives of the policy include the following: - Properly developing and administering the country's wildlife resources, and enabling the sector to contribute fully to the nation building process; - Protecting the wildlife resources and their habitats, maintaining the balance of nature for posterity in accordance with international wildlife conventions and agreements to which the country is a signatory.
4	National Policy on Women	- This policy was issued in March 1993 emphasizing that all economic and social Programmes and activities should ensure equal access of men and women to the country's resources and in the decision-making process so that they can benefit equally from all activities carried out by the federal and regional institutions as well as implementation and operation of private establishments. - The policy urges all development actors, Programme/[projects including initiated by communities properly consider the interest/benefits and problems of both men and women equally and equitable. Extension workers in this regard should know that the national policy on women provides equal opportunity for both women and men; and they have to be sure that the policy is being implemented in their community-based initiatives/projects.

C. Ethiopian Legal Provisions Related to Land Resource Governance Issues

S/N	Proclamation	Description
1	Proclamation on Rural Land Administration and Land Use	This proclamation (Proc. No. 456/2005) was enacted for ensuring tenure security; strengthening property rights of farmers; sustainably conserving and developing natural resources; establishing land data base; and establishing an efficient land administration in the country. - Regional governments are the principal administrators and regulators of land, including the assignment and granting of use rights. - Regional land use planning and administrative authorities are responsible for recording, documenting, and administering use rights. - Rural land users have the right to rent or contract their land either for farmers or investors and the contract duration depends on to whom it is rented out. Hence, no formal land transaction exists by law except giving out in a form contract or lease for certain period. - The maximum period to rent out is up to 25 years for investors. - To ensure land use rights the government has been issuing out of land entitlement certificates for each rural landowner. - In relation to compensation payment to be made for a holder in relation to public works either by the federal or regional governments, Section 2, Article 7(3) states that: "Holder of rural land who is evicted for purpose of public use shall be given compensation proportional to the development he has made on the land and the property acquired or shall be given substitute land thereon.

S/N	Proclamation	Description
2	Proclamation on Environnemental Impact assessment	- The aim of this proclamation (Proc. No. 299/2002) is to make EIA mandatory for specified categories of activities undertaken either by the public or private sectors and is the legal tool for environmental planning, management and monitoring. - The proclamation elaborates considerations with respect to the assessment of positive and negative impacts and states that the impact of a project shall be assessed on the basis of the size, location, nature, cumulative effect with other concurrent impacts or phenomena, trans-regional context, duration, reversibility or irreversibility or other related effects of a project. - Categories of projects have been defined that will require full EIA, partial EIA or for which study of EIA is not called for.
3	Environmental Pollution Control Proclamation	The environmental pollution control proclamation (Proclamation No. 300/2002) was declared on December 3rd, 2002 by the Council of the Peoples' Representatives (FDRE - Council of Peoples Representatives, 2002b) to ensure the following obligations. - No person shall pollute or cause any other person to pollute the environment by violating the relevant environmental standard - The Authority or the relevant Regional environmental agency may take an administrative or legal measure against a person who, in violation of law, releases any pollutant to the environment. - Any person engaged in any field of activity which is likely to cause pollution, or any other environmental hazard shall, when the Authority or the relevant regional environmental agency so decides, install a sound technology that avoids or reduces, to the required minimum, the generation of waste and, when feasible, apply methods for the recycling of waste. - Any person who causes any pollution shall be required to clean up or pay the cost of cleaning up the polluted environment in such a manner and within such a period as shall be determined by the Authority or by the relevant regional environmental agency. - When any activity poses a risk to human health or to the environment, the Authority or the relevant regional environmental agency shall take any necessary measure up to the closure or relocation of any enterprise in order to prevent harm.
4	Forest Development, Conservation and Utilization Proclamation	Forest Development, Conservation and Utilization Proclamation No. 1065/2018 - This Proclamation in many of its articles, states about designation of various forest types by the concerned government organs signifying the importance of allocating the necessary proportion of land for forestry. - Designation of land for forest development or maintaining the existing forests as forest covered lands and giving the necessary protection for them can be taken as a subsection of a comprehensive land use planning.
5	Proclamation on Wildlife Development, conservation and Utilization	- This proclamation (Proc. No. 541/2007) repeals the Forestry and Wildlife Conservation and Development Proclamation No. 192/1980 and the Wildlife Regulations No. 416/1972. It provides for the legal administration of national parks, wildlife sanctuaries, and transboundary wildlife conservation areas. - This Proclamation has the following three objectives: 1. Conserve, manage, develop and properly utilize the wildlife resources of Ethiopia 2. Create conditions necessary for discharging government obligations assumed under treaties regarding the conservation, development, and utilization of wildlife 3. Promote wildlife-based tourism and to encourage private investment.
6	Wildlife Development, Conservation and Utilization Regulation	- These regulations (No. 163/2008) were issued by the Council of Ministers pursuant to Article 17(1) of the Wildlife Development, Conservation and Utilization Proclamation and, among other things, implement provisions of that proclamation with respect to management of wildlife conservation areas, hunting and various other licenses, possession of wildlife products and harmful animals. - The regulations provide rules around the management of wildlife conservation areas (National Parks, Wildlife Sanctuaries and Wildlife Reserves) and the administration of these areas. - It also details the rules around the lawful and unlawful possession and trade of wildlife products.
7	Proclamation on Expropriation of Land Holdings and Payment of Compensation	- As per the proclamation, the power of expropriation of landholdings mainly rests on Woreda or urban administration authorities. - Article 3(1) of the proclamation states that: "A Woreda or an urban administration shall, upon payment in advance of compensation in accordance with this proclamation, have the power to expropriate rural or urban landholdings for public purpose where it believes that it should be used for a better development project to be carried out by public entities, private investors, cooperative societies or other organs, or where such expropriation has been decided by the appropriate higher regional or federal government organ for the same purpose." - A land holder whose land has been expropriated for public use by the concerned government authorities is entitled for compensation for his property situated on the land and for the permanent improvements he made on the land. - Woreda or urban administration has to notify in writing to the entity (which is either an individual or an organization) to be expropriated indicating the time not less than 90 days when the land has to be vacated and the amount of compensation to be paid. A rural land holder, where his land does not have any crop or other property on the expropriated land, should hand over within 30 days. - Any expropriated property: in addition to the amount of compensation payment it will also receive a provision for cost of removal, transportation and erection.

S/N	Proclamation	Description
8	Payment of Compensation for Property Situated on Landholding Expropriated for Public Purposes Regulation	This regulation (No. 135/2007) provides detailed directives regarding the payment of compensation for property situated on land holdings expropriated for public purposes specific to Proclamation No. 455/2005. The methodology followed by the regulation for the assessment of compensation establishes the basis and formula for compensation that will be made for the different types of assets and categorizes into ten parts: - Compensation for buildings, fences, crops, crops, trees, protected grass - Compensation for permanent improvement on rural land - Compensation for relocated property - Compensation to mining license - Compensation to burial ground The regulation recognizes that land replacement should be made for urban and rural lands. In rural areas, if land replacement is not possible for permanently affected land, project affected persons (PAPs) will be compensated for the affected perennial crops ten times of the annual production.
9	Proclamations on Cultural Heritage (the relevance/importance has to be discussed)	- The Proclamation (Proclamation No. 374/2003) defines cultural heritage broadly as "anything tangible or intangible which is the product of creativity and labour of man in the pre-history and history times, that describes and witnesses to the evolution of nature and which has a major value in its scientific, historical, cultural, artistic and handcraft content." Prior approval of the Authority for Research and Conservation of Cultural Heritage (ARCCH) is required to remove immovable (Article 21/1) and movable cultural heritage (Article 21/2) from its original site, during the execution of the project. - Proclamation No. 209/2000 (Research and Conservation of Cultural Heritage Proclamation) allows the use of cultural heritage sites for economic and other purposes if and only if such use is not detrimental to its preservation and does not impair its historical, scientific and artistic values (Article 22). - It specifies that the protection and conservation of cultural heritage is the duty and responsibility of the Authority for Research and Conservation of Cultural Heritage (ARCCH).

10	Ethiopian Water Resources Management Proclamation No. 197/2000	The purpose of this Proclamation is to ensure that the water resources of the country are protected and utilized for the highest social and economic benefits of the people of Ethiopia, to follow up and supervise that they are duly conserved, ensure that harmful effects of water are prevented, and that the management of water resources is carried out properly.
		The proclamation addresses very important issues among which the following can be seen when communities are developing, managing and using water resources:
		- All water resources of the country are the common property of the Ethiopians people and the state.
		- Domestic use shall have priority over and above any other water uses
		- Any person shall utilize water resources for the following purposes without holding a permit issued by the Supervising body: (a) dig water wells by hand or use water from hand-dug wells; (b) use water for traditional irrigation, artisanal mining and for traditional animal rearing, as well as for water mills.
		- The supervising body, in collaboration and in consultation with the appropriate public body may
		  - Delimit the boundaries of the banks of certain water bodies
		  - Prohibit clearing, cutting trees or vegetations and construction of residential houses within the delimited banks of water bodies
		  - In consultation with appropriate public bodies encourage the establishment of water user associations

11	Apiculture Resources Development and Protection Proclamation No. 660/2009	The objectives of the Proclamation, as stated in its preamble, are:
		- Promoting household and commercial beekeeping development in areas of high apiculture resource potential to realize appropriate contribution of the sub sector in the process of rapid economic development.
		- Recognizing that proper development of apiculture resources require the conservation of the biodiversity of honeybee races and honey source plants.
		- The proclamation clearly indicates specific beekeeping development, management, protections, and utilization issues for proper consideration of the beekeepers:
		  - Any person may undertake backyard or field beekeeping development on his own premises or fields under his possession.
		  - Any person who wishes to undertake beekeeping development activities in natural resource rehabilitation area enclosure, community forest, state forest or wildlife park and protection area shall obtain written permit from the body that is authorized for the administration of such land.
		  - Any person who wishes to undertake commercial beekeeping development or commercial queen bee rearing shall obtain a business license issued pursuant to the relevant laws.
		  - Any beekeeper shall, in the course of his operations, protect and conserve the apiculture resources.
		  - Any person who practices honey hunting from forest, rock or cave nested honeybee colonies shall keep the removal of honey without causing any damage on the honeybee colonies and natural resource ecology of the area,
		  - Other specific issues indicated in the proclamation

2.3.2 Drawbacks/Limitations in Implementing Legal Provisions

Legal provisions are one of the main tools for resource governance, as they establish the rights and responsibilities of different actors and stakeholders. However, legal provisions also have

some drawbacks, such as:

- They may be overlap of institutional mandates, lack of coordination and frequent reshuffling and restructuring of responsibilities as a result extension services may be overlooked.
- They may be legislative gaps or shortfall to integrate indigenous resource governance mechanism. Laws are developed without considering local context. As a result, it will be difficult to enact the implementation and enforcement of environmental legislation.
- There may be lack of awareness and limited information sharing on relevant environmental laws, their functions and benefits. This resulted in limited in overall contributions to enforcement of the legislation, regulations and standards. In some cases, there is no culture of environmental compliance or there is a lack of political will, coupled with a perception that environmental rules will slow down or impede development.
- There may be lack of enforcement due to limited resources (both people and equipment) and the lack of commitment of the authorities towards conservation. The inability to bring offenders to court, the small penalties imposed
- So far there is no land use policy. Absence of policy create a problem to enforce land rights
- They may be outdated, inconsistent, or incomplete, and not reflect the current realities and challenges of resource governance.
- They may be influenced by political or economic interests, and not represent the needs and preferences of all affected parties, especially marginalized groups.
- They may be poorly enforced or monitored, and not ensure compliance and accountability of resource users and managers.
- They may be rigid or inflexible, and not allow for adaptation and innovation in response to changing circumstances and opportunities.

Therefore, it is important to find solutions to address these drawbacks and improve the effectiveness and legitimacy of legal provisions for resource governance. Some possible solutions are:

- Reviewing and updating existing legal provisions regularly, and involving a wide range of stakeholders in the process, to ensure that they are relevant, coherent, and comprehensive.
- Promoting participatory and inclusive decision-making processes, and ensuring that legal provisions reflect the views and interests of all affected parties, especially marginalized groups.
- Strengthening the capacities and resources of institutions and actors responsible for implementing and overseeing legal provisions, and enhancing transparency and accountability mechanisms.
- Promote awareness campaign on available legal provisions for the wider community. Awareness campaigns are essential tools for informing the wider community about the legal provisions that are available to them. Awareness campaigns can raise the level of knowledge and understanding of the legal provisions among the wider community. They can also empower people to exercise their rights and responsibilities, and to seek legal assistance when needed. Awareness campaigns can take various forms, such as workshops, seminars, leaflets, posters, radio Programmes, or social media campaigns.
- Encouraging flexibility and innovation in legal provisions, and allowing for experimentation and learning from different approaches and experiences.

2.4 Techniques to Implement Land Resource Governance

There are various factors that play significant influence on the governance of land resources, mainly in the implementation of community-based land management approach. Extension workers and the community have to know what those factors are and how these factors are considered in land resource governance implementation process. Some among others are shortly presented as follows:

2.4.1 Enhancing the Role of Community Leadership in Resource Governance

Community leadership plays a vital role in resource governance, especially in contexts where formal institutions are weak or absent. Community leaders can mobilize collective action, negotiate with external actors, and ensure accountability and transparency in resource management. Therefore, it is important to understand the dynamics and challenges of community leadership in different settings and how they affect resource governance outcomes.

Communities have accumulated experience and knowledge about resources management. Availability of community leadership is highly desirable for organizing people, mobilization of resources, nurturing and sustaining the organization, establishing liaison with the external support (project sponsoring agencies), removing uncertainty on people's access to benefits available, and enforcing rules regulations against their violation.

Community leadership is a vital factor in ensuring effective and sustainable resource governance. Resource governance refers to the processes and institutions that determine how land resources are managed and distributed in a society. Community leadership involves the participation and empowerment of local actors, such as indigenous groups, civil society organizations, and grassroots movements, in shaping and influencing resource governance outcomes. Community leadership can enhance resource governance by:

- Promoting inclusive and democratic decision-making that reflects the needs and interests of diverse stakeholders, especially marginalized and vulnerable groups.
- Fostering social accountability and transparency that prevent corruption, mismanagement, and environmental degradation of natural resources.
- Enhancing local capacity and ownership that enable communities to access, utilize, and benefit from natural resources in a sustainable manner.
- Strengthening social cohesion and resilience that reduce conflicts and violence over natural resources.
- Mobilize community labor and local resources; the leadership plays significant role in mobilizing labour and local resources using various forms of participatory mobilization and solidarity schemes following existing forms of mutual support.
- Proper targeting of needy beneficiary households for different development projects/support; community leaders usually identify and bring forward community problems and interests and identify target beneficiaries or community members who can be involved in implementing identified interventions.
- Creating strong partnership and linkage with different institutions; Community leaders have opportunities to establish formal and informal linkages with different institutions/stakeholders who may have stakes or interests in community-based land management practices. The possible institutions with whom networking and partnership can be established are development organizations, financial institutions that can provide credit services, potential markets, NGOs, private sectors who are channelling technologies or inputs, etc.,
- Lead planning and implementation of community-based projects
- Facilitate knowledge sharing events among different actors including other communities
- Plays key role in search and provision of technologies & new practices to the community
- Leading role in the development of community bylaws and strong role in implementation
- Lead the development of appropriate mechanisms for communal resource management and equitable use of resources.

Community leadership can also face various challenges and constraints in resource governance, such as:

- Lack of recognition and support from national and international actors that undermine the legitimacy and effectiveness of community leadership.

- Power imbalances and inequalities that limit the voice and influence of community leaders in resource governance processes.
- External pressures and threats that endanger the security and well-being of community leaders and their constituencies.
- Internal conflicts and divisions that weaken the cohesion and solidarity of community leadership.

Therefore, it is important to foster an enabling environment that supports and strengthens community leadership in resource governance. This can be done by:

- Providing legal and institutional frameworks that recognize and protect the rights and roles of community leaders in resource governance.
- Providing financial and technical assistance that enhance the capacity and performance of community leaders in resource governance.
- Providing platforms and mechanisms that facilitate dialogue and collaboration among community leaders and other actors in resource governance.
- Providing recognition and incentives that reward and motivate community leaders for their contributions to resource governance.

2.4.2 Benefit Sharing Mechanisms as Governance Issue

In general, people will not participate in collective management of resource unless they are assured of their exclusive right to the benefits from the project. Community resource-specific issues can be addressed by participatory need assessment, participatory implementation and monitoring. The waiting time to reach the benefits of a project to the people can be reduced by planning for immediate and intermediate benefits such as fodder, minor forest produce, wage-paid employment.

Current Ethiopian policies and laws recognize the importance of equitable benefit-sharing mechanisms for natural resource management. The government policies on benefit sharing are pro-poor with an emphasis on legal and customary rights.

Since benefits sharing as well as governance issues are crucial for natural resource management projects to succeed. As a cornerstone for success the mechanism for benefit sharing should be:

- Benefits should be shared according to efforts made in reducing environmental/land degradation problems.
- Any benefit sharing arrangement at the community level should take into consideration the size and state of the resource managed properly in each village.
- In deciding who should get benefit, the decision needs to be based on participatory decision-making process which takes into account different actors' voices, concerns and interests.

2.4.3 Community Bylaw

For natural resources to properly develop, manage and equitably and sutaibably use, communities should have an agreed bylaw that is developed and agreed by the general community. In principle the process of bylaws formulation shall follow democratic processes. Communiuty byaw can be drafted by a team of community representatives who have adequate knowledge and expereince about the resource and the community. The bylaw has to be prepared actually in close consultatiion and frequent discussions with different sgentemnts of the community including women, youths and marginalized communities. At the end, before implementation the bylaw has to be discussed and approved by the general community. Unless the bylaw is approved by majorty vote of the community it could not be functional.

Moreover, the bylaw has to be submitted to concerend governent bodies for approval and familiarization. The bylaw could not have stattements that contraardict the governmnt laws.

For general knowledge, the steps to follow for developing a WUC By-law is indicated in the following diagram:

2.4.4 Conflict Management/Resolution/Grievance System

Conflict and Conflict Analysis

In natural resource management, conflicts are disagreements and disputes over access to, and control and use of, natural resources. These conflicts often emerge because people have different uses for resources such as forests, water, pastures, rangeland and other resources, or want to manage them in different ways. Disagreements also arise when these interests and needs are incompatible, or when the priorities of some user groups are not considered in policies, Programmemes and projects. Such conflicts of interest are an inevitable feature of all societies.

In recent years, the scope and magnitude of natural resource conflicts have increased and intensified due to scarcity of resources aggravated by population growth and vested interest. These conflicts, if not addressed, can escalate into violence, cause environmental degradation, disrupt projects and undermine livelihoods. Acknowledging that conflict is a common feature of any resource use system is a prerequisite for sustainable management and implementation of interventions (FAO, 2000).

In Ethiopia natural resources related conflicts are common phenomena. Competition for land and other natural resources to sustain their livelihoods are the main causes for conflict. Therefore, natural resource management advisors, development workers and their organization must conduct a conflict analysis as part of situation analysis in order to understand the ways in which natural resource conflicts impacts the watershed development interventions and livelihood strategies of targeted Programme participants, and implications for planning longer-term, sustainable livelihood Programmes.

Conflict should not be characterized negatively but rather as an indicator that different stakeholders have different interests in resource use. The process of conflict resolution provides an opportunity to review the needs of various stakeholders and to decide how they can be addressed jointly in the context of the larger resource governance strategy.

Extension worker or facilitating team in conflict management should analyse natural resources conflict and should come up on the best way to address them together with the community planning team. The nature of the measures to be applied will depend to a large extent on the nature of the conflict, the interests, powers and relationships of the parties involved as well as on outcomes of previous attempts to solve the conflict.

Conflict Analysis:

There are many different tools for conducting conflict analysis. One approach consists of determining the profile, causes, actors and dynamics of conflicts. It is a generic approach that can be applied to land issues. The most prominent dimensions are land tenure, institutions and political economy (interests, constraints and incentives). By asking questions related to context, causes, actors and conflict dynamics, the different dimensions and root causes of conflicts are analysed.

Structural causes: Pervasive factors that have become built into the policies, structures and fabric of a society and may create the preconditions for violent conflict.

Proximate causes: Factors contributing to a climate conducive to violent conflict or its further escalation, sometimes apparently symptomatic of a deeper problem; and,

Triggers: Single key acts, events, or their anticipation that will set off or escalate violent conflict.

As simple approach, conflict can be shortly analysed to know what the conflict is, what are the causes of the conflict, who are main actors, and how the conflict is dynamic. Before further analysis, one can easily analyse a conflict using the following information in the table below.

Table 2.1 Conflict analysis

Context	Causes	Actors	Dynamics
Where? Timeline? What is the conflict about?	Why is there a conflict? What are the root causes? What are the triggers of conflict?	Who is involved? Who benefit from the conflict?	How does the conflict change over time? What are the power relations? What are the incentives and constraints?

Source:

Conflict Matrix

A conflict matrix permits the exploration of issues related to conflicts and how they are dealt with in a community. One way to set up a conflict matrix is to put the resources that might cause conflicts on the vertical axis. On the horizontal axis place the different groups that might be involved in conflicts. Decide at this point whether the matrix will show the frequency of conflicts or whether the number of beans will reflect the severity of the conflicts. Be sure that everybody understands what is being ranked before the counters are placed in each square. In this matrix it makes more sense to complete the analysis horizontally; that is, ask first about all the conflicts concerning forest in the village. Are there many or few conflicts concerning forest within the family? What about among villagers? With neighbouring villages? and so on. As the beans are placed in each square ask what the nature of the conflicts are. When the first row is completed, move to the second row and ask the same question about pastureland. When the entire matrix has been completed seize the occasion to ask more questions about conflicts and institutional issues. How are various types of conflicts resolved? What are the procedures? When do the various conflicts take place and what causes them? and so on.

Table 2.2: Conflict Matrix

	Conflict Matrix				
	Within the household	Within the village	With neighbouring village	With strangers	With state
Forest					
Pastures					
Cropland					
Water					

Techniques and Procedures of Conflict Resolution and Grievance Management

The ways in which people (even those from the same community) respond to natural resource conflicts vary considerably. All communities have their own ways of handling conflicts. These mechanisms may be formal or informal, violent or peaceful, equitable or not. Although the specific strategies may vary, people generally rely on the same basic procedural modes to handle conflicts: avoidance, coercion/intimidation, negotiation, mediation, arbitration and adjudication (FAO, 2000).

How Disputes are Settled?

In conflict or dispute resolution

- The nature and scope of conflicts must be characterized before intervention occurs.
- Decisions must be enforceable, and
- Adjudications must be provided

- Resolution mechanisms must be viewed by citizens as legitimate.
- Means of accommodating the “losers” of the dispute or conflict must also be provided.

Appropriate conflict resolution or management mechanisms have to be identified and applied, as now a day, conflicts arise due to use of land and its natural resources. In Ethiopian context, the following are major areas of conflict that are happening within households and communities and among communities, that need appropriate conflict resolution mechanisms.

- Expansion of urban areas towards other land uses such as crop lands, forest lands, grazing areas, rural villages.
- Land grabbing due to investment projects
- High population growth and the need for land, main causes of conflict among household members – youths in the family. It is major causes of inheritances of a family
- Construction of infrastructures such as roads, nursery sites, irrigation canals, etc.
- Conflict is related with distribution of agricultural inputs and management of revolving fund
- Other causes of conflicts

Cognizant of the above challenges, according to Proclamation number 1223/2020 (Development, Management and Utilization of Community Watershed), any dispute arising in the micro-watershed can be handled by the Watershed Users Cooperative (WUC). Smallholder farmers are required to establish temporary dispute settlement committee. Temporary because those who reconciled cases of Mister X and Y cannot probably resolve cases of Mister Y and Mister Z. Similar case is dealt with by permanent committee in Proclamation number 985/2016 (Co-operatives Societies Proclamation).

Methods of conflict resolution

1. Litigation

The formal and ultimate mechanism for conflict resolution is taking it to the courts/ legal system.

2. Alternative Dispute Resolution (ADR)

2.1 Negotiation

This is a process where the parties to the dispute meet to reach a mutually acceptable solution.

- Parties meet (usually without the help of a 3rd party) to resolve differences.
- Direct exchange of proposals.

2.2 Facilitation

- Is a process in which an impartial individual participates in the design and conduct of problem-solving meetings to help the parties jointly diagnose their issues and create and implement jointly owned solutions?
- The role of the facilitator is to provide a medium for negotiation.
- The Facilitator is not involved directly in negotiations.

2.3 Mediation

- Is a process of settling conflicts, in which an outside party oversees the negotiation between the two disputing parties.
- It requires a neutral/impartial person or persons to facilitate negotiation between the parties.
- The introduction of a 3rd party makes it different from an “eye-to-eye” negotiation.
- The Mediator’s role is to:
  - Help the parties think in new and innovative ways.
  - Enable parties avoid rigid positions and instead focus on their shared interests.
  - Facilitate a conducive environment for discussions, by focusing on positives, and joint gains.

2.4 Arbitration

- Is usually used as a less formal alternative to litigation. It is a process in which a neutral outside party, or a panel, meets with the parties in a dispute; hear presentations from each side and make an award.
- Has defined rules and procedure that are explained to and accepted by the parties before the process starts.
- The Third party decision is binding, but subject to appeal.
- Settlement is made outside the court process, hence is not determined by legal procedures (except basic ground rules).

MODULE THREE: COMMUNITY BASED INSTITUTIONS FOR LAND MANAGEMENT

3.1 Concepts of Community-Based Institutions

Community-based institutions/organizations (CBO/Is) are no-profit making organizations at local level that are intended to facilitate community efforts for social, economic, and environmental activities within the community. These institutions could have formal or informal rules about who makes decisions, according to which procedures, what actions are permitted and what information must be provided.

Community-based institutions/organizations could be formal or informal/traditional. Formal CBI refers to state bodies. At the community level, they are Kebele administration, Kebele level office of agriculture and cooperatives, including community watershed user's cooperatives, which are recently organized based on the proclamation 1223/2020. These institutions focus on leading and controlling local community about the use, management, and conservation of land resources. On the other hand, Kebele administration, as the state-initiated institutional framework through which governmental policies ought to be implemented 'on the ground' has the mandate of monitoring and sanctioning of illegal users' activities in the Kebele. Additionally, "gotts" Development team ('Limat Budins') are CBOs under the government structures which are responsible for their surrounding human and natural resources mobilization and management.

Informal/traditional CBIs are systems of rules and decision-making procedures which evolved from endogenous socio-cultural codes and give rise to social practices, assign roles to participants, and guide interactions. Mostly, it is accustomed that in rural areas community members get together and set rules to govern the commons they share, and those who violet the advantage of commons will be sanctioned according to the rule they set.

The most common informal community-based institutions in Ethiopia are: 'idir"', "equb", "senbete", "jige", "wonfel", "mahiber", "dado" and so on. "Iddir" is one of the most common informal institution established on the bases of neighbourhood, sex, and workplace with the primary purpose of providing financial, material, and moral support in times of death for the bereaved members and/or their families. Although, 'Iddirs' are initially organized by the members of the local community to help each other in the time of death, in some places, 'Iddirs' are currently influencing the governance of commons at the local level through social sanctions. Any violation of the commons in the community members is treated through 'iddirs'.

The following rules and regulations were recorded in one of the 'iddir' in Keffa concerning forest management (Till Stellmache, 2013): 1) If any iddir member from the village stands against the rule and regulation of the forest management, for example, when ordered to keep the forest from any attacks, in the first instance, he will be fined 50 birr, in the second, 75 birr, and finally he will be accused and referred to the Kebele social court. 2) If any iddir member is absent from any [working group] call concerning forest management and development, he will be fined 5 birr the first time, 10 birr the second time, and finally he will be denied any share of the forest produce.

Like in keffa, there are plenty of communities who have local level institutions dedicated to conserve and wisely utilize their natural resources in a sustainable way. One of the common examples and widely known traditional natural resource conservation is practiced by the Konso community which is already registered by UNESCO world heritage as a Konso cultural landscape. The Konso traditional code of management is practiced side by side with the modern administrative system and elected community members and elders ensure the protection and management of the cultural properties. A management plan sets out in detail the current

management structures and explains how the Konso community, through its recognized village committees and the district management committee, will endeavour to ensure the necessary standards of conservation.

3.2 Relevance of Community-Based Institutions in CBLM

At community level, different social, cultural, agricultural, and natural resource management activities are undertaken by the community members either collectively or individually. These interventions and efforts can be well coordinated and facilitated by CBIs. CBIs facilitate the process of rural change i.e., increase social cohesion and improve cooperation in economic development activities.

As community-based institutions are made up of formal rules, informal norms, and enforcement characteristics of both, and it is the admixture of rules, norms and enforcements. The following are why community-based institutions are important for sustainable land management for several reasons:

- Institutions encourage people to take a longer-term view by creating common expectations and a basis for cooperation that goes beyond individual interests. To the extent institutions are regarded as legitimate, people comply without (or with fewer) inducements and sanctions.
- CBIs enable communities to solve their common problems and reach a common goal – such as improved livelihood, ensured environmental security, reduce poverty, etc.,
- CBIs are community structure whereby communities build their development capacity
- People's behaviour is conditioned and governed by community norms and consensus, so preserving or instituting practices that are environmentally sound requires more than just individual incentives and persuasion.
- For mobilizing resources and regulating their use with a view to maintaining a long-term base for productive activity.
- Monitoring changes in resources' status can be quicker and less costly where local people are involved; making adaptive changes in resource use is speeded up where local decision- making has become institutionalized.
- While local institutions are not always able to resolve resource management conflicts, if they are absent, all conflicts must be dealt with at higher levels, yielding slower and often less appropriate outcomes.
- Institutions helps minimize transaction costs, control the opportunistic behaviour of some members of the community, and enhance the capacity of farmers to adapt to major drivers of change such as population pressure, climatic change, and market signals

However, it must be recognized that local (informal) institutions can produce practices that do not favour sustainability. If factionalism prevails, some groups may use them to exploit local resources to their short-run advantage and others' loss. Institutions that regulate resource use may break down and limits of regeneration may be exceeded when people do not understand these limits or feel they have no alternative.

Despite the important role of informal community-based organizations in land management (e.g., controlling free movement of livestock, ensuring area closures, and sharing benefits), they are not sufficiently organized to manage land management activities and their agreements and arrangements are informal and not legally binding. Clarifying and enforcing rights and responsibilities of all stakeholders is essential. Moreover, formal organizations give a strong bargaining power for communities in terms of input – output and market linkages and mobilize and solicit funds to implement community level projects by their own force.

In our context, we are focusing on establishing cooperatives to lead community owned land management interventions via local resources (human, material, and financial resources).

The following are some of the importance of community-based watershed user's cooperatives:

- Establishing a system which enables the community watershed users to protect, develop, administer, and use natural resources with a sense of ownership, with a view to increasing the community watershed users' capacity.
- To reduce the vulnerability of the society to drought and enhancing their resilience capacity by preventing environmental and natural resource degradation, protecting biodiversity, developing water resources, reducing greenhouse gas emissions.
- To enhance land productivity; increasing the products and productivity of peasants and pastoralists; ensuring food security and job creation through sustainable community watershed protection, development, and utilization.

3.3 Techniques to Establish Community Watershed User Cooperatives

3.3.1 Policy Framework that Supports the Initiative

A good policy environment and legal framework facilitates enforcement mechanisms with gradual sanction mechanisms. Thus, legally recognizing local institutions, endorsing their bylaws, creating tenure security, and respecting property rights are essential elements to encourage investment in sustainable natural resource management. Recently, to enhance institutional capacity and community level land management, the Ministry of agriculture has enacted a proclamation 1223/2020 on Development, Management and Utilization of Community Watersheds.

The Proclamation is applicable to all community watersheds found in the country and defines community watershed as a geographical area, described by the watershed limits of water system including surface and underground water flowing into a common terminus and with the average size of about 500 hectares. The Proclamation develops community watershed by implementing measures to harmonize the use of soil, water and vegetation in a way that conserves these resources and maximize their productivity in the community watershed.

The following are some of the provisions from the Proclamation 1223/2020:

- Provides the principles of participation and adherence to the land use plan shall be applied in the preparation of community watershed plan, among others.
- Advocates for the establishment of cooperative society of community watershed users.
- Advocates about ensuring gender balance in any watershed management and utilization process.
- Provides that private or communal holders within a watershed shall have the duty to undertake soil and water conservation works, rehabilitation and maintenance to prevent soil erosion and maintain soil fertility, as well as control and protect animal roaming in order to prevent harm to the watershed development works that have been undertaken, maintain fertility and health of soil by planting and protecting forests, forage trees, and plant species which enhance soil fertility on the boundaries of his farmlands and on the farmlands, and on the sides of walkways within the watershed, among others.
- Therefore, it is necessary to organize communities and establish their institutions for better lead and ownership of CBLM initiative.

The following sections explain about the processes and procedures to establish CWUC as CBLM instrument.

3.3.2 Basic Steps and Procedures to Establish CWUC Societies

The steps of establishment/formation of community-based watershed user's cooperatives at micro-watersheds are indicated below. The whole watershed communities need to be involved in all stages of establishment processes (steps).

Step1: Sensitization of community watershed members and key/relevant woreda experts and Kebele development agents

- First undertake stakeholder's analysis to identify key and relevant stakeholders who could support the establishment of community-based watershed users cooperatives
- Next, provide orientation/workshop to those key and relevant woreda experts and Kebele DAs on WUC proclamation, bylaw, the process of **c**ommunity based watershed users cooperatives establishment, and their roles in the establishment process. The workshop participants should prepare checklists and action plan when to provide/conduct sensitization/ awareness events to the watershed communities up to watershed users cooperatives formation and by law development.
- Arrange and facilitate consecutive sensitization/awareness creation meetings/events on watershed users' cooperatives proclamation, the benefits & requirements to be the members of WUC, duties and rights to be the members of watershed users' cooperatives, etc.
- Meetings/events shall be conducted in the presence of the watershed communities' members.
- Then undertake registration for those who have an interest to be the members of the watershed user's cooperatives.

Requirements to become the members of the watershed user's cooperatives in accordance with 1223/2020 watershed user's cooperatives proclamation

- Those who have landholding in the community watershed & earn their livelihoods thereof
- Persons who, even if they do not have landholding in the watershed, use the natural resources because they live in or around the community watershed
- Persons who do not live in the watershed area but who are connected to the watershed through land rental or other lawful means
- Persons who have land holding in the watershed & who are less than eighteen years of age may be registered as the members through their guardians
- All people with special need in the society who meet the criteria set out in 1223/2020 proclamation shall have full right to become the members of a cooperative and beneficiaries thereof

Step 2: Call for general assembly & conducted the selection of election committees

After identifying those who have an interest & showed their willingness to be the members of watershed user's cooperatives, call the general assembly and elect the election committees. The responsibilities and the duration of this committee is to facilitate the election processes of the watershed user's cooperatives, executive and sub-committee members who will be responsible to run the day-to-day activities of the watershed user's cooperatives, as well as the lifespan is until the executive committee takeover the management responsibility of the watershed user's cooperative.

General consideration/election rules:

1. The election/electoral committee members shall be elected either by old executive committee or directly by the general assembly,
2. At the end of the executive committee election processes, the electoral committee prepare minute and sign on minute.

Step 3: Election of watershed user's cooperative executive, control, and sub-committee members

The community watershed users' cooperatives shall have the following bodies:

- General assembly of the community watershed users' cooperative
- Executive committee.
- Control committee and
- Sub-committees.

The executive and control committees of the watershed users' cooperative shall be elected by the general assembly and shall have 13 and 3 members respectively. These committees shall be accountable to the General Assembly. The executive and control committees shall be elected through the facilitation of electoral committee members. From the candidates of the executive and control committee members about 30% shall be women.

The sub-committees' members shall be arranged or structured by the executive committee and the size of the committee as deemed as, necessary and it includes loan, input & marketing, conflict resolution, gender & capacity development, crop, livestock, NRM and infrastructure development sub-committees. The size of each sub-committee members shall not be more than 3 and one of them must be female. The chairpersons of each sub-committee shall come from the executive committee members except the chairperson, secretary, accountant, cashier, and store man of the watershed users' cooperative. The remaining 2 members shall be selected from other members of the watershed users' cooperative. After the fulfilment of all necessary watershed users' cooperative structure/committees, the electoral committee members must hand over everything to the watershed users' cooperative executive committee members and withdraw from its responsibility.

Step 4: Developing multiyear and annual land use and watershed development plan

Participatory community watershed development planning has to be prepared by making use of watershed development planning guideline and some PRA planning tools. Which the steps include the following: planning done at the grass-root levels:

- Conduct a planning workshop; the respective woreda experts, kebele agricultural heads as well as agriculture, NRM and cooperative Das involved.;
- Establish w watershed team (WT) at different levels; woreda (WWT) and kebele levels (KWT).
- Initiate and support the conduct of biophysical and socio-economic survey.
- Conduct transects walk across the micro-watersheds to have insight about the existing potentials and problems these to be used later as important inputs for planning.
- Identify the micro watershed problems and prioritize them. The data obtained from transect walk, those problems previously identified and flagged and put forth by the planning team, etc can be used as an input for problems identification.
- Then change problems into objectives and develop interventions options.
- Carryout discussions on problems identified and regarding possible intervention options with the general assembly making use of coaching methodologies learned and get approval from the general assembly.
- Facilitate the preparation of development plan map, inputs and action plan.
- Produce 3 years, annual and quarter micro-watershed plans for verification and approval

Step 5: Development of general and internal by laws

One of the most important activity that the community should do is developing bylaws and enforcement mechanisms. General and internal by laws are the most important legally binding documents for the communities. These bylaws and any other legal documents serve as watershed users' cooperative rules governing the procedures of the cooperative. They are also written to provide members with definitions of organizational procedures, rights and responsibilities, etc… as well as provide the general rules for the internal governance of the watershed users' cooperatives and these bylaws should define basic rights and responsibilities members have in voting and capitalizing the watershed users' cooperatives and the basic responsibilities of the watershed users' cooperative management bodies. These bylaws can be changed over time but doing so requires a majority vote of the membership.

The elected watershed users' cooperatives executive committee members shall prepare detail draft general and internal by laws on how the watershed users' cooperatives manage and

protect watershed as well as present the general assembly of watershed users' cooperatives for discussion and approval. The watershed users' cooperatives agreement /by law drafts shall be approved at least by 2/3 members vote of the general assembly in accordance with, the cooperative proclamation.

Step 6. Legalization of community-based watershed user's cooperatives

The importance of legalization is the law should be to give a legal status to the cooperatives and facilitate their working. It should also ensure that cooperative work as genuine bodies and in accordance to the universally accepted cooperative principles. According to WUCs proclamation No 1223/2020, community watershed users' cooperative shall, up on the fulfilment of necessary requirements, obtain legal personality from the relevant organ. Here the relevant organ is cooperative commission especially respective woreda cooperative offices. To get legal personality from the relevant organ, from woreda offices of cooperatives, the following prerequisite conditions are to be fulfilled by each of the WUCs.

Any cooperative including community watershed users' cooperatives should be registered by mandated cooperative office and this case the woreda cooperative office agency has a mandate to give legal entity to community watershed users cooperatives. To get legal personality or to be legalized should be fulfilled certain requirements and these requirements are indicated as below:

- The presence of approved bylaws, 3 years, and operational plan, etc.
- Legal stamps, receipts, bank account opened in the name of the WUC and
- Application letter readied for submission for legalization.
- Minute for establishment meeting.
- Name of WUC executive committee members with their address and respective signatures.
- Name of control committee members with their address and respective signatures.
- WUC working place, address, and the area the WUC is working.
- Document describing accountancy related to WUC capital and debit
- Description for legibility of members to the members of watershed user's cooperative according to watershed user's cooperative proclamation 1223/2020.
- Feasibility study document etc
- Submit the above-mentioned requirements to respective woreda cooperative agency.

MODULE FOUR: COMMUNITY LAND RESOURCE MANAGEMENT PLANNING

4.1 Definition of Terms

Participatory planning: It is a process by which a community undertakes to reach a given socio-economic goal by consciously diagnosing its problems and charting a course of action to resolve those problems. Experts are needed, but only as facilitators. Moreover, no one likes to participate in something which is not of his/her own creation. Plans prepared by outside experts, irrespective of their technical soundness, cannot inspire the people to participate in their implementation.

Participatory planning approaches involve the systematic effort to envision community's desired future and planning for that future, while involving and harnessing the specific competencies and input of community residents, leaders, and stakeholders in the process.

Community based participatory planning approaches are people-cantered planning approaches that help integrate different sectorial development interventions and optimize the benefits to be attained from intended results. Participatory planning approaches are aiming to meet the interests of different end users such as households, communities, and the society/public at large.

4.2 Rationale for Participatory Planning

It was recognised that community-based development is a deeper concept of usual public participation where issues of community empowerment remained the core of participation and outside experts should only serve as facilitators (Kent, 1981). There are some very important advantages to broad participation beyond the intrinsic benefits to the participants. Full engagement of local people in the planning process can lead to better outcomes for three major reasons (George Kent 1981).

First, planning is always contextual; it cannot be done at a distance or in the abstract. Local people always know the local context better than any outsiders. Thus, in some respects local people are in fact better equipped to undertake planning than professionals who have come in from the outside.

Secondly, broad participation in planning expedites the implementation of plans. There is a new and growing literature on the problem of implementation agonizing over the fact that, repeatedly, plans which appear to be technically sound is not carried out successfully. It seems that the core problem is simply that people do not like to carryout schemes devised by others-regardless of their merits. In contrast, when plans are generated by the people who are to act them out, so that the goals and the motivation are wholly internalized, implementation becomes much less problematic.

Thirdly, there is the issue of justice. Oppression and other kinds of injustice arise out of displaced decision-making-situations in which one group makes decisions affecting others. When people plan for themselves, they may make mistakes and they may harm themselves, but they will not normally be unjust to themselves. Thus, community-based planning has the quality of assuring that decisions will-at least in this sense-be just. It does not risk the injustice which can arise from displaced decision-making.

4.3 Purpose/Objective of Community-Based Planning Approaches

Community based planning approaches provide wider opportunity for development planners to properly address the interest of different stakeholders (both primary and secondary), enhance ownership and sense of responsibility for every actor who do have stake, optimize benefits (social, economic and environmental), ensure equitable use of resources among different users, and ensure sustainable development. In community-based land management, communities are taking the lead for the entire planning process, staring from problem identification to monitoring and evaluation activities. It gives opportunity for the community to influence government institutions in getting adequate administrative and technical support during planning and implementation.

To be more specific, participatory planning will help to gain the following advantages in implementing different community-based development initiatives:

- Helps to identify real problems and their root causes from the perspective of different stakeholders mainly to the beneficiaries of the development interventions
- Gives opportunity to exploit local knowledge and experiences that could be considered during development recommendations
- Helps develop ownership and transfer management responsibilities to local communities or end users
- Used as mechanisms to develop conflict resolution mechanisms from the beginning, i.e., during planning stage
- Provides opportunity to negotiate and optimize benefits among different uses and users
- Helps to identify factors for sustainability during planning & develop sustainability plan
- Gives opportunity to build local capacity: management/leadership, institutional and resources

4.4 Principles of Participatory Planning Approaches

Participatory planning approaches have basic principles that should be properly considered and respected at all stages of planning. The most important principles are the following.

Participatory: Communities need to be involved in all stages of planning, implementation and management of development activities. It is a continuous process and not a onetime exercise. Different participatory techniques are used based upon existing and innovative experience.

Gender sensitive: Women are the most affected by environmental challenges; for example, they need to walk long hours to fetch increasingly scarce water, firewood and animal dung in addition to attending livestock, to name a few. Their involvement in watershed development planning, implementation and management is the key to ensuring that they benefit equally from the various measures.

Building upon local experience, strength and what works: Local knowledge is essential to improve existing technologies, to adapt new ones and to manage natural resources and other measures once they are introduced and established.

Realistic, integrated, productive and manageable: Community based resource development planning should be realistic, based upon local capacity, locally available resources and other forms of government and partners' support. From land development context, integrated conservation and development of the natural resources is the guiding principle for development together with the optimum use of social resources.

Adequate consideration for potentials and real problems*:* In participatory community-based planning approach, potentials should be identified and properly considered. It is the potential that motivate communities, develop interest, and encourage them to participate. Problems are equally important to communities to participate and need to see resolved and see less challenged livelihood engagement for individual, community and the public in general.

The need for flexibility at different levels: Flexibility is a key criterion required in participatory planning that to fit in local conditions. Flexibility is needed during selection of interventions, technologies, and beneficiary targeting.

Cost-sharing and empowerment/ownership building: Cost-sharing by stakeholders, mainly from the local community, contributes to the sustainability of a project for establishing the responsibility of various stakeholders in the management of the resources.

Complementary to food security and rural development*:* To the extent possible, community-based development planning need to incorporate additional elements related to basic human needs, social services, and infrastructure for sustainable development.

Environmental and Social Sustainability: community-based development planning should be designed according to the required environmental and social sustainability standards and should incorporate mitigation measures.

Participatory approaches do have key development elements that need to be properly recognized and well addressed during planning and implementation. The key elements include:

- Multi-stakeholder collaboration that involves all participants, from communities, to government, to NGOs,
- Conflict management mechanisms: support processes to manage NR conflicts among stakeholders.
- Participatory action research – collaborative fact-finding and analysis.
- Strong local organizations: like watershed user cooperatives, forest cooperatives, irrigation user cooperatives, beekeeper group, etc., and established strong network
- The need of adequate consideration for livelihood improvement & environmental services.
- Policy support and law enforcement are essential to curbing illegal actions and establish equitable use of resources and share responsibilities
- Collaborative management plans: That build shared responsibilities and decision-making among all stakeholders through joint management plans of natural resources.
- Participatory monitoring & evaluation: promote learning, trust & accountability through monitoring of the natural resource base
- Gender and social justice in access to, and control of, natural resources is the ultimate measure of the sustainability.

4.5 Context Analysis, the Bases for Planning

Contextual analysis is the systematic analysis, identification, sorting, organization, interpretation, consolidation, and communication of the contextual user work activity data gathered in contextual inquiry, for the purpose of understanding the work context for a new system to be designed.

From the watershed development and land use planning point of view, context analysis is the characterization, analysis, and developing clear understanding about the biophysical and socioeconomic elements of a community watershed.

The bio-physical characteristics of a watershed include climate (rainfall, temperature, humidity, altitude, winds), drainage and water, soil, vegetation, specific topographic features (steepness and length of slope, curvature – shape, direction), and past/current erosion features (rills, gullies, landslides). Land use includes homesteads, cultivated land, grazing land, forest (natural and artificial), and degraded areas used for various purposes. Some areas have more potential than others. However, watershed development applies to more potential as well as less potential areas as both are not only interconnected but also can recover or improve their productivity with a specific set of measures and management.

The socio-economic elements and characteristics of a watershed include population (human and livestock), farming systems, social setups, economic activities, vulnerability profile, and gender. As a main approach for community-level planning, watershed development planning aims to improve the livelihood of the community and takes into account the views of various groups of people in the watershed(s). Although all community members are expected to benefit from watershed development, specific attention is often required to address problems of resource poor and vulnerable families and promote the empowerment of women .

In order to prepare a good watershed development and land use plans it very important to adequately characterize the community watersheds and properly analyse the existing contexts. Characterizing the community watershed, its problems, and potentials provides the basis for developing effective management strategies to meet the intended goals. The characterization and analysis process helps to focus management efforts on the most pressing needs within the community watershed.

Rural communities and individual farmers face climate risks associated with climate variability and climate change elsewhere in Ethiopia. Their livelihoods are exposed to climate risks and associated impacts. Therefore, there is a need to practice adaptation measures to lead live in the face of climate risk induce climate change environment. Hence, we need to conduct risk identification and assessment that are important steps towards successful implementation of adaptation practices. This topic covers identification and assessment of current climate risk hazard, impact and future climate risks and associated societal vulnerabilities. The most important climate hazards that need to be well explored during the context analysis are drought, flooding, land slide and soil erosion, and other risks due to climate variability's.

The planning team needs to have clear understanding about the methods and procedures of climate risk assessment. Risk assessments generally consist of three steps: risk identification (finding, recognizing and describing risk), risk analysis (estimation of the probability of its occurrence and the severity of the potential impacts) and risk evaluation (comparing the level of risk with risk criteria to determine whether the risk and/or its magnitude is tolerable). The steps to be followed for proper assessment of climate risks are shortly described as follows:

Risk identification: is the process of determining what, where, when, why and how something could happen. Risk identification aims to identify relevant risks starting from existing knowledge and expert input.

Risk analysis: is systematic process to understand the nature of and to deduce the level of risk. Provides the basis for risk evaluation and decisions about risk treatment. In risk analysis, the risk components (hazards, exposure and vulnerabilities) and their interlinkages, resulting cascading impacts and the potential for adverse consequences for selected human or ecological systems are explored and analysed using quantitative and qualitative methods. Risk levels are assigned (e.g., from very low to very high).

Risk evaluation: is process of comparing the level of risk against risk criteria. Risk evaluation assists in decisions about risk treatment. Risk evaluation then identifies urgent actions and risk reduction measures based on the levels of risk tolerability defined by the communities and key stakeholders.

Participatory tools are used for characterizing a community watershed or gathering and analysis of biophysical and socioeconomic elements of a community watershed. Vulnerability and exposure to climate risks have to be well analysed and considered in the management plan. A brief summary of the common tools suggested use for characterization of a community watershed and climate risk assessment are presented on the tables below: the detail procedures can be found in the community based watershed development guideline and other documents.

Table 4.1 Common Tools for watershed Characterization

PRA Tools		Purpose
Mapping Tools	Resource mapping	Shows resources of the area like soil, water, minerals etc. It increases the knowhow of the natives about their surrounding and the physical features of the area. Shows resources of the area like soil, water, minerals etc. Villagers prepare map showing resources, forest land, agricultural land, grazing land, degraded and gully areas, water resource, roads as well as problems and management issues
	Social mapping	Consists of household information such as population density, social classes, land use etc. It increases the knowhow of the natives about their surroundings. A Social Map is useful for displaying the existing social situation/condition of the community in visual form. The map shows the social structure and services of the community such as School, Health Post, Co-operatives Banks, NGOs, CBOs, Religious Centre, Parks, Roads, Canals. Villagers prepare maps by using locally available materials
Diagramming Tools	Transect Walk	Transects are observatory walks to study the natural resources, topography, indigenous technology, soils and vegetation, farming practices, problems and opportunities. These are done with a group of villagers-either following a particular course, cross country or covering the area.
	Trend Analysis	It is helpful to understand the residents' perceptions of significant changes in the community overtime or provides local perspective on time changes in natural resources. It used to analyze the past and present situation regarding resources, issues, and village initiatives.
	Seasonal Calendar	Seasonal Diagrams can be used for obtaining seasonal patterns of rainfall, employment, income/expenditure, diseases, livestock, production, workforce availability, crop pattern etc. Helps to identify lean periods for resources and timing of supply of key farm inputs
	Venn diagram	It is used to depict key institutions, organizations and individuals and their relationship with the local community or others. Key players in decision making are shown. On the Venn diagram each institution is represented by a circle. The size of the circle represents the importance, significance or power of that institutions
Problem Identification tool	Problem tree	A problem tree or causal diagram enables farmers to identify the root causes of problems they face and to assess the importance of each cause
Ranking tools	Preference ranking	A method to rank the problems that afflicting agricultural production. The preferences are identified by assigning scores of different problems. The scores 5 - most important, 1 - least important. Each individual or the group as a whole performs the rankings.
	Pair-wise ranking	Each individual item is compared directly against the others so as to emerge with a ranking from highest (Most Preferred) to lowest (Least Preferred). Is a decision tool to help the community discuss and agree on the most important problems that they want to address in development activities.
	Matrix ranking	Used to compare several items against a set of different indicator of preference
	Wealth/Well-being ranking	It is used to rank differences in standard of living as perceived by the people. Helps to gain insight into relative social stratification
	Proportional piling	Proportional piling is a technique that allows farmers/respondents to give relative scores to a number of different items or categories according to one criteria
Interviewing	Semi-Structured	SSI is a tool that can be used any time. SSI is guided interviewing, where only some of the questions are predetermined and new questions come up during the interview. The interviewer prepares a list of topics and questions rather than a fixed questionnaire. SSI could be i. Individual interviews, ii. Group Interviews, iii. Key Informant Interviews and iv. Focus group discussions

Table 4.2 Common PRA tools used for climate risk assessment

PRA Tool	Purpose
Climatic Hazard Mapping	Helps to identify areas at risk and vulnerable members of the community.
Climatic risk-hazard trend analysis or community history (time line):	Identifies frequency of shocks and local coping mechanisms.
Climatic risk-hazard ranking:	Analyses problems in order to rate community priorities or the significant problems faced by the community.
Focus Group Discussions (FGD)	Brings together community residents, farmers' groups and associations, formal and informal village cooperatives, landless labourer, fishers, livestock farmers, etc., to discuss specific issues. This tool helps to gain information about the locality, people, their livelihoods, local risk environment (hazards) and local/traditional preparedness and coping strategy.
Timeline	Narrates the history of climate risks and significant events that happened in the community. Helps community, to get an insight into past hazards, changes in their nature, intensity and behaviour, to make people aware of trends and changes over time and to evaluate extent of risk analysis, planning and investment for the future.
Hazard Venn diagram	Helps communities to identify and analyse the common hazards that take place locally, their magnitude and likelihood. Using this tool we can: Identify and analyses the common hazards in the locality, their magnitude and likelihood
Seasonal calendar	Tracks seasonal changes, climate-related hazards, community events and other activities related to a specific month. In the agricultural sector, this is used primarily to plot seasonal farm activities. using this tool we can identify periods of stress, hazards, diseases, hunger, debt, vulnerability, etc.,

4.6 Participatory Planning Approaches Under Implementation in Ethiopia

4.6.1 Integrated Local Level Participatory Land use planning

Land-use planning is the systematic assessment of land and water potential, alternatives for land use and economic and social conditions, in order to select and adopt the best land-use options. Its purpose is to select and put into practice those land uses that will best meet the needs of the people, while safeguarding resources for the future. The driving force in planning is the need for change, the need for improved management or the need for a quite different pattern of land use dictated by changing circumstances" (FAO, 1993). It is a process of decision making on the use of the resources of a certain unit of land for options of more productive, environmentally sound, and sustainable economic uses.

What is Local Level Participatory Land Use Planning (LLPLUP)?

- It is "an iterative process based on dialogue among all stakeholders, aiming at the negotiation and decision for a sustainable form of land use in rural areas, as well as initiating and monitoring its implementation". Thus, LLPLUP must be intended to form a comprehensive Programmeme of activities to improve, boost, sustain, intensify, and expand the required land-use options based on the quality and quantity of the resources and community needs (FAO, 1995).
- It is a bottom-up land-use planning approach carried out with active participation of the concerned community. LLPLUP evaluates and proposes the best possible uses for land resources in a village in order to improve the livelihoods of the local population. Important land resources in a village include soil, water, and plants, which are used for producing crops, livestock, timber, housing, drinking water, etc. Their optimal use depends on the biophysical conditions of the land, people's ability to utilise the land, people's socioeconomic conditions and their expectations. LLPLUP serves improved land stewardship through systematically analysing these conditions and proposing improved land-use options, taking into consideration all the above factors. The implementation of LLPLUP is ensured through ownership over the process by the community and through reliance on local institutions.
- It is a methodology that facilitates community involvement in the identification of land use and/or natural resource use for rural land-use planning and development. It is, therefore, an appropria-

te approach to halt or reverse land degradation, conserve biodiversity and maintain ecosystem services.

The Rationale of Local Level Participatory Land Use Planning

- LLPLUP prevents and solves conflicts over land resources and secures rights and tenure, facilitates discussion among social groups, incorporates formal legal requirements of land use, documents traditional land-use rules and regulations, ensures that interests of the entire community are reflected, excludes external interests, improves the ecological condition of land resources, helps to develop new sources of income (e.g. ecotourism), secures the resource base, improves and empowers local governance, improves accountability of the local administration and compromises local, regional and national interests.
- The main objective of LLPLUP is to create the framework for sustainable land use that is socially acceptable, environmentally sound, politically desired, and economically viable. This objective can be pursued by assisting local stakeholders in planning the use of locally available resources and through strengthening their capacities for managing the resources in a sustainable way. It identifies optimal solutions for alternative land use, considering local socioeconomic conditions and livelihood strategies.
- As participatory approach, it empowers communities through the process and thereby contributes to conflict prevention and a balanced socioeconomic development. Technical measures to combat land degradation are expensive and meet with little long-term success in case their establishment and reproduction is not guided through a participatory framework:
  - LLPLUP is ideal in putting technical intervention measures into a socially appropriate context, thereby ensuring their relevance, long-term application and thus their effectiveness.
  - LLPLUP can significantly contribute to sustainable land and ecosystem management (SLEM), where most land is being frequently cultivated, resulting in soil erosion and loss of productivity, degradation of vegetation and decline of water resources.

Local Level Participatory Land Use Planning Steps and Key Activities in each step

Planning Phase	Planning steps	Key activities
Preparatory Phase	STEP 1. Initiation and organizing the task	- Organizing woreda ILLPLUP team - Agree on criteria for prioritization and selection of kebeles - Defining planning area - Community awareness creation (at woreda level and kebele level) - Calling general assembly and organizing kebele ILLPLUP team - Base map preparation - Identifying stakeholders, land use problems and setting objectives
	STEP 2. Office work	- Provision of training - Budgeting /financial planning - Preparing preliminary mapping units (Capacity gap analysis and training on mapping technique, map and scale enlargement, identification of temporary mapping units) - Action plan preparation - Preparing field data collection sheets/ forms (bio-physical data collection forms, socio-economic data collection forms, human population data collection forms) - Farming systems study (Cropping system, study on livestock types and population,) - Wealth ranking
Field Work Phase	STEP 3. Biophysical data collection	- Defining Scope of data collection - Data collection
	Step 4. Socio-economic survey	- Defining Scope of data collection - Socio-economic data collection - Identifying land use problems
	STEP 5. Data analysis	- Biophysical data analysis - Socio-economic data analysis

Planning Phase	Planning steps	Key activities
Planning Phase	STEP 6. Conduct land evaluation	- Conduct physical land evaluation and determine land capability classes - Preparing land capability map - Identification of opportunities for change
	STEP 7. Environmental and social impact assessment	- Impact identification, prediction, and evaluation - Impact mitigation and adaptation
	STEP 8. Choose the best land use options	- Choose the Best Land Use Options
	STEP 9. Prepare the final land use plan	- Prepare Final Land Use Plan
	STEP 10. Plan presentation and technical report to general assembly	- Presentation of the Plan and Technical Report to General Assembly for public consultation
	STEP 11. Endorsement of the plan	- Endorsement of the Plan at Woreda level after approval at Kebelle level
	STEP 12. Handing over the final plan and report to land users	- Official Hand-over of the final plan and report to Land Users before the implementation process starts.
	STEP 13. Enforcement Mechanisms for implementation	- Participatory bylaw development - Aware Legal and binding rules (based on Land Use Proclamation No 456 / 2005 Article 13) for implementation
	STEP 14. Participatory monitoring and evaluation	- Participatory monitoring - Participatory evaluation
	STEP 15. Plan updating and revision	- Plan updating and review (plan updating, and revision needs to be done regularly at five years interval)

4.6.2 Community Based Watershed Development Planning

Definitions and the Concept

A watershed is defined as any surface area from which runoff resulting from rainfall is collected and drained through a common confluence point. The term is synonymous with a drainage basin or catchment area. Hydrologically, a watershed could be defined as an area from which the runoff drains through a particular point in the drainage system (Figure 4.3). It includes all the natural resources in a basin, especially water, soil, and vegetative factors. At the socioeconomic level a watershed includes people, the farming system (including livestock) and interactions with land resources, coping strategies, social and economic activities and cultural aspects.

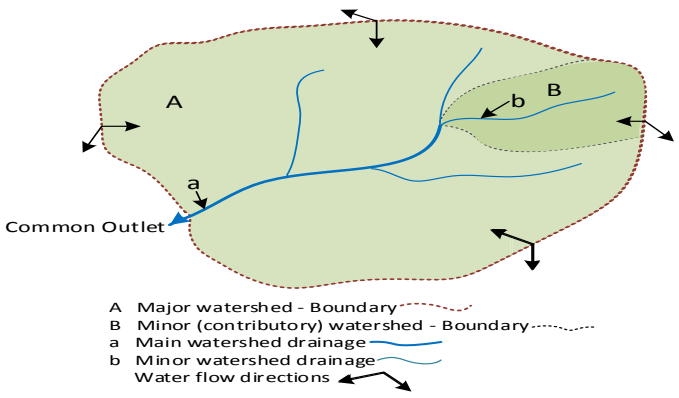


Figure 4. 1 A watershed unit

Key Features of Watershed Degradation

Land degradation in a watershed falls into the following three main types: Soil degradation, Vegetative degradation, and Water resources degradation.

Soil degradation: Soil degradation, especially erosion, is a major component of land degradation caused by excessive exploitative use of the land (cultivation of steep slopes, shallow soils, excessive tillage, overgrazing, and encroachment of forests and woodland). Soil degradation may be physical (erosion, compaction, surface crusting, iron pan formation), chemical (nutrient depletion, salinization, acidification, toxic compounds), and biological (decline in organic matter, and reduction in micro- and macro-fauna). Typical symptoms of soil degradation include reduced rooting depth, soil fertility, organic matter content, water and nutrient holding capacity, and soil compaction, surface crusting, and eroded fields.

Degradation of vegetative cover: Reduction in vegetative cover and biomass is caused by climatic factors, overutilization of vegetation (harvesting of trees for various purposes, land clearing for farming, overuse of crop residues for livestock feed and fuel wood, overgrazing and bush burning), erosion, and reduced soil fertility.

Depletion of water resources: Although annual rainfall amounts in a watershed may be sufficient to satisfactorily produce crops, most of it is often lost as runoff. This occurs on shallow soils with limited water-holding capacity and/or compacted soils which constrain the infiltration of rainwater into the soil. Waste of rainwater occurs when runoff is not harvested for productive purposes. Infiltration of rainwater into the soil facilitates the recharge of water tables and makes groundwater available for small-scale irrigation. Depletion of water resources is directly linked to poor surface vegetative cover. High runoff rates result in high erosion rates, soil degradation, lower infiltration, and a vicious cycle of water depletion with implications for scarce water for domestic and livestock use, adverse impacts on health, income, and quality of life of people. Land degradation is mostly responsible for reduction of the vegetative cover and ultimate depletion of water resources, which, in turn, makes the soil, water, and vegetation more vulnerable to the drivers of degradation in the watershed. The process of degradation could ultimately lead to desertification or the disappearance of the potential of land to sustain life and livelihoods.

Watershed management presents an appropriate option for effective water harvesting and utilization of both surface and subsurface water resources for domestic, livestock, and production uses. If watersheds are not managed properly based on a management plan that is socially acceptable, economically feasible to apply, and environmentally sound, the natural resources (soil, water, vegetation, fauna, and flora) are degraded, with adverse impacts on their livelihood support attributes.

The Rationale for Community-Based Watershed Development Planning

Ethiopia has mostly complex and fragile landscapes. Land degradation seriously affects livelihoods and food security of millions in Ethiopia and threatens the livelihood of many more. The main land degradation arises from (1) high soil erosion rates as a result of steep slopes, continuous encroachment and cultivation of marginal lands; (2) long history of deforestation, overgrazing, negative coping strategies such as the burning of animal dung, extensive use of charcoal, reduced rotation periods, and others.

Interactions between and within communities in these landscapes depend on what happens at the different levels of the watershed. The people living in the watersheds have varying needs, demands, and aspirations as well as activities which interact differently with the resources of the land. The inter-relationship of the many resources in the watershed, such as water, soil, and biomass make it an effective unit for resource management.

Participatory watershed planning is therefore recognized as a holistic approach to understanding what needs to be done at various levels of the watershed to sustain, improve, and diversify production, while developing and managing the natural resource base, promoting income-generation opportunities, and making livelihood systems more resilient to shocks.

The overall objective of Participatory Watershed Development is to improve the livelihood of community/households in rural Ethiopia through comprehensive and integrated natural resource development. It aims at productivity enhancement measures for improved income generation opportunities, enhanced livelihood support systems and high resilience to shocks. The second objective is to optimize the use of existing natural resources and untapped potentials in both already degraded areas and in the remaining potential areas.

More specific objectives include:

1. Conserving soil, rainwater and vegetation effectively for productive uses
2. Harvesting surplus water to create water sources in addition to ground water recharge
3. Promoting sustainable farming and stabilize crop yields by adopting suitable soil, water, nutrient and crop management practices.
4. Rehabilitating and reclaim marginal lands through appropriate conservation measures and mix of trees, shrubs and grasses, based on land potential.
5. Enhancing the income of individuals by the diversified agriculture produce, increased employment opportunities and cottage enterprises, particularly for the most vulnerable, linked to the sustained use of natural resources and
6. Restoring ecological balance

Benefits of Watershed Development to Households, Local Community and the Society at Large

Benefits to households	Benefits to local community	Benefits to the society at large
- Improved water availability and fertility levels for crop production and diversification. - Improved soil quality and better drainage. - Increased access to biomass for multipurpose use (firewood, fodder, fruits, construction, and others) and higher profits. - Increased resilience to shocks and Improved livelihoods. - Increased participation in income generation activities.	- Lower land development costs. - Reduced erosion, deforestation, flooding and waterlogging. - Increased overall agricultural productivity and access to markets and basic services. - Improved livelihood options, including for the poorest households. - A more dependable, clean water supply for domestic and industrial use - Recharge of aquifers.	- Better conservation of natural resources and biodiversity. - Less danger from floods to downstream farmlands. - Reduced sedimentation of costly irrigation projects and protection of major infrastructure (e.g., roads) Increased water supply and improved health. - Reduced occurrence of drought and increased stability of production systems.

Community based watershed development planning steps and key activities in each step

According to the new watershed developed planning guideline issues in 2020 by MoA, the planning procedure and steps are presented with some variation for mixed farming and pastural areas of the country. The variation is observed in the first 3 steps. However, the remaining 5 steps are similar having common characteristics. The planning steps and key activities in each step are separately presented for both mixed farming areas and pure pastoral areas in the following tables. Table a and table b below.

a/ Planning Steps in Mixed Farming Area

Planning steps	Key activities
Step 1: Getting started at Woreda level	- Stakeholders Analysis, - Establishing Woreda Watershed Team (WWT), - Undertake Woreda level preparatory activities, - Establishing Kebele Watershed team (KWT) and - Undertake kebele level preparatory activities
Step 2: Getting started at community level	- Call for general assembly - Establish community watershed Team (CWT) - Agree on timing for planning

Step 3: Socio-economic and Bio-physical survey in mixed farming areas	- Socio-economic survey - Detail bio-physical survey and mapping: - Synergies of bio-physical and socio-economic survey results: Analysis of focus areas and priorities
Step 4: Gender and Social Development (GSD), Nutrition, and Integrated Risk Management	- GSD and Nutrition - Mainstreaming of Integrated Risk Management (Climate Change, disaster risk reduction, eco-system management, and restoration) - Climate smart planning - Disaster risk reduction
Step 5: Identification, Prioritization and Safeguarding of Interventions that bring change	- Identification of Interventions and prioritization elements - General technical and social aspects related to watershed planning - Key elements of Integration and Sequencing in the planning and implementation of watershed management activities - Intervention areas: Description of measures and specific technologies - Environmental and Social Screening of Interventions
Step 6: Getting Interventions approved by the general assembly	
Step 7: Organizing watershed/rangeland intervention plan	
Step 8: Implementation Strategies	- Organizational Management at community/micro watershed level - Decision-making and role of women and other vulnerable social groups and households - Link with different projects and Programmes - Capacity Building - Establishment of Community Watershed Users cooperatives - Establishing economic user groups - Sequencing of Activity implementation

b/Planning Steps in Pure Pastoral Areas

Planning steps	Key activities
Step 1: Getting started at Woreda level	- Stakeholder Analysis - Organizing WRT - Collection of basic Woreda data - Setting preliminary goals - Reconnaissance visits to communities - Determining Minimum Planning Unit - Role of customary institutions
Step 2: Getting started at community level	- Call for general assembly - Establish KRT - Establish community rangeland team - Agree on timing for planning
Step 3: Socio-economic and Bio-physical survey in pure pastoral areas	- Participatory Rural Appraisal tools - Socio-economic Assessment - Biophysical Survey
Step 4: Gender and Social Development (GSD), Nutrition, and Integrated Risk Management	- GSD and Nutrition - Mainstreaming of Integrated Risk Management (Climate Change, disaster risk reduction, eco-system management, and restoration) - Climate smart planning - Disaster risk reduction
Step 5: Identification, Prioritization and Safeguarding of Interventions that bring change	- Identification of Interventions and prioritization elements - General technical and social aspects related to watershed planning - Key elements of Integration and Sequencing in the planning and implementation of watershed management activities - Intervention areas: Description of measures and specific technologies - Environmental and Social Screening of Interventions
Step 6: Getting Interventions approved by the general assembly	- Approval by the General Assembly - Discussion with the community - Discussion with other communities

Planning steps	Key activities
Step 7: Organizing watershed/rangeland intervention plan	- Organizational Management - Decision-making and role of women and other vulnerable social groups and households - Link with different projects and Programmes - Capacity Building - Community Watershed Users cooperatives - Sequencing of Activity implementation - Establishing economic user groups
Step 8: Implementation Strategies	- Organizational Management at community/micro watershed level - Decision-making and role of women and other vulnerable social groups and households - Link with different projects and Programmes - Capacity Building - Establishment of Community Watershed Users cooperatives - Establishing economic user groups - Sequencing of Activity implementation

Figure 4. 2 Community discussions during socioeconomic and biophysical survey (to the left), rainfall distribution mapping (to the right)

4.6.3 Participatory Forest Management

Definition of Terms

Participatory Forest Management (PFM) is used to describe systems in which communities (forest users and managers) and government services (forest department) work together to determine potential forest resource uses, define rights of forest resource users, identify and develop forest management responsibilities, and agree on how forest benefits will be shared (Farm Africa and SoS Sahel, Field manual, 2007).

PFM involves the legal transfer of forest resources (use rights) from the government forest service to a community management group either fully or partly. Participatory Forest Management is interchangeably used with other terminologies, though each has their own specific core elements. The terms which are interchangeably used with PFM are Joint Forest Management (JFM), Community Based Forestry Management, Collaborative Forestry Management, Community Forestry, etc. The big confusion is between the two terminologies, PFM and JFM. In principle, the two terms are similar; they differ only on some elements that they are focusing on. While JFM is focusing on the issue of partnership between some defined actors, PFM is more inclusive which provides wider stakeholders to come to the PFM system. Generally, PFM is an umbrella term to include shared forest management, joint forest management, collaborative forest management, and community forestry.

Shortly PFM can be described as:

- A system through which a partnership or **coalition of individuals**, **communities** and organisations (including Forestry Department) is developed to manage a forest area'
- ''A process through which local stakeholders mainly the **forest adjacent communities influence and share control over development initiatives, decisions and resources** that affect them'

Working definition of participatory Forest Management

- Under Participatory Forest Management, **communities become the primary implementers of an agreed management plan, assisted and monitored by the Forestry Department**. Under such an agreement, communities have a legal right, an institutional base and an economic incentive to take substantial responsibility for sustainable management and use of forest resources.

The rationale of participatory forest management approach

- There is recognition that there is a limited capacity of government to manage forest resources in a sustainable way without the support of the community. The capacity of the local community is also limited to manage forests by themselves. PFM approach is, therefore, a creative and potentially optimal arrangement combining the separate strengths
- The presence of unfair resource utilization among and between the community and the government is another important issue that requires developing fair benefit sharing mechanisms through PFM approach
- The presence of a growing political commitment in nations to decentralize government functions to the lowest level of government is another opportunity to promote PFM approach. It is a major shift towards a more decentralized people-oriented forestry, devolution of management responsibilities to the community
- It is a means to capacitate local community and government institutions. The whole process of PFM is participatory through which the local community can share experiences among themselves and explore additional knowledge and skill from professionals
- PFM system enhances significantly the contribution of forests/woodlands/closure areas for the improvement of household livelihoods; therefore local (forest-adjacent) communities have a strong incentive to manage resources on a sustainable basis
- Provides opportunity for resource users to manage forests with defined rules and bylaws developed by themselves but with genuine consultation of all stakeholders
- Provides equal emphasis for both livelihood improvement and environmental security**.** The two key elements of PFM are income generation and sustainability. If one is missed in the system, PFM could not be functional/operational
- Develops real sense of ownership and responsibility among the community**.** As management responsibility and use right of resources are properly transferred to local communities and the interest of different stakeholder are properly addressed, it is automatic that sense of ownership is created.

Principles of Participatory Forest Management

The principles of PFM are directly related to the principles of ecosystem development, biodiversity conservation and sustainable management systems, and fair and sustainable use of resources. According to the national PFM guideline of Ethiopia, the principles described are many and exhaustive which are expected to be refined some experiences of implementation in different contexts. Four major principles of PFM are described below:

- ***Rights & Ownership:*** The need for securing long-term access and benefit rights, not necessarily ownership of land. Communities will not invest labour, time and hope in schemes which fail to deliver recognisable benefits over time
- ***The pace of process:*** Participatory culture grow at an appropriate pace: the move from passive to active involvement takes time; building positive working relationships between stakeholders cannot be hurried; shared forest management combines short-& long-term benefits; stakeholders need time to understand and adapt to their changing role in resource management; need to provide realistic timetables for stakeholder.
- ***Public awareness:*** Raising public awareness is vital to the success of participatory approaches to ensure sustainable forest management: **communication is the bedrock of the approach**

- ***Economic issues:*** Securing effective and equitable sharing of forest management is a time consuming and painstaking process: It requires high initial inputs of time from all stakeholders. It has high opportunity costs in the short-term to achieve long-term benefits

The crucial bases of PFM approach are diverse and very interlinked. The success of the approach definitely depends on the following diverse principles to be addressed.

- Strong government commitment
- Strong partnership and agreement between different stakeholders
- Real community participation
- Institutional capacity/strength
- New attitude among technical experts and the community
- Built strong trust among the community
- Supportive policy instrument
- Gender sensitivity
- Equal emphasis for resource conservation and livelihood improvement

Establishment of Participatory Forest Management System

According to the national PFM guideline, establishment of the PFM system is categorized into three broad phases: The Mobilization, Planning and Implementation phases. The phases and district steps are shortly discussed as follows. The detail can be referred from the national PFM guideline of Ethiopia.

Table 4.3 Detail processes and activities under each PFM steps

Phase/steps	Steps	Key activities
Phase I. Mobilization Phase	Step One: Getting started	- Selection of forest site - Formation of PFM implementation team - Orientation of stakeholders - Meeting and briefing of the Kebele leadership - Meeting and briefing the Kebele assembly/community members
	Step Two: Familiarization of PFM purposes and processes	- Identifying primary and secondary forest users with proper definition of community groups - Identifying forest uses, users and gender issues - Introductory PFM training to woreda PFM facilitation team - Introductory PFM training to community level planning team
Phase II: Planning Phase	Step Three: Participatory forest resource assessment & management planning	- Participatory forest boundary demarcation, mapping with blocks and sub-blocks - Conducting Participatory Forest Resource Assessment (PFRA) - PFM plan development
	Step Four: Organizing & legalizing community institution(s) & signing FMA	- Awareness rising to community groups on CBO, and identifying appropriate CBI for PFM system - Establishment of forest cooperative & ensuring legal support - Develop/design PFM agreement - Approval and signing of the PFM Agreement
Phase III: Implementation Phase	Step Five: Capacity building and skill development for PFM plan implementation	- Institutional capacity development - Technical skill development - Provision of administrative support
	Step Six: Participatory Monitoring and Evaluation and Revision	- Participatory monitoring and evaluation

MODULE FIVE. INTERVENTIONS OF CBLM

5.1 Communal Resources Management and Utilization

5.1.1 Definition of Terms

***Communal Resources**:* In the context of this manual, communal resources are scarce resource, such as water, forests, pasture, rangelands, wetlands and others, that provide rural communities with tangible benefits but which nobody in particular owns or has exclusive claim to. Communal resources are resources that can provide benefit to society/community, but which is not owned by anybody in particular.

Communal resource management: it is protection/conservation, development, and utilization of communal resources for maximized and diversified benefits for the local community and for the environment. Communal resources management requires strategic solutions to the tragedy of commons that causes over exploitation and conflicts among users. A wide-ranging management plan has to be prepared with active involvement of different stakeholders mainly those who are using the resource and a strong stake to the resource. The management plan needs to clearly define the development, management and utilization operations and that ensures sustainability of the resource and provide optimized benefits for the resource users (both direct and indirect users).

5.1.2 Rationale for Strategic Approach for Management of Communal Resources

Because anybody can enjoy its use in common, the risk of over-consumption and ultimate depletion of communal resources is a big concern. This concern has been formalized under the concept of the "tragedy of the commons". Overuse of common resources often leads to economic problems, such as the tragedy of the commons, where user self-interest leads to the destruction of the resource. Communal resources are highly exposed for overuse, especially when there are poor social-management systems in place to protect the core resource.

In Ethiopia, common property resources are important sources of timber and non-timber products, fuelwood, grazing land, and medicine. Under unrestricted access by community members, or ineffective use regulations, these resources are exploited on a first-come, first-served basis. Rural communities depend primarily on common property resources such as water for irrigation and drinking, forests and grazing lands, construction materials, etc.

However, government failures and the absence or ineffectiveness of use regulations of common property resources has resulted in severe degradation of the resources (Berhanu G., etal. 2003). Communities aren't well organized. The ownership and/or use right, and management responsibility hasn't been properly transferred to local communities. In most cases, communities are accessing benefits illegally and in unwise manner.

Generally, in Ethiopia, the main problems that communal resources are facing are the following:

- Users of the resource aren't well defined or clearly known.
- Resources are highly exposed for over exploitation due to tragedy of the commons.
- Resources, in many cases, are degraded, and production and productivity is declined.
- Resources are used inequitably and unsustainably.
- Resources do not give adequate benefit for the community and don't support rural livelihood.
- Main source of conflicts among different users
- Due to degradation, sites of communal resources become source of floods, sediments and become causes of soil erosion and land slide mainly in slopy sites.

- Biodiversity highly impacted,

As communal resources are under greater threat, in Ethiopian context, it is worthwhile to seek appropriate and effective management strategy and plan, so that resources can be managed and used equitably and on sustainable bases.

The communal resource management strategy and plan to be developed will be used as a mitigation action to ensure the following advantages

- Direct and indirect users are identified and use right and management responsibility can be formally transferred to direct beneficiaries
- Gives opportunity for the community/direct users invest their labour and resources and develop the resource and increase production and productivity
- Benefits can be accessed equitably among community members
- Socioeconomic and environmental benefits are optimized
- Conflicts among user communities resolved and collaboration enhanced
- Ownership by the community enhanced
- Its positive impact on other resources such as soil, water, biodiversity enhanced
- Sustainability ensured

5.1.3 Benefits of Communal Resources, Why Special Focus for Communal Resources?

If properly managed and equitably and sustainably used, communal resources help to generate income that can support community's livelihood and reduce poverty. The benefits are very diverse (social, economic and environmental) that can be gained based on the resource base and the possible management options.

Very important benefits that communities can access from communal resources are the following:

- Generate new & additional income at community level for social welfare
- Provide jobs and additional income for some residents,
- Increase household assets, if equitably used
- Provide land use diversification options in semi-arid and arid areas
- Provide livelihood diversification options for some residents
- Give opportunity to promote ecotourism and biodiversity conservation
- Play key role for mitigation and adaptation of climate change

5.1.4 Principles of Communal Resource Management

The following are the key principles that emerge as being crucial for success in managing communal resources sustainably and towards the benefit of the society and the environment:

1. ***Use right and tenure security***: To take management decisions, communities require rights over their land and resources, so that they can control access to resources and how they can use. Communities must have the exclusive rights to use, get benefit from, and manage the resource by themselves,
2. ***Relevance of appropriate community-based institution*****:** To properly manage/administer the resource, ensure equitable distribution of benefits, and ensure sustainability, communities need strong representative and accountable institutions. Communities can mobilize their labour, local resources and actively participate in the entire management of the resources via their own institutions.
3. ***Access to benefits:*** Communities must be able to derive appropriate benefits from the resources that they manage. It is unlikely they will invest time, effort, and finances into ma-

naging a resource if the benefits of management do not exceed the costs.

4. **Users/community bylaws:** Bylaws are instruments that enable implement properly communal management, utilization and development plans both for the benefit of the users and for the sustainability of the resource. One has to be sure that bylaws, prepared with genuine or active participation of the community and that is approved, are in place for effective and efficient Management and utilization of communal resources.

5.1.5 Strategic Actions for Proper Management of Communal Resources

A. Building the Management Capacity of the User Communities

Communities shall have strong and appropriately established institution that can legally takeover the overall management responsibility of resources and that can collaborate and establish partnership with different stakeholders including the government. Therefore, before any attempt to transfer the management responsibility of communal resources, it needs to provide adequate support for communities to build their institutional capacity.

B. Optimization of Community Benefits

Natural resources can provide various benefits be it social, economic, or environmental. However, there are always trade-offs (differences) between these benefits among different resource users and stakeholders. Conflicts may arise due to these trade-offs (interest differences).

Therefore, optimization of uses could be taken as a mitigation option to tackle the trade-offs and the conflicts that may arise.

- The social, economic, and ecological benefits of resources shall be properly considered, analysed and appropriate decision shall be made in the management plan.
- Detail investigation of resources, local contexts and the interest of community and other stakeholders should be carried out.
- Cost benefits should be analysed and considered to make appropriate decisions.

C. Consideration of Indigenous Knowledge of the Local Community

Indigenous knowledge and experiences are internalized and socially agreed understandings by societies that ensure implementation of community plans. Therefore, local knowledge integration must be properly considered in the development of resource management strategies, in promoting new and existing best practices, and mitigating negative impacts on resources and livelihoods.

D. Legal Provisions

To properly manage communal resources, community-based institutions should be supported with legal provisions, and community agreements or bylaws. Legal provisions will provide them opportunity to get adequate support from government and other stakeholders, to institutionalize benefit sharing mechanism, and optimize benefits among different uses: social, economic, and ecological benefits.

5.1.6 Management Practices of Communal Resources

The communal land and its resources, in Ethiopia, shared a significant proportion of the land use in different agro-ecological conditions. These resources have been used as main source of products such as forage, wood/timber, honey, and spices. In some cases, they are used as ecotourism sites that generate income. Most of communal lands are sites endowed with diverse fauna and flora species with significant ecological impacts in the wider scale.

However, most sites with valuable resources haven't been properly managed and sustainably used. Due to management problems, their role in supporting the national economy is very limited. The role of communal resources is limited only in providing some livelihood support for the

local community (even though not based on use plans and on sustainable way).

Therefore, these resources must be properly considered and get adequate attention in planning and implementation of community-based land management interventions in different agroecological zones and landscapes.

Communal resource management requires proper characterization of resources and resource users and the management system under implementation, and potential problems and challenges. Shortly, for visualization purpose the processes and required actions in the management system are indicated here below.

1. Characterization of the resource and resource users

- Resource identification, characterization, and mapping
- Identification of the resource users – identification of primary and secondary users.
- Conduct stakeholder analysis – to know who will be primary, secondary and key stakeholders that define their interests and engagements in the management

2. Identify/Establish institutional set up (either user group or general community under watershed user cooperative

- The institution can be established either of the following: kebele, watershed, or got level depending on the traditional or legal use rights under exercise
- When the users are watershed communities, the watershed user cooperative will take the responsibility. If not new user group or institution have to be established

3. Defining the management objective based on the potential of the resource and the interest of the community/users. After the resource is properly characterized and the primary and secondary users of the resource are identified, the management objective has to be defined. The key considerations to define the management objectives are the following:

- The potential of the resources – the potential in providing social, economic and environmental services.
- The interest of the users, mainly the primary users
- The capacity of the community to manage the resource – the technical and management capacity
- The required cost to implement the management plan to attain its objective

4. Development of community-based management plan

- Identify appropriate management interventions and prepare yearly plan
- Develop resource utilization plan
- Prepare conflict resolution plan
- Prepare bylaw to enforce agreed actions

5. Transferring use right for established groups (user groups, WUCs, or other that is appropriate)

- Develop agreement document that defines the roles and responsibilities of the users, the government body, and other stakeholders, and the potential benefits to shared among users including secondary users
- Signing the agreement document – that defines the use right and management responsibility

6. Follow up, monitoring and evaluation

Generally, the following tasks will be properly planned and applied to provide adequate support for the community, regularly check/track new developments, and take correction measures for

unexpected negative impacts to occur, and properly document lessons.

- Technical support during planning and implementation by extension workers
- Monitor activities and results achieved and the possible change after implementation- based on predefined result indicators
- Evaluate impacts in terms of social, economic and environmental changes to come

5.2 Rehabilitation of Degraded Lands

5.2.1 Definition of Terms and Concepts

***Land degradation*:** is defined as the temporary or permanent decline in the productive capacity of the land, and reduction of the productive potential. It is a process in which the value of the biophysical environment is affected caused by natural and human made factors acting upon the land.

Degraded land – is a land that has lost some degree of its natural productivity due to human-caused processes. In this context, the degraded land deal with hillsides, farmlands, gullies, and grazing areas

***Land Rehabilitation* -** it is a process of restoration to bring an area of land back to its natural state after it has been damaged or degraded, making it safe for fauna and flora as well as humans.

Land degradation and rehabilitation in Ethiopia context:

Land degradation in Ethiopia has become a serious problem affecting all spheres of the social, economic, and political life of the population resulted in declining of agricultural production, water depletion, and disturbed hydrological conditions. Cultivation on steep and marginal lands without adequate soil conservation measures, low and declining use of manure, loss of vegetative cover due to deforestation and overgrazing, limited use of soil fertility enhancing inputs such as fertilizers, manure and leguminous crops and limited adoption of soil and water conservation practices are the common causes of land degradation in the country.

Socio-economic and policy related factors that are also the root causes for creation of sever land degradation in Ethiopia includes the following:

- Population pressure,
- Poverty, limited development and access to markets,
- Lack of financial capital or credit,
- Limited farmer awareness of appropriate and profitable technologies,
- Limited education of farmers,
- Land tenure related issues,
- Land fragmentation,
- Limited alternative livelihood options.

The fact that controlling land degradation particularly soil and water erosion have been carried out with various land restoration and management measures traditionally in one way or another by local community in Ethiopia over hundreds of years and modern biophysical land management practices have been introduced and implemented by Ministry of Agriculture with support of different development partners for the last more than four decades. With this, a range of land rehabilitation measures have been carried out across all regions of the country on a large scale on cultivated lands, hillsides, gullies, degraded forests, grazing areas, rangelands and others degraded lands. With this, significant number of technological options and methodological approaches have been adopted by land users. However, the success and

sustainability of implemented measures are limited due to a lot of reasons among which lack of meaningful community involvement in the identification of problems, potentials, solutions, planning and implementation processes of land management interventions.

5.2.2 Intervention Packages of Land Rehabilitation

Land rehabilitation can be undertaken with single or integration of different technologies/ practices. These variations may be due to the existing situation of specific area of land to be rehabilitated, it may be in terms of physical, social, environmental and economic aspects.

As community-based approach, for effective and sustainable implementation of land rehabilitation measures, extension workers and the community must know and properly consider the following key development and participatory principles.

1. Land management measures should be carried out with the leadership of communities/ community leaders.
2. Extension workers should understand the need for sectoral integration to make the support comprehensive, and enhance synergy.
3. Farmers should be offered a choice of practices, and communities have to do decisions in selecting adoptable measures, based on their preferences. In fact, extension workers must give adequate information about the advantages and disadvantages of each practice and the required input and skill for implementation.

More importantly, communities have to be given adequate information about the availability of different degraded land rehabilitation options (technologies/practices) recommended for forest sites, grazing/pasture/rangelands, gully areas, farmlands, and other land uses. Biophysical (physical & biological) soil and water conservation measures, drainage management, water harvesting, gully reclamation, restoration of degraded land forest land, area closure, pasture-land/grazing land and rangeland rehabilitation and wind erosion control measures for rehabilitating degraded lands in different agro-climatic part of Ethiopia.

5.2.3 Physical Soil and Water Conservation Measures (PSWC)

Definition

Physical SWC measures are land rehabilitation measures/technologies which have been under implementation largely in various parts of the country. Physical conservation measures are those call for the construction of some kinds of earthwork and also known as structural measures. Physical measures are applied when biological and vegetative measures are not sufficient enough to control erosion. Physical protection works are expensive, skill based, time consuming and risk at a time of failure. Thus, they should be considered only where other conservation practices couldn't provide adequate control.

Level Soil Bund, Level Fanya Juu, Stone Faced Soil Bund, Stone Bund, Bench Terrace and Hillside Terrace are the major physical land rehabilitation measure widely applied in Ethiopia as appropriate depending on different factors.

Figure 5.1 Bench Terrace On Hillside Area

Purpose of physical SWC measures:

The major benefits of constructing physical SWC measures are:

- Reduce velocity of runoff and increase infiltration to soil,
- Modify landscape / reduces the length of the slope,
- Prevent damage of flooding the area below steep slopes,
- Minimizes the occurrence of sheet and rill erosion, and further formation of gullies,
- Converts a steep slope into a series of steps, with nearly horizontal benches which create level land for ease cultivation operation,
- Increase the moisture retention capacity of the soil profile and water availability to plants,
- Improve ground water recharge,
- Regulate water availability in the soil to increase production and productivity,

Implementation approaches and processes:

- **Conduct community (land user) sensitization forum**: - Local community awareness and enhancement of their participation and granted sense of the ownership for rehabilitated land should the critical stage has to be done before entering to on the ground implementation of land restoration measures. The wider local community is the owner and key body in participation of the organized forum. Detail discussion undertaken by the landowner and come up with decision, agreement, negotiation and commitments on what the next action to be taken.
- **Plan preparation:** identify and assess the land degradation challenges in the area and its extent is the critical issue need to be addressed in implementation processes. Then prioritize the identified challenges /problems, define the type of intervention need to be undertaken and prepare the detail action plan for implementation.
- **Site selection**: within the watershed, selection of the specific start site is the critical issue to be carried out. Selection of implementation sites need to be undertaken with consideration of the watershed development logic as priority. The extension workers, watershed committee and local community are the key responsible bodies which will be participated on sites selection processes.
- **Technology selection:** Selection of appropriate technology for an area is one of the key factors to ensure the sustainability of rehabilitation works. Agro-climate condition, land use type, landscape/topography, soil type and depth, degradation level, construction materials availability, labour availability, cost effectiveness, the interest of the land users, simplicity for implementation and adaptability are the factors should be addressed with care in selection of appropriate physical SWC technologies for specific site.
- **Design, layout, and construction materials mobilization**: Design and layout are key components that need to be considered due to its determination of the standard, quality, and durability

of the implemented PSWC structures. Following the selection of implementation site and appropriate technologies, the design has to be carried out with participation of local community and technical support of extension workers/experts. Before implementation, proper field layout is the unforgotten job to do for physical structures. The materials required for construction of physical measures have to be mobilized or be available before staring the ground implementation.

- **Construction of the structures**: PSWC structures mostly constructed in dry season. It can be carried out individually or in group depending on the agreement of the local community/ beneficiaries. However, the designed and layout should be done once and similar on the same land with similar characteristics.
- **Management and Maintenance:** In order to ensure sustainability of structures, after construction, proper management and timely maintenance should be taken place. The community/ land users should agree how to manage and maintain by developing their own bylaw considering their local context.

5.2.4 Biological Soil and Water Conservation Measures (BSWC)

Concept and Technologies:

Biological soil and water conservation can be defined as a conservation measure designed to prevent the loss of soil and moisture through improved soil management and farming practices that can maintain/ restore agricultural productivity and agro-ecosystem stability. It can be applied alone or in combination with physical measures depending on the degradation status of an area.

Biological measures prevent soil erosion through the following basic principles:

A. Prevention of the direct raindrops impact by implementation of adequate vegetation cover
B. Prevention of concentration of surface flow of water that causes runoff
C. Increasing resistance to erosion by improving soil aggregates

The biological SWC measures deal with a wide range of technologies pertaining to prevent/ minimize soil erosion, maintain and/or increase soil fertility and productivity mainly through proper soil and crop management practices.

BSWC measures could be:

- **Vegetative measures**: Stabilization of physical structures, grass strips along contours, gully revegetation, hedgerows of grasses and shrubs
- **Soil management practices:** Conventional composting, vermi-composting, green manure/cover crops, mulching and crop residue management, soil fertilization, soil acidity management, management of salt affected soils, contour cultivation and planting grasses, legumes, shrubs, trees, and other biological materials
- **Agronomic measures:** Crop rotation, intercropping, strip cropping and ley cropping

Purpose of implementing BSWC technologies/practices;

- Stabilizes the structures with their root system and the canopy above the ground protects the structures (ensure sustainability of physical structures).
- Contributing to protect soils against erosion,
- Create less maintenance of the physical structures.
- Encourage farmers to protect conserved areas and appreciate its effects and enhance sustainability.
- Provide valuable biomass used for different purposes.
- Cause less interference to the farmer than other structural measures.
- Permanent protection against the forces of soil erosion.
- Source of animal feed and store carbon above and below the ground.

- Reduces evaporation and maintains of soil moisture.
- improves soil organic matter.

Figure 5.2 Water Way

Implementation approaches and processes

- **Community awareness and agreements**: Communities or land users should be aware enough about the benefits of biological measures in general, and about specific measures in particular in terms of social, economic, and environmental benefits.

Awareness creation events have to be organized and communities or land users have to discuss in detail about the potential practices, and how to apply those practices. Experts or extension workers, in this regard, have to give alternative options from which land users can easily select practices considering their advantages and disadvantages. Communities or land users have to reach consensus or mutual agreement on potential practice/s before implementation.

- **Preparation of inputs:** Planting materials for vegetative measures, like cuttings or seedlings (grass, tree and shrubs), soil management practices (materials for composite making etc.), and agronomic measures (like seeds for strip cropping), should be identified, prepared and ready on time for implementation. The type of plant species has to be selected based on agro-ecological adaptability, soil condition, its potential benefits (environmental and economic benefits), and farmers preferences.
- **Site preparation and planting of the biological materials**: Communities/land users have to make the land/site appropriate for planting of seedlings/cuttings, or direct seeding of seeds. Ground cultivation, construction of moisture harvesting structures, and planting pit preparation are some among other practices to be done before planting.
- Soil fertility and agronomic practices are also other type of practices depending on the land use and landforms. Seeds and seedlings/cuttings have to be planted on appropriate season, mainly at the beginning of the main rainy season, and in some cases in belg season. The operation can be undertaken individually or in group depending up on the land user's agreement.
- **Management and Enrichment plantation:** Weeding and cultivation, protection from animal interference, protection from frost and strong wind have to be done timely. Replanting instead of missed/dead plants could be another important post planting management practice that have to be done by the community or land users. Such management practices can be done individually or in groups based on their own bylaw developed.

5.2.5 Drainage Management Measures

Concept and Technologies:

An agricultural drainage is a system by which the water level on or in the soil is controlled or regulated before disastrous waterlogging occurs on the soil surface so that agriculture can benefit from the subsequently reduced water levels. The system can be made to ease the flow of water over the soil surface or through the underground (surface drainage system' and 'sub-

surface drainage system. The main drainage water sources are surface water including rainfall runoff, irrigation water, and sub-surface water source or ground water. By applying various drainage systems, the water coming from the different sources will be removed or disposed-off safely before it creates waterlogging and reduces agricultural benefits.

The most commonly used drainage management structures which have got due focus by extension workers and farmers are: waterway, cut off drain, graded soil bund, graded fanya juu, and broad bed maker (BBM).

Purpose of implementing drainage management technologies:

- Controls soil erosion, and hence reclaim and conserve land for agriculture,
- Controlled removal of surface water (by keeping the required moisture and removing the excess amount),
- Prevents structural damage to different infrastructures and residences,
- Reduces the cost of crop production in otherwise waterlogged land,
- Provides increased aeration in the root zone,

Implementation approaches and processes:

- **Local community sensitization**: Community sensitization events have to be organize and communities need to discuss on drainage problems they are facing and on how to resolve the problem. The problem with respect to environmental, social and economic aspect have to be clear enough for the community, so that communities will be motivated towards applying recommended measures. The community should take the lead in applying different recommended drainage management measures in their local contexts.
- **Plan preparation:** Identifying and assessing the flooding and waterlogging challenges in the area and its extent is the critical issue that need to be done before any action. Then prioritize the identified challenges /problems, define the type of intervention need to be undertaken and prepare the detail action plan for implementation.
- **Technology selection**: selection of the appropriate technology is the key for sustainability solution of the identified problem. Agro-climate condition(rainfall), land use type, landscape/topography, construction materials availability, labour availability, cost effectiveness, landowner interest, simplicity for implementation and adaptability are the factors should be addressed in technology selection. Cut-of drains and waterways are commonly applied drainage structures that have to be done with detail assessment on the site (slope, soil type, land use, etc) and the rainfall amount and duration, etc before construction. Otherwise, any fault on the design and structural quality will have devastating impact on land and land resources. The next risk may sever than the already identified problem.
- **Design, layout and construction materials mobilization**: The design has to be carried out with full participation of local community and technical support of extension workers/experts. Field layout should be undertaken properly. The materials required have to be available before construction.
- **Construction of the structures**: most of the time the construction is carried out in dry season. Therefore, consideration of appropriate construction time is equally important with other factors. The construction can be carried out individually or in group depending on the agreement of the local community/ beneficiaries. However, such structures are labour intensive that require the community labour. So that such structures are commonly constructed with community labour. Technical support should be provided by extension workers/ experts.
- **Management and Maintenance:** Due to high risk on soil erosion, flooding, damage on agricultural fields and other structures, such structures have to be protected from any damage and have to be managed with adequate follow up and timely maintenance works. Maintenance should be taken place individually or in group depending on the community agreement.

5.2.6 In-Situ Moisture Harvesting Measures

Concept and technologies:

In-situ moisture harvesting is harvesting of water/moisture within a site mainly from rainfall, as a main source. Rainwater harvesting describes methods of collecting, storing and spreading various forms of runoff from different sources for domestic, agricultural, etc uses. It is a deliberate collection of rainwater from a surface (roof/ground catchment) and its storage (soil and structural) to provide a supply of water. The major in-Situ Moisture Harvesting Technologies are ridges and tie Ridging, micro trenches, deep trenches, micro basins, eyebrow basins, herring bones, semi-circular bunds, runoff –run-on area bunds/barrier lines/, runoff –run-on strips, and percolation Pits.

Figure 5.3 Micro basin integrated with hillside terrace

Purpose of implementing moisture harvesting technologies:

- Increased soil moisture content and water availability,
- Reduced soil loss, reduced downstream flooding & siltation,
- Increased crop yield and farm income, improved food security,
- Improved infiltration and groundwater recharge,
- Improved soil fertility,
- Restoring the productivity of crop/range land which suffers from inadequate rainfall,
- Increasing yields of rain-fed farming,
- Minimizing the risk in drought prone areas,
- Combating desertification by tree cultivation,
- Increases adaptation to climate change.

Implementation approaches and processes

- **Local community sensitization**: Local community should be aware of the need of moisture harvesting and extent of the problems in their locality. The local community should discuss on issues in detail, come up with the solution, agreement on what the next action will be done.
- **Plan preparation:** identify and assess the moisture problems in the area and its extent should be conducted. Then prioritize the identified problems, define the type of intervention need to be undertaken and prepare the detail action plan for implementation.
- **Technology selection**: selection of the appropriate technology should be taken place by considering the factors that agro-climate condition(rainfall), land use type (mostly applicable on grazing and rangelands), topography, soil type and depth, construction materials availability, cost effectiveness, labour availability, volunteer/interest/ of the land users, simplicity for implementation and adaptability.
- **Design, layout and construction materials mobilization**: The design has to be carried out with participation of local community in technical support by extension workers and experts.

Field layout should be undertaken properly. The materials required also ready prior to the start of on the ground implementation.

- **Construction of the structures**: Most of the time the construction of these technologies is in dry season. the construction of moisture harvesting structures can be carried out individually or in group depend of the agreement of the local community.
- **Management and Maintenance:** managing properly and timely maintenance should be taken place individually or in group depending on the community agreement.

5.2.7 Gully Rehabilitation Measures

Concept and Technologies:

Gully erosion is the erosion process whereby water concentrates in narrow channels and over short periods removes the soil. Gullies are established by the deepening of rills and collapsing of side slopes through the shearing effect of concentrated overland flow. Once gullies are established, they form permanent locations for discharging concentrated overland flow. Consequently, progressive deepening and widening of the gully continues until the gully has adjusted to a new set of equilibrium conditions.

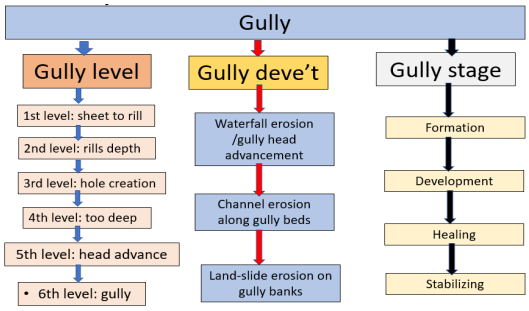


Figure 5.4 Gully level, development and formation stage

As gully control can be an expensive undertaking, *prevention s always better than cure*. In gully control, the following three methods must be applied in order of priority:

A. Improvement of gully catchments to reduce and regulate the run-off volume and peak rates.
B. Diversion of runoff water upstream of the gully area where the condition permits.
C. Stabilization of gullies by structural measures and accompanying re-vegetation.

The most common bio-physical gully treatment measures which have been proven for their effectiveness includes: loose-stone check dam, gabion check-dam, arc-weir check-dam, brushwood check-dam, sandbag check-dam, bamboo-mat check-dam, gully wall reshaping, sediment storage dam (SSD), subsurface dam in gully, gully re-vegetation, and riverbank-stabilization.

Purpose of implementing gully treatment technologies

The main benefits behind applying the technologies in gully land rehabilitation are:

- Reclaim damaged land (stabilize and rehabilitate gullies),
- Convert the gully into productive land,
- Stop loss of farmland expansion,
- Reduce the velocity of runoff in the gully channel,
- Prevent the deepening and widening of the gully channel and encourage siltation,
- Hold fine materials such as silt carried by flowing water in the gully

Figure 5.5 Re-vegetated large gully by tree/shrub spp

Implementation approaches and processes:

Figure 5.6 Enrichment plantation

- **Local community sensitization**: - The importance of gully treatment, management and extent of the gully formation and areas affected by this problem and its impact environmentally, socially and economically should be discussed by the community. They should own the challenges and agree on what the next action need to be done.
- **Plan preparation:** identify and assess the challenges of gully formation in the area and its extent is the critical issue need to be addressed in implementation processes. Then prioritize the identified challenges /problems, define the type of intervention need to be undertaken and prepare the detail action plan for implementation.
- **Technology selection**: of the technologies applicable for gully rehabilitation, the appropriate once should be selected with consideration of different factors such as size of formed gully (small, medium, large), flooding status, slope of the gully formed land, construction materials availability, labour availability, cost effectiveness, simplicity for implementation and adaptability.
- **Design, layout and construction materials mobilization**: design need to be carried out to its standard, and quality of constructed physical structure. Field layout should be undertaken properly. The design and layout have to be carried out with participation of local community and technical support of extension workers/ experts. The materials required also ready prior to the start of the construction.
- **Physical structure construction**: the physical structure of gully should be constructed in dry season. The construction can be carried out individually or in group depend of the agreement of the local community/ beneficiaries. The technical support should be provided by extension workers/ experts. Gully wall reshaping, and revegetation are also practices not to be forgotten.
- **Management and Maintenance:** managing properly and timely maintenance should be taken place individually or in group depending on the community agreement. Management and use plan also need to be prepared.
-

5.2.8 Restoration of degraded forest land

Concept and Practices:

Restoring forest ecosystems involves returning trees to former forest land and improving the condition of degraded forests. As well as planting native tree species, it can include conserving wild plants and animals and protecting the soils and water sources that are part of the forest ecosystem.

Highly degraded forest/bush lands can be set aside from productive use or production for several years to be restored and rehabilitated through a variety of practices. Restoration of degraded forest land includes:

- **Natural regeneration:** includes managing the land to allow the natural process of restoration to occur.
- **Assisted natural regeneration** speeds up the natural processes of regeneration by planting tree seedlings and other favourable species and protecting an area from fire and exploitation.
- **Enrichment planting**: helps to restore over-exploited species and is often used with assisted natural regeneration to restore a specific area of land by directly planting certain types of tree species.
- **Afforestation and or Plantation**: coverage of the degraded land with vegetation for different purposes
- **Fire management techniques**: help to control fire outbreaks by burning patches of grass and undergrowth early in the dry season, when the fire will not become out of control.

Purpose of implementing forest land restoration practices:

- Enhance land vegetation coverage area.
- Improving biomass of the area.
- Create better local climate regulation (improve air and water quality).
- Improve flood and erosion control (improve storm water management: more water retention, less runoff and erosion).
- An increased variety and availability of food and non-food products.
- Economic opportunities for local community.

Implementation approaches and processes:

- **Conduct community sensitization**: - The importance of forest restoration, management and extent of the degraded forest in the area and its impact environmentally, socially and economically should be discussed by the community in detail. The community should realize challenges and agree on what the next action need to be done.
- **Area selection and delineation**: based on the local community agreement the area need to be restored should be identified and prioritized, then demarcating the boundary.
- **Plan preparation:** detail identification and assessment of the challenges related to forest degradation and its extent should be carried out. Then prioritize the identified challenges, define the type of intervention need to be undertaken and prepare the detail action plan for implementation.

- **Practice selection**: based on prepared plan and prioritized problems, the types of practices to be implemented on the specific area identified for intervention should be selected.
- **Input preparation**: required seeds and seedlings production at nursery site or individual plot should be carried out based on the prepared plan and ready on time.
- **Planting site preparation and plantation:** in case the area planned to carry out enrichment plantation, afforestation or reforestation, pitting and planting seedling need to be undertaken.
- **Management and sustainable utilization plan:** development of bylaws is the priority assignment need to be done and then prepare management and utilization plan depending on the community agreement.

5.2.9 Area Closure and Management

Concept and practices:

Area closure and management in the Ethiopian context can be defined as a degraded land (land not suitable for agricultural purposes such as cultivation and grazing), that has been excluded from human and livestock interference for rehabilitation with interventions for management and utilization purpose. Closing area is one of the strategies for rehabilitating degraded lands within the catchments delineated for rehabilitation and soil and water conservation Programme. However, the rate of recovery, productivity and the carrying capacity as well as the economic viability of the area closures very much depend on the appropriateness of the technological interventions and management practices. The experience of large-scale area closure management in Ethiopia proved that this measure is one of the most effective ways of rehabilitating the degraded lands and restoring their productivity.

The value of area closure and its management is well appreciated and accepted by the communities for the restoration of productivity of degraded lands and sustainable management of the natural resources in many localities of Ethiopia. However, there are external interferences and violation of the rights of user communities in some localities that eroding communities' sense of ownership and sustainable management of the areas. Such interferences can seriously affect acceptability of the practice and sustainability of the assets created. But if such inferences are prevented and the communities are enjoying all the ecological and economic benefits of the practice, acceptability and sustainability cannot be a challenge for the implementation and expansion of the practice.

The common practices undertaken in Ethiopia context for area closure rehabilitation are combination physical and biological measures. In generally, Natural regeneration (protect from interferences), tree plantation (enrichment plantation), management plan preparation and implementation are those practiced at present condition on closed areas.

Purpose of closed area and practices

- Reclamation of degraded land,
- Improve vegetation/ biomass coverage,
- Recovery of indigenous plant species,
- Reduce runoff impacts,
- Create alternative income sources,

Figure 5. 7 Regeneration of grasses on closed areas

Figure 5.8 Area closure to enhance natural regeneration of degraded forest sites

Implementation approaches and processes:

- **Conduct community sensitization**: - The importance of area closure, management and extent of the degraded lands and closing is the priority intervention option in the area and its impact environmentally, socially and economically should be discussed by the local community in detail. The community should realize challenges and agree on what the next action need to be done.
- **Area selection and delineation**: based on the local community agreement, the area need to be closed should be identified and prioritized, then demarcating the boundary.
- **Plan preparation:** the degraded lands challenges and its extent should be identified in detail by the local community with support of extension workers. Then prioritize the identified problems, define the type of intervention need to be undertaken and prepare the detail action plan for implementation.
- **Technology/ Practice selection**: the closed area may need regeneration only by keeping free of interferences or applying different physical and biological measures. Accordingly, the selection of technology/practices should be undertaken based on prepared plan and prioritized problems, the types of practices to be implemented on the specific area identified for intervention should be selected.
- **Input preparation**: These may be construction materials for physical structures, seeds and seedling (tree, shrub, grasses, fruits) production at nursery site or individual plot should be carried out based on the prepared plan.
- **Design, layout and construction**: this action is applied on closed area need to be supported by physical land rehabilitation measures. Then the design and layout should be carried out by community participation with support of extension workers and experts.
- **Planting site preparation and plantation:** in case the area planned to carry out enrichment plantation, afforestation or reforestation, pitting and planting seedling will be undertaken accordingly.
- **Bylaw development:** for sustainability of closed area, the presence of bylaw that developed by the full involvement and agreement of the local community is the priority issue need to be addressed.

- **Management and use plan preparation and implementation:** following the reclamation of degraded closed area, the local community can use it for different purpose. Realizing sustainable utilization, preparation of closed area management and use plan is critically important and the community should have this plan and implement it accordingly.

5.2.10 Pastureland/Grazing land and Rangeland Rehabilitation

Concept and Practices:

- **Pastures**: are those lands that are primarily used for the production of adapted, domesticated forage plants for livestock.
- **Pastureland/grazing land**: is a field covered with grass or herbage and suitable for grazing by livestock. It differentiated from rangelands in the narrow sense by being managed through intensive agricultural practices. Grazing lands are lands delineated by individual households or by the community for livestock grazing
- Rehabilitation and conservation of grazing lands refers to the application of appropriate technology packages to the grazing lands. Most of the grazing lands in Ethiopia are excessively overgrazed. Productivity of these lands is very low because of the replacement of productive species by poor species and due to the reduction in the percentage of ground cover.
- **Rangeland**: is land on which the native vegetation is predominantly grasses, grass-like plants, forbs, or shrubs. Rangelands include natural grasslands, shrublands, open-canopy forests, or even essentially closed-canopy forests, so long as they produce low-growing vegetation that is available to grazing animals. It characterized by low and/or erratic precipitation, poor drainage, rough topography, and often low soil fertility and managed through extensive practices.
- Rangeland rehabilitation and improvement is getting of palatable vegetation back in the area for animal. While manging the rangelands, the following principles should be considered.
  - **Adaptive Management:** Producers should always be ready to implement adaptive management to adjust to environmental changes.
  - **Grazing Plan:** create a rotational grazing plan which is a guide to follow throughout the grazing season to ensure your rangeland is being properly grazed.
  - **Ecosystem Biodiversity:** promote ecosystem biodiversity in which the basis of all holistic management.
- **Residual Forage:** leave enough residual forage on top of the soil to keep the system functioning properly. Residual forage or residue is a critical part of the ecosystem, because it protects the soil from water and wind erosion.
- **Climate Ready:** make the operation climate ready. To be climate ready, the operation should have a plan in place for the “what if” scenarios, such as drought, flood, fire, or other natural disasters.

The common practices undertaken for grazing land rehabilitation more of the physical structure in combination with biological measures and also implementation of alternative feed source (eg. forage development). Whereas, in rangelands removal of undesirable plant species (e.g. mechanical, chemical, and biological control methods), seeding desirable plants that compete with undesirable species, reseeding or allowing natural regeneration to proceed, soil and water conservation measures, water harvesting, and dryland forestry etc are practices need to be implemented.

Purpose of Implementing Pastureland and Rangeland Rehabilitation Practices:

The main purpose of this particular intervention is to increase the amount of vegetation cover, quantity and quality of biomass production with aim of increasing livestock production, while ensuring sustainable productivity and management of the grazing lands or rangelands. The increase in the amount of biomass production and vegetation cover also helps in effectively controlling soil erosion.

Specifically, the following are the reason behind the implementation of pastureland and rangeland management.

- Improved forage yields,
- Lower feed costs and improved livestock performance,
- Minimize land degradation,
- Minimize overgrazing,
- Provide enough forage,
- Create conducive environment for land management,
- Provide required amount livestock feed,
- Create conducive environment for proper pastureland utilization,
- Improve quality of animal feed,
- Encourage palatable, productive perennials, as they are good for animal performance and to maintain a healthy environment,

Figure 5.9 Pastureland improvement and grass harvesting

Implementation approaches and processes:

- **Community sensitization**: The importance of pasturelands/ grazing lands and rangelands, management and the extent of the problems due to misuse of these lands and its environmental, social and economic impact should be discussed by the local community in detail. The community should be realized challenges and agreed future action.
  - **Plan preparation:** the challenges and its extent should be identified in detail by the local community with support of extension workers. Then prioritize the identified challenges /problems, define the type of intervention need to be undertaken and prepare the detail action plan for implementation.
  - **Technology/ Practice selection**: to rehabilitate the pasturelands or rangelands the integration of different physical structures and biological measure need to be applied. Accordingly, the selection of technology/practices should be undertaken based on the prepared plan and prioritized problems, the types of technologies/ practices to be implemented on the specific area identified for intervention.
  - **Water Delivery**: this may the priority issue need to be addressed in rangelands areas water demand is high for livestock and human consumption and as well livestock feeding production.
  - **Inputs preparation**: These may be construction materials (physical structure), seeds and seedling (tree, shrub, grasses,). production and seedlings production at nursery site or individual plot should be carried out based on the prepared plan.
  - **Design, layout and construction**: as the rehabilitation of pasturelands/grazing lands and rangelands, need combination of technologies/practices the design, layout and construction should be carried out with critical care accordngly.

- **Plantation:** this may be for vegetation coverage improvement or additional livestock feeding sources and physical structure strengthen**.** It can be done individually or in group depending on the community agreement.
- **Bylaw development:** particularly for communal grazing land is critically important. Therefore, it should be developed with fully involvement of the local community.
- **Improved grazing system application:** rotational grazing and avoidance of overgrazing are few of them need to be practiced.

5.2.11 Wind Erosion Control Measures

Concept and practices

Wind Erosion is the natural process of transportation and deposition of soil by the wind. It is a common phenomenon occurring mostly in dry, sandy soils or anywhere the soil is loose, dry, and finely granulated. it removes the most fertile part of the soil and lowers soil productivity. In addition, dust storms affect air quality and airborne dust has significant economic, health, ecological, and hydrological impacts. Apart from damaging agricultural /cropping fields, sand dunes create a lot of obstruction to infrastructures (roads, irrigation canals, etc) as well. Land clearing, over-grazing by livestock, and cropping are activities that leave the soil exposed to the wind. Drought causes greater wind erosion because less rain means lower vegetation growth and it is vegetation that binds the soil in place. Less moisture in the soil, makes it easier for soil particles to be blown away.

In view of the effect of wind erosion in drier parts of the Ethiopia, efforts have been done by communities to withstand with the challenge. Shelterbelts, windbreaks, biological sand dune stabilization / biological sand dune fixation, permanent soil cover, cover crops, strip cropping, crop residue, and minimum tillage practices undertaken in different parts of the country where wind erosion is a real problem:

Purpose of implementing wind erosion control practices

The following are the benefits why wind erosion control practise undertaken in place where the real problem happened

- Reduce erosion of soil.
- Economic value.
- Provide livestock feed.
- Improve vegetation cover.
- Effective land utilization.
- Create additional income.
- Improve soil fertility.
- Minimize breaks down soil particles susceptible to wind erosion.

Figure 5.10 Wind break plantation

Implementation approaches and processes:

- **Conduct community sensitization**: - The importance of wind erosion control, and extent of the problem in the area and its impact should be discussed by the community in detail. The community should realize challenges and agree on what to be done in future.
- **Plan preparation:** detail identification and assessment of the challenges related to wind erosion and its extent is the critical issue need to be addressed in implementation processes. Then prioritize the identified challenges /problems, define the type of intervention need to be undertaken and prepare the detail action plan for implementation.
- **Selection of practices**: based on prepared plan and prioritized problems, the types of practices to be implemented should be selected.
- **Input preparation**: required seeds for seedling production and seedlings production at nursery site or individual plot should be carried out based on the prepared plan.
- **Planting site preparation and plantation:** particularly for windbreak around farmland and homestead plantation should be undertaken.
- **Management and sustainable utilization:** windbreak plantation should be properly managed and utilized.

5.3 Promotion of Agroforestry Practices

5.3.1 Definition of Terms

Agroforestry: is a collective name for land use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land management unit as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence.

Agroforestry systems:

The words ‘systems” and “practices” are often used synonymously in agroforestry literature. However, some distinction can be made between them. An agroforestry system is a specific local example of practice, characterized by environment, plant species and their arrangement, management and socioeconomic functioning. An agroforestry practice denotes a distinctive arrangement of components in space and time.

The commonly used criteria for classifying agroforestry systems and practices are:

- Structure of the system (nature and arrangement of components).
- Function of system (role and output of components)
- Agro-ecological zones where the system exists or is adoptable, and
- Socioeconomic scales and management levels of the system

The structural and functional aspects are taken as a criterion for categorizing the systems; and agroecological and socioeconomic aspects as the basis for further grouping.

Since there are three basic sets of components that are managed by the land user in agroforestry systems (woody perennial, herbaceous plants, and animals), a logical first step in classifying agroforestry should be based on the nature of these components. Therefore, there are three major categories of agroforestry:

i. **Agri-silvicultur**e: is a land use system that involves the integration of trees and other large woody perennials into farming systems through the conservation of existing trees, new planting and tending operations
ii. **Silvopastoral systems** are those that combine tree growing with the production of livestock. These systems typically include pasture systems containing trees that are widely spaced or planted in clusters throughout the pasture.

iii. **Agro-silvopastoral systems:** are land-use practices in which trees and crops are integrated into livestock production, and they play an essential role in reducing vulnerability and increasing crop resilience, thus help communities better tackle climate change impacts.

5.3.2 Rationale for Agroforestry

Farmers worldwide implement different agroforestry practices in different land uses for their benefits in ecological, economic, and social value. The following are the main reasons behind practicing agroforestry practices.

A. High Productivity and Sustainability

Agroforestry has often been mentioned as a potential alternative for many of the present unsustainable forms of land use in the tropics. The increasing pressure on natural resources and ecosystems as a result of agricultural use has become a serious threat to the sustainability of the environment and the land use system.

Most agroforestry systems aim to maintain or increase production of commodities and productivity of land. It can improve productivity - increased output of tree products, improved yields of crops, reduction of required inputs, and increased labour efficiency. It has the potential to improving the sustainability and productivity of agriculture and forestry.

B. Multiple Benefits

Trees are used on farms for shelter, shade, production of timber, fodder and other products, and for conservation of biodiversity and soil. Trees can be used simultaneously for all of these benefits.

Agroforestry provides wider opportunity for the land users and for the environment in developing productive landscape and healthy environment. Agroforestry is an integrated approach that diversifies products, maximizes production and creates healthy environment.

C. Suited to Smallholder Farmers

Local communities are active managers of woody resources within the local land use systems. Very often they practiced already a form of agroforestry. Improved or new agroforestry technologies can easily be introduced in new areas as they conform to local knowledge and farming practices.

Mostly, agroforestry is seen as a land use system that is attractive, well understood and easily acceptable by small farmers. In many parts of the world, agroforestry has proven to be a main tool in social forestry or forestry for rural development Programmes.

5.3.3 Benefits of Agroforestry

In terms of economic well-being, agroforestry can increase and diversify farmers' incomes and allow them to have access to more nutritious food. As to the social benefits, agroforestry can empower women, validate indigenous knowledge and improve rural livelihoods. From an environmental standpoint, agroforestry helps to reduce agriculture's contribution and vulnerability to climate change, while also improving water's quality and availability, among other services

The role of woody perennials in agroforestry systems can be both productive (producing food, fodder, fuel, wood, etc.) and protective (soil conservation, windbreaks and shelterbelts. etc.).

A. Agroforestry Contributes to Climate Change Mitigation and Adaptation

- Agroforestry decreases the need to cut forest trees, thus reducing the rate of deforestation, which is one of the main factors contributing to climate change.
- Better management of soil nutrients reduces the need to resort to fertilizers, another significant source of GHG emissions.
- Trees planted in agroforestry systems contribute to climate change mitigation through carbon sequestration.

- By using wood fuel from agroforestry systems, people can meet their energy needs in a carbon neutral way.
- By providing shade and a cooler environment to sensitive crops or animals, agroforestry can help maintain or increase yields in the face of climate change. It plays very good role in regulating local climate.

B. Agroforestry Provides a Wide Range of Environmental Services

Agroforestry systems protects natural resources and therefore provide many services.

- Filtering and capturing of water resources by the trees can help improve the quality of water and its quantity, with potential benefits for the entire watershed.
- As trees create suitable environments for a multitude of plants, insects and animals, agroforestry can help increase and protect local biodiversity.
- By using trees with nitrogen-fixation functions, agroforestry can restore soil fertility
- The augmentation of tree cover on agricultural land is an efficient way to do landscape restoration without sacrificing agricultural production.

C. Agroforestry Provides Economic and Livelihoods Benefits

i. Agroforestry Improves Food and Nutrition Security

- Growing trees which produce food (fruits, nuts, leaves, etc.) provide an easily accessible nutritious food for households
- The trees felled or their residues can be used as wood energy for cooking and/or heating.
- Leaves, and other parts of trees, can serve as forage for livestock.
- Trees and plants grown on farms are important sources of medicines and natural remedies, which help improve people's health.

Figure 5.11 Scattered trees on crop lands, as traditional practice in many part of Ethiopia. Photo:Getachew Tamiru 2022

ii. Agroforestry Helps Reduce Poverty

- By reducing agricultural inputs and thus production costs, or by increasing productivity, agroforestry can increase household income.
- With the production of agricultural and forest goods with higher value, farmers and foresters can receive a better return for their labour.
- The recognition through incentives of the environmental services provided by agroforestry can provide a new source of income for the rural or urban poor.

iii. Agroforestry Contributes to Create Resilient Livelihoods

Agroforestry helps to reduce the vulnerabilities and improve the recovery of people after natural hazards, disasters and socioeconomic downturns.

- By increasing diversity of production, agroforestry can reduce risk of economic failure.
- Tree roots help to strengthen soil structure, thus mitigating erosion and preventing possible landslides.

- The water conservation functions of trees and forests help prevent or fight desertification and its social and environmental consequences.

D. Agroforestry can Improve Gender Equality

- When trees are more closely accessible, women, who are often responsible for the collecting of fuelwood or fodder, save precious time and energy.
- By selling fruits, fodder or fuelwood coming from the trees on the land, women can increase their access to cash.
- Agroforestry is a low-input solution to restoring soil fertility and increasing agricultural output.

E. Better use of marginal (poor) land

Planting of appropriate tree species can have positive effect and can be used to:

- Reclaim saline prone land (it is important in dryland irrigation),
- Improve soil structure and drainage, and fertility status of the soil through nitrogen fixation
- Control weeds
- Bring leached nutrient to surface (recycled).

5.3.4 Potential Agroforestry Practices and their Main Characteristics

Commonly known agroforestry practices, most of them are applied in Ethiopia are described here in the table below.

Agroforestry practice	Brief description on arrangement of components	Agro-ecological adaptability
A. Agri-silviculture systems (crops-including shrubs/vine/tree crops-and trees)		
Improved fallow	Woody species planted and left to grow during the fallow phase	In shifting cultivation areas
Tangua	Combined stand of woody & agricultural spp. during early stages of establishment of trees	All ecological regions (where tanguya is practiced)
Alley cropping (hedgerow intercropping)	Woody species in hedges, agricultural crops in alleys in between hedges	Sub-humid to humid areas with high human population pressure and fragile soils
Multilayer tree garden	Multispecies, multilayer dense plant associations with no organized planting arrangements	Areas with fertile soils, good availability of labor, and high human population pressure
Multipurpose trees on crop lands	Trees scattered haphazardly or with some systematic patterns on bunds, terraces or plot/field boundaries	In all ecological regions especially in subsistence farming; can also be integrated with animals
Plantation crop combination	a. Mixture of plantation crops in alternate or other regular arrangement b. Shade trees for plantation crops; shade trees scattered c. Intercropping with agricultural crops	In humid lowlands or tropical humid/sub-humid highlands
Home Garden	Intimate, multistory combination of various trees and crops around homesteads	In all ecological regions especially in areas of high population density
Trees in soil conservation and reclamation	Trees on bunds, terraces, raisers, etc., with or without grass stripes; trees for soil reclamation	In sloping areas esp. in highlands, reclamation of degraded, acid, alkali soils, and sand-dune stabilization
Shelterbelts & windbreaks, live hedges	Trees around farmlands/plots	In wind prone areas
Fuel wood production	Intercropping firewood spp: on/around agri.lands	In all ecological regions
B. Silvopastoral systems		
Trees on pastures land	Trees arranged irregularly or arranged according to some systematic pattern	In all ecological regions
Protein banks	Production of protein rich tree fodder on farm/ rangelands for cut-and-carry fodder production	Extensive grazing areas
C. Agri-silvopastoral systems		
Home gardens involving animals	Intimate, multistorey combination of various trees and crops, and animals, around homesteads	In all ecological regions with high density of human population
Multipurpose woody hedgerows	Woody hedges or browse, mulch, green manure, soil conservation, etc.,	Humid to sub-humid areas with hilly and sloping terrain

Agroforestry practice	Brief description on arrangement of components	Agro-ecological adaptability
Apiculture with trees	Trees for honey production	Depending on the feasibility of apiculture
Multipurpose woodlots	For various purpose (wood, fodder, soil protection, soil reclamation, etc.,	Various

Figure 5.12 Scattered trees on crop land, for soil fertility improvement, and as source of forage for animals during dry season (Photo: Getachew Tamiru 2013)

5.3.5 Selection of Agroforestry Practices

The most important information for extension workers and farmers is to know about the benefits/relevance of agroforestry in the agriculture development, natural resources management and environmental point of view. The knowledge about the different practices of agroforestry is equally important to widely apply it in different agro-ecological and socioeconomic environments. The third important issue is how to select the best agroforestry practice both at landscape or farm level jointly by the community and individually by each land user.

Therefore, procedurally, extension workers and farmers have to do different contextual analysis having at hand required information, so that they can select very appropriate and feasible agroforestry practices in their area of application. Procedurally, in order to select the best agroforestry practice that fit into that specific locality and land use type, the following are key steps to follow and properly apply:

1. Analyse the biophysical condition of the area (both at wider level and specifically to the site)

- Agroecological condition (amount and variability of rainfall and temperature)
- Topography (landforms in terms of slope and other landforms)
- Soil characteristics (soil type, depth, texture, fertility, etc.,)
- Biodiversity condition – natural habitats for wildlife, the role of trees in agroforestry practices for biodiversity conservation, the status of flora and fauna diversity from communities' point of view, etc

2. Analyse the socioeconomic situation of the community and farmers

- Land use type – based on land capability, socioeconomic feasibility, farmers interests and environmental issues.The land productivity, production and land holding size and use right condition, etc.
- Major/dominant crops under production and why they dominate from farmers point of view.
- Existing experience of agroforestry – local knowledge and introduced practices
- Source of household income – example crop production, livestock, forest products, etc.
- The labor engagement of community engagements

3. Summarize the analysis for site characteristics, and basic information for potential practices to select the best agroforestry option.

Table 5.1 Summarized characterization of sites

Sites	Land use type	Agroecology	Annual rainfall (mm)	Average Slope (%)	Experience of soil erosion (high, medium or low erosion)	Soil depth (dominant) (cm)	Soil type	Existing agroforestry practice
Site A _								
Site B								
Site C								

Table 5.2 Summarized characteristics of candidate practices (indigenous and introduced)

Name of Candidate practices	Benefits (social, economic, environmental)	Recommended trees/ shrub spp.	Requirements						
			Agro-ecology	Rainfall (cm)	Soil depth	Required inputs (seedlings, seeds, etc.,)	Accessibility of inputs	Affordability of inputs	Required skill

Select the best agroforestry option based on the findings of analysis (site characteristics, potential benefits of practices, the environmental requirement, required inputs/skill, and the interest of the community or land user considering the summarized information using the above tables. Here the decision could be done by the community or land user/s but with the advice of extension workers.

1. Proper planning: Plan for selected agroforestry practice/s with required inputs including selection of important tree species that is compatible to different agroforestry components, and possible management practices and defining concrete benefits to be gained – social, economic and environments
2. Monitoring and evaluation – recording changes after implementation regularly

5.3.6 Selection of Species for Agroforestry

In agroforestry, species are selected based on their combined potential characteristics (genotypic and phenotypic) in fulfilling the required characteristics in its direct or indirect role in agroforestry farming system.

Characteristics of a tree important in agroforestry are the following:

Characteristics	Description
a) Adaptability	- The ability of the species to adapt the environment (climate, altitude, soil status, management practices, existence of other plants and animals)
b) Growth Rate	- Rapid growth, especially in early years, short rotation is considered desirable requirement in agroforestry trees.
C) Palatability as Fodder	- Nutritious and palatable species, due to severe foraging pressure, are the most preferred ones in agroforestry system.
d) Ability to Withstand Adverse Condition	- When agroforestry is promoted in areas with high level of degradation and with adverse environmental factors (exposure to hot and cold wind, accidental grazing, drought, frost and shock during planting). - Some species can overcome such conditions and exhibit an incredible performance.

Characteristics	Description
e) Growth Habit	An agroforestry tree growth habit is depicted to its branching and rooting characteristics. Important points to be considered are: - Shape and density (for light penetration) of the crown - Depth and spread of the root system and
f) Trees' Capability to Withstand Management Practices	- In general, many of the agroforestry systems demand extensive pruning and lopping to maximize harvest of tree products. Therefore, tree species selected for such agroforestry practices must be able to withstand such practices.
g) Vigour and Productivity	- Tree species with outstanding genotype performance to grow and perform in a certain environment are more preferable
h) Nutrient Cycling and Nitrogen Fixation	- In areas or sites where soil is a problem, species with the potential to fix nitrogen, easy foliage decomposition, and overall contribution in improving soil fertility, structure, acidity, etc., should be properly considered.

5.4 Establishment of Plantation Forests

5.4.1 Definition and Characteristics

Plantation is a forest community or stand that is established artificially by sowing or planting. Sometimes it is referred as man-made forest. Biologically, plantations are favoured when it is known that natural means would likely fail. Plantation with one species only is called monoculture. However, mixed_plantations consist of two or more species.

Most plantations are regenerated artificially by planting or direct sowing and at maturity clear felled and replanted or regenerate from stump shoots. The clear felling and replanting system is advantageous due to its simplicity, provides reliable and uniform regeneration and gives the opportunity of introducing genetically improved tree crops.

Plantations are much less in habitat diversity as there are only few species that are about the same age and structure. Besides, the different management activities in a plantation (site preparation, thinning etc.) will also have a negative impact. Therefore, plantations have less richness of flora and fauna leading to a reduction in the associated values to the local people and the country at large.

We need to give due consideration that plantations are more susceptible to disease and pest as they may provide favourable conditions for massive build-up of pest or disease, and rapid spread. The major conditions are presence of enormous food, multiplicity of breeding and infection sites, uniformity of species and closeness of trees.

5.4.2. Importance of Plantation Forests

Wood and wood products to be used for household consumption and for small scale wood processing workshops have become very scarce in Ethiopia. Due to scarcity, the price also goes very high. Lack of adequate supply of wood and its products from plantation forests, the pressure on natural forests is increasing from time to time that leads degradation natural forests in many parts of the country. Expansion of plantation forests has become very important development measure in Ethiopia for the following major reasons.

1. Past and continuing destruction of natural forests

Natural forests have been cleared for a long period of time for agricultural expansion, for exploitation of timber, charcoal, firewood, settlement expansion; and this has led to a severe shrinking of the natural forest to an extremely small proportion. As a result, the existing remnant forests can no longer satisfy the increasing demand for various forest products. The major source of wood for construction, timber, fuelwood, charcoal, household furniture and farm implements are now become plantation forests.

2. Unsatisfactory natural regeneration and lack of management

Considering the natural forest condition obtaining a satisfactory regeneration of merchantable species is very difficult. The required silvicultural interventions to bring about adequate regeneration and growth of desirable tree species are very complicated tasks as compared to plantation silviculture.

3. Land availability

In Ethiopia, a vast area of land, that is marginalized by poor agricultural practices and deforestation, is potentially suited to tree planting purposes. In the highland of Ethiopia, due to its rugged topographical nature, production of annual crops aggravates soil erosion and land degradation, and it is also difficult to modernize agriculture with mechanization for increased production. In many respects, forest plantations will be the best alternative land use to bring such lands to an economically productive area.

Figure 5.13 Marginal area for crop farming but suitable for forest plantation (Protection + Production forest)

1. High productivity

Plantations have higher productivity than natural forests for the following reasons

- Plantations are established artificially offering a possibility of making species choice with respect to its adaptability to the site, degree of its social and economic value with regard to the quality of its product
- Planting could be done with a desirable spacing and density and also can be manipulated throughout its life resulting in a desirable mix of products (pole, firewood, sawlog).
- Plantations give a homogenous, uniform, and higher amount of product from an appropriate species.
- Management, maintenance and harvesting of plantations are much easier.

2. Plantation as a tool for development

As an integral part of the forestry sector, plantation Programme contributes substantially to the economic development of a country.

- Supply raw material to forest industries and create employment opportunity
- Plantations in social forestry make great contribution to rural development
- Can supply all required wood products for consumption and commercial purposes

Figure 5.14 Plantations established for commercial purpose, for income genation (creation of community assest)

3. Plantations as land rehabilitation and protection purposes

More importantly, forest plantations can be established for protective purposes on problematic sites.

- To stabilize soil by protecting from erosion, controlling run off in catchment's areas,
- Providing shelter from wind and heat and against sand and dust storms
- Nowadays, the role of plantations in sequestrating atmospheric CO_2 is receiving an increasingly greater attention by environmentalists.

Figure 5.15 Plantation for watershed protection on degraded mountain areas

5.4.3 Important Attributes of a Site for Plantation Purpose

Three important aspects of an area are worthy of consideration in site evaluation for forestry. These are: biophysical attributes, socio-economic and environmental factors.

i. Biophysical attributes of the site

Biophysical attributes of the sites denote the totality of biotic and abiotic factors that can affect the survival, development and growth of a given tree species. The major factors are **climate**, **soil** and **topography**.

Factors	Sub factors	Descriptions
Climate	Rainfall	Total amount and monthly distribution determine the performance of plant survival and growth
	Temperature	important variables are MAT, MT of the hottest months, MT of the coldest months, and the coldest or hottest temperature ever recorded

Factors	Sub factors	Descriptions
Soil	Soil Depth, structure texture, Fertility, PH.	As the soil provides three basic functions for tree growth. - Supplies moisture and nutrient - Provides mechanical support
Topography	Slope, Aspect Ground roughness, stoniness	It influences the following key environmental aspects - Moisture availability, Exposure to sunlight, wind and frost, Soil depth - The required site preparation activity, Suitability for forestry operations
Biotic factors	Includes all living organisms existing on the site	- Damaging or grazing animals, Insect pests: like termites - Pathogenic fungal, bacterial or viral species - Existing vegetation including presence of problematic weed sp

ii. Socio -economic considerations

In any plantation Programme or intervention, one has to give due consideration the following key socioeconomic aspects that determine the benefits to be gained from plantations and other related economic activities. Some among many are the following:

1. ***The use right and ownership:*** Use right & ownership issue have to be properly considered and agreed on. Otherwise, conflicts may arise after some time when benefits are shared.
2. ***Accessibility:*** Access Road is so important for both transportation seedlings and other materials to the site and for the extraction of forest produces from the site
3. ***Optimization of uses:*** Forests do have diverse benefits. The social, economic and ecological benefits have to be optimized.
4. ***Size of plantation:*** the size of the plantation sites is an important factor to introduce technologies and value addition practices.

iii. Environmental considerations

Assessing the site, to ensure that establishment of forest plantation is the best land use type, is very important for appropriate decision. Identifying its suitability by weighing the value of the sites for natural reserve, recreation or wildlife conservation is also very worthy. The role of plantations for regulation of local climate is substantial that benefits local community in creating conducive environment for agricultural production. The contribution for sequestration of atmospheric carbon and its contribution of mitigation of climate change is also another important advantage of plantations when seen from global point of view.

5.4.4 Major Practices or Operations in Plantation Establishment

Successful plantations are established if the required operations and practices are adequately considered during the initiation and planning stage and applied with the consent of the resource users. The most important operations/practices and the implementation procedure have to be properly designed; and required labour and other resources have to be taken into consideration. The following are most important ones that extension workers and the community should give due consideration in providing technical support and advise for the community.

S/N	Practices/operations	Description of practices
1	Forest Site Selection	Site selection is an important kick off task to establish a plantation. The most important factors that determine site selection are the following. - The objective of the plantation: for fuelwood/charcoal, construction, industry, ecological services etc., - The available land in the target area: based on the availability of space, plantation sites can be very small in size or to large can be considered for large scale plantation - The suitability of the site for forestry

S/N	Practices/operations	Description of practices
2	Pre-planting Survey	- To decide on areas not to be planted - To know the required land preparation and moisture conservation measures - To determine the appropriate species for each site type - To decide on possible harvesting systems - To plan internal lay out of infrastructures such as roads, firebreaks, - To know the exact extent of plantation area
3	Defining the purpose of a plantation	Production forest, protection forest, agroforestry depending on the site quality and the interest of the community
4	Species Selection	Careful selection of tree species to be planted is very important because: 1. The purpose of the intended plantation 2. The species available for planting 3. The site quality and adaptability: What can grow on the site available
5	Site Preparation	Needs to know the benefits of site preparation, and plan reasonable resource and time - Removal or clearing of the existing vegetation to reduce or eliminate excessive competition for moisture, nutrient and light - To cultivate or prepare the ground - To facilitate planting operation and establishment - To reduce the weed cover and competition - To reduce erosion by providing physical barriers - Construction of moisture harvesting structures in moisture deficit areas - Site preparations are ground preparation and pit preparation
6	Planting	Planting can be done in different methods depending on the site quality, species, type, objective of the plantation and other environmental factors like temperature, frost, rainfall, disease and pest, etc.,
7	Protection of plantation site	After planting, plantations must be protected from different agents using different mechanisms, such as mulching, fire protection, and protection against Diseases and Insect pests
8	Other practices	- Replacement Planting - Weed Control - Thinning - Pruning

Figure 5.16 Moisture harvesting structures in steep slope areas for seedling planning purpose, photo taken from ORDA Greening Programme annual report, 2005

5.5 Promotion of Energy Saving and Alternative Rural Energy Sources

5.5.1. Definition of Terms

Alternative Energy - Also referred to as environmentally preferable sources of energy and may include low impact hydro power, geothermal, biomass, solar and wind.

Energy efficiency: refers to the efficient conversion and use of energy and is a measure of the productivity provided per unit of energy consumed. It employs devices and practices, which result in less energy being used for the same task and function.

An example would be a fluorescent bulb as opposed to an incandescent bulb. Technological advances have allowed for increases in energy efficiency, reducing energy demand while increasing economic activity.

Biomass Energy - Energy that is stored in plants and other organic matter. e.g. Wood and forest residues, animal manure and waste, grains and cane trash.

Energy conservation: It is the saving of energy by any means including energy efficiency. It could also entail being more economical – for example, turning lights off when not in use or providing information of ways to reduce energy. Some of the common meanings associated with energy conservation include:

- Using less energy in a particular application
- Finding ways to purchase particular forms of energy at lower cost. This is usually accomplished by negotiating with energy providers or by using energy under less costly conditions.
- Shifting to different energy sources of lower price
- Using “free” or “renewable” energy sources
- Shifting to energy sources that are considered to be more desirable.
- Conserving water and materials, as well as energy sources.

5.5.2. The Impact of Using Fuel Wood, Cow Dung and Crop Residue as Source of Household Energy on Land and Its Resources (Forest, Soil and Biodiversity)

The current energy regime in Ethiopia, one that is heavily reliant on the burning of biomass, has had major implications for the environment. The use of traditional fuels as the main source of energy by rural households, which comprise the vast majority of Ethiopia’s population, is especially an area of concern. Deforestation, land degradation, decreases in agricultural productivity, and increased greenhouse gas emissions have resulted from these patterns of unsustainable fuel consumption, and are further exacerbated by Ethiopia’s growing population’s increased energy demands.

The high dependency of rural and semi urban population on natural forests as source of fuelwood and charcoal has highly degraded forests and biodiversity resources. Valuable tree and shrub species have become extinct locally in different agroecological zones, habitats/ecosystems. Similarly, the cow dung and crop residue collection for cooking in rural areas have determinant negative impact on the soil health: soil fertility and structure. Huge biomass of cow dung and crop residue have been collected, which have been expected to be left for the soil and help recycle back basic soil nutrients and organic matter to the soil. As a result, productivity and production of land has significantly reduced. Farmers are forced to use artificial fertilizer as mitigation measure to enhance production. This has exposed farmers for additional cost, cost of production. Beyond economic impact, artificial fertilizer is bringing negative environmental consequences, mainly on water bodies and biodiversity in waterbodies and in the soil.

Having all the negative consequences of using cow dung and crop residue for rural energy, the current use of traditional biomass fuels cannot meet the energy needs of Ethiopia’s growing population without compromising the health of the environment (Ethiopian Environment Review, 2010; Karakezi, 2003). For cooking and lighting needs, most Ethiopians rely on unsustainably sourced fuels such as charcoal and fuel wood.

A 2010 report by the Ethiopian non-governmental organization (NGO), Forum for Environment, found the Ethiopian population as a whole is almost exclusively reliant on traditional biomass sources, using charcoal and fuel wood to meet 94% of total energy requirements, with petro-

leum and electricity representing the remaining 6%.

The burning of biomass and the resulting emissions are contributing to global climate change. In particular, the incomplete and inefficient combustion by traditional cook stoves releases greenhouse gases including carbon monoxide, nitrous oxide, and methane into the atmosphere (Kees & Feldmann 2011; Panwar 2009). Meanwhile, other organic compounds and particulate matter from biomass combustion contribute to local and regional air pollution.

5.5.3. Rationale for promotion of energy saving and alternative energy sources

In Ethiopia, biomass is the main cooking fuel that is used by 99% of the rural and 80% of urban households. Specially, women and girls are burdened with its collection. Unsustainable use of biomass results in deforestation and consequently land degradation. In addition to this, the incomplete combustion of biomass inside the home generates indoor air pollution which causes adverse health effects.

The current use of traditional biomass fuels cannot meet the energy needs of Ethiopia's growing population without compromising the health of the environment. For cooking and lighting needs, most Ethiopians rely on unsustainably sourced fuels such as charcoal and fuel wood.

Fuel wood consumption to this degree is a major issue, as it is associated with extensive deforestation and land degradation. Ethiopia's dependence on traditional fuel sources has resulted in the depletion of fuel wood stocks faster than they can regenerate. This pattern, paired with the country's rate of population growth, will end in environmental disaster unless changes are made in the near future. In addition, the cost of fuelwood and charcoal is increasing that is taking the significant share of their household income.

5.5.4. Benefits of Energy Saving and Alternative Rural Energy Sources

Alternative energy options enable local institutions to manage their own energy needs and thus provide rural development opportunities. This situation encourages decentralized decision making, which has far-reaching implications for the governance of a community. In addition, dissemination and popularization of energy-efficient devices and alternatives to conventional fuels can do the following:

- **Provide better lighting**: better lighting enables the poor to stretch their period of economic activity; their children can help them in daily tasks and then study in the evenings.
- **Help the environment**: Efficient use of conventional sources of energy or use of renewable energy helps save the environment from further degradation and gives it an opportunity to regenerate.
- **Provide sustainable fuel systems**: Afforestation and agro forestry, combined with the introduction of energy-efficient devices, can help to create a sustainable fuel-use system within the rural community and sustain the ecological balance of a region.
  - **Benefit women**: Lower dependency on fuel wood and other household fuel sources reduces the workload of women by shortening or eliminating the distances they travel for fuel collection.
  - **Benefit human health**: Use of improved cook stoves and biogas plants, for example, helps reduce or eliminate health problems associated with using conventional cook stoves, including respiratory diseases and eye problems.
  - **Enhance income**: Alternative energy sources can provide local employment opportunities through direct use of energy in small-scale industry and agriculture, through construction, repair, and maintenance of energy devices, or through the sale of energy to local utilities.

Cleaner use of traditional fuels can significantly improve health by reducing acute respiratory infection and conjunctivitis, commonly caused by indoor pollution. Wider health benefits can occur too; cooking with more efficient technologies can make dietary choice and boiling of

water more affordable or more likely. Women and children in particular will have more time for education, leisure and economic activity.

Access to electricity from biogas plants can significantly reduce the time required to devote to household activities, such as fuel wood collection. Solar power at small scale level, can be used as energy sources that help rural communities use radio and television that can improve educational opportunities and provide entertainment. Radio services can provide farmers and fishermen with weather forecasts and telecommunication services can provide growers with information on crop prices (World Bank, 2004b).

Generally, improved health and education, combined with more time to undertake non-energy related activities, are important goals in themselves.

Table 5.3 Potential energy sources for rural and semi urban communities in Ethiopia

Energy sources	Uses	Remark
Solar	For cooking and lighting	Needs to identify affordable and applicable technologies
Biomass (wood, and charcoal)	For cooking	Required to use improved cookstoves
Biomass (crop residue)	Recommended only in exceptional cases, otherwise recommended only for soil fertility management	Use of improved stoves
Biomass (animal waste)	Recommended to use by biogas digester – for cooking and lighting	Recommended mainly when backyard livestock management system is applied

5.5.5. Technologies and Practices that Saves Energy or Improve Efficiency

Renewable Energy Resources

Although Ethiopia is reliant on traditional biomass fuels to meet its energy needs, there are abundant and diverse renewable resources and electricity generating technologies available that present Ethiopia with the opportunity to move away from the current energy regime. These resources and technologies include energy efficient biomass cook stoves, biogas, solar thermal and photovoltaic, large and small-scale hydropower, wind, and geothermal. However, so far only few options are available for rural communities to access energy sources. Table 2 below summarizes only available renewable energy possibilities that could be used as main source of energy for different uses in rural community.

Table 5.4 Renewable energy possibilities in rural communities of Ethiopia

Resource	Detail	Size	Benefits	Cost
Efficient cookstoves	Rocket stoves	Household	Affordable to individuals	Still relies on direct combustion of biomass
Biogas	Large livestock population, cattle dung available	Household or mini grid	Not directly depleting forests	Financial limitations, may encourage deforestation
Solar	Thermal or photovoltaic, strong solar regime	Household or main grid	Clean	So far, not affordable to individual households, especially solar power for cooking

Improved/or energy efficient cook stoves

This technology would still leave people reliant on fuel wood however the amount of fuel wood needed to generate the same amount of energy would decrease, helping to alleviate pressure on forests. This strategy can be implemented immediately because of the affordability of fuel-efficient cook stoves on a household level, low maintenance requirements, and little training needed for use. Many different models of stoves have emerged, but all aim to either improve combustion efficiency, which reduces harmful emissions, increase heat transfer to cooking surfaces, which reduces fuel use, or both (Kees & Feldmann, 2011: Ruiz-Mercado et. al, 2011; USAID, 2010).

Efficient cook stoves used in Ethiopia include: *Mirt*, *Tikikil, Briquett* charcoal*, Lakech, Gonziye*

and Arif cook stoves. The use of such technologies and alternative energy sources will have various advantages. Some among these are:

- Reduce deforestation/or reduce pressure on natural resources which in turn contribute to decreased soil erosion and increase soil fertility
- May increase soil fertility directly contributes to productivity and production that will have a direct relation with household food security.
- Reduce indoor air pollution
- Reduce the amount of fuel wood consumption of beneficiary households by 46.98% to 52.94%/ or saves fuelwood consumption per household per year
- Reduce the frequency of travel of households especially women and children to collect fuel wood.
- Minimize workload and expense to be incurred by households to purchase fuel wood
- Reduce risk of fire hazard
- Faster cooking
- Easy to clean and maintain

Figure 5.17 Concrete biomass stove (left side), and biomass stove made from local material (right side)

Biogas

Biogas is gaseous fuel produced from animal and crop residues. It is a mixture of methane, carbon dioxide and water vapor. Biogas is a clean-burning methane-rich fuel gas produced through anaerobic digestion (bacterial action in a tank without air) of suitable biomass feedstocks, is the only biomass-derived modern energy carrier for household applications with which there is widespread experience. Biogas can be generated from cattle dung and animal wastes, and with substantially more difficulty, from some crop residues. Although these feedstocks are frequently used directly as cooking fuel, in most areas they are not preferred fuels and are used only when wood is not available.

Biogas systems offer multiple benefits. The digester-effluent is usually a good fertilizer, and, if connected to latrines, biogas plants can provide valuable sanitation services. For cooking and other thermal household tasks, it is simple and reasonably efficient to use the gas directly in conventional low-pressure gas burners.

Ethiopia's large livestock population, and the involvement of most rural households in subsistence farming, which includes animal husbandry, makes animal dung readily available for biogas generation. The technology is technically feasible, and it works at household level for household having a minimum of three (3) to four (4) cattle.

Benefits of this technology include low investment levels on a household level. Also, it alleviates pressure on fuel wood demand, and soil fertility is maintained as the bio-slurry that remains

after the gas is produced can be used as organic manure.

Beneficiaries of the biogas reported that biogas offer a lot of advantage when compared to fuel. According to the beneficiaries, no smoke hazard, quick preparation of meal and the quality of cooked food better than food prepared by fuel wood are some of the advantages they obtained. Furthermore, use of fuel wood for cooking decreased and additional advantage of light during the night is the benefit they obtained.

Challenges arise though in the collection of dung, which can be difficult if livestock are not kept in one location. Also, herds must be large enough to ensure steady generation of electricity, which may prove difficult for farmers with small herds. Additionally, deforestation may be encouraged if grazing lands are expanded at the expense of forest lands (Getachew et al., 2006; Karekezi, 2003).

Figure 5.18 Strong flam from the biogas digester

Solar PV and Thermal

Solar PV: solar photovoltaic devices that convert the sun's energy into electricity for use (PV) technologies in lighting, refrigeration, telecommunications, etc.

Solar thermal: solar thermal devices that use the sun as the primary source of energy for technologies heat appliances, e.g., solar water heaters, solar dryers.

Solar energy has the potential to be used in both small- and large-scale electrification measures and can be utilized in two forms: thermal energy and photovoltaics. Thermal energy is the use of heat to run a heat engine to generate electricity, while photovoltaics involves the direct conversion of sunlight into electricity.

On a household scale, solar thermal and PV can be used to generate electricity for cooking and lighting, while larger outputs of electricity could be produced at the community level through mini grids, and at an industrial level through grid extension. Solar PV is a technology that is being widely pursued around sub-Saharan Africa with the support of international development agencies (Karakezi, 2003; Karakezi & Kithyoma, 2002).

Solar energy can be used as main substitute for diesel in irrigation farming. Many farmers in Ethiopia are using diesel generator for irrigation water pumping, mainly in vegetable and fruit development, as solar technology is not well familiarized, accessible which is due to high initial cost. However, solar technologies do have various advantages over diesel generators. The following some of the advantage of solar plants over diesel generators:

- Solar is reliable than the diesel

- Solar power requires almost no maintenance as compared to Diesel generator set which have lots of moving parts.
- The above cost competition does not include maintenance cost of generator including spare parts.
- Solar pumping might be 10 –30% higher in initial cost but will be equal or cheaper after a year operation cost added.
- Solar pumping will save community/farmer money of operation (eg1mln ETB/year per 10hectar system. In addition to this saving from pollution of diesel and C02

Figure 5.19 Solar power investment cost comparison over the years

5.5.6 Alternative Approaches for Financing Small-Scale Rural Energy Technologies

At the smallest scales, the cost of many sustainable energy technologies (including small-scale wind and hydropower supplies and photovoltaics for homes) isn't affordable for rural communities. Beyond this, the supply of such energy sources in Ethiopia is very limited, as that is concentrated only in urban areas. Even in urban areas the supply is highly interrupted due to shortage of power and not reliable at all specially to satisfy the daily demand of households for cooking and other small scale energy demands.

However, in semi urban areas where such sources are accessible, communities could not afford the cost to buy technologies or the services from suppliers, unless some financial provisions are available from external bodies. In the near future, the possible means of accessing such energy sources could be via credit bases.

The possible source of funding for the rural community to buy technologies or services provided by private suppliers or government institutions could be the following: However, such financial and service provision mechanisms need policy, strategy and legal support and also incentivizing mechanisms to make the system operational and sustainable. Therefore, in CBLM such issues need to be considered in the long-term plan of watershed user cooperatives and other community-based institutions. The formation of unions and federations will give opportunity for cooperatives to influence policy and decision makers from government side, and help them establish partnerships with other funding organizations and service providers.

- ***Financing through dealers.*** Banks transfer the collateral problem from the end user to dealers by lending to dealers, who in turn lend to purchasers using payment schemes compatible with their income. Dealers must bear the financial risk along with technical risks. This system is best suited to large, relatively high-income rural markets.
- ***Financing through energy service companies***. These companies can replace dealers as the financing intermediary. Companies typically require greater efforts to establish higher funding levels, because they provide a more comprehensive installation and back-up service to clients.
- ***Revolving funds (with grant support).*** A bank takes on the risk of operating a revolving loan fund, usually with start-up capital provided by a grant.

- ***Loan aggregation through cooperatives***. To avoid the high costs of servicing many small loans, prospective borrowers form a community association (or enlarge the functions of an existing village or farmer cooperative). Banks lend to the cooperative or lease the energy systems but retain ownership of the equipment in case of payment defaults
- ***Concessional funding for public sector objectives***. The government contracts and pays a local company to provide energy services that meet development objectives, such as photovoltaic lighting for schools. This provides entry capital for the company to offer credit and expand its business to other local markets, such as photovoltaics for households, health clinics, and community centres.
- ***Payment for energy services.*** Payment for outputs, such as irrigation & drinking water, have been used to fund the recurrent operation and maintenance costs of small-scale energy systems. These cost streams are usually hard to fund, or remain unfunded, when loans target the capital cost.

Most of these approaches demand high levels of local participation and so take time to mature. Participation must start at the concept development stage, so that local people can decide which schemes and parameters are most appropriate.

5.6 Promotion of Crop Production

5.6.1 Definition of Terms

Crop: Crop, in this module, is plant or plant product that can be grown and harvested extensively for profit or subsistence. It can be also defined as a cultivated plant that is grown on a large scale commercially, or for subsistence by small holder farmers like cereals, fruits, or vegetables

Crop Production: Crop production management references multiple processes that are geared to improve the growth, yield and developments of agricultural crops. This may vary according to the class of crops as well as the location. Crop production is a common agricultural practice by farmers to grow and produce crops to use as food and fibre, either for market or for consumption.

5.6.2 The Contribution of Crop production on Natural Resources

The contribution of existing crop production practices for land degradation in Ethiopia

Existing crop production practices in in Ethiopia are generally not sustainable. It is characterized by excessive removal of crop residue for feed and diversion of organic fertilizer sources to energy use, repeated/multiple tillage, mono-cropping of cereals, burning of crop residue, continuous depletion of soil nutrients due to inadequate fertilization and blanket chemical fertilizer recommendation. Those unsustainable farming practices leads to severe organic matter depletion and depletion of soil fertility; hence contributing to land degradation.

The contribution of crop production on conservation and management of natural resource

Crop production as one of the interventions in community-based land management should contribute to the conservation and management of natural resource. Crop production contributes to the conservation and management of natural resource by following the path of **sustainable intensification** by implementing **improved agronomic practices** (crop rotation, intercropping, strip cropping, ley cropping Intercropping, use of appropriate crop varieties, appropriate planting spacing and date, appropriate water management, appropriate weed management, and appropriate pest management) and **improved soil fertility management practices** (efficient use of inorganic fertilizers, compost making, green manure/cover crops, crop residue management, acid soil management and management of salt affected soils). If those practices

are properly implemented, they can ensure sustainable crop production and ensure the protection of the soil from degradation.

Following the path of sustainable intensification is a necessity if we are to ensure sustainable increase in productivity and ensure environmental protection. Sustainable intensification aims to produce more food from the same piece of land with less environmental impact. Sustainable intensification is a profitable way of producing high-quality food and fiber that protects and renews the natural environment, builds local economies, and enhances the quality of life of farmers. Sustainable intensification maintains soil and water quality, reduces risk, uses integrated modern and traditional strategies, utilizes ecological processes (e.g., biological nitrogen fixation, natural predators), minimizes environmental hazards, and acknowledges local environmental and cultural conditions, resulting in increased productivity.

The following farming practices should be promoted for sustainable intensification of crop production:

- Use of improved crop varieties, promotion of perennials (fruits),
- Use of improved agronomic practices (crop rotation, intercropping, strip cropping, ley cropping Intercropping, appropriate planting spacing, appropriate land preparation, appropriate planting spacing and date, appropriate water management, appropriate weed management, and appropriate pest management).
- Use of soil management practices (efficient use of fertilizers, vermi-composting, conventional composting, green manuring/ cover cropping, Crop residue management/mulching)

While pursuing the objectives of sustainable intensification, it is important to learn from the following lessons:

Smallholders need immediate returns on their investments. Smallholders need immediate returns on their investments, mostly in terms of increased yields to achieve greater profit. Any new agronomic intervention (such as inputs, better practice, better decision and new technology) must lead to a recognizable yield increase and a profit increase to be of interest to small holder farmers. Without such immediate benefits, any alternative technology is doomed to fail.

Sustainable intensification requires the efficient and combined use of organic and inorganic fertilizer. Sustainable intensification is impossible without the combined use of organic and inorganic fertilizer, but such input should be used as efficiently as possible, both for environmental and for economic reasons.

Investment in fertilizer needs to be combined with other agronomic improvements. A third lesson learned is that investment in fertilizer (organic and inorganic) needs to be combined with a minimal number of other agronomic improvements and investments aiming at maximizing the profitability and resource efficiency of this input.

Investments in technologies that target environmental services should follow profitable increases in crop yield and not vice versa. A fourth lesson learned is that the sustainability of investments in technologies that target environmental services above crop yields should follow profitable increases in crop yield and not the reverse. Although often well-intended, applying the reverse logic will not result in sustainability or intensification of smallholder farming systems. Once smallholders start benefiting from increased yields, production and income, then investments in other aspects of their farming system can happen, for example, to introduce better crop rotations and new crops with potentially higher market value, grow more trees on their farms, enhance the soil organic matter pool or prevent soil erosion. Increased yields result in increased availability of organic resources, mainly in the form of crop residues that can be left in the field, for example as mulch, or recycled as manure after being fed to livestock.

5.6.3 Crop Diversification and Specialization

Definition of Crop diversification

Crop diversification is the growing of more than one crop in an area. It is accomplished by adding a new crop species or different variety, or by changing the cropping system currently in use (e.g., crop rotation, intercropping, strip cropping, mixed cropping, ley farming and etc.). Diversification can also be implemented to complement low-value commodities with high-value commodities, such as fruits, vegetables and spices.

Crop diversity encompasses several aspects, such as crop species diversity, varietal diversity within crop species, and genetic diversity within crop species. It is recognized as one of the most feasible, cost-effective, and rational ways of developing a resilient agricultural cropping system.

The need for crop diversification

In Ethiopia, farming is particularly rain-fed and weather-dependent and farmers face price, yield and resource risks that arise from the biophysical and socio-economic environment in which they operate. Rural households in the country are exposed to a variety of risks that include harvest failure as a result of drought, frost, floods and other climatic events and death of livestock. In subsistence farming communities, agricultural diversification refers to a system of farming where in farmers cultivate varieties of crops on a given piece of land in order to reduce vulnerability, marketing risks, income stability, and food security.

- Provides resilience. Farming households can spread production and economic risk over a broader range of crops, thus reducing financial risks associated with unfavorable weather or market shocks.
- Reduces pressure of insect pests. Crop mixtures frequently have lower pest densities, especially of insect pests. This occurs both because the mixture confuses the insects and, if the mixture is chosen carefully, because the mixture attracts beneficial predators. Pests are less damaging in fields with a mixture of crops than in fields with a single crop, also known as monocultures. This idea is based in part on the assumption that a given pest will find fewer acceptable hosts to feed or lay eggs on in a more diverse field.
- Increases income on small farm holdings. Diversification improves the economic picture of the farm by reducing production costs and increasing gross income. For example, the inclusion of legumes into rotation reduces spending on nitrogen fertilizer or adding crops (two or more) into the rotation, resulting in fewer pest problems, reducing expenditures on pesticides.
- Growing diverse produce may also help financially by expanding the market potential. The inclusion of a variety of crops, in some areas, can lead to the development of new agriculturally based industries, improving the economic potential of a rural community.
- Introducing a greater range of varieties also leads to diversification of agricultural production which can increase natural biodiversity, strengthening the ability of the agro-ecosystem to respond to these stresses, reducing the risk of total crop failure and also providing producers with alternative means of generating income.
- Diverse cropping systems generally provide more varied and healthier food for humans and livestock.

Limitation of crop diversification

It may be difficult for farmers to achieve a high yield in terms of tons per hectare given that they have a greater range of crops to manage. Farmers also face risk from poor economic returns if crops are not selected based on a market assessment. For example, drought tolerant crop varieties may fetch a low market price.

Strategy to implement crop diversification

The Table below shows how diversification can be implemented.

Table 5.5 Crop diversification approaches

No.	Approach	Description
1	Temporal diversification	Diversifying existing crop mixes for a particular farm, over time
1.1	Crop rotation	Growing of two or more different crops in consecutive growing seasons
1.2	Double to multiple cropping	Growing of two or more different crops in one growing season
1.3	Catch crops	Minor crops planted before, between or after a major crop
1.4	Relay cropping	The seeding of one crop into another standing crop and thus growing two crops simultaneously for a certain time
2	Spatial crop diversification	It is growing of different crop cultivars and species in different configurations at the same time in a given field.
2.1	Alley cropping	The simultaneous growing of arable and perennial crops in different broader strips
2.2	Intercropping	Simultaneous growing of at least 2 crops in different yet proximate rows
2.3	Mixed cropping	Simultaneous growing of at least two crops in the same field but not in rows
2.4	Companion crops	Special form of mixed cropping. Simultaneous sowing of at least two crops. One of it is used in the year(s) after sowing
2.5	Variety mixtures	Growing of two or more varieties of one species
2.6	Trap crops	Mixture of commercial and non-commercial crops on the same field to control pests or diseases

5.6.4 Crop Specializations

Definition of crop specialization

Crop specialization can be defined as growing a single crop or few crops on a particular area. Specialization focuses on one crop/few crops considered best suited to a certain agro-ecological zone. Market oriented production enforces the producers to produce the only marketable product. Then the crop production system is diverted from diversification into specialization.

What are the benefits of crop specialization?

- The efficiency and skill of the labour increased: Specialization allows a farmer to be more efficient and expert at doing a few things.
- Intensity of production leads to relatively large amount of output.
- Better management: fewer enterprises on the farm are liable to be less neglected and sources of wastage can easily be detected.

Limitations of crop specializations

- Applicable only for high value crops
- Demands high fertilizer input
- Needs large farm size
- It is machinery intensive
- Needs high initial investment
- Vulnerable for risks
- Demands market-oriented production
- Creates ecosystem imbalance

Implementation techniques of crop specialization

Crop Specialization is implemented by focusing on few crops and practices considered best suited to a certain agro-ecological zone (Stellmacher and Kelboro, 2019) and by focusing on commodities which have high market value. Through this, the crop production system is gradually diverted from diversification into specialization

Crop diversification and specialization strategy in community-based land management

Each of the production system has its own merits and demerits on the economy of the farmers. Accordingly, specialized farms achieve higher economic efficiency but lower environmental sustainability of the production than diversified farms, beside to this, diversification is also one of the most ecologically, feasible, cost-effective and rational ways of reducing uncertainties in agriculture, especially among small-scale farmers.

Food and Agriculture Organization (FAO) policy supports crop diversification with the understanding that it may be an effective strategy for dealing with issues as varied as food and nutrition security, employment generation, sustainable agricultural development, environmental and ecological management, and poverty alleviation (FAO, 2012). Similarly, recent International Food Policy Research Institute (IFPRI) publications have argued that growth in agricultural incomes will require diversification by farming households (Tadesse et al., 2011).

Maguje Masa Malko and Fekadu Nigatu Melaku (2021) have reviewed the effect of crop specialization on food security of smallholder farmers in Ethiopia. According to the review, the developing countries at whole and particularly Ethiopia faces reduction of farmland per household, because of rapidly booming population and urbanization. Many scientific findings reported that crop specialization has significantly negative effect on the food production of smallholders' due to their small farm size. Meanwhile the few findings concluded as crop specialization has positive effect due to mechanization and market orientated high value crop production. However, reports indicated preconditions like farm size, agro-ecology, climatic condition, food security status and overall economy of the farmers to choose the appropriate production system.

Furthermore, the agricultural policy which emphasizes on the market-oriented crop production to get cash on hand has negative effect on food security of smallholders. Even though they adopt crop specialization to produce marketable food crops and get cash on hands, it minimizes the food items for their home consumption, and leads to dietary insecurity and malnutrition. Currently, in fact such problems are the main challenges of smallholders in every corner of Ethiopia, and the problem might be solved by adopting crop diversification.

Crop diversification is therefore the best alternative approach in community-based land management. This approach the best not only for sustainable food production and food security but also for the current agenda of climate smart agriculture and sustainable crop production system.

5.6.5 Integrated Soil Fertility Management for enhancing soil Fertility and productivity

The term Integrated Soil Fertility Management (ISFM)

Integrated soil fertility management (ISFM) is defined as a set of soil fertility management practices that include the integrated use of mineral fertilizers, organic inputs and improved germplasms combined with the knowledge on how to adapt these practices to local conditions which are aimed at optimizing efficient agronomic use of the applied nutrients and thereby improving crop productivity. In this definition, all inputs need to be managed following sound agronomic principles.

In the above definition, four elements are included: use of mineral fertilizers, organic inputs,

improved germplasms, knowledge on how to adapt to local conditions local adaptation **and** sound agronomic principles. The detail description of each element is presented below:

Mineral fertilizers: Mineral fertilizers are concentrated sources of essential nutrients in a form that is readily available for plant uptake. ISFM places great emphasis on using mineral fertilizers on fields in the farm where they will provide the greatest beneficial effect.

Organic inputs: Organic inputs (crop residues, compost, green manures and etc) like mineral fertilizers are also an important source of nutrients, but their N, P, Mg and Ca content, though only released following decomposition. In addition to supplying nutrients, organic inputs also

contribute to crop growth in other ways by: increasing crop response to mineral fertilize, improving the soil's capacity to store moisture, adding nutrients not contained in mineral fertilizers, improving the availability of phosphorus for plant uptake, ameliorating problems such as soil acidity and replenishing soil organic matter. A key aspect of organic fertilizers is the maintenance of or an increase in soil organic matter.

Improved germplasm: Improved germplasms are crops with higher harvest index (HI) (the ratio of crop product to total biomass production), because more of the total biomass production is converted into the harvested product than in unimproved varieties. It is important that the farmer uses the crop planting materials (usually seed but sometimes seedlings) best adapted to the particular farm in terms of: responsiveness to nutrients (varieties differ in their responsiveness to added nutrients); adaptation to the local environment (soils, climate); and resistance to pests and diseases (unhealthy plants do not take up nutrients efficiently).

Knowledge on how to adapt to local conditions: While prompting ISMF we need to take into account variability between farms: in terms of farming goals, and objectives, size, labour availability, ownership of livestock, importance of off-farm income; in the amount of production resources (i.e. land, money, labour, crop residues and animal manures) that different farming families are able to invest in the fields in their farm. Local adaptation also refers to the need to take into account differences in the responsiveness of soils: only small amounts of fertilizer are required to replenish nutrient stocks and maintain the fertility of fertile fields. For example, for responsive soils, fertilizer recommendations should be targeted to each field based on anticipated or proven responses. The recommendation should also include soil amendments and other soil fertility management practices (e.g. organic inputs) required to achieve a full response. On the other hand, for non-responsive soils often have complex and less understood sets of constraints to crop production. Rehabilitation should only be carried out where solutions have been developed and tested and have been found to be practical and economical.

Sound agronomic principles. Sound agronomic principles includes the use of appropriate land preparation, spacing, planting dates and practices, weeding, pest and disease management practices, and eventually appropriate intercropping arrangements.

ISFM Interventions

ISFM involves the combined use of appropriate interventions on soil management, fertilizer use and crop agronomy. The options include:

Soil management

- Green manure/Cover crops), mulching and crop residue management, Acid soil management, Management of salt affected soils,

Fertilizer use

- Inorganic Fertilizers use: Use of Right fertilizer product, Use of Right fertilizer rate, Right time for fertilizer application, Right placement of basal fertilizers
- Organic Fertilizer: preparation and use of conventional compost, preparation and use of vermicompost

Crop agronomy

- Intercropping, crop rotations, Ley cropping, Use of appropriate crop varieties (e.g. planting seed of improved crop varieties), use of appropriate agronomic practices (planting spacing, water management, weed management, disease management and pest management)

Benefits and limitations of implementing ISFM

Integrated soil fertility management (ISFM) is a means to enhance crop productivity while maximizing the agronomic efficiency (AE) of applied inputs and can thus contribute to sustainable

intensification.

When ISFM is introduced successfully, productivity is increased, and less land is required to achieve a given level of production. The impact is the sustainable improvement of food security, increased farm incomes and lower food prices, which benefit the urban population.

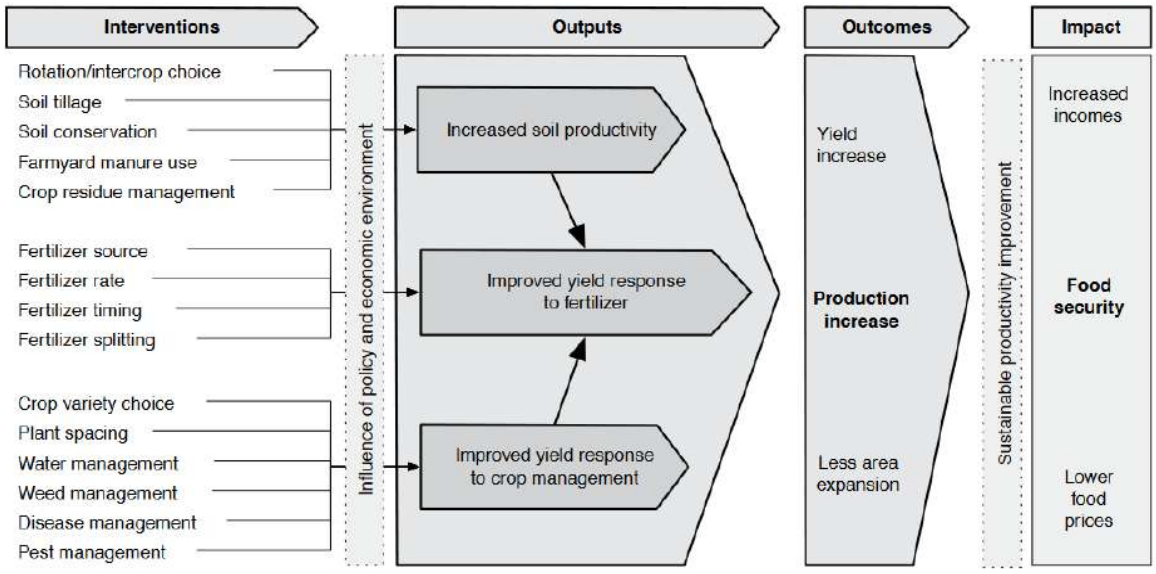


Figure 5.20 Impact of ISFM (the combined use of appropriate interventions) in driving the main outputs of increased yield and productivity.

Case study: Benefit of ISFM implementation in 24 Micro watershed on six woredas (Amhara region)

The objective was to increase crop yield by 20% for main crops (Teff, wheatmaize , barley and Faba bean) as compared to control areas not covered by ISFM technologies. Implementation was made in six Woredas of Amhara region in Twenty four (24) micro watersheds. FREG/FFS approach was used for implementation. In each Micro-watershed, three FREG/FFS was established. From each FREG/FFS group, three Model farmers were selected for ISFM demonstration. Hence, ISFM demonstration was conducted on 6 Woredas, 24 MWS, 303 Male 33 Female = 336 Model farmers (Maize 52, =Teff =49, Wheat= 189, F.bean= 40, barley 6).

The demonstrations was implemented on an area of 600m2

ISFM technologies applied on treatment plots

- Blended Fertilizer-NPSBZn 6 kg per 600 m2
- Compost 300 kg per 600 m^2
- Urea= 14 kg (top dressing) per 600m^2
- Improved seed of wheat (Danfe) 6 kg per 600m^2
- Lime 2.5 quintal per 600m^2
- Green manure/ lupins= 5 kg per 600m^2
- Seed Sowing was done by Line seeding
- Improved agronomic practices

Technologies used for control plots

- Blended Fertilizer-NPSBZn 2 kg/600 m2
- Urea= 1.5 kg (top dressing) per 600m2
- Seed, local wheat variety= 8 kg
- Seed sowing was done by Broadcasting
- Agronomic practices applied using Farmers traditional practice

Crop	Yield (q/ha)	Plot treated with ISFM practices	Control plots
Wheat	Average yield	55.11	21.3
	Maximum yield	75.42	34.69
	Minimum Yield	35.20	3.77
Faba bean	Average yield	29.89	11.59
	Maximum yield	36.91	15.08
	Minimum Yield	25.14	9.05
Teff	Average yield	21.07	9.66
	Maximum yield	31.17	12.57
	Minimum Yield	15.06	2.51
Barley	Average yield	35.82	24.34
	Maximum yield	37.71	25.14
	Minimum Yield	32.68	23.13
Maize	Average yield	71.92	33.67
	Maximum yield	84.37	40.22
	Minimum Yield	50.28	27.15

In order to see whether ISFM practices improve production they need to be compared with farmers' normal practices. Without a comparison It is difficult to know whether new practices are better or worse than the existing ones.

Challenges to Adoption of ISFM

Despite the significant benefits of ISFM for food security, household income and environmental protection, the adoption of practices by farmers is usually low and incomplete, especially in African smallholder systems. The most important factors curtailing adoption are related to:

- high transaction costs of input and produce trading
- low awareness and common disbeliefs about the benefits of soil fertility management
- shortage of credit facilities for making initial investments
- aversion to risks surrounding the profitability of inputs
- cost and availability of labour
- land size and property rights
- weak social networks and pervasive distrust
- lack of information about soil fertility and rainfall forecasts of organic residues and competition for residues with livestock

How is ISFM Implemented?

The ISFM intervention implementation in Ethiopia follows two participatory extension approaches. The two participatory extension approaches proven and tested as effective for implementation in Ethiopia are Farmer's research and extension group (FREG) and the Farmers Field School (FFS).

Farmers Research Group (FREG). Farmer's research and extension groups are a voluntary group of farmers formed to undertake research and extension activities on their own field. The formation of groups is based on farmer's production constraints as identified and prioritized by farmers themselves.

FREG is a group of farmers who could be used as a tool for adopting and transferring improved technologies (initially developed in the research centres) to their fellow farmers in their locality. From the major extension approach that are believed to empower farmer and enhance knowledge sharing among farmers is, farmer to farmer communication that fits in line with FREG approach in communication and dissemination information between farmers.

It is a grass root level platform aims to bridge gaps on agricultural technology transfer between research and extension linkage and provide a platform of 20-30 members from research, extension and farmer for their joint learning and active participatory role in agricultural technology evaluation and dissemination.

FREG aims to facilitate the selection and transfer of agricultural technologies to end users through active participation and coordinated efforts of research-extension and farmer together. The objectives of FREG are: 1) evaluating and selecting improved agricultural technologies through participatory processes at field level, 2) demonstrating improved agricultural technologies to FREG members and other non-member land users in the villages, 3) facilitating farmer to farmer knowledge and technology exchange for faster and wider dissemination and adoption.

Farmers Field School (FFS). FFS is a participatory and discovery-based non-formal adult education approach developed by FAO. It is a Group extension approach implemented by many NGOs (e,g, JICA, GIZ-ISFM) in Ethiopia. This approach Enables groups of farmers to be trained over an extended period (e.g. a cropping season) using regular classroom and field activities. Emphasizes participatory, action based and problem-solving learning.

The FFS approach is field orientated and participatory placing emphasis on learning by doing. Training takes place over an extended period such as a cropping season and is a combination of classroom and field work. Training is also holistic in that it follows the farming systems adopted by participants. This means that the training starts from an understanding of existing farmers practice e.g. inputs used, resources available for production, market prices, availability of inputs etc.

FFS is usually a time bound activity (generally one agricultural production cycle or a year), involving a group (commonly 20-30) of farmers. It is facilitated by extension staff or increasingly by farmer facilitators (FFs). The method emphasizes group observation, discussion, analysis, presentation, and collective decision making and actions.

5.6.6 Subsistence and Commercial Farming

Based on the Central Statistical Agency (CSA), Ethiopian farms are divided into two major groups. They are smallholder (mainly subsistence) farmers and large commercial farmers. The majority of Ethiopian farmers are smallholder farms, producing mostly for their consumption. Based on the finding of Leavy and Poulton (2007), there are three different but related models of agricultural production. These are:

Small-scale farmers: -These can be further grouped into two. The first one is Type A which refers to non-commercial farmers. These farmers are subsistence oriented but may also sell

some of their production in the output market, but agriculture is not the only means of their living. The second category, which is Type B, is small-scale commercialization farmers. These farmers are better integrated with the market than the first group. Hence, they produce crops both for own consumption and the market.

Small-investor farmers/emerging commercial farmers: - These are exclusively engaged in market-oriented agriculture despite their modest scale production.

Large-scale business farmers: these farmers are capital incentive enterprises that are either private or state-owned agriculture is the business of these farmers provided that profit maximization is their objective.

Subsistence farming

Subsistence farming, or small holder agriculture, is when a farmer grows food for themselves and their family on a small plot of land. Unlike other types of farming, subsistence farming is focused more on survival. There is very little or no emphasis on trading and selling goods or operating as a business.

In subsistence farming, there is not usually much harvest to sell or trade, and what surplus there is tends to be stored to last the family until the next harvest. This is the most widely used method of agricultural farming in sub-Saharan Africa, and the majority of the rural poor depend on it for survival.

It is a method farming that has appeal to rural farmers because it allows food to be produced (with very little cost) in the rural areas, it lessens their need to find transportation to a city, and it creates opportunity to continue living in a village (where housing and land are much more affordable). It also means the family is self-sufficient in terms of food. Ideally, nothing needs to be purchased or borrowed from another source.

The majority of farmers in Ethiopia are subsistence smallholders, with little separability between production and consumption decisions of the household. Smallholders in Ethiopia are known for their resource constraints such as capital, inputs and technology, their heavy dependence on household labor, their subsistence-orientation, and their exposure to risk such as reduced yields, crop failure and low market prices of the produce.

The agricultural sector of Ethiopia is dominated by smallholder farming. Smallholder farms are defined as being smaller than 2 ha and are mainly managed with family labor. In Ethiopia, about 95% of main crops (e.g., cereals, pulses, oilseeds, vegetables, root crops, fruits, and cash crops) are produced by smallholder farms. Small-scale farmers produce 94 percent of the food crops and 98 percent of the coffee, the latter being Ethiopia's leading export good.

Commercial farming

Commercial farming is a method where the crops are raised to sell products in order to make money by selling them in the market. As we know subsistence farmers are raising crops to take care of their livelihood. On the other side, farming business owners raise crops or livestock on large scale to make a profit from it.

To raise commercial farming, a huge amount of capital investment is necessary. Along with that, it needs large scale farms, modern technologies, innovative machinery, good irrigation methods, chemical fertilizers etc. to produce a high yield. Commercial farming has the main feature consisting of modern inputs for higher productivity like good fertilizers, pesticides, weed killers and many more. Commercial farming crops are also in high demand because they are exported to other countries. It also used as raw material in industries to make food products. Commercial agriculture marketing also varies from region to region.

Commercial farms in Ethiopia refers to the farms that include state and private commercial

farms mainly established for the purpose of profit making by selling agricultural products at local market and/or abroad. These farms are commonly owned and operated by government, private companies and nongovernmental institutions, such as private individual investors, shareholders, religious and non- religious institutions...etc. The sub-sector is mainly characterized by the use of relatively capital intensive, mechanized and market-oriented farming system, with increased use of modern farm management practices and inputs such as, use of high tech-farm machineries and implements, irrigation scheme, use of chemical fertilizers, pesticides and improved seeds. In Ethiopia, however, due to various reasons, commercial farms are not widely spread, and as a result of which the contribution of these farms to the country's gross total agricultural output is limited only to about 5 %.

Private and state commercial farms produce just 6% of food crops and 2 % of the coffee grown. These commercial farms use about 5 % of the total cultivated land. Coffee, cotton, tea, fruits, and vegetables are the major crops grown by the few commercialized state farms, although with very minimal return despite huge investments in them (MEDIC 1999). With these statistics, one can easily infer to what extent the small-scale farmers (who are all rural dwellers) are the key element in strengthening the effort towards agricultural growth and consequently to the overall economic growth.

Commercialization of subsistence farmers: How this issue should be considered in community-based land management?

Commercialization in agriculture refers to the progressive shift from household production for consumption to market-oriented production.

Agricultural commercialization results in welfare gains for farmers through comparative advantage and increased total factor productivity growth because the commercialization of smallholder agriculture leads to productivity growth, income growth, employment growth, and poverty reduction. It also improves food supply in urban areas, with broader growth and welfare effects.

Commercialized farmers have a better living standard than subsistence farmers. This is because commercialized smallholder farmers have used more advanced production systems which are based on a comparative advantage. Consequently, higher production is achieved through economies of scale, regular interaction, exposure to new ideas, greater learning by doing, and better incentives in the form of high income, which of course have welfare gains for smallholder farmers.

In Ethiopia, 95% of the total area is cultivated by smallholder farmers and 90% of the total agricultural products are obtained from smallholder farmers. In the long run, this subsistence agricultural production may not be a viable production system to ensure food security. Therefore, commercializing smallholder agriculture is seen as a means to bring the welfare benefits of market-based exchange economies and is central to an inclusive development process. This implies that commercializing smallholder agriculture is an indispensable pathway towards economic growth and development for most developing countries relying on the agricultural sector as a means of livelihood. Especially, the development of the Ethiopian economy heavily depends on the rate that a subsistence production system is transformed into a market-orientated production system. This entails that the poverty-reduction strategy seeks to achieve growth through the commercialization of smallholder agriculture. Consequently, promoting the commercialization of agricultural production is a cornerstone of the rural development and poverty-reduction strategies of Ethiopia.

Agricultural commercialization clusters (ACC) Initiatives for commercializing subsistence farmers in Ethiopia

Agricultural Commercialization Clusters is defined as a shift from household production for home consumption to production for sale in the market. This shift entails that production and

input use decisions are based on profit maximization, reinforcing vertical linkages between input and output markets.

ACC is formally launched in 2019 as a five-year Programme with 10 commodities (Wheat, maize, teff, malt barley, sesame, Avocado, Mango, Banana, Onion and Tomato) across 4 regions (Amhara, Oromia, SNNPR and Tigray) in 300 woredas with about 4 million farmers.

The ACC Initiative contains clearly defined geographic clusters specializing in priority commodities across the four major agricultural regions of the country. These ACC clusters are intended to act as Centres of Excellence (CoE), where regions will be supported to maximize production and productivity while integrating commercialization activities. These clusters are therefore are meant to serve as models for learning as Ethiopia intensifies the ACC approach and scales up best practices across the country.

Within the ACC, farm scale is achieved by clustering farmers. 30-200 farmers are grouped together on adjacent land to farm as one. These groups of farmers are required to adopt the latest full-package farm recommendations, including use of improved seeds, fertilizer application, and other farming best-practices. Over time, it is expected that **Farmer Production Clusters** will move towards becoming established as commercial companies.

5.7 Promotion of Climate Smart Technologies/Practices

5.7.1 Definition

Climate-smart agriculture (CSA) is an integrated approach to managing landscapes: cropland, livestock, forests and fisheries that addresses the interlinked challenges of food security and accelerating climate change. Climate-smart agriculture (CSA) can also be defined as: an approach for transforming and reorienting agricultural development under the new realities of climate change (Lipper et al. 2014).

5.7.2 Characteristics of Climate Smart Agriculture (CSA)

CSA integrates multiple goals and manages trade-offs: CSA ideally produces triple-wins of increased productivity, enhanced resilience and reduced emissions. But often it is not possible to achieve all three. Frequently, when it comes time to implement CSA, trade-offs must be made. This requires us to identify synergies and weigh the costs and benefits of different options based on stakeholder objectives identified through participatory approaches.

CSA maintains ecosystems services: Ecosystems provide farmers with essential services, including clean air, water, food and materials. CSA interventions do not contribute to the degradation of these services, rather maintain them. Thus, CSA adopts a landscape approach that builds upon the principles of sustainable agriculture but goes beyond the narrow sectoral approaches that result in uncoordinated and competing land uses, to integrated planning and management at landscape level (FAO 2012b; FAO 2013a).

CSA is context specific: What is climate-smart in one-place may not be climate-smart in another, and no interventions are climate-smart everywhere or every time. Interventions must take into account local specificity in terms of agro-ecosystem, socio-economic conditions and institutional arrangements. The fact that CSA often strives to reach multiple objectives at the system level makes it particularly difficult to transfer experiences from one context to another.

CSA addresses climate change: Contrary to conventional agricultural development, CSA systematically integrates climate change and environmental degradation into the planning and development of sustainable agricultural systems (Lipper et al. 2014).

CSA has multiple entry points at different levels: CSA should not be perceived as a set of practices and technologies. It has multiple entry points, ranging from the development of

technologies and practices to the elaboration of climate change models and scenarios, information technologies, insurance schemes, value chains and the strengthening of institutional and political enabling environments. As such, it goes beyond single technologies at the farm level and includes the integration of multiple interventions at the food system, landscape, value chain or policy level.

5.7.3 Main Benefits of Promoting Climate Smart Agriculture

Agricultural production systems need to simultaneously tackle three intertwined challenges: sustainably increasing agricultural productivity and incomes; building resilience to the impacts of climate change; and contributing to climate change mitigation where possible. Climate smart agriculture (CSA) was developed as a framework to address these three challenges.

Sustainably increasing agricultural productivity and incomes: CSA aims to sustainably increase agricultural productivity and incomes from crops and livestock without having a negative impact on the environment. This, in turn, will raise food and nutritional security. A key concept related to raising productivity is sustainable intensification.

Building resilience to the impacts of climate change; CSA aims to reduce the exposure of farmers to short-term risks, while also strengthening their resilience by building their capacity to adapt and prosper in the face of shocks and longer-term stresses. Particular attention is given to protecting the ecosystem services which ecosystems provide to farmers and others. These services are essential for maintaining productivity and our ability to adapt to climate changes.

Contributing to climate change mitigation where possible: Wherever and whenever possible, CSA should help to reduce and/or remove greenhouse gas (GHG) emissions. This implies that we reduce emissions for each calorie or kilo of food, fiber and fuel that we produce; avoid deforestation; manage soils and trees in ways that maximizes their potential to acts as carbon sinks and absorb carbon dioxide from the atmosphere.

In short, CSA aims to promote the adoption of technically, financially and environmentally sound production practices, while incorporating resilience to climate effects and contributing to reduced GHG emissions. CSA integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges. Unlike conventional agricultural development approach that only focus on income generation and food security, CSA systematically integrates climate change in terms of adaptation and/or mitigation objectives.

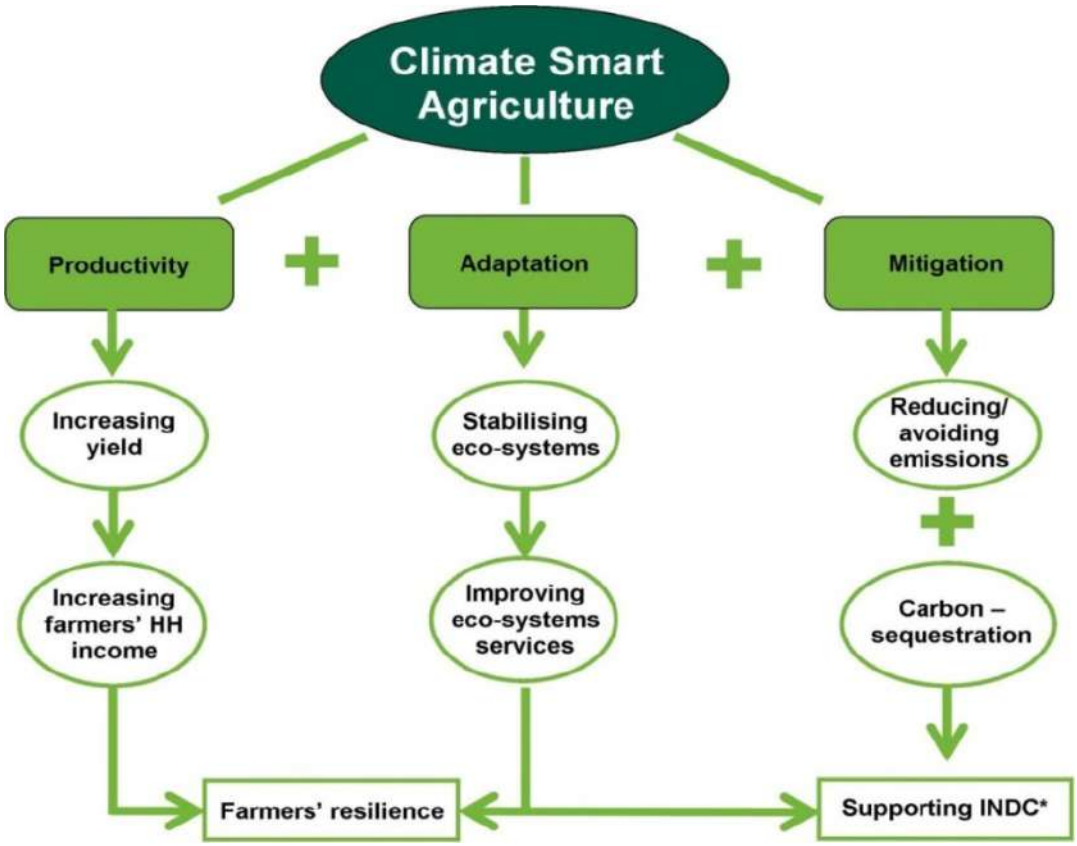


Figure 5.21 Benefits of CSA, Source: SLM (MOA, 2019)

5.7.4 Climate Smart Agriculture Technologies and Practices

Climate smart agriculture practices presents opportunities for addressing climate change challenges, while simultaneously supporting economic growth and development of the agriculture sector. For this profile, practices are considered climate smart if they maintain or achieve increases in productivity as well as at least one of the other objectives of climate-smart agriculture (adaptation and mitigation). Hundreds of technologies and practices around the world fall under the heading of CSA (FAO. 2013). The technologies and practices presented on Table--- below are documented as CSA practices in Ethiopia and East Africa.

Table 5.6 Climate smart practices/technologies

CSA practice	Benefit		
	Productivity	Adaptation	Mitigation
Physical soil and water conservation technologies and practices	Increases productivity through improved soil fertility and water availability.	Increases soil moisture conservation, prevents erosion. Builds soil fertility	Improves soil above and below ground carbon stocks and organic matter content.
Agronomic practices: crop rotation, intercropping, contour ploughing	Lowers production costs, reduces financial vulnerability by diversifying production, Increased yields and hence improved incomes.	Improves soil fertility, maximizes the use of soil nutrients, reduces pest and disease risks, improves soil moisture content and storage	Increases soil organic matter, and soil carbon stock, reduces the need for nitrogen fertilizers application
Soil management practices: use of Compost and Vermi-compost, Green manures, Mulching and crop residue management, Bio-fertilizer application, Acid soil liming, efficient use of inorganic fertilizers	Increases productivity as a result of enhanced soil health	Improves soil structure, improves water retention capacity of the soil, reduces crop failure risk, allows the efficient use of fertilizers and Increases supply or availability of nitrogen or other primary nutrients.	Increases carbon sequestration or carbon storage in soils, reduces use of synthetic fertilizers, reduces carbon footprint related to production, transport and application of inorganic fertilizers.

CSA practice	Benefit		
	Productivity	Adaptation	Mitigation
Conservation Agriculture (CA)	Improves soil fertility and subsequently productivity and income	Conserves soil moisture and reduces erosion. Helps avoid crop losses during dry periods.	Increased carbon stocks in soils. Reduces nitrogen loss. Emissions of GHG stored in soils can be avoided by reducing tillage.
Agroforestry	Crop diversification improves yield with potential benefits for food and nutrition security and income diversification.	Improves soil fertility, increases soil moisture, regulation of canopy temperature reduces heat stress on the soil and increased soil moisture maintains yield during dry periods.	Increased carbon sequestration and carbon storage from greater tree density.
Climate information systems:(crop calendars, seasonal forecasts and early warning systems)	Contributes to efficient use of agricultural inputs. Increases in product quality and/or quantity and reduces crop losses through more informed decision making.	Improves farmer's preparedness and responsiveness to unpredictable weather patterns and extreme weather events (risk management strategy).	Planning appropriately for timely fertilization (the right time and amount applied) can reduce nitrogen emissions.
Use of Climate Change adapted improved seed and planting materials	Use of improved varieties Increases yield and quality at harvest. Reduces investment in pesticides and water use.	Increases responsiveness to unpredictable weather patterns and enhances resistance to diseases and heat stress	Reduce the need for pesticides, reduces carbon emissions by decreasing pesticide demand as well as the number of in-field applications.
Water harvesting and efficient water management	Increases productivity hence incomes and allows continuous production throughout the year.	Prevents soil erosion, increases availability of water during dry spells and droughts, , increases water use efficiency and reduces soil erosion.	Reduces loss of water as runoff and this results in reduced emissions, reduces energy required for irrigation, hence reduced GHG emissions.
Improved livestock feeding and grazing management: Improved forage production in different land uses, Zero grazing, Improved feeding, Feed reserves for the dry season (hay, silage, etc.) and Improved pasture management	Increases total production and productivity per unit area during the year. Increased income stability and food security.	Improves quality and quantity of the Feeds, decreases drought vulnerability and feed scarcity for animal production. Increases preservation and retention of nutritional forage, improves quality and quantity of the feeds, increases productivity per unit area and promotes soil and water conservation	Improved feed quality reduces methane emissions related to enteric fermentation .
Improved livestock breeds and Shift towards small ruminants and chicken	Improved productivity, rearing of different livestock species expands the sources of income and food security and high-value product with export potential.	Improved breeds have greater resistance to diseases and various abiotic stress conditions, , reduces exposure to adverse climatic conditions and diversifies the production	Reduces feed requirements, hence reduction in the emissions; greater production per unit of feed results in reduced emissions per unit of milk, Provides moderate reduction in GHG emissions per unit of output.
Improved livestock housing and veterinary services	Increases meat production due to conducive environment for feeding and growth and reduces mortality and hence improves productivity and profitability.	Protects the stock from extreme weather conditions such as heat waves, floods or extreme cold, healthy livestock result in improved resilience to climate hazards	Enhances manure management hence reduced emissions, Increases production efficiency reducing GHG emissions per unit of product.

5.7.5 Mainstreaming of Climate Smart Agriculture into the generall and management Interventions

Mainstreaming of Climate Smart Agriculture in CBLM

In the climate change context, mainstreaming refers to the incorporation of climate change considerations into established or on-going development Programmes, policies or management strategies, rather than developing adaptation and mitigation initiatives separately.

There are two mainstreaming levels: strategic and operational. Strategic level of mainstrea-

ming addresses the organizational environment or structure in which policies and Programmes are developed and implemented. Operational level involves integrating climate risk assessment into plans and actions. This involves undertaking an evaluation of climate risks assessment and identifying effective, efficient and equitable adaptation and mitigation measures to build adaptive and mitigation capacity of communities and households.

Mainstreaming of Climate Smart Agriculture (CSA) at watershed level

The main reason for applying watershed development approaches is to move away from narrow sectorial approaches with uncoordinated and competing land uses, to integrated planning and management where the multiple interests of stakeholders are considered, synergies identified and trade-off among different uses negotiated. It is argued that only a holistic approach that integrates all sectors and stakeholders in a watershed can sustain such ecosystem services and achieve sustainable development (FAO 2013).

Climate-smart agriculture (CSA) requires actions beyond the farm scale. It goes beyond new technologies and practices like drought resistant varieties or precision farming. To achieve the multiple objectives of productivity and food security, enhanced farmer resilience and reduced greenhouse gas emissions, CSA must adopt watershed planning approach. In addition, CSA must adopt watersheds planning and implementation approach, because:

- By taking a watershed approach and applying climate-smart agricultural practices, one finds ways of increasing mitigation and adaptation opportunities on community lands as well as the entire ecosystem, while at the same time sustainably increasing and intensifying productivity on farmlands.
- Operating at water level also helps to address trade-offs. When adaptation and mitigation goals are pursued separately in agricultural systems, as is often the case, trade-offs may occur over different temporal or spatial scales. For example, efforts to promote agricultural productivity of individual farms by increasing the use of fertilizers and agrochemicals could maintain crop yields in the face of climate change but result in greater overall GHG emissions. Conversely, the promotion of fast-growing tree monocultures or biofuel crops for mitigation purposes may enhance carbon stocks, but potentially reduce water availability downstream and decrease the land available for agriculture. Potential trade-offs between adaptation and mitigation activities can often be minimized, and sometimes even avoided, through integrated landscape level planning, an approach.
- Planning, implementing and evaluating CSA practices in a watershed or using a watershed approach enhances field level productivity because it maintains ecosystems service and creates synergies between differed production systems. Watersheds are natural and cultural mosaics of land and water. Watershed approaches seek to integrate sustainable management of ecosystems and natural resources with livelihood considerations, recognizing that watersheds are multifunctional, providing benefits and services for a wide range of ecosystem processes, species, and social actors.
- Working at watershed level ensues inter-sectorial coordination and cooperation.
- The final objective is to create climate smart watersheds. Climate-smart watersheds are comprised of a variety of field and farm practices, in different land and tenure types, that support both adaptation and mitigation objectives (Table 1).

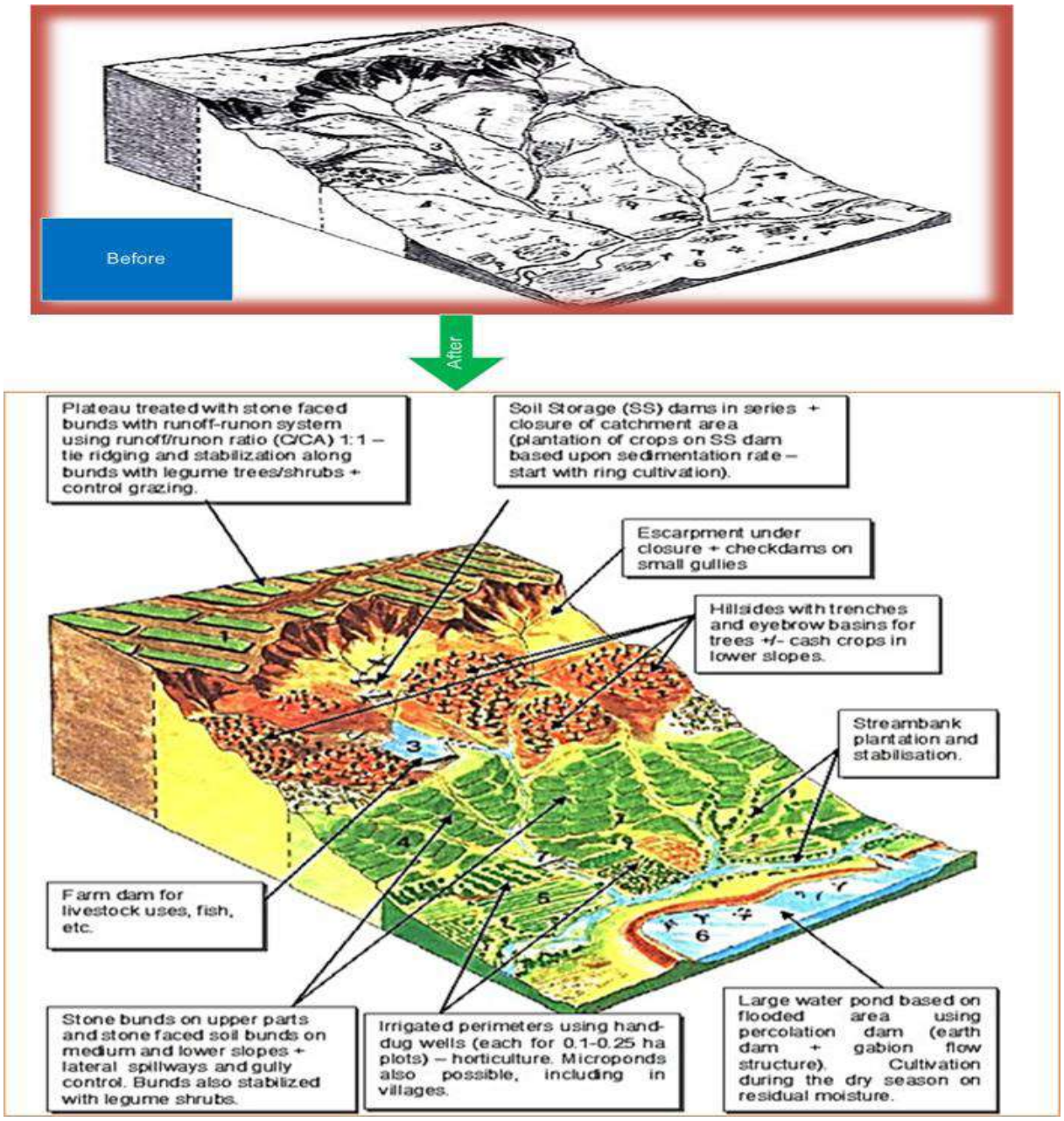


Figure 5.22 Degraded watershed and Climate smart watershed

How are CSA Interventions integrated into the overall watershed development plans?

As part/ continuation of the watershed development planning, CSA interventions are normally planned on multi-year and annual basis. CSA interventions under SLM are usually implemented primarily in micro-watersheds that have already been supported with biophysical measures. In order to ensure complementarity of CSA interventions with existing biophysical SWC measures, the planning of CSA interventions should be integrated and aligned with the watershed management plans, as described in the community based participatory watershed development guideline (CBPWDG) (see process flow adapted to CSA on Table 2).

A key aspect of the CSA operational approach is the regional and local assessment of CSA practices with due consideration of the CSA initiatives are implemented iteratively. For this, prior to engaging the individual communities at the micro-watershed level, the extension workers will conduct a review of the CSA practices presented in the previous section with the objective of adjusting, if needed to the local agro-ecological conditions. CSA planning need to consider

the interest and workload of women and children in the household

CSA planning starts from the information and knowledge of the identified watershed. It is linked to the biophysical information and the prevailing conditions of the selected watershed. Parallel to the watershed planning process appropriate CSA measures are integrated and supported with clear indicators and targets for the proper follow up. Budget requirements are estimated based on the planed targets and the nature of the intervention, as some of the practices are mainstreamed into the scheduled watershed development.

Table 5.6.1: Process flow for Integrating CSA into the watershed development planning

Steps for Major watershed development planning	Steps for CSA planning and implementation
Step1 Prioritization and selection of watersheds at Woreda Level based on the criteria set in the guideline. - Focus on identifying major and micro-watersheds - Formation of Kebele Watershed Team (KWT)	Prioritization and selection of CSA watersheds. - Create general awareness on climate variability, climate change and impacts
Step 2 Forming and organizing community level watershed planning team (CWT) - Agree on timing for planning work	Make sure community watershed team in place otherwise establish. - Establish CSA farmer groups and leaders.
Step 3 Biophysical and Socio-economic Survey DAs & communities jointly assess the socio-economic & biophysical situations 3.1 Socio-economic survey Getting to know the watershed, people's interactions, opportunities and limitations (Trend analysis; Transect walk, Village mapping; Stakeholder analysis; Getting to know people needs, strength, problems; Vision of change exercise; Problem Identification (PI) and Ranking; Socio-economic baseline survey (Questionnaire and other document reviews) 3.2 Biophysical Survey - Mapping (Base map, Present land use map) - Resource survey and assessment (Land use, Soil depth, Degradation level, Slope)	Identify climate risks and vulnerabilities through discussions with kebele/community watershed teams and observations within a micro-watershed. - Prioritize the risks and vulnerabilities with the watershed team and map them within the micro-watershed. - Present inventory of CSA options to the farmers groups
Step 4 Identification and Prioritization of Interventions that Bring Change Technologies are selected to address major problems (socio-economic and biophysical problems) and opportunities	Identification and prioritization of CSA interventions with households /communities (farmer groups). - Provide CSA awareness training - Rank CSA interventions based on need, synergies and trade-offs
Step 5 Getting the options and interventions discussed and approved by the general assembly	The CSA packages of practices discussed and approved by farmer groups
Step 6 Preparation of Development Plan Map, Inputs and Action Plan	Prepare and approve CSA action plans - technical and financial inputs at micro-watershed level by each farmer group (CSA action plan)
Step 7 Implementation Strategies - preparation for implementation - institutional responsibilities - resource identification and mobilization - organizational arrangement at community level - training and experience sharing	Implementation strategy - Provide technical training (skill enhancement - Implement the identified CSA practices at on farm and FTCs (whenever and wherever needed)
Step 8: Participatory Monitoring and Evaluation - Participatory monitoring - Participatory evaluation - Reporting and documentation - Plan revision	Participatory CSA Monitoring and Evaluation - Conduct regular monitoring and provide support as needed - Evaluate implementation and benefits of the implemented CSA interventions - Draw lessons and incorporate them in the next planning

Source: MOA, 2019

Detail description of Steps for CSA planning and implementation

Step 1. Selection of Micro watersheds that receives CSA support

Intervention watersheds should be prioritized based on the following eligibility criteria.

- Within a watershed, CSA interventions are designed and implemented at a micro-watershed (landscape) level.
- CSA interventions could be linked to existing soil and water conservation practices, allowing synergies between different efforts in a watershed such as forage utilization from zero/controlled grazing on hillsides and from increased soil moisture and water availability; and enhance the climate smartness of individual CSA practices.
- The primary eligibility criteria for the selection of areas (micro-watersheds) for CSA interventions in community watershed would be the treatment of highly degraded areas through biophysical measures. Yet, CSA can be implemented in any watershed considering the conditions of the watershed.
- Although CSA practices can be implemented on individual farms, CSA is more successful when it is implemented by organized farmers within a micro-watershed (landscape).
- The process for implementation of CSA practices assumes that each practice presents synergies and trade-offs that need careful consideration.
- Zero-grazing bylaw adopted and enforced (a CSA practice in itself and precondition for implementation of additional climate smart practices related to both crops and livestock)
- Access to functional Farmer Training Centers (FTCs)
- Local knowledge or traditional practice of multi-cropping system; and
- Performance/functionality of community and Kebele watershed teams

Awareness raising on climate risks and vulnerability: Awareness raising/sensitization of the community representatives on the climate change impacts and adaptation measures is important entry point for CSA planning at micro-watershed level. Documentary films, photos and other info kits can be used to visualize climate impacts and adaptation options. Sharing experience through locally esteemed persons can be used to sensitize the community.

Step 2: Organizing farmers to CSA groups

The operational unit for CSA interventions in eligible micro-watersheds should be a group of organized farmers or CSA groups. CSA groups would be organized by the DAs assisted by woreda experts. In each group, the number of members should ideally range between 20 and 30 farmers. The actual number of groups to be organized within each micro-watershed will be decided by development agents of the kebeles and Woreda specialists, based on the number of households in watershed, and the capacity of DAs to provide regular technical support during the entire adoption process.

Groups and individual farmers eligible to participate in CSA adoption groups will be required to meet the following criteria:

- At least one member with recognized leadership
- Farming in contiguous plots or located in the same area (slope, village)
- All member complies with zero grazing
- Group members participated actively in Soil and water management activities
- At least one member willing to participate in field days and/or demonstration events
- All members agree to contribute the necessary labor to implement the selected practices, as a form of counterpart financing
- When women headed households are available, at least 20 percent should be women headed households or the 20% of parcels should be owned by women

Step 3. Identification and prioritization of climate risk and vulnerability at micro-watershed level

Following the awareness raising meetings, the extension workers identify the climate risks, vulnerability and production potentials of the farming systems in consultation with the commu-

nity representatives. Identified climate risks and vulnerabilities are prioritized by the community representatives based on ranking with the facilitation of the extension workers.

Step 4 5 and 6: Identification and prioritization of CSA interventions, discussion and approval by farmer groups and development of CSA action plans

Once the CSA group is established, the CSA plan of the group is prepared in a participatory manner. For this, make the community aware about different CSA practices by explaining the concept of climate-smartness and especially what is understood as adaptation; presents the range of interventions available for adoption. Emphasizes that the anticipated CSA interventions need to have a clear linkage to the previously implemented SWC measures. Consequently, the meeting will also review the previous SWC measures and build upon them towards creating a climate-smart landscape.

From the list of practices presented in the previous section, the group decides the specific practices that would comprise the CSA package to be adopted. Once the package has been selected, the CSA plan is completed with the calculation of physical (i.e. inputs) and financial requirements, including not only the investments at the farm level, but also the training and technical assistance need. In addition, the DA and the group conduct a similar process to select the practice (or package of practices) to be established by the group and used for demonstration purposes. The resources required are also included in the CSA Plan, under a separate category. The process of aggregating the group CSA plans will be the same as for the community watershed plans.

Basic guidelines to be followed for developing packages of climate smart interventions and/or practices are as follows:

- A package can have a combination of multiple interventions which must fulfill the objective of CSA (adaptation, mitigation and productivity enhancement). The number of combinations will depend on the synergies and trade-offs of the candidate CSA practices within the target micro-watershed. During the selection it is advisable to consider gender aspect particularly women's preference including capacity and ability to implement. A package refers to a combination of two or more practices which can be developed by looking into the complementarity of each intervention

Step 7 Implementation strategy

Training and backstopping of CSA farmers group and Development agents

Prior to implementation of planned activities extension workers/DA and farmers will be trained on the technical standards and application of the selected CSA practices and technologies. Training of farmers will be supported by practical field exposure to pilot CSA watersheds where relevant technologies controlled grazing and other sustainable Land management approaches are tested. DAs and technical experts will provide timely support including access to inputs and required information during the implementation of planned CSA measures. Lead farmer will play important role in providing technical advises to their respective farmer groups and communicate to DA and extension workers based on skill gaps during implementation. Regular exchange between the CSA farmer groups will be facilitating at micro-watersheds and Woreda level through the extension workers.

Implementation of CSA plans

Implementation of CSA interventions at watershed level will follow two modalities: (i) direct field adoption and (ii) pre-adoption demonstration (FTC, model farmers). In both cases, the selection of practices to be included under each modality will be decided jointly by DAs and beneficiaries, based on the practices/ technologies discussed in the previous section.

Direct Field Adoption. The practices selected for direct adoption will be implemented by all

members of the CSA groups in the form of packages. As part of the development of the CSA Plan, the DAs and the members of the CSA group must jointly agree on the priority intervention to be implemented, and the set of CSA practices to be included in the implementation package.

Pre-adoption demonstration. Farmers are not expected to make informed decisions on innovations that they have not seen or applied before. To address this, in each micro watershed, beneficiaries will also select CSA practices for pre-adoption demonstration. These practices will be established either in Farmer Training Centers (FTC) or in smaller plots owned by beneficiaries willing to make land available for demonstration purposes. The FTCs should demonstrate a number of technologies that have been screened by the region and woreda as potential for implementation. Farmers can see them in the field and make an informed decision. The required budget for implementation of demonstration practices would be developed by DAs and included in the annual micro watershed CSA Plan.

The individual demonstration plots will be used to conduct CSA formal field days or informal farmer exchanges in appropriate periods of the year, while results related to the three dimensions of CSA will be monitored and evaluated using a methodology to be developed in accordance to the type of practice to generate appropriate information for planning, training, and extension purposes.

Table 5.7 Example of CSA practices at different scales (plot, farm and watershed)and their benefit

Scale	CSA Practices with adaptation benefits	CSA Practices with adaptation and mitigation benefits	CSA Practices with mitigation benefits
PLOT	- Use of new crop varieties or livestock breeds that are drought-tolerant, or bred for specific environmental stresses - Adjustments in irrigation practices and systems - Changes in timing of planting, pruning or harvesting - Adjustments in cropping sequence and timing of irrigation or application of fertilizers and pesticides - Changes in timing, duration, and location of animal grazing - Conservation of crop & livestock genetic diversity	- Integrated soil and water conservation efforts - Incorporation of organic fertilizers and cover crops - Reduced or zero tillage - Maintenance of crop residues - Breeding crop varieties for shade tolerance - Use of agroforestry	- Reduced or more efficient - use of fertilizers and pesticides - Adjustments in the type of feed provided to cattle - Reduced frequency or extent of fires - Reduced or more efficient use of machinery and fossil fuels - Improved management of cultivated wetland rice areas to reduce methane emissions
FARM	- Changes in rotation or production systems - Improved water harvesting and retention through ponds, dams, etc. - Increased water use efficiency through improved irrigation practices - Conservation of agro-biodiversity - Use of seasonal and multiyear forecasting - Farm insurance or crop or livestock insurance	- Diversification of crops and livestock systems on the farm - Soil conservation practices, including terracing and land contouring - Improved residue management and use of cover crops - Integrated nutrient management - Use of agroforestry - Use of silvo-pastoral systems (e.g., trees in pastures, live fences, fodder banks) - Appropriate animal rotation practices - Use of conservation agriculture (i.e., minimal soil disturbance, maintenance of mulches, use of crop rotations and intercropping, integrated pest management) - Use of multi-cropping, intercropping, and crop rotations	- Reduced or more efficient use of agrochemicals - Planting of biofuels and trees for fuel wood - Planting of fast-growing tree plantations - Reduced use of machinery and fossil fuels - Generation of biogas from manure - Use of improved feeding practices for livestock

Scale	CSA Practices with adaptation benefits	CSA Practices with adaptation and mitigation benefits	CSA Practices with mitigation benefits
Watershed	- Maintenance of habitat connectivity to ensure pollination and pest control - Development of water collector systems, irrigation infrastructure and other engineering solutions to reduce risks of floods, water scarcity, and other climate-related risks - Targeted location of intensive livestock production within the landscape to reduce water contamination - Diversification of farmer income options	- Land-use planning at the landscape level for multiple objectives - Maintenance of landscape diversity including a mosaic of agricultural land and natural habitat - Conservation and restoration of riparian areas within the agricultural landscape - Conservation and restoration of remaining forest habitat in the surrounding landscape including formal & informal protected areas - Establishment of agroforestry and silvo-pastoral systems - Sustainable intensification of livestock production and crop production in some areas, to reduce pressure on fragile areas - Increases in the duration of fallow periods in shift and burn cultivation - Restoration of degraded or fragile lands - Conservation and restoration of wetlands and peat lands - Reduced expansion of cropland into remaining natural habitat	- •Planting of biofuel feedstock - •Careful management of fires

Source: Harvey et al., 2013

5.8 Managing Livestock to Secure Sustainable Use of Natural Resources

5.8.1 Livestock Management in Ethiopian

Although mixed farming in Ethiopian highlands has been practiced over the last many years, the low level of integration among the three sectors (livestock, crop and natural resources) coupled with other reasons has severely affected productivity and has become a cause for the expansion of land degradation. In this regard, the existence of high livestock population managed in a free grazing system lacking any improvement intervention is considered as one of the fundamental causes of land degradation in Ethiopian condition. What we have learned from practical evidence is that a livestock husbandry system based on free grazing in general enhances land degradation and poor productivity in all the agricultural sub sectors.

1. Negative impacts of free grazing

The livestock husbandry system that we are practicing today is no more different from what was done during the period of livestock domestication and raring /i.e Before Christ/. This means the current land use has largely failed to recognize social and economic changes that have evolved over the years. As a result, on top of our failure or inability to use this huge resource to the maximum possible, the livestock husbandry system that is based on free grazing is causing natural resources degradation and a reduction on agricultural productivity. The details of the major negative impacts of free grazing are indicated as follows.

Table 5.8 ill effects of free grazing on natural resource, crop and livestock productivity

Effects on Natural Resource/Env't	Effects on Livestock productivity	Effects on crop production
Cause of destruction of SWC measures constructed	Aggravated existing feed shortage	Soil fertility loss and increase the risk of soil acidity
Major cause of gully formation	Favour disease prevalence mortality	Unable to practice agro-forestry
Loss of soil fertility and health [OM, ACIDITY, MN]	Heat stress: Poor/reduced reproductive performance	Traction power shortage due to low reproduction
Significant reduction on survival of planted seedlings	Energy loss: 25-45% energy loss because of free grazing	Inappropriate use of manure for compost
Reduce infiltration & enhance run off Water	No breed improvement under free grazing system	Limit moisture availability /content of soil

Enhance potent GHG emission	Overall productivity of livestock is very poor	

5.8.2 Backyard Livestock Farming

Definition

Back yard livestock farming in this manual means stopping free grazing and practicing stall feeding at the back yard; and this improved livestock management increases productivity of crop-livestock production system and also substantially reduces the negative impacts of free grazing on natural resources development. Backyard Livestock Farming is a livestock husbandry system that can be practiced by community members living in a defined area (for example at watershed level) and who has willingly accepted to implement the system. In this system, all community members will tie/keep their livestock in their back yard and based on their land holding size they have to prepare hay plots, collect fodder from different sources. The system prohibits all farmers to let their livestock to move in to the communally used places and on any farmland.

Approaches of applying BYLiSF

To protect and manage communal grazing land and farm plots, farmers living in a given locality or watershed are expected to formulate common bylaws. In this regard the proclamation enacted by the Ethiopian federal government serves as an important input and it is also claimed that there will be adequate support from the government. It is essential to understand deeply that controlling free grazing and changing it to backyard livestock farming apart from protecting soil and water conservation structures, induces far reaching economic and social benefits.

In general, the process of implementing the backyard livestock farming system is basically a change in production system and demands concerted efforts of stakeholders and provision of adequate resources. Among the several activities that the above stakeholders carry out individually as well as jointly the following are depicted under Table 2.

Table 5.9 Major activities implemented by different stakeholders for the adoption of BLiF

S/N	Major Activities	Implementation Period	Executing Agency
1	Organize a consultative workshop and carry out critics on the draft document together with concerned government bodies; and collect ideas/inputs that improve the quality of the document.	September	Bureau of Agriculture
2	Incorporating ideas or inputs that improve the draft document and prepare the final document.	October	Bureau of Agriculture, Livestock Agency, and GIZ
3	Providing training of trainers	October	Bureau of Agriculture, Livestock Agency, and GIZ
4	Carry out discussions with beneficiary farmers in selected watersheds and develop common awareness	November and December	Woreda Agricultural Development Office
5	Organizing/packaging best practices in areas where there is well developed improved livestock farming and disseminate or make it available to beneficiary farmers	December	Bureau of Agriculture, Livestock Agency and Woreda Agricultural Development Office
6	Create favourable conditions for farmers to visit areas having best experiences on improved livestock farming system	December	Livestock Agency and Woreda Agricultural Development Office
7	Launching Backyard livestock farming/formulating bylaws and get it approved/	December and January	Woreda Agricultural Development Office
8	Launching backyard livestock farming	January and February	The community and Woreda Agricultural development Office
9	Availing forage and other inputs that are sources of better livestock feed in the crop–livestock production system	April and May	Woreda Agricultural Development Office

S/N	Major Activities	Implementation Period	Executing Agency
10	Provide advisory service to farmers to work on selected commodities and facilitate market integration	September to December	Woreda Agricultural Development Office
11	In general, by following up the implementation of the strategy organize a data base supported by video and figures/numbers	All year round	Stakeholders
12	Encourage watersheds registering better accomplishment by rewarding them motivating prizes	At the end of the year	Woreda Agricultural Development Office

Based on the experience from our previous efforts having strong community leadership, dedicated extension workers, project/Programme support and recognition by local authorities are found to be the key success factors.

5.8.3 Socio Economic and Environmental Benefits Gained From Adoption Of Back yard livestock farming

i. Natural resources protection and development

Damage caused by free grazing on the soil and water conservation structures and the poor performance of forage trees and shrubs, and herbs planted to reinforce the physical soil and water conservation structures are now the key challenges. In general failure to consider or take in to account the potential damages that could be caused by open grazing has severely weakened effectiveness of the natural resources protection and development interventions.

ii. Improving soil fertility and productivity

In Ethiopia due to population number increment more land is brought under agriculture by clearing forest land and also steep slope areas are cultivated using poor farming techniques. Consumption of vegetation cover and crop residue by livestock, removal of topsoil by runoff and wind, compaction of topsoil by trampling of livestock, reduction of soil depth and depletion of its natural fertility are all contributed by free grazing system and have made crop productivity drastically reduced.

In the Ethiopian high lands about 30-35% of the arable land is affected by soil acidity and this clearly shows the severity of the problem. In addition, studies indicated that in soils affected by acidity and lacking natural organic matter, use of improved technology like improved seed and chemical fertilizer that is bought with huge financial outlay has brought no visible yield increment.

However, in areas where free grazing is stopped and backyard livestock farming is implemented, land that was out of production due to soil acidity was returned back into productive. The biomass from tree Lucerne and other green vegetation was turned under/ploughed under and the decomposed biomass drastically reduced the soil acidity and the land became rehabilitated. As a result, farmers were able to grow crops on this land and the yield harvested was threefold compared to the previous productivity. Improvement on the soil was attributed to the increment of the organic matter within the soil and its capacity to retain important minerals within the soil system and enabling plants to absorb the nutrients. When this method is compared with lime application that costs a lot of money and labor, it is noticed that the biological method is by far better in terms of cost and crop production effectiveness.

iii. Improving soil moisture and ground water

When backyard livestock farming is carried out it is practically observed that the biomass generated from the crop residue and the proliferating vegetation cover on common grazing lands and other land holdings is incorporated in the soil. This incidence apart from reducing the chance for run off formation it increases the capacity of the soil to absorb moisture, enhance water infiltration and thereby makes the ground water available at short distance. Impro-

vements in soil moisture holding capacity has enabled farmers to grow chickpea and rough pea and other crops using residual soil moisture and generate additional income. Moreover, prevalence of water at shallow depth compared to the previous situation has given farmers the opportunity to abstract ground water easily and use it for livestock watering and household use. This was practically observed in many places.

iv. Improving vegetation cover and forest development

In addition, avoiding free grazing has drastically improved the survival percentage of fodder trees and other plants planted on soil and water conservation areas. Likewise, it has created conducive condition to carry out forest and fruit development on selected sites. In these activities, apart from improving biodiversity, the improvement in the green vegetation cover plays an important role to curb the challenges of climate change.

v. Conservation agriculture and mixed agriculture development

Conservation agriculture is an agricultural method that conserves, improves and ensures effective use of natural resources. Conservation agriculture is practiced based on the three key principles: permanent soil cover, no tillage and crop rotation. Failure to integrate these key principles with controlled /backyard livestock farming practices makes undertaking of conservation agriculture impossible. This is because in free grazing areas crop residue is consumed by livestock and no more biomass is available to serve as a permanent soil cover.

vi. Improving crop production and productivity

In the Ethiopian highlands crop production and livestock husbandry are highly integrated and the livestock are used for crop land ploughing, threshing, and transport. However, the current farmer-oxen ratio shows that those households having no ox and one ox are about 50% of the households in the region. This is an indicator that the current livestock husbandry is not satisfactorily supporting crop production in the region. preliminary, however, shows that those community members who adopt BLiF has increased their oxen availability as a result of increased livestock productivity. In addition, the system has also positively contributed for having healthy and strong they provide effective traction power for timely and good seed bed preparation that improves crop productivity Furthermore, BLiF has also contributed for better use of manure for soil fertility. Improvements in soils fertility and its capacity to retain moisture has enabled farmers to grow additional crops such as chickpea and rough pea using the residual moisture after harvesting the major crop and this has increased the product from a unit of farmland.

vii. Improvements in livestock resource development

In the free grazing system, a large number of livestock are deployed on a small grazing land and this does not enable them to get adequate fodder; hence, the yield from the livestock is low. In addition, as the livestock are coming from different places or villages congregation of a large number of livestock in a small place creates conducive condition for the incidence and spread of livestock disease. In this situation apart from economic losses inflicted by livestock death, farmers are exposed to high expenses for livestock veterinary services. However, implementing back yard livestock farming creates possibilities to avoid the problems and obtain high meat and milk yield.

Currently the milk productivity in the country is about 1.3 liter per day per cow and this milk yield is obtained on average for only five months. Although there are about 19 million cows in the country poor milk yield has forced the Ethiopia to import large amount of milk at the expense of a big sum of foreign exchange. However, it is practically observed that backyard livestock farming has proved the possibility of increasing livestock product (meat and milk).

A. Improving forage supply

The idea of stopping free grazing and introduction of backyard livestock farming was comple-

mented by repeated meetings and discussions with watershed communities to enlighten and convince them about the value of the proposed interventions. During the discussions the burning question repeatedly raised by most participants was ''*what can we feed our livestock if we tie them at the back yard?*''. The possible ways of producing adequate feed for their livestock in the backyard farming system were elaborated. Currently farmers that adopt backyard livestock farming have practically seen the amount of forage they harvest is by far greater in terms of quantity and quality compared to what they used to get during the free grazing period. It should be clear that free grazing could not improve the availability of feed rather reduce significantly the both the quality and quantity. Thus, the usual argument that comes both from farmers and 'experts' (how can we stop free grazing without having adequate feed) doesn't hold water.

Such a system is believed to bring quite a lot of opportunities for producing additional forage from different land use, including bunds, gullies and degraded areas which was not the case at time of free grazing. On the other hand, when the livestock are kept at the back yard farmers prepare feeding trough and feed their livestock by grouping them according to their ages and productivity and this has enabled farmers to use the forage properly and avoid wastages.

Figure 5.23 Control of free grazing, and cut and carry system exercised by farmers

B. Improving livestock health

When different kinds of livestock are kept on a small grazing land in large numbers, incidence and spread of livestock disease affected the sector's productivity. However, information collected from those areas which have banned free grazing shows that the disease distribution has drastically decreased. As could be realized from the experiences of watershed communities practicing backyard livestock farming it is possible to reduce the current 10% annual livestock death rate to an estimated 5% by changing livestock management system. If we calculate this from the perspectives of available livestock (cattle, sheep and goat) there is a high probability to save above 1.5 million heads of livestock from dying and make them productive. Backyard livestock farming helps to drastically reduce leech attack and gastrointestinal problem, physical damages due to fighting amongst the livestock, as well as losses that arise from damages due to falling of livestock in gullies and cliffs, and also from wildlife attack.

C. Improving provision/supply of water

In backyard livestock farming the livestock are not exposed to long walks under hot temperature in search of forage and water and this reduces the water need of the livestock. This is because of the reduction of water that could otherwise lost through evapotranspiration. Moreover, because the natural resource is rehabilitated ground water is available at shallower depth; hence, farmers are able to dig water wells at their backyard and provide clean water for the livestock and household use.

D. Improving reproductive potential of livestock

Backyard livestock farming creates conducive condition to carry out productive livestock husbandry. The system enhances opportunities to improve and expand the livestock breed through use of genetically superior bulls and artificial insemination. It also helps to keep record of the breeds' history and avoid the problem of traceability particularly for livestock products supplied to the international market. As backyard livestock farming enables the livestock to get improved fodder, better veterinary service and management, their age at first calving and calving intervals become shorter. The weaning age of calves and calf mortality is also reduced. The system further allows close follow up of the heat period of cows and carries out selective breeding that result in better reproduction.

E. Destocking and creating equity in the use of grazing land

Under free grazing system land is not equitably used being divided among the community rather it is a system where those farmers having more livestock and few livestock number are using the grazing land without any restriction. This system has encouraged farmers to keep more livestock number without giving due regard to livestock productivity. In those areas that have banned free grazing poor famers including women are able to benefit equally from the communal grazing land. Although farmers having more livestock number were unhappy when free grazing was stopped, in due course they are able to earn more income than they used to get during the free grazing by reducing the number of livestock and keeping few more productive livestock. Destocking is only possible if such a system are adopted.

5.8.4 Social Benefits of Backyard Livestock Farming

i. Reducing conflict

As the current livestock management in Ethiopia is predominantly based on free grazing the freely moving livestock encroaches privately owned crop and grazing lands and this intrusion has been causing conflict that sometimes goes up to loss of human life. However, the currently proposed back yard farming system implementation, that bans free grazing, plays vital role in solving social problems that could arise due to free grazing. As a result, there is no as such conflict among community members due to livestock grazing.

ii. Improvement in children schooling/enrolment

It is widely known that the labor required to keep livestock largely rests on children as a result many of them lack opportunities to go to school; however, in areas where free grazing is banned there is no need for children's labor to look after livestock and it is observed that the number of children attending school has increased.

5.8.5 Key Lessons from Adopting of Backyard Livestock Farming

Capacity of backyard livestock farming for overall farming system productivity

Backyard livestock farming system is a decisive method to enhance the livestock sector productivity. The system focuses on millions of farmers and if appropriately applied the change is tremendous. As can be seen in areas adopting this system the daily milk yield of local breed cows has increased from 1.5 to 3 liters. Likewise, calves become ready for market in two years and the lambs in 4 months. This yield increment is a decisive step to carry out a value chain-based development work in the sector. In areas where backyard farming system is implemented farmers are highly engaged in fattening of cattle, sheep and goats. Improved forage utilization method and better livestock health services are widely practiced. It is also realized that these activities are creating better employment opportunities and improvements in the economic status of farmers.

What we can learn from other areas or countries is that expanding these kinds of activities

helps for the emergence of local agro processing industries that enhance economic transition in the agricultural economic sector. As it is known a 1% agricultural sector development brings a 4-5% development of other economic sectors. That is why this strategy has multi-dimensional benefits and requires a lot of endeavor for its implementation.

Role of backyard livestock farming system to the green economy strategy

At national level the contribution of livestock to polluting gas emission reaches up to 42%. Out of this the polluting gas that comes from ruminant livestock /sheep, goats and cattle/ is estimated up to 80%. As it is known the amount of polluting gas released from a single head of livestock depends on its health status, the type and amount of fodder it consumes, its age, its daily movement as well as the way how manure and urine of the livestock is handled.

Backyard livestock farming system improves health conditions of livestock and research outputs indicated that the use of improved fodder and industrial by-products drastically reduces emission of polluting gases. In addition, improvements in the reproduction time and the associated productivity make the livestock to be ready for market in a short period of time; thus, as the life span of the livestock becomes shorter emission of polluting gas from each animal also decreases. Moreover, banning of free grazing allows growth of plants intact to the soil and this reduces the amount of carbon emission as a result of soil degradation. On the other hand, backyard livestock farming system is convenient for different mixed farming systems; trees and shrubs and other herbs/plants grow well and sequester polluting gas in their leaves. All these added up significantly magnify the vital role that could be played by back yard farming system in establishing climate change resilient economy.

5.8.6 Concluding Remarks

Land degradation and declining soil fertility is a rampant and serious problem observed across Ethiopia. Tackling land degradation and improving soil fertility is an urgent development issue. Among the development systems that could solve the problems of land management, back yard livestock farming system through organized communities is proposed and implemented as one and all rounded strategy. Assessment of the experiences of other countries has showed that none of them have achieved sustainable development without organizing and undertaking proper livestock husbandry. Especially in Ethiopia because livestock has several purposes and its number is huge, the impact it imposes on the natural resource development and crop production is high in general. Therefore, adopting an efficient livestock management system, backyard livestock is decisive for the country's overall small holders' economic development. In this regard there are good opportunities to implement the backyard livestock farming in the watersheds. These include:

- Awareness developed in the leadership as a result of consultation carried out taking into account the economic and social problems caused by free grazing.
- The existence of political commitment in the leadership to implement the improved livestock farming.
- Awareness created in the watershed users, albeit low level, on the proclamation number 1233/2020 which deals with establishment of watershed users cooperative
- Special consideration given to natural resources development and protection in all parts of the country and the existence rich experience in some places that could be used as a learning ground.

In general implementation of the improved livestock farming system gives an opportunity to change the existing/traditional farming system and bring a transition to better level of economic development in the country. In the absence of improved livestock husbandry, the labour and time of experts and local communities spent on the annual natural resources' development is a huge wastage and their effort no more helps to realize sustainable development. On the

other hand, it should be noted/underlined that implementation of improved/backyard livestock farming system can be taken as a fundamental safeguard to natural resources even in the absence of any kind of soil and water conservation structures. Implementing this strategy in an integrated and organized manner is therefore a matter of urgency, not an option.

Backyard livestock farming is a practice of raising animals such as chickens, goats, pigs, or ducks in a small area of land, usually within an urban or suburban setting. Backyard livestock farming can have many benefits, such as providing fresh and organic food, reducing environmental impact, saving money, and enhancing animal welfare. However, backyard livestock farming also requires careful planning and management, as well as compliance with local regulations and ordinances. Some of the factors to consider before starting a backyard livestock farm are:

- The size and location of your backyard
- The type and number of animals you want to raise
- The housing and fencing needs for your animals
- The feed and water sources for your animals
- The health and veterinary care for your animals
- The waste management and sanitation for your animals
- The legal and ethical issues of backyard livestock farming.

Backyard livestock farming can be a rewarding and enjoyable hobby, as well as a way to contribute to a more sustainable and humane food system. However, it is not a decision to be taken lightly, as it involves a lot of responsibility and commitment. If you are interested in backyard livestock farming, you should do your research and consult with experts before you begin.

5.8.7 Forage development Strategies

The following are the major land use based approaches for forage development

i) Backyard forage production

Backyard forage production is the growing of forage in the house compound. Forage plots or hedges in the backyard of the farmhouse are an easy and quick way of increasing forage production. The forage planted in the backyard is easily established and highly productive because of availability of more fertile soil in the backyard and because of better protection and management that can be provided. In addition, forage is produced near to where the animals are usually tethered and can be utilized as feed supplement for highly productive animals. A small plot of 100 m2 size can provide 150 kg dry matter per year; that is 1 kg per day for 5 months which is enough to supplement feed for one large animal, particularly if the forage species planted is of high nutritive value and produces better biomass, which is always advisable. The size of the plot could be varied depend on herd size and land holding of the household. Key species for a backyard forage in different agro-ecologies of Ethiopia include, Leucaena, Sesbania, Pigeon pea, Tree Lucerne, Vetch, Greenleaf, Silverleaf, Alfalfa, Oats, Rhodes grass, Elephant grass, Panicum grass and Phalaris grass

ii) Forage development in stock exclusion or closures areas

This is the introduction of improved forage species into areas from which livestock are permanently excluded. These areas have often become generally degraded with little quantity and quality forage. The strategy is designed to prevent further soil erosion, improve soil fertility and provide forage for cut-and-carry management. Suitable species include: Herb legumes: greenleaf and silver-leaf desmodium, siratro, glycine, verano stylo, seca stylo. Grasses: - rhodes, buffle. Tree legumes: tree lucerne, sesbania, lukina. Area closures refer to restricting livestock and human access to an area to allow regeneration of a degraded ecosystem. This is common practice in rural areas of Ethiopia. Herbivore animals and any human misuse are excluded so

that the ecosystem can regenerate and increase its productivity. This land use-based option is, therefore, more of land rehabilitation than a feed improvement practice. However, it serves both purposes well. The success of this strategy mainly depends on the involvement of different sectors and introduction of appropriate technology that may enhance productivity and natural resource rehabilitation. Excluding livestock is an important means of protecting degraded areas of communal land.

iii) Gully rehabilitation as a base for forage development

This is an innovative way of producing fodder in gully areas. Forage plant species are planted along the gully banks, the gully wall and inside the gully to rehabilitate the gully and at the same time to produce forage

iv) Forage development on Farmlands

Most common one is under sowing. It is Establishment of forage species in annual or perennial plantation. This strategy provides a most convenient way to rapidly increase on farm forage supplies for a large number of farmers and can have a major impact in the short to medium term. The use of legumes improves the fertility and structure of soils for food crops. Common Examples are: Lablab intercropped with sorghum, under-sowing of forage and wheat. Under sowing works best with sprawling, low-growing annual legumes but can also work well with climbing dual purpose legumes. The strategy is particularly suited to the tall cereals - maize, sorghum or finger millet – but can also work with other crops like wheat.

v) Fodder crop system or pure stand

The fodder crop system involves the growing of high yielding, high quality short-term forage crops for intensive livestock feeding system. It is cultivated in an area which is suitable to the crop and could be under irrigation or rain-fed. Most of these crops are high feed value and supply green feed for long period of time. Because these forages have high feed value they are mostly given to highly productive animals such as dairy cows and finishing animals. Some of the crops such as Alfalfa, Oats, Vetch and Fodder beet can be grown over a wide range of altitudes.

Fodder crop system is **promoted** on fertile soils, For intensive livestock enterprises mainly dairying, where extra land is available so that food production will not be reduced and In sites convenient for cut-and-carry utilization

vi) Forage developments in grazing land

This forage improvement strategy is applied to newly establishing pasture and to encroaching existing grazing land. But establishing new pasture may demand high cost and may be applicable only to high-producing enterprises with high cash returns. It has a high management requirement and seeding rates. Some form of stock control or community bylaws need to be implemented to protect the pasture from overgrazing.

Suitable Species

- **Low altitude:** Rhodes, Green panic, Desmodium, Siratro, Stylo
- **Medium altitude:** Phalaris, Rhodes, Setaria, Desmodium, Trifolium
- **High altitude:** Phalaris, Cocksfoot, Tall fescue, Trifolium, Vetch (mainly as a pioneer species.)

MODULE 6: SUSTAINABLE FINANCING MECHANISMS IN COMMUNITY BASED LAND MANAGEMENT

6.1 Definition and Basic Considerations for Sustainable Financing

Sustainable finance: It refers to an organization's ability to raise resources to fund its activities, based not only on financial criteria, but also on environmental, social and governance considerations. Traditionally, decisions were made based exclusively on financial considerations alone, whereas today, environmental, social and governance issues are being factored in which are important for us to contribute to a sustainable development.

Hence, **sustainable finance is defined** now as investment decisions that take into account the environmental, social, and governance factors of an economic activity or project.

Environmental considerations might include climate change mitigation and adaptation, as well as the environment more broadly, for instance the preservation of biodiversity, pollution prevention and the circular economy. A circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.

Social considerations could refer to issues of inequality, inclusiveness, labor relations, investment in human capital and communities, as well as human rights issues.

Governance refers to public and private institutions including management structures, employee relations and executive remuneration which plays a fundamental role in ensuring the inclusion of social and environmental considerations in the decision-making process.

6.2 The Rational for Sustainable Financing

The origin of sustainable financing can be traced back to the 1970s. It was realized that constant economic and productive growth is not possible and that it comes with a set of environmental problems. Another model of thinking came into being was sustainability and sustainable development applied to production and finance.

The financial sector has a key role to play in reaching sustainable development goals. It can

- re-orient investments towards more sustainable technologies and businesses
- finance growth in a sustainable manner over the long-term
- contribute to the creation of a low-carbon, climate resilient and circular economy.

With increasing frequency, governments and financial and non-financial organizations are relying on the so-called sustainable finance instruments to fund projects intended to create a positive impact on the environment - such as the development of eco-friendly energy sources - and promote social and inclusive growth. Development partners strongly support the transition to climate-neutral, climate-resilient, low-carbon, more resource-efficient and sustainable economy and has been at the forefront of efforts to build a financial system that supports sustainable growth.

The Importance of Sustainable Financing for Sustainable Land Management

Sustainable land management is a continuous process that requires ongoing investment for maintenance, productive use and management of natural resources. Currently, the bulk of investment funds for sustainable land management activities come from the federal government, donors, NGOs and local communities through community campaigns that mainly include labor mobilization. However, considering the growing demand to address land degradation challenges and ensure the continuation of sustainable land management investment throughout

the country, acquiring innovative financial mechanisms that could be tapped to support the promotion and scaling up of Sustainable land management need attention. To this effect, sustainable development Programme and the government have recently been exploring different approaches to ensure sustainable financing for country-wide implementation of sustainable land management. Generally, natural resources management/ conservation is capital intensive that requires sustainable finance.

6.3 Costs and Benefits of CBLM

6.3.1 Elements of CBLM interventions in the cost/benefit valuation

As a multi-sectoral intervention, community-based land management has various forms of costs and multidimensional benefits. The cost-benefit analysis involves identification of all relevant components of land management, quantification of the items, and translating them into monetary terms. The cost of CBLM measures can be categorized into two: 1/The conservation/ rehabilitation and development measures and 2/the management, and sustainable and equitable use of resources.

iii. The conservation/rehabilitation and development measures

From the conservation or rehabilitation point of view community-based land management measures comprise both structural and non-structural measures. The structural measures can be defined as permanent features formed from earth, stone or masonry that are designed to protect the land from uncontrolled runoff, encourage infiltration into the soil and retain water where needed. Non-structural measures could be vegetative and agronomic measures that promote soil and water conservation through reduced runoff, encouraging infiltration and moisture retention, and reducing evaporation to the atmosphere. The development measures are practices to develop/produce good and services for both the benefit of the land users and the environment. The development measures include agricultural practices (crop and livestock production), forest development and agroforestry practices, ecosystem maintenance and climate regulation, ecotourism, etc.

iv. The management, and sustainable and equitable utilization of resources

The management, sustainable and equitable utilization of resources include practices such as protection of resources from external destructive factors/agents, activities applied to enhance quality of products, improve the health of the resources, and ensure sustainability of the resources and the benefits gained from the resource. Resource governance/administration issues are part of the management interventions that have to be considered as management practice.

Therefore, management, sustainable and equitable utilization of resources incur significant costs in land management that must be properly considered in the management and development of resources.

6.3.2 Costs and Benefits of CBLM

Costs of community-based land management

For simplicity, to be easily valued by land users/communities with local capacity, the costs of community-based land management intervention/practices can be categorized into material, technology, and labor costs. However, for special interventions such as land use changes, changes in production systems may have opportunity costs. The costs in each category must be properly evaluated and considered during the preparation of management plans of land resources.

Most importantly, the costs can also be grouped based on different land management practi-

ces, which help see the cost categories at different level of land management. The cost categories that have to be evaluated properly and help make comparison with the multidimensional benefits of each land management practices are investment and maintenance costs.

Investment/establishment costs: Costs that farmers incur in implementing land management practices can be classified as investment costs, since farmers expect to realize benefits from implementation, though often only in the long-term. All costs in the base year (base year = year 0) are regarded as establishment costs. The investment costs incurred in base year are costs of laying out the practices in the landscape/watershed, costs of construction and/or establishment of the practices, and costs of stabilization (establishing stabilizer materials, e.g. grasses).

Maintenance Costs: Costs thereafter establishment can be taken as maintenance costs, usually annual management costs. Annual maintenance costs include costs such as maintenance (where relevant) and other management costs. In establishment of forests for example are weeding and cultivation, pruning and thinning, and protection of diseases and pests.

Even though it is very complex task for communities to estimate exactly the cost of investment and maintenance costs in the dynamic farming system, it could be possible to estimate the costs communities incurred at least for labor, inputs, and possible opportunity costs.

A. Labour

The amount of labour (in person-days) required to construct and maintain the practice/s vary with the volume of the structure/practice to be constructed/established and maintained on the area and the slope of the land. Labour required for collection of the material from the source to construction/establishment site has to be considered and valued. It has to also include skilled and semis-skilled labour used for establishment (during lay out and establishment). Labour inputs for land management interventions differ with the type of practice, availability of labour source and amount of labour payments.

B. Inputs (tools and equipment)

Land management practices requires tools and equipment during establishment and maintenance. The type of tools and equipment used for establishment/construction, their current prices (comparing these with market prices) and expected lifespan (and salvage value if any) must be properly considered. Most frequently used tools for construction/establishment should be included as a form of investment.

C. Opportunity costs

Opportunity costs represent the benefits forgone by choosing one option over another. Recognizing opportunity costs can help land users or communities make better decisions in all aspects of land management. This cost has to be estimated and considered when cost benefits of community-based land management practices are planned and applied.

Benefits of community-based land management

It is for various benefits that land management at community level is being promoted widely in terms of social, economic and environmental benefits. However, the benefits aren't properly valued and translated into monetary terms, so that the benefits can be understood by land users and the wider stakeholders. If all the benefits are well valued and understood by the land users/communities, it helps them make appropriate decisions on doing different land management practices.

The social, economic and environmental benefits that have to be properly valued are the following:

1. Economic benefits

The most critical concern of communities/land users on land and its resources is the economic uses, because the livelihood of rural communities is highly dependent on land and its resources. All the possible multidimensional benefits getting from land and its resources need to be properly valued and changed in monetary terms. The most important benefits that have to be estimated and properly considered during cost and benefit comparison and for making decisions are the following:

Income and livelihood support

Land management practices, directly or indirectly, aims to increase the productivity of land and its resources and overall production of goods and services the eventually increases income for their livelihood. For the estimation of benefits in monetary terms, goods and services produced due to development/management practices must be quantified and changed into monetary values. The products could be agricultural crops, tree and its products, forage, and meat and milk from livestock, honey and other agricultural produced that have been produced in the particular areas. Production of goods per unit area of land needs to be estimated and changed into monetary values.

Current market price for products/goods and labor are considered for estimation of benefits in monetary terms. Long term benefits could be included in the estimation using the formula to estimate net present value of benefits.

The following table can be used to describe the possible produces and services, the value in monetary terms.

Table 6.1 Estimation of benefits gained for increased production (gross return) due to land management practices

S/N	Products/Services	Value in Monetary terms (ETB) (NPV)	Remark
1	Agricultural crops in good and bad year		
	Cereal crops		
	Fruits		
	Vegetables		
	Other crop varieties		
2	Livestock production		
	Animal Forage		
	Live animal		
	Milk and milk products		
	Honey		
3	Forest Products		
	Wood/timber production		
	Fruit		
4	Other products		

Social benefits

Beyond economic benefits, CBLM as an approach enables communities build local capacity, ensure equitable use of resources, and reduce conflicts among land users and external stakeholders who do have stake on the land and its resources. As the approach is community based, local knowledge and experiences are better considered; ownership and responsibility can be enhanced. Community driven land management will be instrumental that will reduce workload on government institutions. Moreover, CBLM practices create jobs for communi-

ties and provides wider employment opportunity, so that reduces labor migration from rural to urban areas. Therefore, its role to ensure social security is very worthy.

For social values that are difficult to change into monetary terms, the benefits could be valued using comparative analysis taking some economic benefits that are changed into monetary values. The comparative analysis can be done using community representatives using different tools, such as pairwise ranking.

2. Environmental benefits

Proper management of land and its natural resources plays a significant role in keeping the environment healthy and ensuring sustainability. They provide us with oxygen, food, solar energy, fuel, and other raw materials. Natural resources are important for maintaining the balance of ecosystems and providing habitats for wildlife. Therefore, the benefits of CBLM practices from environmental perspective are very diverse that improve the potential of land in producing goods and services they are providing for direct economic benefits. Some among many benefits that communities need to consider in the analysis of costs and benefits in the planning and implementation of land management practices are indicated here below.

- Climate regulation,
- Carbon sequestration,
- Water filtration,
- Biodiversity maintenance
- Recreation,
- Preserve cultural heritage
- Prevent Soil Erosion and Maintaining Soil Quality
- Reduce Flooding
- Reduce Air Pollution and Water Pollution

Methods of valuation of environmental services of CBLM practices

As most of environmental services do not have market values, it is usually used indirect valuation methods to know the benefits in monetary values. The most commonly described/used valuation methods include: contingent valuation and choice experiment, travel cost, hedonic pricing, benefit transfer, as well as the cost-based methods (damage cost avoided, replacement cost, and substitute cost methods).

The Contingent valuation (CV) and the Choice experiment (CE) are the stated preference methods most frequently used in valuation of non-market forest ecosystem services. They consist in the measurement of values that people attribute to environmental services that are not traded on the market. For the needs of these methods, interview/survey schemes are developed, the purpose of which is to determine preferences with regard to the stated willingness to pay (WTP) for improving the quality of the availability of natural assets or else with reference to the minimum amount of money that someone is willing to accept to abandon a good or put up with adverse changes in the natural environment (willingness to accept – WTA). The stated preference methods enable establishing WTP, based on the choice of scenarios, taking into account the various attributes of a given natural asset, e.g. forest features related to recreation, leisure and tourism, such as e.g.: species composition and age of tree stands, forms of forest protection or the availability of tourist infrastructure.

The Travel Cost Method (TCM) is applied to the valuation of components of the natural environment (forests, national parks, nature reserves), whose “consumption” is associated with the necessity of incurring expenses determined by market prices. For example, a visit to a national park embracing forest areas is associated with expenses for commuting (travel), the cost of which implicitly attests to the quality of tourist/recreational value of the destination. The

turnout of stays and the amount of travel expenditures are, therefore, an indirect indicator of the attractiveness of the forest/national park that constitutes its value to the consumer. This method of valuation allows estimating values related to the quality of the environment and tourist attractions (admiring the views, trekking, recreation, etc.).

The Hedonic Pricing Method (HPM) uses valuation of e.g. a property, depending on its location in the natural environment. The basic premise for using the HPM is the fact that the prices of market goods depend on the existence of non-market (natural) goods, such as proximity to the forest, clean air, uncontaminated water or low noise. As components of the natural environment highly influence real estate prices, it is possible to ultimately estimate the value of services provided by forest ecosystems on the basis of property prices.

Cost-based methods (damage cost avoided, replacement cost, and substitute cost methods)

The damage cost avoided, replacement cost, and substitute cost methods are related methods that estimate values of ecosystem services based on either the costs of avoiding damages due to lost services, the cost of replacing ecosystem services, or the cost of providing substitute services. These methods do not provide strict measures of economic values, which are based on peoples¡¦ willingness to pay for a product or service. Instead, they assume that the costs of avoiding damages or replacing ecosystems or their services provide useful estimates of the value of these ecosystems or services. This is based on the assumption that, if people incur costs to avoid damages caused by lost ecosystem services, or to replace the services of ecosystems, then those services must be worth at least what people paid to replace them. Thus, the methods are most appropriately applied in cases where damage avoidance or replacement expenditures have actually been, or will actually be, made.

Some examples of cases where these methods might be applied include:

- Valuing improved water quality by measuring the cost of controlling effluent emissions.
- Valuing erosion protection services of a forest or wetland by measuring the cost of removing eroded sediment from downstream areas.
- Valuing the water purification services of a wetland by measuring the cost of filtering and chemically treating water.
- Valuing storm protection services of coastal wetlands by measuring the cost of building retaining walls.
- Valuing fish habitat and nursery services by measuring the cost of fish breeding and stocking Programmes.

Determining discount rate and time horizon for cost benefit analysis

Benefits of investments into land management made now are mainly realized in the long-term, thus there is unfavourable distribution of costs and benefits over time. A benefit obtained in the future is not as valuable as the same benefit obtained today. A cost-benefit analysis takes this fact into account by using a discount factor (rate) to reduce the value of the future net benefit and show its present value. Discount rate chosen affects the magnitude of streams of benefits realized and the time it will take for farmers to have positive returns on their investments on practices. It has little effect on the value of immediate costs and benefits but the greater the value of the discount rate, the smaller the impact of long-term costs and benefits on the result of the analysis.

Thus, the appropriate discount rate to use should be the interest rate payable by the farmer at an appropriate bank loan. Discount rates should reflect time preference of rural households on the one hand and opportunity costs of capital on the other hand. However, in the literature, the discount rate commonly used for the evaluation of land management projects is 10% for a 5-50year time period.

Since the stream of benefits derived from land management practices are realized in the long-term, the most practical way of comparing costs and benefits is to estimate costs incurred for implementing practices and the extra income arising from implementation, on a year by year basis over a selected time period (the time horizon). When the time horizon is short, the viability of practices may become questionable and when a longer time horizon is selected, the benefits can be weighed accordingly. However, according to Kappel 1996, smallholder farmers plan their activities over a shorter time period, given the insecure environment and risks they are faced with and there is a drive to use all the available resources for current consumption to secure survival. Therefore, it is advisable to assume a medium time horizon and postulates that the land management activities provide returns within 5-10 years.

Cost Benefit Analysis

The livelihood of local communities. This requires estimating the total economic value of these services (use and non-use values), to estimate the benefits of action or the cost of inaction (i.e., the maximum benefits from action that could be derived). Thus, procedures required to undertake cost and benefit analysis of land management are presented in the following section.

Steps in CBA

CBA as a decision tool requires assessment of sustainable land management options that can reduce or remove degradation pressures, including analysis of their economic viability and identification of locations for which they are suitable. It compares the costs of adopting a sustainable land management practice against the benefits derived from it. By detracting costs from benefits, the net economic benefit from action in sustainable land management course of action can be determined. Key steps in performing a cost-benefit analysis are:

I. Definition of the target group to be guided or informed

II. Definition of criteria: the timeframe for analysis and categories of benefits and costs must be defined in advance. A discount rate is also needed to be able to compare the costs and benefits in time and produce three indicators of success (i.e., net present value, internal rate of return, and benefit-to-cost ratio) to assess whether the action is financially (or economically) worth undertaking

III. Calculating economic benefits and costs under alternative scenarios (e.g., business-as-usual or changes in land use)

IV. Comparing net benefits of action to net benefits from business-as-usual to estimate the 'added value' of action compared to what is already being done

V. Deriving economic indicators of viability to assess whether an action is worth taking from an economic point of view; and,

VI. Undertaking a sensitivity analysis to determine the degree and impact of uncertainty.

One of the major strengths of cost-benefit analyses is that by quantifying everything homogeneously (in monetary units), it allows for direct comparisons between costs and benefits across different scenarios. This can help provide an idea of the scale of desired implementation (e.g., from a village market to international trade) and to identify the most economically efficient and sustainable practice for a given context.

6.4 Financing Mechanisms in Community-based Land Management

6.4.1 Finance from Internal Sources / Local resource mobilization

Recently, in watershed development works, business development based on natural resources is undertaken considering two subjects: (1) optimizing economic benefits by creating alternative livelihood options (income and jobs) for local communities; and (2) maintaining sustainability of rehabilitated areas through reinvestment of economic value gained from resource use). However, the key limitation or bottle neck is to access sustainable financial source that support communities, primarily to increase production and productivity and income, and secondly to reinvest on resource conservation, maintenance, and further development of the resource base.

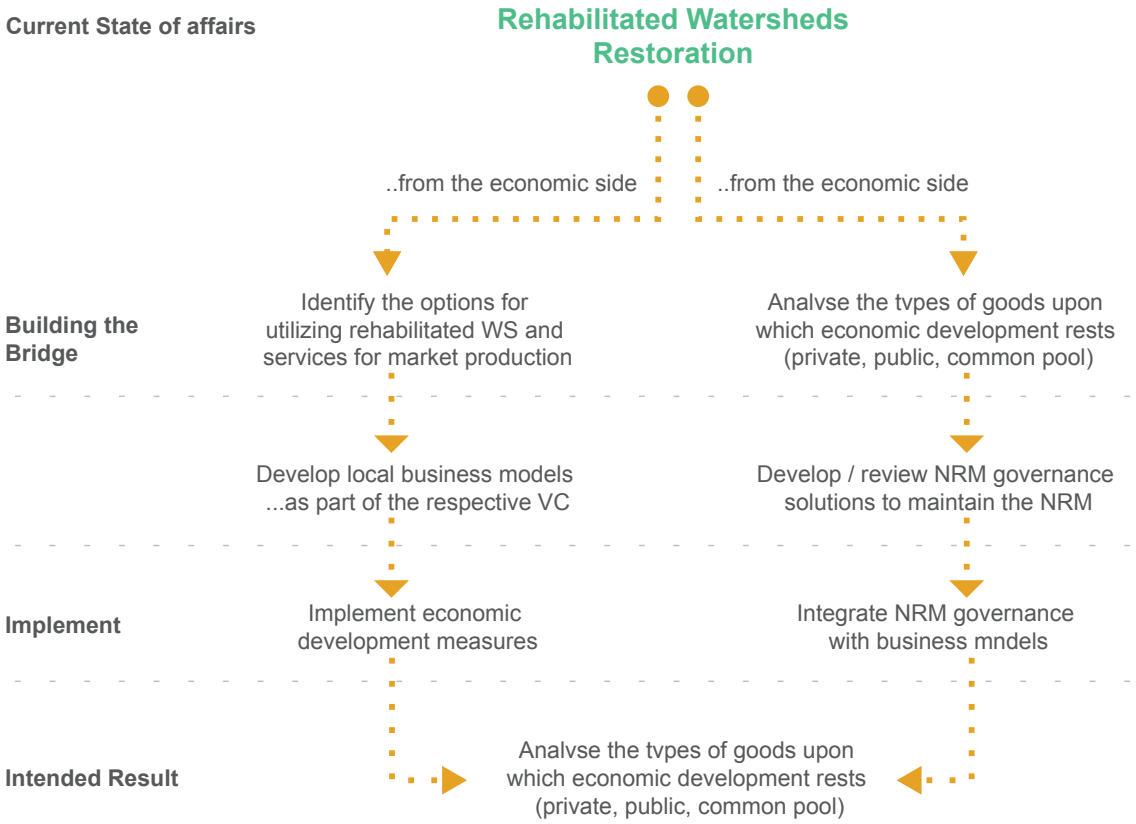
The primary option to support land management interventions is mobilizing internal resources mainly from the local community and local materials. Beyond communities, creating partnership and development collaboration with the private sectors who are indirect beneficiaries of watershed resources, and engaging them could be another option to mobilize local resources.

Therefore, involvement of communities and the private sector in land management interventions help to ensure the sustainable engagement to developing land resources for diversified and maximized benefits both for direct user communities and indirect users who may involve in supply of inputs/technologies, market products to end users, and access environmental services from watershed development impacts. Some among the benefits from inclusive engagement of diverse actors will be the following:

- local communities receive benefits from rehabilitated watersheds to ensure the sustainable use of resources like grass, trees and other products.
- benefits of rehabilitated watersheds should include 'immediately' obtainable increased income for communities.
- activities undertaken in the rehabilitated watersheds must at least maintain and ideally enhance productive capacity of rehabilitated watersheds.
- measures should focus on linking diversified and environmentally friendly valuable products to output markets.

Thus, ensuring the sustainable use of rehabilitated areas is a concern for safeguarding returns on resources invested in rehabilitation works and optimizing the use of natural capital. The conventional approach of NRM is skewed towards physical and biological measures of conservation rather than socio-economic elements. The concept of 'protection through production' argues that the economic value gained from the use of rehabilitated areas should be partly re-invested in the rehabilitation of natural resources on top of improving livelihoods of local communities (the linkage is shown in the figure below.

The central tenet of the 'protection through production' framework is that the community's dependence on external resources for implementing and financing rehabilitation efforts is minimized. A sense of ownership among the ultimate beneficiaries of the resource base is increased as they put part of the economic value of their production into maintaining production capacity of the natural resource.



The above argument shows that community is one source of finance to rehabilitate degraded lands, protect and use sustainably. Community members can pool their own resources through their organization. The watershed users' cooperatives established are legal organ to collect, allocate and administer financial resources from members and other stakeholders. They can collect money from their members as a shareholder and other contributions with different purpose.

6.4.2 Finance from External Sources/ Grants and loans

The SLMP experience reveals that communities need economic incentives to protect and maintain rehabilitated areas through better access to market for products and services. In this regard, partnerships between development organizations and private sector partners are becoming important. Private companies are proactively choosing to run their businesses in ways that help ensure lasting sustainability. These firms collaborate and co-invest with communities in activities that are designed to simultaneously achieve development objectives and address key business interests.

The community through its organization can access resources from different stakeholders including government, NGOs, Civil societies, international development partners and the private sector.

Some methods of accessing finance from external resources include:

- Develop a proposal with the support of extension workers and seek resources showing the interest, the progress and current management capacities of the cooperative and their collective efforts from government, international and national organizations and the private sector.

- Mainstreaming natural resources conservation into any development efforts of outsiders in the community and the surround area. For example, agriculture, health or education or any other projects to intervene in the community.
- Requesting payments for the ecosystem services they are rendering fulfilling the requirements (section 5.7 gives the details of the payments for ecosystem services).

The cooperatives can also borrow money from financial institutions through their umbrella organization or micro finance institutions or saving and credit associations as per the regulation of the financial institutions in the country.

Who are the key providers of sustainable finance?

Climate funds, such as the Green Climate Fund, Adaptation Fund, Global Environment Facility and Climate Investment Funds, are multilateral funds for climate change adaptation and mitigation projects, funded through contributions from individual countries.

National governments determine the amount of public funding earmarked for green investments, as well as institutional support for them. They can also support the design of dedicated domestic investment vehicles such as national climate and environmental funds.

Central banks and regulatory authorities can also steer the finance sector towards green investments through policies and regulations.

Micro-finance institutions and saving and credit Associations: at local level, these institutions are accessible for the watershed communities to provide loans in the framework of general financial mobilization.

How can sustainable finance help support restoration?

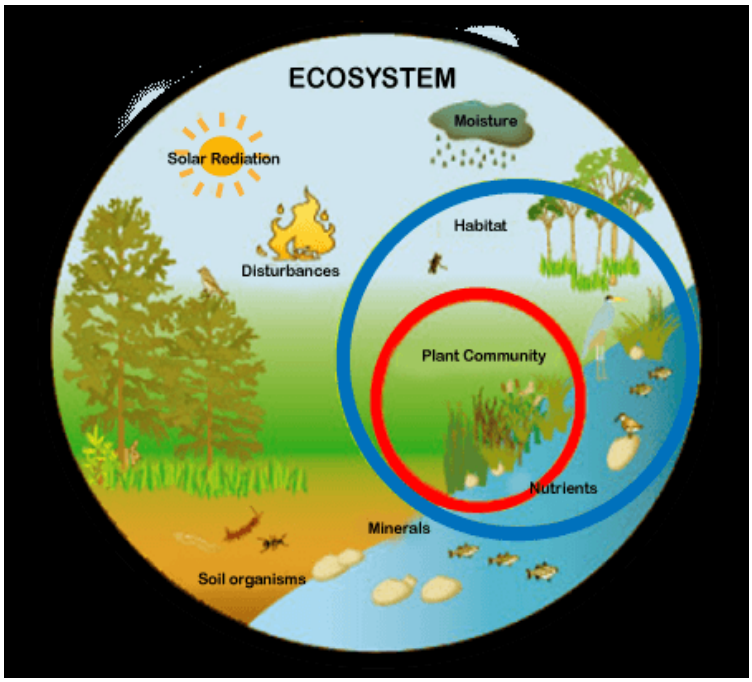
FAO and UNCCD have identified several work streams that policymakers can unleash to mobilize resources to support land rehabilitation:

- **Mainstream SLM in state budgets**: funds can be earmarked for restoration initiatives, kept in check through public expenditure reviews, and SLM can be integrated into national accounting. In the field of development aid, donor countries can also provide funds specifically to support SLM.
- **Set up appropriate funding mechanisms**: these can include national environmental or forest funds or public incentive schemes (such as payments for ecosystem services), as well as support for local approaches.
- **Engage the private sector**: policymakers can work with companies to promote voluntary commitments through corporate social responsibility (CSR) schemes. They can attract investors by developing marketplaces, reducing the risks of investments on NR (e.g. through backing them with public institutions).
- **Build alliances and partnerships**: these can be built at the international, regional, national or local level, ranging from global partnerships to small businesses and farmers at the local level.

6.4.3 Payments for Ecosystem Services (PES)

An ecosystem is a dynamic community comprising populations of plants, animals, microorganisms and the non-living environment interacting together as a functional unit. **Environmental factors,** such as soil type, position in the landscape, climate and water availability, determine the presence and distribution of ecosystems. **The main inputs** to ecosystems are sunlight, soil, nutrients and water, while wastes from one part of the system form fuel for other parts (See fig5.1 below).

A key output is biomass (or carbon-based life) regenerating itself. **An ecosystem functions** by continually cycling energy and materials through living organisms that grow, reproduce and then die.



Source: Web site https://www.javatpoint.com/what-is-ecosystem

Payments for ecosystem services (PES)

The idea that human society benefits from the environment or nature in various ways, both directly and indirectly, is certainly not a new one, and can be traced back several millennia.

The concept of ecosystem services was brought into widespread use by the Millennium Ecosystem Assessment (MA), a global initiative set up in 1999 to assess how ecosystem change would affect human well-being.

The MA defines ecosystem services simply as: “the benefits that people obtain from ecosystems”. This encompasses both goods, such as food, and services such as air purification.

Payments for ecosystem services (PES) occur when the beneficiaries or users of an ecosystem service make payments to the providers of that service.

- In practice, this may take the form of a series of payments in return for receiving a flow of benefits or ecosystem services.
- The basic idea is that whoever provides a service should be paid for doing so.

Categories of ecosystem services

The MA divided ecosystem services into four categories:

I. **Supporting services**. These are services, such as nutrient cycling and soil formation, which are needed for the production of all other services.

II. **Provisioning services**. Products obtained from ecosystems, such as food or timber.

III. **Regulating services**. The benefits obtained from the regulation of ecosystems, including services such as purification of water, flood control, or regulation of the climate via carbon sequestration.

IV. **Cultural services**. The benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences.

V. **The last 3 are ‘final services’, those that directly contribute to human well-being;** Common International Classification of Ecosystem Services (CICES) uses these threefold

division. Figure 5.2 illustrates the three ecosystem services

A. Provisioning services are material outputs,
B. Regulating services are the mediation of aspects of the environment that affect people's well-being,
C. Cultural services include non-material, intellectual benefits.

Source: Website: https://www.shutterstock.com/image-vector/ecosystem-services-subdivision-categories-collection-outline-2128033043

Why payments for ecosystem service?

1. Despite the importance of the ecosystem services to people, in the past many have been taken for granted, being viewed as free and infinite.
2. Many of the ecosystem services are under severe threat from man-made pressures
   - Habitat degradation, over-exploitation, invasive alien species, pollution and climate change are all affecting ecosystems across the globe.
3. Implementing the ecosystem services approach effectively will require decision makers and other stakeholders to understand the trade-offs and synergies between multiple ecosystem services and biodiversity.
4. PES schemes offer considerable potentials to raise new funds for nature conservation or to use existing funding more efficiently, and that both the public and private sectors can play a role in establishing PES in different contexts.
5. PES is not only a prominent, globally promoted policy to foster nature conservation, but also increasingly propagated as an innovative and self-sustaining governance instrument to support poverty alleviation and to guarantee water, food, and energy securities.
6. PES can be executed to satisfy both economic and environmental objectives and demands.

PES options

PES options or Programmes are based on the following ecosystem services

1. carbon sequestration and storage

2. biodiversity protection/bundled services (highly efficient but very difficult to organize and maintain)
3. watershed protection (often occurs when at least one stakeholder recognizes the need for resource protection and a willingness to pay suppliers ensues, often using intermediaries such as government or nongovernmental organizations (NGOs) to channel payments from users and suppliers.
4. landscape beauty (for example, for ecotourism).

PES initiatives in Ethiopia

1. Humbo Community-based Natural Regeneration Project, SNNPR

- The first PES project in Ethiopia (a carbon trading initiative) funded by World Bank, a farmer-managed natural regeneration approach was used to restore the degraded natural forests, with village-level co-operatives.
- The seven CBOs in the project began to receive payments for the carbon credits in 2011 directly benefiting 5,000 members – and indirectly also benefiting the 2,000 local people who declined to join the CBOs.

2. A Study to Introduce payments for ecosystem services in Ethiopia

- Ministry of Environment, Forest and Climate Change (EFCCC) of Ethiopia has initiated a study in 2017 to charge fees from different companies and individuals who directly and indirectly generate income by using the natural resources of the Country.
- The study was started with pilot project on the lakes of Hawassa and Zeway, targeting resorts, flower farming, irrigation using farms and boat owners.

3. Other initiatives:

- Eden water bottling has already started payment for ecosystem services, and Raya Brewery has agreed with the Tigray regional government to fund the conservation of upper catchment.
  - But EFCCC made a study to integrate such initiatives into national PES framework.

4. National Strategy and Road map for Payment for Ecosystems Services for Ethiopia

- This strategy was prepared by EFCCC in collaboration with UNDP/GEF under the project Mainstreaming Incentives for Biodiversity Conservation in CRGE.
- The main environmental scope of PES is to change the land use and management including the implementation of correct conservation measures which directly improve (or slow/halt/reverse the decline of) the conservation status/ecological condition of ecosystems and the ecosystem services targeted.
- The document has three parts,

i. Baseline survey
ii. Feasibility study and
iii. PES strategic plan

The PES strategic plan has proposed different kinds of PES schemes considering their potential opportunities, conservation measures, and land use/land management changes.

6.4.4 Revolving Fund as Financing Mechanism

Watershed users' cooperatives can sustainably use the fund they could raise from internal sources (members contribution and sale of watershed-based resources) and fund they could receive from external resources (government, private enterprises or other development organizations). One of the fund management system commonly practiced for cooperatives is revolving fund method. Many cooperatives have turned to the "revolving fund" method of providing assets for use in performing their functions.

A revolving fund is a gap financing measure primarily used for development and expansion of small businesses. It is a self-replenishing pool of money, utilizing interest and principal payments on old loans to issue new ones. A revolving fund is to give loans to members to be

expended or invested for a specific purpose with the condition that repayments or benefits or income from the fund may be used again to give loan to other members of the cooperative. The loan is given to members who have interest and willing to use the money for the specified business or purpose and willing to repay the principle with interest.

The revolving fund is vital for its borrowers as they get easy and convenient finance. Similarly, it is essential for the users as they get the return on investment and borrowing option in case of need, and that too at affordable rates.. And if managed properly, revolving funds build self-sufficiency.

How Does the Revolving Fund Work?

- The initial loan of revolving funds came from its members, donors, Government, or a third party. Then this fund is collectively given to its members who need money where the cooperative charges interest at a nominal rate or lower than the market rate.
- At the year-end or after a specific period, the fund is returned by a borrower to the cooperative. Again, the fund is given to another willing borrower or invested or expended.

Sustainability of revolving funds

The operations of the revolving fund are to be monitored periodically. It usually becomes self-sufficient after a specific period, but factors responsible for its failure are inflation, imbalance in interest income and expenditure, liabilities, hefty legal expenses, etc. The proper management of the fund and fast recovery of the cost generates a sense of ownership and financial viability and increases sustainability and faith.

The performance of a Revolving Fund is assessed based on the number of entitled beneficiaries, the level of repayment of Revolving Fund loans, the recirculation of funds, and the increase in the welfare/economic capacity of beneficiaries. Based on these performance indicators, the longer the operation of the Revolving Funds, the more people who obtain the funding facility and the more people whose welfare are improved.

6.5 Business Planning in Community- based Land Management

6.5.1 Watershed Development as a business

Watershed development is an integrated approach that includes sustainable management of natural resources, enhances production and productivity, improves the livelihood of the community, and ensure environmental security. It is a dynamic and inclusive approach that intends to address the diversified interests of the community in terms of social, economic, and environmental benefits. Therefore, it is very vital to see the watershed management interventions from business development point of view, as all investments in managing resources have costs and benefits that must be evaluated to maximize gains from multidimensional aspects of the community and the watershed environment. The watershed community mainly the community leaders should have adequate understanding and knowledge about the concept of business from development of point view, how business plans are prepared both for communal interventions and for individual engagements in the watershed. Business plan is a requirement for the proper management of resources specially in using the limited financial resources for more profitable and environment neutral business and to address poverty alleviation in the rural communities through the creation of innovative jobs for youth and women.

6.5.2 Definition of Concepts

What is a business?

From the land management point of view, a business is a either commercial or other development (in terms of bon in monetary and non-monetary terms) activity that is designed to supply

goods and/ or services that are demanded by the market at a profit. In a normal business set-up, a given set of inputs are processed and converted into outputs, which may be goods or services. The figure below is an illustration of the business concept in farming.

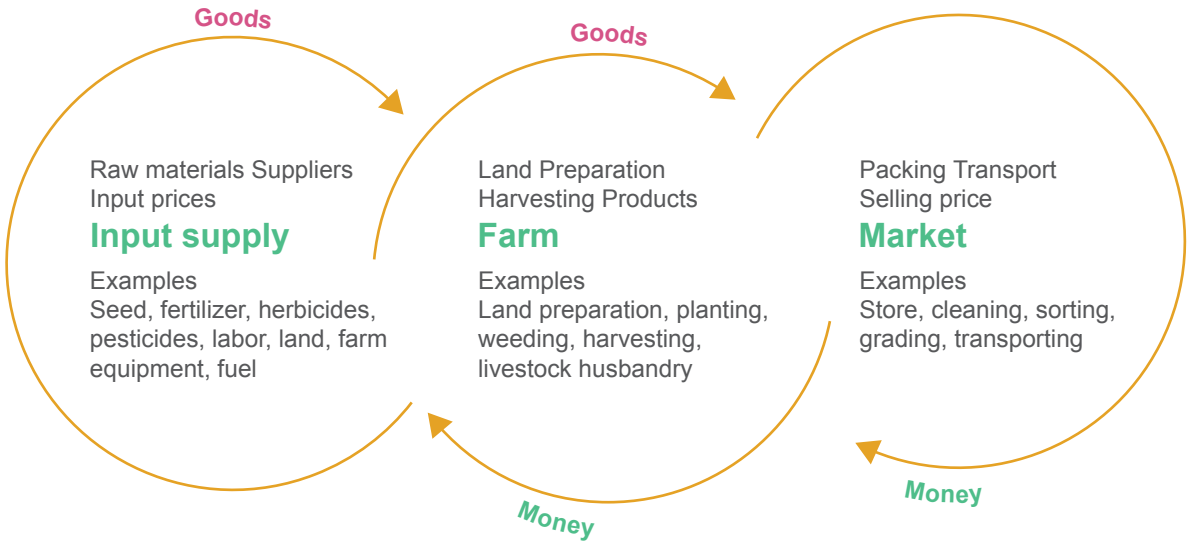


Figure 29: Illustration of Business concept

The Farm Business

Farm business means a business that engages in agricultural production, including provision and use of agricultural inputs, tillage of the soil, livestock production, poultry, dairy, forestry, horticulture, bee keeping, fish farming or any other activity undertaken to produce, process, and market agricultural products. The farm business is made up of three main parts: input supply, the production unit/farm and the market. As a system or business process:

- ***Inputs*** go to the production activities where products are made, and products go to the market to be sold. This is the physical flow of a farm business.
- ***Money*** is spent on inputs. Inputs are used to produce products. The products are sold on the market for money. The money returns to the farm. Some of it is used to buy more inputs. This is the financial flow of a farm business.

Table 6.2 Key business principles applicable to a farming business

Business Principles	Description
Investment of resources with a profit motive	All business resources are invested with a motive to make profit.
Provision of products or services to satisfy the market.	Businesses offer goods and services of value to satisfy the market in exchange for a monetary return.
Legal and ethical activities with a defined purpose.	Businesses undertake activities that conform to the laws and standards of the society in which they operate, and they clearly state what they exist to do for customers and stakeholders
Plan, analyze the environment, and manage risk	Businesses make plans, continuously check what happens within and outside of the business, stay alert to uncertain events, and work to reduce potential loss
Record keeping.	Businesses keep up-to-date records for reference in planning and decision making
Relationship management and continuity.	Businesses develop long-term relations with other stakeholders and continue to operate even beyond the life of the founder

What is a business planning?

A business plan is a document describing the status and the future plans of a business, its products or services, strategic goals, how it earns (or will earn) money, its leadership and staffing, its financing, its operations model, and many other details essential to its success. It explains your future goals and how you plan to achieve these goals.

Why do farmers need a business plan?

The importance of business planning is reflected in the proverb, "he/she who fails to plan, plans to fail". Business planning should therefore never be overlooked. Indeed, if you do not know where you want to go you will go anywhere. Starting a business and successfully running it is a journey. It requires business planning. This process equips an entrepreneur's mind with tools necessary to handle problems that may arise. Most businesses fail because they were not properly planned. Business plan will serve the following purpose among others

- Enables you to set objectives and guidelines on paper
- identify problems quickly, before they become unmanageable
- Explain your goals and strategies to people inside and outside of your operation
- Create a standard against which to compare your actual results with your anticipated results
- Keep your operations on track

6.5.3 Business Idea Development/Innovation

A business idea is a short and precise description of the basic operation of an intended business. Before starting a business, you need to have a clear idea for the sort of business you want to run. Your business idea will tell you:

- **Which** need will your business fulfill for the customers and what kind of customers will you attract?
- **What** good or service will your business sell?
- **Who** will your business sell to?
- **How** is your business going to sell its goods or services?
- **How much** will your business depend upon and impact the environment?

A good business idea will be compatible with the sustainable use of natural resources and will respect the social and natural environment on which it depends.

Why do we need to innovate our business?

Starting-up or innovating a business is creating a new product/service for the market, redesigning an existing product/service, or establishing beneficial structural changes within the production system. The market demand for a product fluctuates frequently. One product/service may be good for a particular season but not for the next. Farmer needs to anticipate market demand in order to have timely innovations or improvements in their production system. The situation in farming system is more dynamic than the case in other sectors of the economy. Farmers need to assess their business environment to innovate in their agricultural production.

Starting-up or innovating a business aims to:

- Attract attention towards products, resulting in higher prices.
- Create products that meets the market demand
- Minimize risks in business
- Increase family income.

In order to be successful in business, the farmer needs to thoroughly think of all aspect agricultural operations as a business. These include:

Production

- What are the needs of the market and buyers/consumers?
- Are they going to produce or innovate/improve products that satisfies the market needs?
- What skills are required to carry out these business activities? Do they have it? Who can you ask for advice?
- Do you have enough capital to invest in their business? Where can they borrow money?
- Do they have enough labor to run the business?
- Do they know whether the business will bring them a profit?

Market

- Does a farmer know how to collect market information? From whom or where?
- Who are their main buyers?
- Do they have any relationship with the buyers? What do they demand from agricultural produces (appearance, quality, or price)?
- How do they bring products to the market?
- Do they have power to negotiate in the marketplace?
- Do those products have potential to develop in the future? E.g. are they key products of the economic development strategy of the locality?

6.5.4 Steps in Farm Business Planning

The following 6 major steps are followed in the preparation of business plans by smallholder farmers.

Step I. Situation Assessment

A farming community, be it individual household or farmer cooperatives, should understand existing situations and capacities before setting goals. Identify strengths and weaknesses as well as opportunities and threats which enable them to understand the existing situations. As the result of the assessment communities will identify applicable solutions for problems/issues in their local contexts.

Farming communities has to sort out potential assets which are relevant for running the farming business. Common assets needed for farming operations are:

- ***Human*** (individual capacities)
- ***Assets***: land, water, ability to adapt to new demand for production, etc.
- ***Tools and infrastructure***: production tools, livestock and equipment, road, etc.
- ***Group capacities and relationships***: membership, informal networks, relationship with traders, relationship with trust that facilitate cooperation and economic opportunities, etc.
- ***Financial:*** savings, loans, income from trade, employment, and remittance, etc.

Step II. Vision and Goal Setting

A common issue for farmers is that they hardly spend time to think of what they want in the future. A clear vision and specific objectives for short, medium and long term can help farmers plan their production and business activities more easily and proactively. The more specific the objectives, the better the farmers envision their business.

- Production: What to produce? What to change? How much land do you want to expand/engage?
- Marketing: Which consumers do you want to approach? How much volume do you want to sell?
- Knowledge and Skill: Which technical knowledge do you want to apply? And which skill?
- Tools: Which production tools you require? Which approach & technologies are accessible?

- Role assignment: How do you assign group of people/community, family provision of inputs, production and marketing.

Step III. Business Description

Business description is a detailed description of the business or the business idea which includes

- Name and location of a business
- What the farm will produce/supply
- How did you come up with the business idea/innovation?
- Who is/are the owners?
- Legal status – is the business registered?
- Which business associations are you a member of?
- Current status in terms of what the business has achieved, or how far the owners have come in trying to get the business.
- How the business has been funded to date?
- According to your hopes and plans, how good will your business be in the next 5 to 10 years?

Step VI. Marketing plan

The marketing plan explains everything you plan to do to find out who your customers are and what they need. It also shows how you plan to satisfy their needs while making benefits out of the business. These include:

- Explain why your target market need your product.
- Describe the products and their features
- Describe the target market
- Estimate number of targeted customers who will buy from your farm.
- How often will people buy from your farm?
- How the products will reach the targeted customers?
- How the customers will know about the upcoming harvest?
- How are you going to set prices?
- How do you know that your customers will afford to pay for your products?
- Who are your competitors? How do you plan to beat your competitors?
- How will your business be advertised?

Who are actors in the market and where do you stand?

Farmer has to identify actors of the market for their produce. The actors could be:

- Direct actors: producers, collectors, traders, processors, wholesalers, retailers, restaurants, supermarkets, and consumers.
- Indirect actors: service providers (input suppliers, transporters, extension agents, marketing companies, and financial service providers).

Step V. Description of Products and services

This part is about the details of what it will take to produce the products or services of a farming business.

- Describe what you make and/or sell or describe the services you offer
- Which quality of products will the farm produce?
- Where will the farmer buy inputs?
- Is this supplier reliable to maintain the supply in the quantities required?

- Which special skills are required to produce the planned quality of products?
- Are these skills readily available in your business? If not, how will the farmer get these skills?
- Briefly explain the production process for each of the products of the farm.
- What are the maximum quantities that your business can produce? How much can be produced?

Step VI. Financial Plan

A **budget** is a formal financial plan for carrying out business activities in the future. It shows the process of carrying out an activity and the end result. Budgeting is the planning process or the development of a plan of action (budget).

For the financial plan of a small business, two very important financial planning tools are essential and need to be applied for smallholding farmers. These are enterprise budget also known as gross margin analysis and cash flow budget (can refer detail financial planning manual).

The process of coming up with a farm budget begins with an assessment of individual enterprises on a farm. Enterprise Budgeting is the estimation of costs and returns expected on each enterprise and comparison of the two.

6.6. Management of Financial Resources in Community-based Land Management

6.6.1 Financial Resources in Community-based Land Management

Financial resources are the funds and assets that finance an organization's activities and investments. In simple terms, financial resources are the monies that keep an organization operating, and there are several ways an organization will raise and use its financial resources. Financial resource is a very important resource which an organization needs not only for its functioning but also for its sustained success. For this purpose, the organization need to have systems in place that help it to both fund its ambitions and also to manage its financial resources in support of its daily operations, including funding for improvement of activities.

Financial management is the practice of handling an organization's finances in a way that allows it to be successful and compliant with regulations. A financial management system combines several financial functions, such as accounting, fixed-asset management, revenue recognition and payment processing.

The financial management is about setting procedures regarding how an economic entity or organization process and distribute financial data, like invoices, payments and reports, with security and accuracy. These written procedures also outline who is responsible for making financial decisions at a cooperative and who signs off on those decisions. It revolves around planning, forecasting, and controlling expenditures.

6.6.2 Elements of Financial Management

The three key elements to process financial management in community-based land management are financial planning, controlling, and decision making.

i. Financial planning:

Financial planning, as an *important element* of financial management, ensures that adequate finances are available at the *requisite time* to meet the needs of an organization. A financial plan is a tool to help you decide how to use your money to achieve your goals. Setting financial goals can help to change the future by influencing your current actions.

The financial plan/budget preparation will: -

- Help determine your future expenses

- Allows you to be disciplined in your saving and spending
- Helps you avoid a money crisis
- Allows you to feed less financially stressed

ii. Financial control

Financial controls refer to the development of policies and procedures by an organization to manage its financial resources and operate efficiently. It is essential for cash flow management, budgeting, and the prevention of any fraud or theft. Thus, it enables the business to track and oversee its financial activities to grow and prosper. Financial Controls are based on policies and procedures, are introduced and implemented to ensure achievement of objectives or management of risks.

They include: procedures for approval, procedures for the provision of power and responsibilities, separation of duties, dual signature system, rules that ensure the protection of property information, procedures for comprehensive, accurate, and properly keep the records of all business transactions; procedures for managing human resources and more.

An organization must prepare a financial controls checklist to minimize the risks, avoid future consequences, and ensure sustainability. Its main objectives are –

- Direct, allocate, manage, and employ financial resources per needs, resulting in increased performance and income.
- Improve operational efficiency by evaluating financial data, distributing resources more efficiently, and controlling cash flow.
- Maintain financial accountability and communication at all levels, ensuring all stakeholders comply with fiduciary responsibility, governance, and due diligence obligations.
- Meet production targets, cut costs, and prevent invoice fraud through on-budget, on-target expenditure.

Key Elements of Financial Control

Being in control of organizations finances is as simple as understanding four key aspects of money and then introducing suitable methods to keep them in check. These are:

1. Authority - Control the Who and the How of taking and spending money

It's a big decision to delegate the authority for making payments. It's important that you have checks and balances in an organization to prevent funds from being moved without your ultimate permission. You need the ability to confirm every invoice is real, and that every supplier is genuine.

Being vigilant is a good start. Having regular checks and occasional audits will give you more confidence. Deciding who has the right to make payments, set up new suppliers and customers, raise invoices and so on is an important decision.

2. Cash Flow - Control How much is in the Bank

Cash flow is a measurement of the amount of cash that comes into and out of your cooperative in a period. When you have positive cash flow, you have more cash coming into your organization than you have spending it. When you have negative cash flow, the opposite is true.

3. How to Implement controls

Processes and policies are the simple keys to controlling your organization's finances. A process is simply a defined method of working. With a process, things get the done in a particular way every time. They make your organization operate consistently and when it comes to controlling money, consistency is the key.

iii. Financial decision-making:

This element of financial management relates to financing or investment. This aspect states that investments should be financed in some way or the other. However, financing alternatives can always be considered. For instance, finance can be raised through the sale of new shares, taking credit from suppliers, or borrowing from banks. One of the most crucial financing decisions is deciding on what is to be done with the income from sale of cooperative owned natural resources. – whether to retain them or to distribute to members.

6.6.3 Financial Management at Community-based Cooperatives

Cooperatives and their members should be aware of and pay attention to all financial matters related to the operations and functioning of their collective groups. Members do not require professional qualifications but should have financial training and understand the need for sound financial management for the cooperatives to be successful.

Cooperative financial management can be defined as managing the finances of a cooperative to provide satisfactory service to its members in accordance with the bylaws. Financial management for a cooperative is all about budgeting and making decisions that enable the cooperative to exist and be financially viable, while ensuring the money is spent efficiently.

Financial management is crucial for cooperatives in many ways, including:

- Establishment of appropriate financial management structures and accounting procedures
- Organize accounting books and journals in a professional manner
- Preparation of monthly, quarterly, and annual budget plans and support in compliance with and adherence to the financial policy of the cooperatives
- Help to follow and respect the financial policy of the cooperative
- Record transactions chronologically and perform a monthly, quarterly, and yearly cash inventory
- Assist in processing payments according to the cooperative's budget plan
- Prepare monthly, quarterly, and yearly financial reports and communicate them to the management committee
- Submit the audit report and findings to members at the general meeting

6.6.4 Components of Financial Management in Cooperatives

A. **Financial statements**: Financial statements are official records of an organization financial activities and status. They are important because they enable the evaluation of previous measures and serve as a basis for the selection of future projects. However, the most important financial accounts for businesses are cash flow, income statements, and balance sheets.

A cash flow statement: A financial statement that shows how much money has been generated and spent over a specific period.

A profit and loss statement: A financial statement that shows how much money was earned and how much money was spent over a certain period.

A balance sheet: Annual financial statement that shows a cooperative's assets, liabilities, and equity (total value) at a specific point in time. These three statements are always required at the end of the financial year and after the audit has been completed.

B. **Financial controls:** The systems, rules, and means by which a cooperative monitor and regulates the management, allocation, and use of funds are known as financial controls. In a cooperative, these are the focus of resource management and operational efficiency.

Internal control: This is a process that ensures accurate financial reporting, efficient operations, and compliance with applicable rules and regulations. It includes the cooperative's plan as well as any coordination mechanisms used to protect assets, ensure the integrity and reliability of accounting data, improve operational efficiency, and promote compliance with the cooperative's statutes and regulations. Operational controls, accounting and financial controls, and compliance controls are examples of internal controls.

External control: This is bookkeeping and financial control by an external auditor.

C. **Financial recording**: Financial accounting is the most important primary level of financial management that enables cooperatives to oversee monetary business transactions by showing the correct picture of assets, liabilities, profits and losses.

Keeping financial records is important as it enables cooperatives to:

- Prepare proper and timely financial accounts.
- Provide data for financial management and business decisions in the cooperative.
- Allow for a quick assessment of the cooperative's financial condition at any time.
- Allow management to quickly identify places where problems may arise and potential solutions.
- Allow the cooperative to calculate the taxes to be paid and fulfill the legal obligations of the country's tax and cooperative law.
- Assist in the providing information to funding or credit organizations.
- Increase the likelihood that cooperatives will function sustainably and successfully by providing essential information and details for future financial planning.

6.6.5 Record keeping and management for Cooperatives

Record keeping in a cooperative is the practice of documenting and updating different information that is relevant/crucial for its success. Keeping records is important for accurate information on a cooperative business to make good decisions. Business success depends on good record keeping. All cooperative records should be carefully kept, books, and ledgers should be archived, so that they can be inspected and checked if necessary. Auditors usually recommend that financial records are kept for at least seven years. The statutory yearly audited accounts are kept permanently, as Cooperative Proclamation 985/2016 states that audited accounts must always be available for inspection. Watershed User Cooperatives are supposed to be audited periodically as per the proclamation which requires appropriate record keeping.

Cooperatives keep appropriate recording and management of documentations for the following reasons:

- save a lot of time and effort
- assist in preparing financial statements quickly and accurately
- provide information to enable control of cash for the cooperative
- provide information on which to base business decisions
- enable prompt assessment of the financial situation of the cooperative at any time
- keep a good track of the cost of staff and their performance
- measure the performance against projections which are set originally
- enable management to quickly highlight areas where problems might arise, and remedies that can be put in place
- enable the cooperative to work out how much tax to pay
- fulfil the legal obligations of Ethiopian tax and cooperative law
- assist in providing information required by funding/loan organizations
- help to detect theft
- provide valuable information and detail for future
- increase the chance of the cooperative operating sustainably and successfully.

Types of records to be kept in a cooperative

- Basic information about the cooperative
- Training received

- Production records (quantity of inputs used, labor costs, equipment costs etc.) yields, storage, transport etc.
- Member participation and shares
- Sale/customer information
- Income and expenditure of the cooperative
- Personnel information and documentation

MODULE SEVEN: COMMUNITY BASED KNOWLEDGE GENERATION AND LEARNING

7.1 Concepts and Relevance of Monitoring and Evaluation

7.1.1. Concepts and Definitions

Monitoring and evaluation are two related but different activities. The words are commonly used together.

Monitoring is a systematic and continual collection, analysis, interpretation, and use of data on key aspects of an intervention and/or its expected results to inform decision making.

Evaluation is a systematic process of data collection and analysis, about activities and/or effects of a Programme, looking to provide explanations for observed levels of Programme implementation or changes in social conditions under intervention with the purpose of informing decisions".

The concepts of monitoring and evaluation are interrelated to each other in different ways. In most instants, the words are used together rather than one at a time. The relationship between the two concepts is mainly related to three attributes: **purpose, methods, and complementarity**.

Table 7.1 Relationship between Monitoring and Evaluation

Characteristic	Relationship between M&E
Purpose	Both monitoring and evaluation have a primary purpose of improving the quality of decisions at different levels by furnishing relevant information in a timely manner.
Methods	In both cases, there is a process of collecting, analysing, interpreting, and using Programme related data.
Complementarity	In practice, monitoring and evaluation activities are implemented in an integrated manner. Activities commonly referred as "Monitoring" usually include some explanatory components which are theoretically features of evaluation. Evidence from Programme monitoring describe situations and evaluations explain observed patterns, together providing the full picture of how a Programme is functioning. Programme evaluations also use most of the data generated through routine monitoring.

Despite the relationship, there exists a difference between monitoring and evaluation, the two concepts are distinct. Table below summarizes the differences between the two concepts.

Table 7.2 Differences between Monitoring and Evaluation

Attributes	Monitoring	Evaluation
Frequency	Continuous	Episodic
Objective	Describing	Explaining
Method	Follows trends, compares actual performance with targets	Compares achievements with counterfactual
Performed by	Mostly internal	Internal and External
Uses	Alerts when to act	Provides detailed information on what types of actions to take

Result chain: Monitoring and Evaluation is about measuring and tracking results. That is why it is important to understand what results are, and how to distinguish between different levels of the results chain. In general, a "result" is something that happens or exists because of something else that has happened. The result chain distinguished between five logically connected elements: inputs, activities, outputs, outcomes, and impact.

Table 7.3 Result chain, descriptions and examples

Result chain	Definition	Examples
Inputs	The financial, human, and material resources used for the development intervention	- Extension workers - Machines - Seeds, land, fertilizer

Result chain	Definition	Examples
Activities	Actions taken or work performed through which inputs are mobilized to produce outputs	- Providing trainings - Distributing materials
Outputs	The products, goods or services, which result from development intervention	- Number of trained extension workers - Number of materials distribute
Outcomes	The likely or achieved short term and medium-term effects of an intervention's outputs	- Change in attitude - Resource utilization - Improved land management
Impact	Positive and negative, primary and secondary, long-term effects produced by a development intervention, directly or indirectly, intended or unintended	- Increased production and productivity - Improved community livelihood

Types of Monitoring Activities

i) Input/output Monitoring

Input output monitoring involves tracking of priority information about the availability and quality of resources availed and the volume of services produced in a Programme. Monitoring of inputs and outputs is usually undertaken as part of routine Programme monitoring integrated with implementation of routine operations and projects.

Input/output monitoring provides information about

- The type and volume of resources availed and used in a Programme
- What services are provided to different groups of beneficiaries in a Programme
- Number of people served, and volume of products produced

Routine management information system in an organization is most of the time established to service information for input/output monitoring. It provides regular information about resources and immediate products of Programme activities with the purpose of alerting when decision makers need to take actions.

ii) Outcome Monitoring

Outcome monitoring is the regular tracking of information related to a Programme's expected effect upon targeted beneficiaries. Expected effects in outcome monitoring are those considered as intermediate ones expected to lead to the achievement of what is considered as impact.

Outcome monitoring describes if there are changes in the levels of outcome indicators among target beneficiaries; however, there is no intention to attribute observed changes to a specific Programme or component of a Programme. The Programme may or may not have contribution to the observed changes. And even when the Programme is known to contribute for the observed changes, it is not possible to measure the extent of contribution just from outcome monitoring activities.

Outcome monitoring describes how the situation related to intermediate results changes over time. Behavioural observations regularly measuring the levels of knowledge, attitude and practice related to sustainable land management are good examples of outcome monitoring activities. These regular surveys show if there is any change among target populations in characteristics that potentially lead to an impact like watershed community livelihood improvement and sustainable natural resources management. Apart from describing trends, there is no possibility to attribute observed changes to a single intervention; these trends represent the cumulative effect of all factors of which interventions could be just one of them. In situations where there is a need to assess the level of contribution of a specific intervention for observed changes, an outcome evaluation should be conducted.

iii) Impact Monitoring

Impact monitoring is a special type of outcome monitoring that focuses on expected long term accumulative effects of interventions considered as impact. For natural resource management related Programmes, impact monitoring follows up information on biophysical and socio-economic indicators of improvements and quality of life in the target population. Impact monitoring activities describe how a social condition is affected by the interaction between different Programme/user/context related factors influenced the magnitude and consequence of a social problem targeted by an intervention.

7.1.2 The importance of Monitoring and Evaluation

One can readily understand the significance and importance of measuring progress towards the achievement of objectives using predetermined and quantitative indicators from the statements provided below:

- If you don't measure results, you cannot tell success from failure;
- If you cannot see success, you cannot reward it.
- If you cannot reward success, you are probably rewarding failure.
- If you cannot see success, you cannot learn from it.
- If you cannot recognize failure, you cannot correct it.
- If you can demonstrate results, you can win public support.

Thus, it is important to adopt this concept of measuring results for the effective management of community land management interventions. This entails that the community-based land management need to have an M&E system that shows logical relationship across the expected results from the implementation of community-based land management interventions at community watersheds level, methods how to measure them and their use for informed decision making. It will also help to learn from weakness, optimize use of limited financial resources and person days in the planning and implementation process for effective and sustainable watershed and rangelands development.

Monitoring measures progress towards achieving a given plan. It enables the tracking of progress towards the achievement of the desired results over time and enables informed decisions to be made regarding the integrity and efficiency with which the financial resources are being used and the effectiveness with which planned activities are being implemented. It constitutes a periodic function over the course of the implementation of planned activities managed mainly by internal institutions and their staff. By doing so, it provides timely and accurate information for the community, government bodies, development partners and other principal stakeholders on the implementation status of planned activities/interventions, as well as progress towards the desired changes.

On the other hand, evaluation measures the extent to which changes brought within community watersheds is because of the plan/intervention under consideration or other factors. It is used to measure how well an intervention/plan has met planned and expected objectives. In most cases, it is done by an external body with the ability to provide an objective view of plan/project achievements. In doing so, the primary aim is to determine the relevance and fulfilment of the objectives, development efficiency, effectiveness, impact and sustainability of a given watershed development intervention.

The basic reasons for doing evaluations are to confirm the plans have been implemented, and to be able to answer public accountability issues at least in relation to the use of public finances, but also in terms of benefits to the community. An important secondary purpose is also to be able to benefit from the lessons-learned in planning and design, community involvement and implementation strategies, and resource management issues, which can then be used in planning, design and management of future initiatives.

7.2 Monitoring and Evaluation Framework For Community-Based Land Management

The M&E framework *is one part* of the M&E plan, which describes how the whole M&E system for the Programme works, including things like who is responsible for it, what forms and tools will be used, how the data will flow through the organization, and who will make decisions using the data. In order to monitor, evaluate and report watershed development intervention successfully, the M&E system should provide a proper guidance on how to set watershed development objectives, develop indicators, determine baselines, set targets, design evaluation methods and reporting.

I) Determining Development Objectives

The watershed development plan objectives are designed based on the problem analysis conducted all the way through application of the participatory planning steps. It is just like a solution for the problems and challenges identified within watersheds through community participation. The overall objectives for implementation of a watershed development plan will be depicted in a hierarchical structure that will have the following (see hierarchy of objectives or result chain from table 8.6):

1. **The Impact** – is the ultimate objective of the plan, i.e. the sustainable change of status among the beneficiaries such as improvement in HHs income, livelihoods and resilience to shocks in the face of climate change
2. **The Outcomes** - represent the changes directly attributable to the successful establishment of initiatives that singly or jointly contribute to the impact. For example, increased production and productivity of watersheds (crop & livestock productivity) is part of an outcome;
3. **The Outputs** – represent the products and services derived from the activities initiatives that contribute to the achievement of outcomes. In community watersheds these included developed water points for drinking and irrigation, areas of degraded lands rehabilitated etc;
4. **The Activities** – represent specific actions in capacity building, construction, the rehabilitation etc., that singly or jointly contribute to the required outputs. For example, capacity building training on watershed management, implementation/ construction of different soil and water conservation activities constitute an activity.

Ii) Setting Indicators And Developing The Framework

Key to monitoring is to identify the indicators that need to be monitored. This is a very important step, so you should try to involve as many people as possible to get different perspectives. Indicators may be quantitative measurable (measurable) or qualitative (observational) although quantitative indicators are preferable as they provide more accurate and defensible measures of change and progress. The following should be considered in the process of developing indicators:

- The number of indicators should be reduced to the minimum necessary to meet the key management, learning, reporting and decision-making needs.
- Adequate time should be allocated in the planning process to engage stakeholder participation in the identification of indicators.

In relation to each indicator, means of verification (MoV) must be identified which forms an essential element of the M&E plan for the overall watershed development plan. It identifies the types of data to be generated, the sources of data, the methods of data analysis, the frequency of data collection, the body responsible for data collection, analysis and management; and use of information generated. This is summarized on Table 8.7 (Monitoring Framework provided as an example and to be contextualized).

The Monitoring Framework shows the indicators that will be used to measure the achieve-

ments of the impact, the outcomes, and the outputs, how these indicators will be verified, how often and by whom. Its use will address whether inputs and activities incorporated in the watershed/rangeland development plan are in compliance with design budget, work plans, and schedules.

Table 7. 4 Monitoring & Evaluation (M&E) Framework Example

	INDICATOR	DEFINITION How is it calculated?	BASELINE What is the current value?	TARGET What is the target value?	DATA SOURCE How will it be measured?	FREQUENCY How often will it be measured?	RESPONSIBLE Who will measure it?	REPORTING Where will it be reported?
Impact								
Outcomes								
Outputs								
Activities								

Table 7.5 Key Natural Resource Management Related Indicators with detailed performance monitoring plan

Hierarchy of Objectives (result chain)	Indicators	Means of verification				
		Source of Data	Methods of analysis	Frequency	Responsible Body	Information Use
Impact Improved HHs income, livelihoods and resilience to shocks in the face of Climate Change	- -Changes in household income and livelihoods - -Changes in household adaptive capacity and resilience to climate related shocks	Household Survey	Use of IE methods	Two & half Years or more after implementation	Evaluation Expert	
Outcome - Reduced Carbon emissions - Increased Production and Productivity - Improved Soil Fertility	Quantity of above and below ground carbon accumulation	Field Data Collection	Soil Laboratory Analysis GIS application		Carbon Expert	To measure progress towards outcome To determine whether the watershed development is benefiting the community To take corrective action
	Changes in biomass of the watersheds rehabilitated	Field level measurement	Amount of rainfall modified by local topography and drainage properties DBH measurement		SWC Technical Expert	
	Changes in vegetation cover	Satellite images	Land use land cover change		GIS technical Expert	
	Improved crop productivity for major cereal crops in the rehabilitated watersheds Improved productivity of livestock	CSA production data Household Survey	Use of IE methods		Evaluation Expert	
	Amount of reduced soil erosion (metric ton)	Field level measurement	Revised Universal Soil Loss Equation (RUSLE)		SWC Technical Expert	
	Amount of reduced runoff	Field level measurement	Curve Number hydrological model SCS-CN		"	

Hierarchy of Objectives (result chain)	Indicators	Means of verification				
		Source of Data	Methods of analysis	Frequency	Responsible Body	Information Use
Output - Enhanced community infrastructures - Enhanced environmental Rehabilitation - Improved water supply for human and livestock consumptions	Land area restored or reforested, Number of water points developed by types of service and number of beneficiaries, Increased area under irrigation	Monthly, Quarterly and annual Physical and financial reports at *Kebele*, *Woreda* and Regional levels	Compare target against achievements and analyse relevance, effectiveness, efficiency and sustainability of activities implemented	Quarterly and annually	Das	Informed decision making about quality of implementation
Activities	Bio-physical SWC technologies, Forestry & Agro-Forestry activities, Rangeland Management, Water development for domestic irrigation, Community roads construction, Nutrition sensitive watershed development activities, Capacity building (human and institutional)		Compare target against achievements	Monthly, Quarterly and annually	Das	"

Once objectives with indictors and MoV defined, it is necessary to determine the baseline condition, set targets and decide on the M&E system that should be adopted for measuring results.

iii) Setting baselines

Baselines provide the essential quantitative or qualitative information on the conditions relating to the indicators at the beginning of, or just prior to, the implementation of an intervention or watershed development plan. It involves the collection of data during or before the start of the intended intervention. The baseline requirement and data available in a community watershed should to a large extent be established using the socio-economic and biophysical survey conducted during the development of watershed plan.

iv) Setting of targets

The targets indicate the planned level of results which are to be achieved within an explicit timeframe (quarterly, annually, interim, or over a five-year period). It thus consists of quantitative or qualitative indicators of the results (at the level of impacts, outcomes and outputs) that the community, government representatives (experts & DA) and financing organizations want to achieve in a given time. In setting targets, following considerations should be taken into account:

- Status of the baseline situation before the beginning of the intervention
- Historical trends in the value of the indicator over time
- Urgency and level of the development challenge based on expert judgments and research findings
- Experience from other similar Programmes (lessons learned);
- Implementation capacity (community commitment, availability of external resources, available expert-time, etc.).

v) Setting evaluation methods

One other important aspect of an M&E system is setting of evaluation methods on how to assess the achievement of expected results associated with watershed activities intervened at community watersheds level. The key variables to be considered in evaluation are relevance, efficiency, effectiveness, impact and sustainability of development interventions. For watershed interventions, the relevance measures whether the prioritized and implemented technologies reflect communities need or not. Efficiency is all about whether the resources (human, financial, material etc) invested for watersheds development are used optimally to achieve the desired objectives (inputs used compared against outputs generated), while effectiveness is concerned with attainment of objectives regardless of the way resources are used (outputs/ results generated compared against results expected).

As to impact, in most cases changes brought by any interventions are determined based on comparing treated watersheds with untreated one (treatment vs control). But it is unethical to treat one watershed and leave the other for comparison purpose. Even it is more challenging in Ethiopian context whereby all communities engage in the rehabilitation of their community watersheds, the so-called mass labour mobilization for natural resource management purpose every year. Also, it is difficult to establish control sites due to varying agro-ecologies indicating that it is not possible to establish control community watersheds especially for bio-physical impact parameters. But, if conditions allow, it is possible to establish such micro-watersheds for socio-economic impact variables. Thus, the impact evaluation methods for assessing bio-physical impact parameters should generally be based on what is called dose effect analysis (analysing the differences in extent, quality and number of interventions within a given watersheds), or to focus on the with and without the intervention approach.

To do impact evaluations, a theory of change should be developed for a given intervention based on the expected and projected changes within the community watershed. For example, biophysical soil and conservation measures will have direct onsite, intermediate and long-term impact as described in table 8.7 below which helps in the analysis of results expected to be generated from watershed and rangeland interventions.

Table 7.6 Sample theory of Change for Biophysical Soil and Water Conservation interventions

Watershed Development Interventions	Output	Direct Onsite Impact (immediate impact)	Intermediate Impact	Long term Impact
Biophysical Soil and Water Conservation and Rangeland Management	Area (ha) of land treated/rehabilitated	- Reduced soil Erosion - Reduced excess runoff on to cropland - Improved soil Fertility - Increased Moisture Holding Capacity - Arrested loss of land - Improved/ increased vegetation cover - Area reclaimed (Increased total available productive land)	- Increased crop and livestock Productivity - Increased availability of forage for livestock and bees	- Increased household income - Reduced Mal-nutrition Rate - Reduced vulnerability to shocks - Increased dry season flows - Reduced flash flooding - Reduced Sedimentation - Improved/increased biodiversity (fauna and flora)

Also, as part of evaluation it is important to measure sustainability of community watersheds in order to know what happens to community watershed development intervention and what determines the long-term viability of implementation results. The sustainability of any project depends on whether the positive impact justifies the investments expended, and whether the local community values the plan/project sufficiently to be willing to devote their scarce resource to continuing with its support and maintenance. The answer to this lies in knowing what motivates communities to continue to own and rehabilitate their watersheds and rangelands after the completion and phasing out of intervention activities, which had been implemented in their areas?

This analysis can be done using the following four aspects of sustainable watershed development:

- **Technical Sustainability:** The achievement of technical sustainability is the most important determinant of sustainable watershed rehabilitation. NRM interventions using proper standards for the layout and construction of physical structures will result in greater operational success for the rehabilitation of the environment. DAs should focus particularly on the designs and standards for the various intervention technologies described in this guideline.
- **Economic Sustainability:** Economic sustainability of watersheds frequently depends on the existence of ownership rights, i.e., whether the rehabilitated gully, hillside or farmland is owned communally or through legal certificate by a private individual or individuals. There are always differences in sustainability of rehabilitated watersheds belonging to private individuals or those owned by the community. In general, where these resources are in private hands, they are more sustainable than where they are under common ownership. In order to ensure economic sustainability of community lands therefore, it is essential formulate a community agreement on: (i) *how the rehabilitated environment will be utilized and protected* and (ii) *how the benefits derived from project intervention shared.*
- **Social Sustainability:** Social sustainability is the ability of any social system, such as a community in a watershed to indefinitely function at a defined level of social wellbeing. Socially sustainable communities are equitable, diverse, connected and democratic and provide a good quality of life for its members. DAs and *Kebele* administrators need to ensure that developed watersheds should have not to be a source of conflict, inequality and tension among the community and ensure the establishment of watershed/rangeland users association.
- **Ecological Sustainability:** Ecological sustainability of a watershed can be determined by looking at and analysing the extent to which degraded land has been rehabilitated, with increased forest cover, reestablishment of absent wildlife, improvements in rainfall patterns and increases in water availability.

vi) Reporting and use of monitoring

As the prime purpose of M&E is to serve as a management tool, performance progress and findings and the status of data collected must be reported on periodically, systematically and in a timely manner. The reports produced are generally of two types: (i) those that compare watershed plans versus the actual achievements and (ii) separate indicator reports for various levels of objectives (output-outcome-impact).

7.3 Learning and knowledge sharing in community-based land management

7.3.1 Concepts and Definitions

Knowledge is considered as information that is personalized and which relates to procedures, concepts, observations, facts, judgments and interpretations. Knowledge comprises developed skills, attitude and cumulative experiences which enables systematic, effective and reliable performance of functions by individuals.

Knowledge sharing refers to the process of exchanging information between people, teams, or organizations. This knowledge may be explicit, implicit or tacit.

- **Explicit Knowledge**: is a knowledge that is easy to articulate, write down, and share. It is easy to pass along because it's written down and accessible. Explicit knowledge implies declared knowledge, i.e. knowledge being conscious to the knowledge bearer. Very often, this knowledge is already written down in books.
- **Implicit** Knowledge is the application of explicit knowledge. Skills that are transferable from one job to another are one example of implicit knowledge.

- **Tacit Knowledge:** Knowledge, skills, and abilities an individual gained from personal experience that is more difficult to express or to put into words or otherwise communicate. It is usually transferred through socialization and mentoring

With workers shifting roles more frequently than ever these days and high staff turnovers, being able to transfer knowledge between team members is an essential task for many organizations. Not having documented knowledge and experiences can create major challenge for the other and new experts joining an organization. Hence, organizations need a consistent approach to knowledge-sharing so that information survives even when the people who generated that information move on. And it's just as important that the information be organized in a way that people will find useful when they need it.

7.3.2 The Importance of Knowledge Sharing

In spite of the high number of existing Land management (LM) practices, widespread Land management (LM) efforts in Ethiopia these days do generate noteworthy lessons learned resulting from new technologies and approaches. The continuous collection of promising practices contributes to improved effectiveness of LM efforts in the country, allowing less effective existing practices to be replaced by newer ones as they prove themselves to be better.

Knowledge sharing is essential for a community to achieve success, since it can facilitate decision-making capabilities, build learning organizations (through a learning routine) and finally, stimulate cultural change and innovation. Therefore, it's obvious that managing knowledge properly can bring a lot of benefits to a community. Below you can find a list with some of those we consider as most important and able to influence the way an organization works, in a positive way:

i) Make the communities best problem-solving experiences reusable

Once you develop an effective solution to an issue and it turns out to be the best one so far, it allows members of a community to use it in all future situations. Avoiding redundant effort by managing knowledge properly, saves a lot of time and budget – not to mention that it can significantly streamline work.

Knowledge sharing also improves communication among communities. The members of communities can improve their relationship significantly by sharing and managing knowledge properly, no matter if they work in the same or different departments.

ii) Enable better and faster decision making

When communities are facing problems in management of their land, or they have to solve an internal issue, analyze trends, understand competition or plan new strategies, they tend to look for information and resources in order to support such activities. Information overload can make this process difficult. However, using knowledge again and again in repositories allows decisions to be based on the actual experiences of the members in their institutions established for sustaining their land management efforts. All these tasks can be performed efficiently if it's easy to find what they need and, most importantly, when they need it.

iii) Stimulate innovation and growth

Most businesses have the main purpose of increasing revenue, but this can be a bit difficult when competition increases. By managing knowledge properly, community-based institutions gain access to valuable information and deliver better results. The organization stimulates innovation and, directly, achieves growth a lot easier.

iv) Reduce the loss of know-how

Know-how is another important asset in each organization, and it should be exploited and managed properly. Through knowledge sharing, organizations can capture explicit and tacit knowledge and eventually reduce loss of their benefits.

It's also a great way to make scarce expertise widely available to the entire community. Classic tools like forums, training events, presentations, white papers, etc. did the job before, but more dynamic and peer-to-peer centered knowledge sharing Q&A platforms are making information more easily accessible now a days.

7.3.3 Documentation of Knowledge and Experiences

Documenting knowledge can be difficult as different members of the NRM/Extension workers will carry out activities/processes in different ways but not always the best way. This can offer a great opportunity to gain insight and agree on best practices. From the perspective of documentations, there are three types of knowledge that you need to understand so you can develop a knowledge sharing and knowledge documentation strategy.

Explicit Knowledge: Knowledge is easy to document and write down so it can be easily shared. Data is processed, organized, documented, structured, then analyzed, and stored the result is explicit knowledge.

Implicit Knowledge: In contrast to explicit knowledge, implicit knowledge is difficult to reveal, but it is still possible to write it down (document). Usually the knowledge bearer cannot recall this knowledge by himself, because the information is too obvious to him. When somebody is asked, what he is doing in the morning, he might answer "getting up, taking a shower, having a coffee, going to work, checking the emails…" without thinking about that he first has to get undressed to take a shower, without thinking about the single steps when making a coffee and without thinking about switching on the computer before reading his emails. This kind of knowledge can only be detected by observing or asking in more detail.

Tacit Knowledge is gained over time like skills, ideas and from experience that can be more difficult to document. Therefore, as tacit knowledge is developed through experience, it can be very hard to document to make it easily shared. These examples describe knowledge everybody just has. But there is a lot of tacit knowledge in every employee too, for example how he can persuade other people, how to behave indifferent situations or how to organize a meeting. This knowledge cannot completely be explained, since it is wholly embodied in the individual, rooted in practice and experience, expressed through skilful execution, and transmitted by apprenticeship and training through watching and doing forms of learning. It can just be observed, and it is not sure, if it is possible to detect all of this knowledge or to transfer it to another person.

Ways of transferring tacit Knowledge

If it is difficult to transfer tacit knowledge through language, then how can it be passed on? Certain strategies, listed below, allow a person to infer tacit knowledge from stories, conversations and social interactions. We also acquire tacit knowledge through conscious practice, experience and mindful reflection.

Collaboration and social networks: Online collaboration provides a framework for the transfer of tacit knowledge through a process of "socially constructed learning," according to Harris (2009). This is based on the idea that the social nature of collaborative communities offers the opportunity to learn through shared conversations and discourses among participants. Collaborative communities provide learning opportunities and exposure to new ideas. Also, online social networks seem to be a more efficient way to transfer tacit knowledge than are individual face-to-face interactions, By using collaborative platforms, each person becomes a node in a

network of spreading knowledge, increasing their capacity to transmit to others.

Showing your Work: Showing your work is a strategy that calls for making one's work visible with the intention of transferring the tacit knowledge hidden in how work gets done. This strategy calls for going beyond superficial procedures into the deeper aspects of a person's expertise. Bozarth (2014), in her book, Show Your Work, gathers examples of how to demonstrate showing your work. The "working out loud" strategy involves narrating your work as you are doing it. One example is a surgeon using Google Glass and narrating during surgery to medical students. Another approach is capturing your work after the fact and writing or recording how it was done. By sharing enough information about how you get work done, others can begin to sense, recognize and acquire the tacit knowledge behind the accomplishment.

Storytelling: Organizational stories are considered an effective way to capture and transmit tacit knowledge. Stories transform information into knowledge. Stories provide context that give facts their meaning. Using structured interviews, you can elicit stories from employees getting ready to retire as well as from subject matter experts. Then use best practices to capture, store, analyse and index the stories as part of a knowledge management system. One study demonstrated that participants benefited more from video recordings over written stories because the visual and tonal cues enriched the story with facial expressions, gestures and voice fluctuations (Wijetunge, 2012).

Screening the list of documented land management practices in search of knowledge products requires that first-hand research has to be conducted in communities in which land management practices have been established and sustained. The process of screening and documentation takes time and care to complete, requiring that lists of land management practices be listed and ranked in order of their relevance and effectiveness.

Well-defined criteria are needed to screen community-based land management practices to establish knowledge bases for further sharing of experiences. The following are criteria used to screen knowledge products for documentation in community-based land management:

- **Acceptance**: To what extent is the land management practice accepted by the community/individuals where it is practiced?
- **Effectiveness:** To what extent does the practice achieve its intended results in terms of land rehabilitation and/or increased productivity?
- **Efficiency:** To what extent farmers perceive investing in this technology is worthy?
- **Relevance:** To what extent is the SLM practice suitable for tackling land degradation and/or generating increased productivity?
- **Sustainability:** To what extent is the SLM practice (or physical infrastructure) with locally available resource?
- **Replication for scaling-up:** To what extent is the SLM practice, as it is currently carried out, replicated elsewhere under similar conditions?

Knowledge Documentation (Management) Process:

A. **Identifying Knowledge**: Experienced NRM/agricultural experts who hold key information on how elements within the agriculture organization work and activities/processes that are core to operations. All this knowledge is critical for implementation strategy and operations.

- Policy: Guidelines and rules
- Process: How something should happen (processes of land use and watershed development plans).
- Procedure: Steps for adoption of technologies and approaches (awareness creation, training, coaching, etc.
- Instructions: Step by step instruction on how something is done (e.g application of SLM technologies, conflict management, bylaw development, etc...

- Compliance & Legislation: Essential steps that need to be performed to comply with any regulation that SLM requires.

B. **Acquisition and Capturing Knowledge**: Collecting knowledge to share with everyone. Knowledge capture is the process where you need to convert tacit to explicit knowledge. People are not always aware of what knowledge they hold that benefits the community or individuals.

C. **Evaluating, Reviewing and Documenting**: Evaluate knowledge relevance, accuracy, and applicability processes. Organize your knowledge repository and decide how this information will be documented. It's better to identify your main business processes, procedures, policies and who has the most knowledge of how that process runs. Business process mapping can help include main processes and sub-processes. When documenting processes remember to include relevant policies, procedures, best practices, compliance information, tools and relevant training information.

D. **Storage and Retrieving**: Decide on the best way that everyone can get easy access to this critical information.

E. **Distribution, Use and Easy Sharing**: Documented knowledge and processes must be simple and easy to use. user focused information. This information should be a single source of truth within the business so must be easily accessed.

F. **Evolving New Knowledge**: New knowledge is always is being discovered, every day, continuously developing all the time so you need to harness and document and share.

G. **Maintaining and Analysis**: It is an ever-evolving cycle, additional knowledge needs to be added, processes need to be changed and amended. Analyzing how everything is working or not!

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